

**THE EVOLVING BINARY:
PERSPECTIVES ON INFRA- AND ULTRAHUMANISATION**

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I, Kathleen Bryson, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

For Mom and Dad

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ABSTRACT

We often pigeonhole our surroundings into dualistic categories, e.g., nature/culture. Perhaps evolutionary forces favoured dichotomous brains, or dualistic categories may be only social constructs. These lines of thought led to my research question(s): Do juxtaposed mechanisms of dichotomous black-and-white (essentialist) cognitive patterns exist; and, if so, how do such mechanisms affect cultural and scientific concepts of reality?

My thesis focusses on four classic modes of othering (Human–Animal, Human–Machine, Male–Female, Heterosexual–Homosexual) oft-cited in biological anthropological studies, aiming to reconstruct the developmental forces that can bring about, stabilise or modify such binaries. My thesis therefore also is situated in discourses of sociology, psychology, animal studies, AI theory and gender/sexuality studies.

I explored how rigid – respectively, fluid – the above exemplary alterities were by gathering data on the perceptions of their boundaries as reflected in electronic archives covering 16 years of newspaper reporting in the UK (1995–2010) and then subjecting this data to both a quantitative and qualitative analysis, measuring the fluctuation of ambiguity tolerance.

My results strongly indicate similar temporal patterns of ambiguity tolerance across three out of four dichotomies – including a distinct “millennial effect” of intolerance – and a remarkably stable Male–Female dichotomy. This suggests firstly that received understandings of concrete descriptions in evolutionary theory such as “human”, “animal”, “species”, “tool (machine)”, “homosexual” and “heterosexual” may function as cultural concepts considered to be *natural kinds*, but also are temporally malleable in both popular and academic discourse; and, secondly, that we may have natal (arguably plastic) gender schemata. I show quantitatively and qualitatively that essentialist thinking – as expressed by ambiguity (in)tolerance in socially empowered individuals – functions as an *infrahumanisation* mechanism to protect one’s perceived ingroup, be that humans, males or heterosexuals. I argue instead for an *ultrahumanisation* that may allow for less anthropocentrism, less androcentrism and less heterocentrism.

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1. INTRODUCTION: “SET IN STONE?”

1.1. Setting the Scene

The stone sign is found tucked away behind a noisy and grimy boiler outside the anthropology department of University College London. On it is carved a quote attributed to anthropologist Erik Wolf, describing anthropology as “the most humanistic of the sciences and the most scientific of the humanities” (1964:88). It is within this framework of scientific humanism and humanistic science that my thesis is situated. Touted as this phrase may be in anthropology, there is some sense that the aphorism has become like the stone sign itself, forgotten or hurried past, and even once-important insights may fall into disrepair. There are very few solid attempts of implementing this lofty goal of synthesising the two camps of the sciences and the humanities, though amongst them is work by French cognitive scientist Dan Sperber and British cognitive psychologist Dierdre Wilson (1986) – cognitive psychology being the study of mental processes – as well as work by French anthropologist Pascal Boyer (1994) and American anthropologist Francisco Gil-White (2001). One aim of my thesis is to attempt exactly this.

“Science”, in a common-sense understanding, increases factual knowledge as well as the understanding of causes. In this way, it is often believed, science gets closer to the hidden “truth” of reality. This is a matter of debate (Kuhn 1962). In any case, what humans believe is *true*, and *why* we believe certain “truths” to be true, involves the subject of categorisation. Specifically, categorisation deals with either/or thinking – an object either belongs to one group or does not – and either/or thinking is dependent upon there being a “true” essence to a category. This is how *essentialism* – the idea that objects and/or concepts have immutable and deeply intrinsic properties (Fuss 1989) – is related to *dichotomisation*, a split into two distinct elements that do not overlap. German philosopher Ludwig Klages theorised that in terms of language, this invariably results in one side of that split becoming more privileged (“logocentrism”: Klages 1929; see also Derrida 1967, Bryson 1998, Prasad 2007)

One belief system, *pantheism*, holds that everything in the universe, including all life, is connected and divine, a type of equalising in itself that challenges dichotomisation. Pantheism was particularly championed by Dutch 17th-century philosopher Baruch Spinoza, as a response to Frenchman René Descartes’ famous 1647 dichotomising of the body and the mind (Picton 1905). That division of corporeality from spirit has been vastly influential, yet many dichotomies are social constructs and our frustration with them suggests that we are aware of this, with challenges to essentialism dating back to first-millennium Persian scholar Ibn-Sīnā and arguably even back to Aristotle ca.350 BCE (but see Robinson 2012). In this thesis, I examine four classic dichotomies: Human–Animal, Human–Machine, Male–Female and Heterosexual–Homosexual.

My thesis addresses these dichotomies via an examination of *ambiguity tolerance*, also known as tolerance of ambiguity (TA), first theorised by Polish-Austrian psychologist Else Frenkel-Brunswik (1948). TA has a generally psychometric meaning: “a one-dimensional scale: those who are intolerant of ambiguity are described as having a tendency to resort to black-and-white solutions, and characterised by rapid and overconfident judgement, often at the neglect of reality. At the other end of the scale, ambiguous situations are perceived as desirable, challenging and interesting, usually by individuals who score highly on an Openness to Experience scale [...] and show both sensation-seeking and risk-taking behaviour” (Furnham & Marks 2013:718). When discussing specific studies by others on ambiguity tolerance, the preceding definition will be intended, but in this thesis the term ambiguity (in)tolerance is used in a related but more colloquial sense to mean exactly what it says on the tin: *(in)tolerance of ambiguity*. In this manner I avoid “essentialising” ambiguity (in)tolerance. That said, I inevitably will essentialise by defining multiple terms.

I look at ambiguity tolerance in the UK public through the lens of another “dichotomy” – *biological determinism* (evolutionary adaptation and our genes are responsible for human behaviour and therefore behaviour is predictable; Velden 2010) versus *social constructivism* (the environment is responsible for human behaviour and therefore behaviour is malleable; Vygotsky 1978). But, unlike the sign outside the UCL anthropology department, my thesis aims to demonstrate that these concepts themselves are not rigidly “set in stone”.

Essentialism and the associated mental dichotomies shape the assemblage of concepts with which we perceive our surroundings. Consequently, we tend to pigeonhole our world into dualistic categories such as human/animal, human/machine, male/female, heterosexual/homosexual, nature/culture or good/bad – an inclination that is particularly well reflected in Cartesian Western philosophy, and famously observed by early scholars such as anthropologist Claude Lévi-Strauss (1969); other early sociologists had previously noted cross-cultural classificatory systems in general (Durkheim & Mauss 1902). Such a binary approach is certainly practical, as it allows us to decide, communicate quickly and also provides some sense of security. A social anthropologist might not hesitate to understand dualisms as conventions that do not necessarily describe physical or biological realities correctly. A “traditional” biological anthropologist, on the other hand, works much more readily within dualistic frameworks – and therefore faces conceptual problems in the light of phenomena such as reproductive hybrids, intersexuality, attraction to both sexes or humans who incorporate “inanimate” objects such as pacemakers.

This is where my own contribution comes in: I analyse how traditional binary constructs are subject to shifting boundaries in reports of UK newspapers over the last two decades. A second significant element of my thesis is devoted to describing the mental “tug-of-war” between categorical reasoning and ambiguity tolerance. On one hand, we may well have a “natural” tendency to essentialise and dichotomise, as this enables practical and pragmatic approaches to dealing with everyday problems

(“adaptive prejudice”: Sommer 2001). On the other hand, we are capable of behaving in a more plastic fashion due to our cultural mores and ideotypes (and, likely, genotypes: Konorski 1948). From this derives the central question of my thesis: Do such juxtaposed mechanisms exist, and if so how do they affect our wider cultural concepts and socio-political world – and even our scientific understanding of “truth”? In this way, my thesis is poised between the frameworks of both social constructivism and biological determinism and therefore concerned with both scientific humanism and humanistic science.

1.2. Social Instructions, Scientific Prescriptions:

Fragile Boundaries, Randy Risk-Taking and Miracle Mules

The tension between social constructivism and biological determinism was vividly embodied in a TV programme on evolution and human origins aired in October 2011. Well researched and sporting a charismatic scientist as presenter, the wider media held up this programme as an authority regarding human behaviour past and present – as is not uncommon for BBC science productions (Jones 2010). The documentary screened a modern-day example of how males show off in the presence of females. The producers elected to broadcast an experiment that captured how a group of young male skateboarders increased their risky jumps whilst females were watching. The conclusions were that this behaviour aimed to subconsciously convince females about the superiority of the males’ genes, thus ensuring more mating opportunities and therefore reflecting a natural adaptation in young men.

This might not seem particularly controversial at first glance and fits in with evolutionary theory as most people understand it. But things may not be this simple. This is because there are two theories which address behaviour – and they start out from opposite camps, both associated with the determinism-vs-constructivism previously noted. One is *evolutionary psychology* (EP), the concept that “our behavior can be explained by appeal to internal psychological mechanisms” (Downes 2010); the other is the concept of the “blank slate”: “human intellect at birth is rather like a *tabula rasa*, a pure potentiality that is actualized through education” (11th-century philosopher Ibn Sīnā, cited in Rizvi 2006:6). These competing theories are particularly pertinent in controversial arenas such as “gendered” behaviour.

What, for example, if the young men had been primed since childhood to impress girls, and been rewarded for doing so? An EP advocate would argue, “Yes, because I taught them so well, that’s why they are showing off so nicely as young men!” They also would argue that the teaching itself is a result of hard-wired behaviour in human beings. A blank-slatist would counter, “Yes, but had you taught them to show off for other boys or for onlooking wolfhounds, they would have done that too!”

This leads us to other questions. Why was the same experiment not conducted with a group of onlooking males? What if some of the young men were attracted instead to the same sex, and were showing off to fellow male skateboarders? What if the skateboarding males were attracted to *both* boys and girls? What if there had been female skateboarders in the group – for whom would they be showing off? What if some of the skateboarders were chromosomally female, unbeknownst to themselves? What if there were actually a risk-taking skateboarding grandmother present – but the cameraperson felt that Granny wouldn't propel the documentary storyline forward?

If anything, these caveats illustrate that assumptions are made when we create narratives to highlight scientific theories. Nevertheless, "classic" evolutionary psychologists would probably dismiss these alternative possibilities as inconsequential to what is likely to be the prevailing heterosexual drama, based on evolutionary theory, which, alongside survival functions, is always framed from the dynamic of sexual selection and competition for heterosexual mates. A social constructivist, on the other hand, argues we can only see things through a societally constructed lens – in this case, a male-dominated, heterosexist culture (also called *heteropatriarchy*), and that other scenarios might prevail in other cultures. A similar critical view would be espoused by feminist and queer theorists such as Judith Butler and Michel Foucault (Wikholm 2002).

All of this is not to say that the favoured BBC narrative is necessarily wrong – it very well could be accurately reflecting the actual dynamics. What my thesis will argue, however, is that once we have a social narrative (in this case the BBC television researchers) telling the audience that something is true, we often accept these ideas as the "real reality" humans (cf. Henrich & Gil-White 2001). It could be that such a dominance of a "real" version "fossilises" the reality in our heads into a prototype.

Apart from issues of gender and sexuality, dichotomies also are prevalent – and questionable – in another central paradigm of evolutionary theory: *taxonomy*. This discipline of naming and ordering organisms relies – and must rely – heavily on categorisations, in the sense that a given animal or plant belongs to one type, and therefore, *not* another (Sober 1980). While this seems sensible, it becomes once again problematic if we take a closer look.

Let us take a famous example: the relationship between horses and donkeys and the hybrids that can result if members of these two "species" mate. Are the resulting mules evidence that *Equus caballus* and *Equus asinus* are the same species? For they, in fact, fulfil the *biological species concept*, as defined by German-American biologist Ernst Mayr as "groups of actually or potentially interbreeding natural populations, which are reproductively isolated" (1942:120). No, even well-informed laypersons would argue – because mules are sterile. Since offspring of two separate "species" must be fertile to be considered one and the same, mules do not trespass the species barrier.

But, looking more closely, *some* mules are indeed fertile and *some* have even given birth to fertile offspring (Rong *et al.* 1985). Does this little-known fact now mean that horses and donkeys *are* one species? Or two separate distinct species, nevertheless confounded by apparent, occasional fertility? One could, of course, retreat to reiterate that *most* mules are *not* fertile, and only female mules – and only very rarely – can procreate (Ryder *et al.* 1985)? Should we only include female mules into a mixed single species of horse/donkey? Can we consider female mules as horses (or donkeys), but not the male mules? Should one or two individual “miracle mules” alone count as having passed the species barrier (Kay 2002)?

These issues emphasise the difficulties biologists have with hybrids – as they resist easy classification. Only few have risen to similar public prominence as the mule, but they include wild and wonderful combinations such as the cattalo, the liger, the geep, the pizzly and the wholphin. These creatures may or may not be considered to be proper products of interspecies reproduction, because taxonomists often change the criteria they employ to be able to maintain their basic wish to organise organisms into neat “species” pigeonholes (Kimbel & Martin 1993). Taxonomy often has ranked “complexity” with our own species at the apex (the kings/queens of the animal “kingdom”); early taxonomic systems also favoured a human perspective/vantage point (*anthropocentrism*) (Lucht & Yarri 2010). Yet evolution is not prescient nor directional, and does not “improve” towards complexity: human (mammalian) reproduction is one example – technically our two-gendered system of gene inheritance is more “primitive” than the haplodiploidy splitting involved in ant, wasp and termite reproduction (Foster *et al.* 2001).

Here the curtain parts and reveals another conundrum in regards to how humans label objects: We can only communicate if we categorise via such dichotomous splitting. But does that mean that our categories reflect the structure of the world we live in? Both scenarios exemplified above (exclusive heterosexuality as representative of all human males in the former; horses and donkeys as representatives of two clearly defined separate species in the latter) rely on a strict – possibly too-strict – categorical adherence to function as useful labelling tools.

In this context, it seems necessary to introduce some relevant concepts regarding categorisation. In doing so, such an exercise in itself already will have limited thought, for it will boundarise where we can go and where we cannot venture. This conundrum is akin to the *cultural relativism* of sociocultural anthropology, which suggests that if everything is relative, then the position of cultural relativism also is relative – cultural relativism being the idea that a person’s behaviour and belief systems should be understood under the terms of that individual’s native culture, not that of the cultural observer (Boas 1887).

But we do need tools to pick our way through the dark chaos, even with the disturbing possibility that it might be the chaos itself that is real, and our tools that are not. Therefore, we shall describe

the tools before we throw away any toolboxes. And although this thesis will be working through the lens of an oppositional dichotomy – or, rather, four dichotomies, and multiple sub-binarisms – it is hoped that we can unpick our way to other possibilities once we are aware that these boundaries may not themselves be “real”. Or perhaps we will conclude that they are very “real” indeed.

My thesis not only examines the classic struggle between the two camps of Darwinian evolutionary theory versus social constructivism, but also inquires into the dimensions and aspects of what could be termed an interdisciplinary evolutionary epistemology, brought about by a dialogue between biological anthropology and sociology. Such a conceptual framework incorporates evolutionary theory, psychology, sociology, social constructivism, machine/cyborg studies, queer/gender studies, animal studies and media studies. This has not been done before in the specific realm of evolutionary theorising. Still, my thesis has some affinity to previous works by “Darwinian feminists”, notably American anthropologist Sarah Blaffer Hrdy (1981, 1999) and queer/feminist approaches in relation to primate, animal and cyborg studies, again notably by American theorist Donna Haraway (1989, 1991).

Nevertheless, unlike Hrdy and Haraway, who aim to reconstruct a status quo, the focus in this thesis will be to reconstruct *if* and *how* boundaries are changing. Particular focus will be on the interplay between scientific reports and the popular media representing in these cases an idealised or “enforced” opinion, though not necessarily always a mass public opinion. This is timely because we live in an evermore media-saturated world (Hjarvard 2008), where trends of thought and political movements are limited or expanded by access to information. Often, those who control the information can control a society’s environment and cause reactions (Kriesberg 1949, McQuail 2000). If we aim to change our society towards a more equal one (and, granted, this might not be everyone’s aim, but it is certainly mine), then we will need to examine how our prejudices and categories have evolved, both *how* (*proximate mechanisms*, e.g., bullying to isolate non-group-members) and *for what purpose* (*ultimate functions*, e.g. bullying might favour the survival of individuals within an ingroup at expense of individuals within an outgroup). In short, we really *must* count such functional chickens before they are hatched. My contribution will be to reveal the categorical tendencies – perhaps adaptive prejudices, perhaps environmental influences – behind dichotomatic thinking.

1.3. Vivisection: The Psychological Perspective

Categorisation is as simple sometimes as the difference between light and dark, left and right, scream or be silent. Distinguishing therefore is necessary to survival. Even earthworms can make categorical choices, as American psychologist Susan Gelman makes note of Darwin pointing out

(Gelman 2003), as these invertebrates “exhibit some degree of intelligence instead of a mere blind instinctive impulse, in their manner of plugging up the mouths of their burrows” (Darwin 1881:356).

So, how might earthworms – and humans – go about categorising? Earthworms likely do not imbue their categories with hidden meaning. Hidden meaning and hidden “roots”, however, are a central topic of *essentialism* – one of the main theoretical paradigms concerned with source and origin. Accordingly, essentialism is the belief that objects and concepts have unchangeable, deeply intrinsic qualities. As feminist theorist Diana Fuss puts it, essentialism is “a belief in the real, true essence of things, the invariable and fixed properties which define the ‘whatness’ ” (1989:xi). An understanding of essentialism is important, because essentialism implies that there is a way of accessing or acknowledging truth (quite in contrast to cultural relativism).

Essentialism is believing that a chair contains chair-y qualities (e.g., more than two legs and a place for no more than one person to sit on) that distinguishes a chair from a sofa or a mat. Essentialism applies to abstract concepts as well as objects (e.g., believing that masculinity must always contain strength, and that such timeless strength is a prerequisite to be masculine). Therefore, essentialism involves believing that the definition will not shift, because it reflects a deep internal truth, and is thus static (McLeod 2008).

Essentialism implies firstly a separation into groups, secondly, labels for them, and thirdly, boundaries that define where one group stops and another begins (as in this very sentence). If a substance or concept is always one thing, then everything else must be something else. This may be how uneven dichotomies often result from such thinking patterns (cf. Derrida 1967). If so, such dichotomies may shape the assemblage of concepts with which we humans perceive our surroundings and from which we form perspectives.

Child development psychologist Gelman, who along with Australian psychologist Nick Haslam is probably the most renowned scholar on the topic, distinguishes essentialism from *categorisation*. According to her book *The Essential Child*, all types of animals form categories and “can display quite sophisticated categorical judgments”. Still, it would not be appropriate to “attribute essentialism to a mealworm, or even an octopus” (2003:11) (though I counterargue that we cannot know the “minds” of other species; see Nagel 1974, Dawkins 2012). Gelman also emphasises the *interiority* of essentialism. She is not alone in this belief that an unseeable cause and quality is what binds certain sets of individual entities into categorical groups, and it is not just psychologists who reference this, as both religious scholars and philosophers do as well (and arguably some biologists via “species” concepts). The American contemporary theologian David Whitford refers to Protestant reformer Martin Luther’s concept of “Deus Absconditus” – the “Hidden God”: “Luther notes that revelation must be indirect and concealed” (2005:7). “God” in this sense is both causal and unseen. The American feminist classics philosopher (and self-proclaimed essentialist) Martha Nussbaum refers to

what she calls internal essentialism as the belief that “the deepest examination of human history and human cognition from within still reveals a more or less determinate account of the human being, one that divides its essential from its accidental properties” (1992:207). Austrian-British logician Ludwig Wittgenstein theorised, on the other hand, that “family resemblance” sets are instead gradualist with overlapping but not essential features (1953; see also Needham 1975, Evens 2008).

This concept of *internal* is key. It is this idea of “hidden-ness” in concepts of biological sex, sexual orientation and definitions of human-ness that my thesis explores. Gelman refers to a “privileged view of insides” – DNA awareness amongst adults (cf. Alper & Beckwith 2000) – and argues that children in their nativism “understand that insides have a privileged status: their removal leads to the loss of category identity and category-typical functions” (2003:80). What Gelman calls causal essentialism (the essence causes the categorical properties, as well as being described by those properties) involves such *hidden* characteristics: “Whereas the sortal essence could apply to any entity (pencils, wastebaskets, and tigers are all categories for which certain properties may be ‘essential’ [...]) the causal essence applie[s] only to entities for which hidden inherent properties determine observable qualities” (*Ibid.*:11). In terms of psychology, when we engage in essentialism (or even when we attempt to address essentialism), we actively are referencing our own assumed belief systems – a self-administered vivisection, a near-impossible act – to get at the “realness” inside. Many human labels, both psychological and societal, are invoked via essentialist concepts in terms of mental states, birth-month/generation, nationality, and political leaning: a “schizophrenic”, a “psychopath”, a “genius”, a “Capricorn”, a “Baby Boomer”, a “Frenchman”, a “Communist”, etc.

Essentialism, dichotomous framing and categorisation, alongside hybridisation frameworks, are mental strategies when faced with a blurry environment. For essentialism in children, the two most important categories seem to be age and gender, in that order (*Ibid.*). Knowing the age and gender of group members obviously would be useful to young primates in terms of survival, purely in terms of care, avoidance of infanticide and kin-recognition (*Ibid.*). For adults, it has been argued that gender is the most frequently essentialised category (Carothers *et al.* 2013).

It is notable that Gelman is not arguing that essences are “real”, just arguing that we as children and sometimes adults believe that they are real. This contrasts with famed 20th-century child development psychologist Jean Piaget, who theorises that children form fuzzy categories and over-generalise because they *cannot* essentialise and because their categories are unstable (1954; see also Alexander & Enns 1988). That means that a child who has only experienced small dogs will not – let’s call it “doggify” – an animal until the child learns that dogs can be big, as well. In an opposing view, the Gelman school claims that we essentialise *less* as we grow older (Levy *et al.* 1995), arguing that children mis-categorise even when corrected by adults. For example, four-year-olds say, “only girls wear dresses”, whereas eight-year-olds will concede that boys can wear

dressess, although they are uncomfortable with the fact.

Gelman proposes that children actually have quite distinct categories. She believes that there are certain objects and concepts that children categorise more often, which would be considered to be *natural kinds*: sets where traits are intrinsic to individual category members, unalterable, stable over transformation, a non-obvious basis and there exists an absolute category membership, e.g., an “old person” (2003). Natural kinds are inductive-rich sets, e.g., animals, plants and sometimes substances. The concept was first proposed by the philosopher John Stuart Mill in 1843 (1843/2002: but see Braisby 2001). Natural kinds are felt to be discovered; they are not invented. Here we can see clearly the link with essentialism. Social constructivists would most likely disagree with this conclusion of discovery. Having said this, again it should be emphasised that this does not necessarily mean that natural kinds *are* discovered – but that they are certainly *thought to be* discovered by those who consider them to be natural kinds (as even the concept of a natural kind can vary).

These natural kinds are opposed by *artefact kinds* (we see a dichotomy being set up, before our very eyes). Artefact kinds are considered to be invented categories, which are products of external forces, easily changed, transient, having low inductive potential, a superficial basis, overlapping traits and graded category membership (Gelman 2003), e.g., an “angry person”. These are objects or concepts that can be considered to be human-created, e.g., birdhouses or “knick-knacks”, or grouping sets that are adjective-based, such as “striped things” (*Ibid.*).

Such natural-kind sets and artefact-kind sets – and hybrids between the two categories – have been explored by Gelman, as well as by the American cognitive linguists George Lakoff, Hilary Putnam and Saul Kripke, by the philosophers W.V. Quine and Noel Carroll and by the anthropologist Mary Douglas. Gelman’s studies indicate that we love artefact-kind hybrids, such as Mickey Mouse telephones (2003) – perhaps because we don’t consider either artefact category “real” and are amused by the contrast – while we are uncomfortable with natural-kind hybrids, such as centaurs (a human/animal hybrid) or monsters (a human/beast hybrid, cf. Asma 2009). Possibly such blurred boundaries regarding natural-kind sets *are* distasteful – to children, at least, who, as mentioned, seem to essentialise more frequently. Perhaps such discomfort establishes (or reflects) category norms even in human adults. The framing of natural versus artefact kinds is useful as it supports categorical observations, particularly those we feel to be “true” such as species or gender, but I question, perhaps invariably, the sortal criteria. It is those criteria that I believe are context-dependent even in the realm of “adaptive prejudices”. We may be hard-wired to distinguish in essentialist terms; the sortal categorisations potentially may take varying, culturally-influenced forms.

Gelman also interestingly suggests that “the stereotyping individual treats social groups as natural kinds” (*Ibid.*:14). Is bisexuality, for example, an uncomfortable concept because it is a hybrid of two “essences” (heterosexual/homosexual) that we see as natural kinds, one of which is socially proscribed? Do apes make us uneasy because they occupy a liminal zone between “human” and “animal”, and thus “have a privileged relation to nature and culture for Western people: simians occupy the border zones between those potent mythic poles” (Haraway 1989:1)? This string of thought leads to further questions; for example, whether essentialist thinking is innate or learned. And does natural-kind hybridism – what economics theorist Jane Jacobs refers to as “monstrous hybrids” (1992) – reinforce category norms by othering more gradualist categories? How can we possibly disengage far enough to *engage* in what is possibly the auto-vivisection of our “truest” self – essentially, othering ourselves (Viveiros de Castro 1996, Holbraad 2009) – when truth itself may be just a relativist position? This topic of social-category essentialism has not only been investigated by multiple social anthropologists, but has been investigated also by other prominent psychologists, including Nick Haslam and Americans Susan Fiske, Shelley Taylor and Lasana Harris; and also discussed at length in this thesis.

1.4. Categorisation: The Philosophical Perspective

Essentialism has a long philosophical tradition as *metaphysical essentialism*, being associated with 4th-century BCE philosopher Plato. Plato’s concept of “ideal” forms states that they are “eternal, changeless, supremely real, and independent of ordinary objects”, which have “their being and properties by ‘participating’ in them” (Ross 1951:232-233). This great-grandfather of essentialism theories should not be confused with the philosophical and social construct of *idealism*. Idealism is a school of thought that suggests that it is impossible to achieve true objectivity (Kant 1804). Well-known idealist scholars and thinkers include Ming-dynasty writer Wang Yangming, the Prussians Immanuel Kant and Georg Wilhelm Friedrich Hegel and the German Arthur Schopenhauer (see also phenomenology [the study of consciousness and subjective experience]: Husserl 1913, Heidegger 1927). Again, it seems that we find ourselves in the “cultural relativism” loop-trap, as it might be argued that Schopenhauer’s view that all subjects need an object also is remarkably oppositional, even as it attempts to state that the imaginary (abstract) is equal to the concrete. Acknowledging that Western society is often dualistic, Hegel previously attempted to address such binaries via dialectical methods in his *Phenomenology of Spirit* (1807) and *Science of Logic* (1812-1831). Perhaps an inclination towards the oppositional in human beings is a result of an adaptive tendency to assign category membership to all subjects within an *ingroup* (membership), of every category needing the mirror un-category of the *outgroup* (denied membership),

This type of theorising points us towards the domains of materialist philosophy and cognitive-behavioural models of psychology, where the human (including the human mind) is thought of as a machine. This concept, suggested by Descartes in the 16th century and further explored by 20th-century British mathematician Alan Turing (Evans & Zarate 1999), will be discussed in Chapter 6. That said, idealism is not normally considered to be associated with materialism, mainly due to its reliance on the supremacy of interiority.

A further crucial relationship is that between metaphysical essentialism and both *realism* and *nominalism*. Realism argues that categories such as the concept of *species* are real. Realism is very much about pinpointing, as well as pinning-down. It might be thought of as a 19th-century naturalist's display-board of dead butterflies, varied in colour and size with a naming system inherited from the 18th-century Swedish zoologist Carl Linnaeus (Linnaeus 1735). (Though Linnaeus himself has been argued to be gradualist [Winsor 2006], gradualism itself is arguably dependent on an opposite-pole-based spectrum [cf. Kinsey 1948/1953].) Despite the rejection of *deus ex machina*, or a "god in the machine" solving all problems miraculously (Horace 18BC), realism, like *naturalism* (the rejection of divine devices; Simpson 2003), could still be seen to have strong "essentialist" underpinnings (cf. Hume 1739, Popper 1934).

The opposing "pole" to realism is nominalism, the concept that abstract objects do not exist or that universals do not exist (Rodriguez-Pereyra 2011). *Universals* involve several aspects: those properties that members of a group (let's say, tigers) have in common. "Stripeyness" may be a universal tiger property (and it may not be). The type of characteristic is its categorisation, e.g., as an animal. A universal exists for its existence in relation to other existences, as well (Loux 2001), a concept that is rejected by non-universalist nominalists. (Metaphysical realism, on the other hand, does deal with universals.) What is known as "the problem of universals" relates to their actual existence, e.g., to the question: Are these categories true categories? Nominalists would argue no; realists, again, would tend to say yes: universals exist. Rooted in Platonic philosophy, some branches of realism further posit that abstract universals (faith, hope, good, bad) do indeed exist (Balaguer 2009). To take one example, realist idealists would state that "humankind" exists even if no single human is alive ("*universalia ante res*"), whereas nominalists would deny this and see the concept of "humankind" as a reflection of our mental ordering of similar beings ("*universalia post res*").

1.5. (Post)Construction: The Anthropological and Sociological Perspectives

If essentialists believe in core truths, hardline constructivists might argue that "truth" as such does not exist (Latour 1979). Constructivists thus believe that science itself is not discovered (as this

would imply an underlying truth), but that science too is influenced by culture and abstracts, thinking patterns from which it would be impossible for us to escape. Our thoughts therefore generate meaning (Whorf 1956, Roberson *et al.* 2000: but see Berlin 1974).

Structuralism, founded by linguist Ferdinand de Saussure in the mid-1900s (Deleuze 2002) and made use of by anthropologists Claude Lévi-Strauss and Marcel Mauss, is often grouped under constructivism, although there is a clear link to essentialism at its “structural” core, for structuralism involves believing that the artificial structures that form our environments, mental and physical and linguistic, are themselves the “real” roots of a society (importantly, I think, also unseen or hidden, and therefore potentially related to essentialist hiddenness as noted by Gelman). Post-structuralists, on the other hand – among them the French-diaspora philosophers Kristeva, Derrida, Deleuze and Baudrillard – would argue that these structures are not in themselves self-sufficient, and that the viewpoints of the builder (read: artist, writer, musician, architect etc.) are not as significant as the viewpoints of those who *experience* the structure (the ones who look at art, read books, listen to music, work and live in buildings, Harrison 2006).

Much post-structuralist *queer theory* (the idea that gender as well as sexual identity is constructed), *vis à vis* Foucault and others, is based on structuralist views, for its *deconstructions* attempt to unpack hidden (but “true”) qualities in the societally unacknowledged structure (Wikholm 2002). Again, this type of *cultural relativism* (a person should be understood under the terms of their ingroup, aka *idioculture*) was first developed by the German-American anthropologist Franz Boas in the late 19th century and clarified later by the philosopher Allan Locke in the mid-1940s (Simpson 2009). American cultural anthropologist Daniel Maybury-Lewis investigated this “attraction of opposites” (Maybury-Lewis 2009). Although I will be writing primarily in a biological anthropology paradigm (with support from the disciplines of sociology and psychology), as opposed to sociocultural anthropology, I wish to note these scholars whose studies overlap strongly with mine even within a different “paradigm”. For example, similar discussions surrounding cultural mimicry and identification with (or rejection of) *alterity* (“otherness”) were provoked by Australian-American anthropologist Michael Taussig (1993); relativism in terms of gender relations also is argued by British anthropologist Marilyn Strathern (1988; see also Frye 2000). That said, cultural relativism could be described as circular: under this framework, relativism too must be relative, and possibly therefore not useful as an overarching paradigm. For example, I can argue that the minimisation of the harmful effects of non-Western rape or female genital mutilation in the paradigm of cultural relativism promoted by Western anthropologists might be correlated to Western patriarchal sensibilities (cf. Chadha & Kavoori 2000, Sznycer *et al.* 2012, Lindoso 2012, Foster 2014); *meta-ethical relativists* would argue that my very terminology (“rape”, “genital mutilation”) shows lack of cultural relativism. We once again are back to the chicken – or possibly its egg, as under relativism, as with many thought-systems, it is difficult to distinguish.

That said, *deconstruction* and *post-structuralism* also work with the premise that truth is flexible, that the viewer/listener/reader's experience is as "true" as (or "truer" than) that of the artist/author, and that binary, oppositional – and often abstract – configurations of bad/good, god/man etc. are made, not innate. Both schools are heavily connected to political movements such as Marxism and feminism (Simpson 1989, 2000; Belsey 2002). However, it is not necessarily the case that essentialism is relegated only to right-wing politics. The right-leaning philosopher Norman Geras pointed out that Marxism is essentialist because it explains human essence as being "naturally" that of a worker (Geras 1979). Similarly, some variations on *afrocentrism* (which puts an African perspective at the heart of cultural and historical discussion, with those who are the most African being the most "natural"; Mehler 1993) are essentialist structures, as are some types of *feminism* (females in these cases being considered to have innate, immutable qualities of female-ness; Stone 2004). Within the non-partisan Alcoholics Anonymous group, members think of themselves as "essentially" alcoholics as part of the sobriety programme. It should by now be clear that both essentialist and non-essentialist structures and philosophies vary widely in scope and doctrine, though it also should be clear that essentialism is associated with rigidity (McLeod 2008). In a rigid structure, anything uncontrollable or difficult to understand is to be feared (Bryson 1998). It can be argued that our cognitively-experienced world is more rigidly structured than we often acknowledge (Rosado 1995–2012), and perhaps dichotomisation is an indicator of that. To address this, it can be useful (though counter-intuitive) to view essentialism within a framework of fluidity, including the borders, boundaries and labels, as well as their limitations and advantages. Our culture is in many ways dependent on labels as tools through which to better understand category meaning in a given structure – and somewhere down the line, someone had to reify (create a category) and others *en masse* had to accept that reification. Via essentialism, we believe that, thusly reified, objects and concepts have innate, fixed and universal properties.

It is possible that essentialism, because of its belief in the influence of a biological "whatness", this hidden essence, often results in a normalising set of behaviours attributed to members of the different groups and categories. Could the establishment of a norm result from reification itself? Let us take the common example that the human species in a "chain of evolution" in museums is a white adult male, as opposed to a non-white female child. Perhaps, once such a norm has been fixed, the dichotomisation of social structures can occur because many things might exist that do not fit into or match the norm's prescribed biological essence. One initial hypothesis is that due to essentialism, dichotomies are rarely equal in terms of prestige. There is always the large (at least cognitively) "version" and the bit at the side. This privileging process has been referred to by Jacques Derrida (Derrida 1967; see also Bryson 1998, Prasad 2007).

If there is often a preferred "half" to each dichotomy, the norm, it is possible to consider also that, once such norms and "abnorms" (or *versions* versus *per/versions*; Bryson 1997) have been

established, more fluid descriptors such as transgender and intersex people, bisexuals, so-called “mixed-race” people, hybrid animals or even females (who differ from the human prototype represented more often by males; Hamilton & Henley 1982, Hamilton 1988, Bojarska 2012) may be viewed as a threat to a given structure. That is, unless these suspect categories are controlled within the structure, often by denying or marginalising their existence.

1.6. Reconstruction: The Evolutionary Perspective

Why is an examination of essentialism important in terms of human evolution? Because essentialism might be directly related to our biological and cultural adaptations. Possibly the labels we use for our environment are or were necessary as adaptive prejudices, even if the world *per se* may not fit the categories we create or are taught. Thus, essentialising might aid us to “make sense of the world [...] track identity over time in order to recognize individuals [...] cultural knowledge [...] [and] make (generally) accurate predictions [...] We search for causes in order to create more useful tools and technologies” (Gelman 2003:325). There are multiple dichotomies that we often think of in essentialist terms – healthy/sick, thin/fat, alive/dead, male/female – and many of these deal with deep Darwinian function: survival and/or reproduction, and some involve the awareness/avoidance of death (*mortality salience*) or disease (*pathogen avoidance*).

Still, we may be missing vital information when we essentialise and dismiss outliers. Some obvious counter-examples to simplistic biological/social definitions of sex are lactating males, ejaculating females, bearded females and the fact that, according to biologist Anne Fausto-Sterling, 1.7% of human births could be classified as intersex (2000).

Another prime example is our view of our closest living biological relatives, chiefly the common chimpanzees and the bonobos. In the 1950s, we defined humans as “Man the Toolmaker”. In the next decade, it was asserted that other species – not even just other primate species – make and modify tools. Language also was questioned as being a defining human signifier, when it was argued by American primatologists such as Beatrix Gardner, Allan Gardner, Duane Rumbaugh and Sue Savage-Rumbaugh that non-human great apes were capable of sign language and computer-board languages (Menzel *et al.* 2002). Similar academic discourses developed with respect to other criteria thought to define human uniqueness, such as composite tool use (Carvalho *et al.* 2009), hunting, abstract thought and now, currently, with emulative versus imitative learning, cumulative culture and transmission of culture (Boesch & Tomasello 1998, Whiten 2011).

Does this mean that chimpanzees also are “human”? If they are human, does that mean they are no longer animals? If we, vice versa, reflect *their* behaviour, does this mean that *we* are animals?

As shown, the Human–Animal dichotomy also may be, like the species barrier and the gendered dichotomy, merely a cognitive or cultural construction. The closer we get to our norm – that which is “essentially human” – the more specific our definitions. Indeed, the recognisance that apes share many of our emotional and behavioural adaptations led to scientific arguments that humans should be grouped in a clade with chimpanzees and bonobos by biological anthropologist Colin Groves (1996), an idea first proposed by molecular evolutionary scientist Morris Goodman in 1963 (Grossman & Wildman 2014) – as well as recent papers stressing shared chimpanzee and human DNA differing by only 0.6% (Wildman *et al.* 2003) – and has already led to calls for a new cladistic system in which chimpanzees and bonobos are re-classified as humans and join our genus as *Homo troglodytes* and *Homo paniscus*, respectively (*Ibid.*; Hof & Sommer 2010). This would make the definition of what it means to be “human” and “animal” even blurrier and so the dichotomy is, in a sense, unwinding.

If such a classification were scientifically changed, soon after one might expect a backlash against evolutionary studies (with an emphasis on singularly human qualities), both academically and societally. This reprisal would involve *infracumanisation*, a mental process first theorised by French psychologist Jacques-Philippe Leyens *et al.* (2000, 2001). The term refers to the belief that one’s ingroup is more humanised than an outgroup (*Ibid.*), a mechanism observed particularly during threat (Morton *et al.* 2009, Hackel *et al.* 2014). Discussions surrounding both *infracumanisation* and “ultrahumanisation” – a dichotomised “alter” that I hypothesise myself, where we bring into our human ingroup members of outgroups – will unfold in this thesis.

1.7. Deconstruction: The Political Perspective

Are we forced to dichotomise? How can we know when or if we do so? The epistemologies we use to explore this question – constructivism, essentialism, evolutionary biology, political movements, anthropology, neuroscience, psychology – are themselves bound within the same cultural tangle, as are our own prejudices that we have acquired (or honed). Inevitably, these studies have their agendas – or, as structuralists might argue, possibly *hidden* prejudices and agendas. Similarly, racist, sexist and homophobic structures often are essentialist because they are rooted in attributing biological essences. At the opposite end of the political spectrum, building on work by post-colonial theorist Gayatri Chakravorty Spivak *et al.* (1988; see also Azoulay 1999), there is evidence that disempowered minority groups resort to a type of *strategic essentialism* themselves when it is in their best interests to do so, i.e., in times of change (Morton *et al.* 2009). Morton and colleagues initially assumed that women would be more essentialist in times of stability, a concept called the *system-justification* approach, meaning that people like to hold on to the status quo (Jackman 1994; Jost *et*

al. 2000). However, essentialism and stability did not correlate when it came to the disenfranchised party (in this case, females). There was, however, a high correlation between essentialism, sexism and instability by the more socially enfranchised party (males), in that “the positive link between prejudice and essentialism emerged only when the dominant group was threatened by the prospect of social change” (Morton *et al.* 2009: 663).

We see here then, in a more general deconstructivist power framework, that notions of both “truth” and “falsehood” bear further scrutiny.

1.8. Recapitulation and Definition: Central Terms

Here I will summarise and define some central terms that will crop up with frequency: a linguistic toolbox that will prove useful for the remainder of the thesis.

Tab. 1. Definitions of terms.

TERM	DEFINITION
Essentialism/dichotomisation	<i>Essentialism</i> is the belief that objects and/or concepts have immutable and deeply intrinsic properties (Fuss 1989). This requires <i>dichotomisation</i> , a (not necessarily evenly divided) splitting into two distinct elements.
Natural kinds/artefact kinds	<i>Natural kinds</i> are inductive-rich sets of objects or concepts that are felt to be discovered. <i>Artefact kinds</i> are inductive-poor, adjective-based sets that are felt to be invented (Mill 1843, Gelman 2003).
Infrahumanisation, ingroups, outgroups	<i>Infrahumanisation</i> is the mental process whereby one's <i>ingroup</i> (the set to which one belongs) is more humanised than an <i>outgroup</i> (the set to which one does not belong) (Leyens <i>et al.</i> 2000, 2001). For all four alterities discussed, ingroup protection mechanisms include <i>dehumanisation</i> (the denial of humanity to other humans), <i>subhumanisation</i> (the attribution of less humanity to other humans) and <i>objectification</i> (e.g., literally thinking of cognisant beings as things and/or tools; Fiske 2009, Nicholson 2009) via a process called <i>instrumentality</i>; Cikara <i>et al.</i> 2011, Klaassen & Jochen 2015). In terms of the Human–Animal alterity, infrahumanistic mechanisms of enforcement can include <i>human exceptionalism</i>, where humans are different, or more special, than any other animals, animals which are then lumped together; <i>anthropocentrism</i>, where human beings are the most important species on the planet; and possibly even via the use of the ranked (therefore implicitly biased) Linnaean <i>binomial nomenclature</i> taxonomic system (Linnaeus 1735). With Human–Machine, similar mechanisms are the manifestation of the <i>uncanny valley</i>, e.g., the uneasiness humans feel when robots come close to being perceived as humans, but not quite – and the way in which humans are more comfortable with beings either clearly robotic or clearly human (Mori 1970/2012); the <i>AI Effect</i>, the discounting of machine intelligence by arguing that it is not genuine [human] intelligence (McCorduck 2004); and “strong AI”, the requirement of human mimicry to be “true” artificial intelligence (cf. Turing 1950). With Male–Female, boundary control is found via <i>androcentrism</i>, where male humans are placed in the centre of a culture's or individual's world-view, subsuming or replacing females; <i>sexism</i>, prejudice against (usually) females; <i>misogyny</i>, hatred of females; <i>misandry</i>, hatred of males (occasionally); <i>transphobia</i> and <i>transsexism</i>, fear and/or prejudice against transgender people; and <i>dyadism</i>, lack of acknowledgment of intersex people (Jourian 2015). With Heterosexual–Homosexual, boundary control includes <i>homophobia</i>, i.e., hatred/fear of homosexuality in general; <i>heterosexism</i>, prejudice against homosexual behaviour and the assumption that all “normal” behaviour is standardised as heterosexual; <i>heteropatriarchy</i>, social dominance by heterosexual males; <i>heteronormativity</i> (“taken-for-granted social and sexual arrangements in a heterosexual world-view”; Bettcher 2014); <i>biphobia</i>, hatred/fear of bisexuality; and <i>bisexual erasure</i>, the tendency to ignore (or re-interpret as monosexual) bisexual behaviours and desires.

Ultrahumanisation	<i>Ultrahumanisation</i> is a similar process to <i>infrahumanisation</i> I hypothesise that alternatively extends humanity to one's outgroup – the cognitive act of considering others to have "personhood" (human) traits. "Ultra" as a prefix is Latin, with the sense of expanding to the other side. This fits <i>ultrahumanisation</i> , as I use the word to refer to "expanding" the definition of humanity. The use of the word <i>suprahumanisation</i> (Demoulin <i>et al.</i> 2008) does not suffice, as it refers to either superhumans or gods (and the same for <i>superhumanisation</i> , Waytz <i>et al.</i> 2014), or considering one's ingroup <i>more</i> human than an outgroup: I intend an expansion towards <i>equivalency</i> , rather than superiority.
Ambiguity tolerance	In this thesis, <i>ambiguity tolerance</i> is meant in a colloquial rather than psychometric sense (Furnham & Marks 2013): tolerance of ambiguous concepts, situations or categories.
Biological determinism/ social constructivism	<i>Biological determinism</i> is the belief that evolutionary adaptation and our genes are responsible for human behaviour and therefore behaviour is predictable (Velden 2010) – this concept is related to <i>evolutionary psychology</i> (EP) (our behaviour is based on internal psychological mechanisms (Downes 2010). <i>Social constructivism</i> is the belief that the environment (culture) is responsible for human behaviour and therefore behaviour is malleable (Vygotsky 1978): the concept of <i>tabula rasa</i> (blank slate).
Proximate causation/ ultimate causation	<i>Proximate mechanisms</i> and <i>ultimate functions</i> are interrelated (Tinbergen 1963) yet distinct (Scott-Phillips <i>et al.</i> 2011): e.g., hormones (<i>causa efficiens</i>) facilitate the adaptations made <i>due</i> to ultimate functions (<i>causa ultima</i>) that enhance survival or reproduction, e.g., "why do humans drink alcohol?" can be answered at the mechanistic level of "how come" ("it makes you feel good"). A complementary explanation answering a functional-level "what for" question would be "lowered inhibitions enhance reproductive opportunities" (reproductive) or "quick applications of sugar energy are necessary in terms of energy if food is lacking" (survival).
Altruism: kin selection and reciprocity	Many organisms cooperate. The classic example is <i>kin selection</i> where organisms benefit in fitness terms by cooperating with kin, enabling passing on one's genes via close relatives. Investing in closely related kin is not <i>true altruism</i> as a fitness cost is not incurred (it is, rather, <i>pseudo-altruism</i>). <i>Direct fitness</i> is the sum total of one's direct offspring, e.g., children and grandchildren. <i>Indirect fitness</i> would be aunts, uncles, cousins, etc. <i>Inclusive fitness</i> is the sum total of one's close kin, e.g., children, grandchildren, aunts, uncles, cousins, etc. Accordingly, an organism will likely invest more the more closely related another organism is ("Hamilton's Rule": $rB > C$, where costly actions are performed if they are evolutionarily beneficial to the actor, e.g., r [genetic relatedness between actor and recipient] $\times B$ [benefit to recipient in terms of more offspring] $> C$ [fitness cost to actor], Hamilton 1964). Organisms that are not close kin still benefit via cooperation based on <i>mutualism</i> (mutual immediate benefits) and <i>reciprocal altruism</i> (mutual benefits over time) (Fisher & Haldane 1930, Hamilton 1964, Trivers 1971). <i>Punishment</i> and <i>policing</i> have co-evolved along with cooperative behaviour to prevent those who cheat the system (Trivers 1985), as well as <i>mental book-keeping</i> systems to tally who owes us what. Humans and many other animals engage in alloparenting, where offspring are looked after by non-parents – although often this is by indirect kin and thus likely to be kin selection, it also can be a reciprocal practice between unrelated individuals. Kin selection makes evolutionary sense and has been tested (Cartwright 2000), as do mutualism and reciprocal altruism towards non-kin. More interesting and exceptional in evolutionary terms is when we treat unrelated <i>conspecifics</i> (members of the same species) as close kin ("fictive kin": Curtis 1913) – we do not expect or need immediate or even delayed payback. We see this in extremely long platonic friendships (Kenrick & Schaller 2007), adoptive child-parent relationships, in so-called pair-bonded spouse relationships, and possibly also for <i>heterospecifics</i> (members of different species) via relationships with pets. In all of these examples there are mutual survival or reproductive benefits. Not only do we treat our closest kin and friends as more human at the expense of others, as it happens we treat ourselves as the most "human" human of all (Cortes <i>et al.</i> 2005, Haslam <i>et al.</i> 2005, Loughnan & Leidner <i>et al.</i> 2010). This makes sense in terms of ingroup kin-selection: we are 100% related to ourselves.
Mortality salience and pathogen avoidance	<i>Mortality salience</i> is a hypothesis that one is aware that one's own death is inevitable, and attempts to avoid that reality (MacDorman & Ishiguro 2006); this has been associated with higher ingroup protection rates (Pyszczynski <i>et al.</i> 2003). This is related to <i>pathogen avoidance</i> : heritable behavioural avoidance by organisms to reduce the possibility of contact and infection by bacteria, viruses and other disease-causing micro-organisms.
Biological species concept	"groups of actually or potentially interbreeding natural populations, which are reproductively isolated" (Mayr 1942:120).
Theory of Mind (ToM)	The ability to reason how a different individual's own reasoning works. <i>Intentionality</i> , related, is the cognitive ability to form representations of objects/concepts, i.e., believing in an abstract concept. It is similar to a process called <i>intersubjectivity</i> by psychologists.

<i>Hominins</i>	<i>Hominins</i> include modern humans, our immediate ancestors and all other extinct human species from the genera <i>Homo</i> , <i>Australopithecus</i> , <i>Paranthropus</i> and <i>Ardipithecus</i> . <i>Hominids</i> , on the other hand, include all great apes (including humans) and their extinct ancestors since splitting from the gibbon line ca.15-20 million years ago.
<i>Biological men/ biological women, heterosexual/ homosexual</i>	The terms “biological men/women” in non-scientific contexts often are considered offensive (as transpeople are of course biological people as well). Nevertheless, I use the terms to distinguish particularly biological sex, a distinction that the neologisms and culturally-laden terms “trans” and “cis” do not always make. Similarly, the word “homosexual” is considered clinical and offensive in layperson’s terms; I am writing primarily in a biological anthropological paradigm as well as a quantitative one, and I refer to homosexual behaviour. Furthermore, drawing attention to the concept of “a homosexual” as opposed to “homosexual behaviour” (and the same for “a heterosexual”) has scientifically essentialist implications. I do occasionally use both terms when arguing qualitatively, but generally avoid them otherwise.

1.9. Predictions: Ambiguity Tolerance in British Newspapers

Section 1.9. predictions generally lie within the context of so-called “WEIRD” (“Western, Educated, Industrialized, Rich and Democratic”, Henrich *et al.* 2011:61) cultures. I detail specificities directly below.

1.9.1. Predictions for Classic Dichotomies

I selected the Human–Animal and Human–Machine dichotomies to operate as controls to each other in an investigation of ambiguity tolerance: the former might involve a “natural” (evolved) ingroup protection against other animals, and the latter likely lies outside that context yet is omnipresent in contemporary culture. Most importantly, both alterities involve definitions of personhood/humanity. Similarly, I reasoned that as the topics of gendered and sexual behaviour are salient in evolutionary theory, the linked but still-distinct alterities of Male–Female and Heterosexual–Homosexual would prove illuminating in contexts of ambiguity tolerance. I detail specificities regarding these four dichotomies directly below.

1.9.1.1. Human–Animal

My predictions relating to the Human–Animal alterity are based in observed patterns of dehumanisation that Western humans display towards other, “lesser” humans in particular contexts. This tendency towards creating an exclusive human ingroup of defined set membership has much support (Demoulin 2008, Most 2008, Castano & Kofta 2009; cf. Atran 1988), with studies showing that we are more likely to essentialise – thus narrowing the human ingroup even further – when under stress (Biernat *et al.* 2003, Haslam 2006). The biological determinism that we apply in

such *post hoc* reasoning in determining “who is an animal” and “who is a human” is perhaps understandable in a species context where it might be functionally advantageous to individuals within that species to define themselves as a member of an “more-human-than-thou” ingroup. Therefore biologically determinist attitudes in regards to this particular dichotomy are likely in a context of (individually advantageous) set-protection against hybridity. This ingroup-protecting mechanism known as *infracumanisation* has strong theoretical support from Demoulin *et al.* 2005, Demoulin 2008 and Castano & Kofta 2009. It likely would be operating frequently in highly dichotomised, non-egalitarian states, where one entity is clearly privileged over another (Klages 1929, Derrida 1967, Bryson 1998, Prasad 2007).

I predicted therefore that in a war-time and economic crisis period, modern Western humans would be more critical of animals in general, but particularly in terms of Human–Animal intermediaries (due to general infiltration fears, cf. Demoulin *et al.* 2005). Due to such social unrest, I anticipated a millennial backlash against evolutionary theory specifically, as the discipline highlights gradualism, and a tendency within scientific circles to promote human exceptionalism.

1.9.1.2. Human–Machine

I wished to examine the Human–Machine dichotomy for two related reasons. The first is that it, like the Human–Animal dichotomy, directly describes a relationship between a human ingroup and a potentially “dehumanised” outgroup. The difference here though is that the “machine” component of this societal alterity – and there is evidence that we *do* indeed binarise and essentialise this particular dichotomy via oppositional conceptualisations, Mori 1970/2012, Tinwell 2015 – does not exist in nature *per se*. Therefore we might have differentiated behavioural reactions to a non-organic humanoid form than we would to dehumanised humans, or to non-human animals; there is support for this hypothesis (Mathura & Reichling 2016) and as such and as noted previously I envisioned it potentially as a control group to Human–Animal *infracumanisation*. The second reason I wished to explore the Human–Machine dichotomy is that the nature of this alterity is frequently discussed in Western contemporary culture (Jennings 1985, Kelly 1994, Bostrom 2014), and we are subsequently culturally saturated with the dialectics concerning this particular dichotomy, making it worthy of quantitative and qualitative exploration.

Due to both the social unrest previously referred to in sub-section 1.9.1.1. as well as a culture grappling with a new, potentially threatening machine-based invention-cum-tool called the “Internet” that became culturally ubiquitous directly before 2000 (Zakon 1993–2011), I therefore predicted Western millennial ambiguity fears associated with virtual reality machines and “cyborgs” (hybrids between humans and machines, therefore “unnatural kinds”) – and I expected that the internet would provoke a new type of technophobia associated with unclear boundaries and

(possibly threatening) extensions of the self (Theweleit 1987, 1989). I also believed that this conceptualisation of the natural vs the unnatural meant that there could be a social shift to people in the relatively wealthy West wanting to have things such as food and body products be more “natural” and a backlash against technological “manipulations” such as genetically modified food.

1.9.1.3. Male–Female

In terms of the Male–Female dichotomy, the genders Westerners prescribe are usually two in number and socially linked with biological sex: male and female (usually, but not always, in oppositional terms) (Galdas *et al.* 2010)). As early as 1990, theorists such as Judith Butler argued that gendered behaviour is performed (and therefore *not* implicitly linked to biological sex). And yet despite a recent interest in transgender studies and politics in the last two decades, studies suggest that we in the West essentialise gender into binary male/female sets (*Ibid.*, Gelman 2003, Fine 2010, Fine 2017), with each side of this alterity endowed with what are argued to be biologically determined (essentialised) characteristics; this essentialising is not dependent on birth-sex, either: like non-trans people, many trans people too insist on having a “essential” gender. Indeed, Western humans essentialise gender more than any other human quality (followed by age) (Gelman 2003; cf. Carothers *et al.* 2013). Gender prescription by adults in terms of childhood behaviour and assigned toys currently is more dichotomised than at any point in the last fifty years (Auster & Mansbach 2012, Sweet 2014).

As a female Westerner, I am aware of such dichotomies, including the prescribed/proscribed behavioural characteristics and power imbued to each half of the “binary”, and I also am aware that many people do not behave according to their gender prescriptions/proscriptions. Binarising often involves the privileging of one half of a dichotomy, and often too requires ambiguous states to be a mixture of two essences which in themselves (and similar to the outlying dichotomistic points) may not exist. I acknowledge these binaries can be highly nuanced in terms of power differentials, and in this particular Western UK case of the Male–Female alterity, I am not agreeing that feminine/masculine qualities truly exist, just that when behaviour attached to those adjectives is essentialised, that we *act* as if such qualities exist at a deep level and that they often are associated with biological sex (if not thus associated, then often are still essentialised and argued in essentialist terms even if the biological-set category is expanded to include transgender people, a dynamic that I discuss at some length in Chapter 7).

Due to the aforementioned societally stressful millennial period of economic downturn, war and terrorism, I predicted therefore as an infrahumanistic response ca.2000 a rise in biological explanations for differentiated male and female behaviour, and less tolerance of gender ambiguity. I anticipated that males and females, and even post-operative transsexual males and females,

would be portrayed as essentially male or essentially female during this millennial time-period, with many media discussions regarding societally uncomfortable gender ambiguity (perhaps multiple negative media references to “gender-blurring” such as the concept of the New Man or the heterosexual male dandy newly christened the “metrosexual”, or the tomboyish heterosexual female “Ladette”). In the year-2000 time slice, I therefore also expected fewer explanations based on social constructivism, and a backlash against the wider set of “females” (alongside an even more negative assessment of intermediaries, including trans people, intersex people, non-binary people and so-called biological men and women who do not behave according to prescribed male, respectively female, behaviour).

1.9.1.4. Heterosexual–Homosexual

To predict ambiguity tolerance patterns in the Heterosexual–Homosexual dichotomy was an interesting proposition, as I have myself lived through (and been politically active in) a time period during which a shift occurred in LGBT politics, from a general consolidated mass opinion that sexuality is flexible, to a received understanding that sexuality is based on biological determinism and an “innate” concept of sexual identity. Furthermore, I have observed in experiential terms of my own life a disconnection between behaviour and identity in many of the people I know (identities often justified by essentialist reasoning), particularly amongst those who identify as, or let other identify them as without protest, heterosexual. As with the Male–Female dichotomy, there is a received societal narrative that does not fit my experienced world of people exhibiting more fluid sexuality.

These are of course personal hunches and were not initially a hypothesis. However, first while studying anthropology and psychology as an undergraduate, and later while studying sexuality for my MA and researching the same in terms of my personal employment in book publishing, I grew aware that there were studies that showed that the American public has a great sexual flexibility (Kinsey 1948, Kinsey *et al.* 1953, Hite 1976, Bem 2000, Kirkpatrick 2000, Bem 2001, Diamond 2006, Muscarella *et al.* 2005, Vrangalova & Savin-Williams 2010) – information supported by cross-cultural and cross-historical empirical studies (cf. Kirkpatrick 2000). Yet we live in a culture that generally prescribes and conceives of sexuality primarily as heterosexuality (what Adrienne Rich calls “compulsory heterosexuality”, Rich 1980:631; cf. Fisher *et al.* 2007, Lo 2011, Sandel 2015), and very occasionally also conceives of an opposed, binarised homosexuality (or a rough equivalent).

These additional studies and theories challenged this at-least-Western cultural hegemony and, as I read and studied more, I realised that many other scientific hypotheses and theories that argued for biologically determined (essentialised) sexual behaviour were based on a *a priori* assumptions of

straight/gay, the very terms of which I began to question. Were there implicit essentialising assumptions regarding sexuality right from the get-go? If so, then the theories that rose from these assumptions perhaps already were flawed. This was my rationale for examining deeper the essentialised societal understanding of the Heterosexual–Homosexual alterity, which I also had researched for my MA degree.

Accordingly, and mindful of my (pre-millennial) previous research, I predicted that the Heterosexual–Homosexual dichotomy would experience an upsurge in the already-noted biodeterminist sexuality theories during the millennial period, and that the categories of “heterosexual” and “homosexual” would be considered to be “real”, natural-kind entities. Bisexuality, the hybrid category of the two natural-kind categories, would therefore seem threatening. I thus predicted more black-and-white categorisations of sexuality at that point in time, with less ambiguity tolerance and more social conservatism directed towards all homosexual behaviour (not just – but especially – bisexual behaviour).

1.9.2. Predictions for Variables

By applying a quantitative analysis to a large dataset – 3,456 articles sampled from a larger pool and then coded for ambiguity tolerance – I tested how such ambiguity tolerance was affected by variables such as *temporality*, *political leaning*, *format*, *gender*, *expertise level*, *individual newspapers*, *binary* and *seasonality*. I detail specificities regarding these variables directly below.

I tested **temporality** over a 16-year period in five-year intervals: 1995, 2000, 2005, 2010. I did not expect to see a particular pattern, as I initially was most interested in political leanings, but then realised that any theorising would need to be situated within a temporal context. Although the time-based rationale is covered in more detail in Section 2.1., I will note here that I chose the interval years based in part on standard-practice intervals for longitudinal studies and in part on digital-archive publication availability, but by that point in my analysis also was careful to cover the Western September 11th-period, millennial economic turmoil and war-time: after initially not expecting to see temporal patterns, I quickly reasoned that the landmark year of 2000 and the years following indeed might show reactive fluctuations. The wide-ranging results for temporality are discussed throughout Chapter 4. There is a fair degree of academic support for lowered ambiguity tolerance during turbulent times (Furnham & Ribchester 1995, Biernat *et al.* 2003, Haslam 2006). Now looking at the years with temporality in mind, I predicted that if any year covered by digital archives were going to exhibit a time-related response due to societal shakiness, the year 2000 would be likeliest, and therefore I expected to see low ambiguity tolerance that year.

I looked at **Political leaning**, as there had been recent literature suggesting that those who are

conservative are less ambiguity tolerant than liberals (Jost *et al.* 2003, Kanai *et al.* 2011). As studies suggest that a conservative mindset makes use of more stereotyped as opposed to critical-thinking applications than those with more liberal politics (Jost *et al.* 2003, Thorisdottir & Jost 2011, Mooney 2012), I suspected therefore that access to/acceptance of evidence-based information would be the driver, as opposed to one's political leaning. Conservatism here would be proximate; proximate reasons notwithstanding, I predicted that my results would show these same patterns of a tendency toward ambiguity intolerance in the conservative-newspaper analyses and the inverse for the liberal publications.

Similarly, **Format** was tested to see if there was a "tabloidism" effect of ambiguity intolerance, as I had asymmetry in terms of broadsheets (2 liberal, 1 conservative) and tabloids (2 conservative, 1 liberal). As studies suggest that those who have more information are more likely to be ambiguity tolerant (Tanaka & Taylor 1991, Rosch *et al.* 1976), I expected to see a possible tabloid effect of less ambiguity tolerance due to tabloids being less information-rich (cf. Sparks & Tulloch 2000).

I looked at **gender** in terms of article-author to establish whether there were any patterns of male vs female ambiguity-tolerance patterns. The literature is ambivalent (Erten & Topkaya 2009, Weissenstein *et al.* 2014), though I suspected that there might be a male-ambiguity-intolerant pattern due to a study indicating a male predilection towards essentialist explanations of homosexual behaviour (Haslam & Levy 2006), a domain that also involves gender. Further, I suspected that gender concepts, which as noted above are highly dichotomised and socially connected to biological sex in Western culture, might mean that responses negotiated through a journalist's gender would be particularly reactive to exterior societal changes. I therefore predicted that male journalists might exhibit more ambiguity intolerance than female journalists.

I looked at **expertise level** to see if one was more or less ambiguity tolerant when in a position of authority and/or status; I expected that ambiguity tolerance would be greater as one would have more information; as alluded to above, studies show that the more education one has, the more tolerant one is (Bobo & Licari 1989, ISI 2010). My predictions for this variable were based on readings I have done on status and power that indicated that we are biased towards those who hold high status, and towards their opinions (Jackman 1994, Jost *et al.* 2000, Henrich & Gil-White 2001). I also was aware that this potential behavioural tendency towards hierarchy-adherence occurs in closely related apes to humans such as chimpanzees (Hopper *et al.* 2011) and bonobos (Sommer 2010).

Each **newspaper** was looked at individually, too. As I would be analysing a period of potential societal stressors such as wartime and the September 11th event and its aftermath, I reasoned that the manifestation of newspaper opinion could be seen as either a reflection (or cause) of mass popular opinion and therefore likely would exhibit the same tensions. There is some strong evidence

that newspapers and their journalists do indeed “turn with the tide” (Fowler 1991, Miljan & Cooper 2003) (more recently given support by a 2017 data analysis paper analysing 150 years of trends in UK periodicals, Lansdall-Welfare *et al.* 2017). Therefore I predicted that mass media would be highly intolerant of ambiguity during the millennial, not due to a more proximate chiasm (cf. Jenkins 2000), but rather due to the aforementioned external stressors. As with the four major dichotomies examined alongside the other variables, I predicted a dip, but not a recovery; I did not anticipate the aftermath to such a dip one way or another. The anticipated dip in ambiguity tolerance during the 1995–2010 time-slice ca. 2000, however, was based on many sources that predict conservatism (associated with ambiguity intolerance, Jost *et al.* 2003, Kanai *et al.* 2011) in turbulent times (Furnham & Ribchester 1995, Biernat *et al.* 2003, Haslam 2006). I could not confidently predict which newspaper of six would be the most tolerant, though I suspected that due to information-richness it would be a broadsheet and not a tabloid; and due to political leaning it would be a liberal paper and not a conservative one: leaving either the *Independent* or the *Guardian* as the most ambiguity-tolerant publication. Similarly, I predicted that the *Mail* or the *Evening Standard* (plus proxies) – both conservative tabloids – would be the least ambiguity-tolerant of all six publications.

I looked at **binary** to see whether particular dichotomies were more affected by social change than others. Although in terms of predictions, *binary* is a concept covered at length in Section 1.9.1. above, I predicted that the Heterosexual–Homosexual alterity would be affected most due to rapid social change regarding gay rights during the time period analysed (Wilkinson 2010, Silver 2013).

Finally, I looked at **seasonality** to measure potential seasonal effects noted by previous researchers (Morken 2001, Meyer *et al.* 2016), e.g., humans being more cheerful in spring generally (Kurlanskik and Ibay 2012); I expected to see more ambiguity tolerance therefore in spring-time; and was curious (though sceptical) whether women were less ambiguity-tolerant *en masse* at particular year-times, suggesting a human “breeding season” (cf. Markey & Markey 2013) in the context of the “xenophobic pregnant women theory”, the hypothesis that first-trimester pregnant women more frequently avoid pathogens due to disease susceptibility (Navarrete *et al.* 2007).

1.10. Expansion

It is clear that one’s sense of self, as well as that of others, is highly informed by the phenomenological, epistemological and ontological positions noted in this chapter, which will be referred to throughout the entirety of the thesis. It is important therefore that I make explicit my use of

an unusual (ultimately ultrahumanist) structural device that I have employed. I framed my discussion chapters and the concluding chapter in a specific way in order to reveal patterns of exclusion or inclusion, constructing within said chapters a particular dialectic. I discuss four different major alterities in this thesis, and via this dialectic I cover arguments and counterarguments regarding membership to a particular set from both sides of the dichotomy. I begin with comparing the rigid end-points of a societal (in this case, Western) dichotomy against each other, starting with a universal yet exclusionist position. This exclusionist framing moves from the universal on one side of the dichotomy ever closer to the specific on the other end-point of a given dichotomy, then expands via a more plastic framing from the individual towards the more universal, this time framed in inclusive terms.

To take the example of the Human–Animal dichotomy, I do this by holding a metaphorical magnifying glass far away, to first view said dichotomy in a highly dichotomised state, i.e., very separate sets – e.g., humans and animals – and thereby to observe the reinforcement of this alterity. But then the subject framing moves closer – in this example, rather than humans vs animals it now becomes humans vs primates, and I look at the infrahumanising arguments that protect the human ingroup against other primates. Closer yet, and I examine we-the-humans vs our fellow apes, closer even still and modern humans are compared infrahumanistically with other hominins. (Although I did not pursue this line of inquiry due to space, this framing could have continued with humans vs those humans they dehumanise, and the ways in which the dehumanisation of humans is supported by exclusionary categorical reasoning.) This method of approaching ever-inwards allowed me to examine the ways in which we justify separate (animal) categories and divisions, e.g., the “brute” caveman stereotype of ancient hominins as something quite different from ourselves is discussed first structurally within the Human–Animal alterity chapter before any similarities between the two sets are examined.

That above would be the infrahumanising, exclusionary framing within this dialectic, but then I continue from the same point where we stopped, in this example modern humans vs other hominins, and I “flip the magnifying glass over”, and I examine arguments from an *ultrahumanist* stance; that is to say, I examine the arguments for why modern humans might be grouped *together* with other hominins, considered to belong to the same set, including common behaviour and capacities – then outwards for the next step and a discussion of our similarities with our fellow apes – and then further outwards with an inclusive framing than includes us with other non-primate animals. As the magnifying glass is flipped and retreats toward more universalist interpretations, I highlight arguments showing shared-set patterns, counterarguing the infrahumanist positions initially shown.

This device that I have employed is useful not only in revealing both inclusionary and exclusionary societal and scientific attitudes in terms of set membership, or in evaluating sometimes oppositional arguments and evidence, but also in terms of conceptualising the ways in which an evaluator could

potentially change their categorical perspective. In this thesis, I primarily make use of it because my own leanings are towards similarist thinking (here, the retreat of the magnifying glass). Therefore it is vital to point out that in this model I am putting the counterarguments (“infracommunitarianism”) first, usually (though not always) counterarguments with which I do not agree, not coming from an EP (or human-exceptionalist) theoretical paradigm. My infra/ultra magnifying lens eventually retreats toward the more universal from which my own philosophical underpinning is formed, a paradigmatic underpinning which generally is based in socioecology, and usually (though not always) in varying degrees of social constructivism.

As noted previously, I am aware that I am myself operating under binarised systems (e.g., social constructivism vs biological determinism), and that I myself am likely prone to binaristic thought patterns. It is my intention with my “ultrahumanistic magnifying glass” to be able to use this as an instrument to attempt to break free of such tendencies, be they acculturated or hardwired (or both-and). Indeed, I believe it might be possible to apply this ultrahumanist dialectical lens to other disciplines than anthropology – potentially sociology, philosophy, psychology, historical studies, media studies and other epistemologies that often examine oppositional concepts.

What will follow this introduction is a quantitative analysis of contemporary British ambiguity tolerance via my Methods and Results chapters, a discussion chapter devoted to my finding of millennial temporal influence, and then a qualitative discussion in context of each of the four specific dichotomies studied, with illustrative examples and observations. Finally, I synthesise my findings and analyses in the conclusion, with a view towards potential wider applications on the horizon.

2. METHODOLOGY, METHODS AND MATERIALS: “MINING”

2.1. Exploring Boundaries: Rationale for a 1995–2010 UK Slice

My thesis explores dichotomies, current biological classificatory systems and unequal societal standing in regards to polarised thought patterns, as well as sociological studies of prejudice and inhumanisation. More specifically, my thesis examines categories regarding what defines a human and what is assumed to be gender-specific behaviour: 1) Human–Animal, 2) Human–Machine, 3) Male–Female and 4) Heterosexual–Homosexual. My general aim is to see whether the prevalence of societal concepts of “real” (natural kind) categories potentially reflected political events or scientific discoveries – in other words, *cultural influence*.

Such perceptions would be highly sensitive to a particular societal context (Lopez 1993). Therefore, it was realistic to restrict the exploration to a particular time and place. Popular media are likely to reflect the social construction of categories (Etzioni 2001, Most 2008). To gather quantitative data on the perceptions of boundaries, I focussed on a 16-year period of newspaper reporting in the UK (1995–2010) and sampled articles from six different newspaper groups from 4 years (1995, 2000, 2005, 2010). The decision to concentrate on this restricted geographical and temporal circulation is based on academic and pragmatic reasons.

1. English is my native language and, having lived in the UK close to two decades, I am an insider in “current British culture”. I therefore can detect linguistic, political and social subtleties, which I almost certainly would miss were I to focus my research on media in India or Italy.

2. The research is based on a selection of 3 tabloid and 3 broadsheet groups. Tabloids are considered more sensationalist (Sparks & Tulloch 2000), whereas broadsheets are considered serious and respectable. The selection was mindful to include both politically left-leaning and right-leaning reporting. Therefore, mining left-wing/right-wing and broadsheet/tabloid sources allows for a more holistic reconstruction of the political and socioeconomic landscapes and subcultures of Britain. The article authors themselves – the journalists – are standing as proxies for the British public; journalists do not operate in a cultural vacuum (Fowler 1991, Miljan & Cooper 2003).

3. Some significant British newspapers have been digitally archived, which facilitates searching for keywords within a vast array of text. This would not have been possible with other media such as television, radio or books. However, newspaper reporting is “supplemented” by these other media (McQuail 2000), as reflected in reviews of broadcasts and books.

4. A digital cross-sectional comparison of print newspaper reporting currently is only possible from 1995 onwards. This restricts research to one and a half decades. The alternative, a purely internet-based approach, would have meant an even more restricted timeframe, given that online sources became widely popular only in the last 10 years or so. Moreover, internet reporting is much less regionally identifiable and “standardised” than printed newspaper articles.

5. The period from 1995 is particularly relevant for research into categorical boundaries, as these are likely to be sensitive to surrounding societal narratives (Abercrombie 1996). This period includes the gear-up to a millennium turnover that, *per se*, created anticipatory hype in the wider arena of doomsday cults and expectations of sudden change (akin to medieval *chiliasm*: Jenkins 2000). Moreover, this period accompanies the astronomical growth of the World Wide Web as well as leads up to a unique scientific time-marker: the draft-sequencing of the human genome in the year 2000. Coding over this 16-year period, yet every 5 years, would show both social shifts and stasis. In practical terms, 5-year gaps allow a window into social change; this 5-year gap is the norm in longitudinal studies in the social sciences (Ruspini 2000). Finally, this period immediately precedes significant geopolitical upheavals brought about by a post-Cold-War shift of Western politics to the right, reinforced by the September 11th event in the USA in 2001, and the ensuing military and economic conflicts (Chomsky 2001).

6. A substantial part of my research concerns categorical boundaries in scientific paradigms, especially evolutionary theory. British newspapers regularly report on original scientific findings as soon as they are published, not least because English has become the *lingua franca* of much scientific writing. Moreover, there is a strong tradition in evolution-related journalism, given the Darwinian heritage of the UK.

2.2. Mining British Newspapers: Coding LexisNexis

2.2.1. Newspaper Selection

What of the practicalities of conducting such research within the framework of UK newspaper archives? *LexisNexis* – originally concerned with legal documents – is currently the world’s largest electronic private database. UCL holds a subscription to the UK-centred branch, called *NexisUK* (www.lexisnexis.com.libproxy.ucl.ac.uk/uk/nexis), which was used for my research (*Nexis.com* 2011-2016).

Newspaper articles were mined from 3 tabloid and 3 broadsheet groups (*Tab. 2*). Three of these publication groups are politically conservative (ostensibly right-wing): *Times/Sunday Times*; *Daily*

Mail/Mail on Sunday; *Sun/Evening Standard/News of the World*; and three are politically liberal (ostensibly left-wing) *Guardian/Observer*; *Independent/Independent on Sunday*; *Daily Mirror/Sunday Mirror*.

Tab. 2. Newspaper sources. Particular dates and publications are referenced as, e.g., BG03Feb10 (Broadsheet *Guardian*, 03 February 2010).

Format	Newspaper	Acronym
Tabloid		T
	<i>Daily Mail/Mail on Sunday</i>	TM
	<i>Sun/Evening Standard/News of the World</i>	TS/TE/TW
	<i>Daily Mirror/Sunday Mirror</i>	TD
Broadsheet		B
	<i>Guardian/Observer</i>	BG
	<i>Independent/Independent on Sunday</i>	BI
	<i>Times/Sunday Times</i>	BT

“Letters to the Editor” (LTE) were discarded, because writings of journalist-as-authority were more relevant. Often, categorisation was by implication. Moreover, the article writer counted as ultimate authority. If the biologist Desmond Morris referred to humans as animals throughout his quotes, but the journalist referred to animals as something separate from humans, then the article would be coded as “humans are not animals”. If journalists did not argue the category, it was assumed they tacitly accepted said classification.

All dichotomy samples were manually coded. I sampled a total of 864 articles (6 [newspapers] x 3 [first entries] x 12 [months] x 4 [5-year periods: 1995, 2000, 2005, 2010]) for each dichotomy. There were 3,456 sampled articles in total over all dichotomies. If an identical classification appeared more than once in the article, only the first instance was coded.

I coded a large sample of articles subjectively. However, since I was measuring the temporal changes and weight of specific variables rather than a sum total, as long as my own biases remained constant, then the results, too, would remain robust. To ascertain a sustained level of subjectivity, I repeated the coding exercise for 200 masked sampled articles randomly selected across all four dichotomies (Human–Animal, Human–Machine, Male–Female, Heterosexual–Homosexual) and all four years (1995, 2000, 2005, 2010) two years later in 2015. The resulting error level of .04 was not

statistically significant; that is to say, my biases remained consistent even after some time had passed.

The resulting codings can be analysed *longitudinally* (across the timeline, from 1995 to 2010; or within individual years) and *cross-sectionally* (for all years; or within a given year).

2.2.2. Sampling Substitutions

In some cases in my sampling from 1995–2010, I was forced to resort to substitutions. There was no NexisUK archive for *Sun/News of the World* for 1995–2000 (and nothing existing on the private pay-for archive for the year 1995 belonging to these newspapers either). Thus, *Sun/News of the World* samplings were replaced by *Evening Standard*, which might best be described as an intermediate state between a tabloid and a broadsheet that still “leans tabloid”, run by the same newspaper group. For 1996–2000, the online private pay-for *Sun/News of the World* archive was sampled when *Evening Standards* were not available. If there were not enough samples for a particular month, articles up to 2 months ahead were sourced, followed by 2 months previous, followed by either an extra “tabloid” or an extra “broadsheet” from a different publication. For early 1995, it was necessary in some rare cases to go as far back or forward as 6 months.

Replacements were like-with-like, not just in terms of publications where possible, but also tabloids for tabloids and broadsheets for broadsheets. In reality, this procedure of substituting one month’s *Guardian* for the preceding/following month’s *Guardian* was necessary for a minority of the samples, in the order of 15%. If possible, when substituting from months on either side, I would go from the end of the preceding or following month, so that I did not subtract from a subsequent sampling from a newspaper in its “correct” position in a month where replacement was not necessary (as mentioned, generally replacement was not necessary). *Evening Standard* is published two days fewer a week than the other papers, though this would not affect the article pools, as it is the sampling and not the total that counts.

I initially attempted to use the online *Sun/News of the World* as a source, but due to political issues with the parent company of News International (*News of the World* folded in July 2011), *Sun/News of the World* no longer had any accessible, searchable archives online as of June 2012 – even those previously paid for, as I had done in July 2011. I did send News International an email, as my subscription to the archives was actually valid until July 2012. But, their archive policy had apparently changed. Thus, *Sun/News of the World* was instead substituted with *Evening Standard* (though substituted with *Sun* in a first instance if there were insufficient *Evening Standards* in the preceding/subsequent months, moving on to *Daily Mail* substitutions, etc.) for all years from 1995 to 2010. In this way I ran the searches for all years and all dichotomies using the same method. *Mirror*

has an Eire edition too, which also was sampled, but as long as I had been using it all through (as I had), this should not be a problem, as again the sampling was done from similarly searched pools; Irish and UK cultures have many similarities, particularly in terms of mass media (cf. Moran 2013).

There were no *Mirror* listings for Jan-April of 1995, so these were substituted by *Evening Standard* and *Daily Mail* in turn. I did try to substitute Jan-April 1995 *Mirrors* with *Evening Standards* rather than *Daily Mails* if possible, as the politics between *Mirror* and *Mail* are so different. This was often difficult to do. However, as I normally sourced substitutions from the end of the appropriate month, working backwards, I could in these cases take the closest match in terms of time, because I did not then need to worry about “reducing” that particular month’s samples e.g., if substituting for December 2000, I would source necessary substitutions from the beginning rather than the end of January 2001. That noted, due to the degree of 1995 replacements, I believe it is difficult to do concrete month-by-month analyses for that year – for example, if I was looking at seasonality infrahumanisation rates for the spring months (March, April, May) for 1995. However, as I continued into 2000 and afterwards with the Human–Machine dichotomy, to take one alterity example, there was much less need for substitutions: in this particular case probably due to internet/computer articles saturating Western media (and thus our societies) even more.

2.2.3. Author Categories

I also divided article authors into additional binomial categories: *expert* and *novice*; and *male* and *female*. The expert/novice distinction referred to whether the author’s background in terms of the four dichotomies was that of a scientist (e.g., in the field of sexuality studies), or someone well known to be an oft-quoted research pundit regarding the relevant wider topic (e.g., again with sexuality, the gay rights campaigner Peter Tatchell). Science editors writing on the topic (e.g., Steve Connor writing on evolution in the *Independent*) were considered experts due to presumed exposure to the dichotomy in question; entertainment journalists were not, unless they had additional qualifications. If the level of expertise was unknown or “both”, it was labelled “unknown” and considered as missing data in further analyses undertaken; similarly for “unknown” gender. If there were multiple authors where one was expert and the other a novice (very rare), then it was labelled “expert”, with the reasoning that the expert opinion would over-ride the novice opinion. (I note that *all* journalists may be acting as “experts” to the general populace in terms of authority.) For gender, the classifications were *male*, *female*, *unknown* (missing data), and *both* (in the case of a mixed-gender, multi-author article, which again was rare). I looked at expertise level to see whether specific knowledge influenced ambiguity tolerance, and at gender to see whether there was a disparity between male and female ambiguity tolerance.

2.3. Quantifying Four Prominent Dichotomies

I sourced newspaper articles where ambiguity was already present with respect to the selected common dichotomies (Human–Animal, Human–Machine, Male–Female, Heterosexual–Homosexual).

I then coded the attitude towards the ambiguous state as “negative”, “positive”, “mixed” or “neutral”. By “positive” and “negative”, I mean “overwhelmingly positive” or “overwhelmingly negative” – articles that were more measured would receive a “mixed response” label; and neutral articles would be “neutral”, accordingly. (In addition, I have included at the end of *Appendix A* interesting articles that embraced binarism and eschewed ambiguity, though I did not include them in the sampling, of course.)

Coding articles in this way – one of four potential codings – meant that I was able to operate in a less binary/essentialising manner myself, as there was the possibility for the article not to be solely “negative” or “positive”, but also “mixed” or even “neutral”. However, if an article was overwhelmingly negative towards ambiguity but only very incidentally positive, I would label that as “negative” instead of “mixed”. This was the case for all permutations of categorisations, i.e., overwhelmingly neutral in a 3,000-word article with three words of slight negativity would be a neutral classification by the intended general sentiment of the article.

For each dichotomy, I below provide examples of articles that have been coded as negative, positive, mixed and neutral. I created pools of ambiguous articles by using a search on particular words that would be likely to bring up ambiguous articles. I then sampled 3 chronological articles from each newspaper (*Guardian*, *Times*, etc.) that I deemed ambiguous. The type of intermediacy (such as “machine-enmeshment” for the Human–Machine dichotomy) differs, and so is discussed in separate sections below. The specific types of this state of intermediacy are here called *intermediaries*, and they include both participants in a dichotomous split, e.g., intermediaries via evolution includes both humans and non-human animals. In this sense, *intermediaries* refer to the “links” *between* the humans and non-human animals. There are different responses to ambiguity, here termed *ambiguity tolerance*, and a negative response to ambiguity would result in a negative coding.

I discussed the irony of using binarism to “tackle” binarism in my discussion of cultural relativism in the introduction, and reiterate that I am purposefully reductive in my search pools and coding – as well as in my analyses of various articles and the wider dichotomies: I acknowledge that I am a part of my own culture and bound by my human brain. That said, one way of visualising intermediaries in a dichotomous or even in flexibly dichotomous paradigm is in the following table I used for my own

codings post-sampling (Tab. 3). In the wider chapter discussions, I additionally attempt, where apt, to briefly acknowledge all-/multi-categories (e.g., pansexual) or neither-/un-categories (e.g., gender-neutral, ungendered, asexual).

Tab. 3. Intermediary codings for thesis: Post-sampling.

DICHOTOMY	CODINGS POST-SAMPLING
HUMAN-MACHINE	machine-enmeshment, human-enmeshment, human-machine hybrids, virtual reality, replacement, biotech, prosthetics, interactivity, robots, cyborgs, bionicity, metaphorical equivalisation, humans-as-machines, machines-as-humans
HUMAN-ANIMAL	humans-are-organisms, humans-are-animals, humans-are-mammals, humans-are-primates, humans-are-monkeys, humans-are-apes, primates-are-humans, animals-are-humans, zoonosis, hybridism, chimerism, intermediaries via evolution, anthropomorphisation, zoomorphisation, equivalisation, xenotransplantation
MALE-FEMALE	transgenderism, transsexualism, transvestism, cross-dressing, gender-bending, drag queen, drag king, androgyny, tomboy, sissy, dandy, metrosexual, butch, ladette, she-male, intersex, hermaphroditism, ambiguous gender, gender identity, fluid gender, sex-change
HETEROSEXUAL-HOMOSEXUAL	bisexual identity, bisexual behaviour, bisexual desire, pansexuality, omnisexuality, ambiguous sexuality, confused sexuality, chosen sexuality, sexual experimentation, fluid sexuality, sexuality spectrum, grey-area sexuality

2.3.1. Human–Animal

I restricted the search to articles referring to animal subcategories of “primates”, “monkeys” and “apes”, asking whether humans were perceived as animals of these kinds, which implies intermediary states. The search string was Boolean. I searched for articles that mentioned “apes” OR “primates” OR “monkeys” AND “humans”. I then coded only articles from the sampled result-pool that contained intermediaries.

The newspaper articles were collected on 14.05.2011.

Intermediaries then coded, while not exhaustive, include either explicitly or implicitly intermediate sets where humans were considered to be animals, such as humans-are-animals, humans-are-

mammals, humans-are-primates, humans-are-monkeys, human-are-apes. In addition, mentions of non-bacterial/non-plant/non-fungal organisms were considered to be animals (humans-are-organisms). Intermediaries also went in the other direction, including primates-are-humans, animals-are-humans and hominins (intermediaries via evolution). Hybrid-states such as chimerism and xenotransplantation also were considered intermediate, as were metaphorical equivalisations of humans-as-animals (zoomorphisation) or animals-as-humans (anthropomorphisation) and equivalisation via article-noted identical behaviour or via zoonosis, both suggesting interchangeability (cf. *Tab. 3*). I note that many articles start from anthropomorphic assumptions. Therefore, if there were a sampled article that was pro-animal in terms of the intermediary, but also anti-human in non-intermediary article sections, I would label that coding as positive, as the animal part of the intermediary (and therefore the change from the “essential” state of humanness itself) is therein regarded as a good thing.

Examples for the categorisations are provided in *Tab. 4*. The wording “humans belong to the order primates” and the later mentioning of “scientists consider humans to be primates and I concur” would return a single entry for the category “humans are primates”: “positive”. Multiple qualitative contradictory classifications within the same article were coded as a mixed classification, e.g., if in the same article I found the statement “humans belong to the order primates, but we are not really primates, we are humans and are different” (negative attitude towards intermediaries – this would be coded as negative if it appeared in isolation) and a later mentioning of “I am happy to be a human primate” (positive attitude towards intermediaries – this would be coded as positive if it appeared in isolation), the article then would be coded as mixed.

I coded both anthropomorphism and zoomorphism as intermediary states, but also usually used each term in conjunction with a second – *equivalisation* – since both were found in the context of the equivalising of human and non-human-animal behaviour, morphology or implied taxonomy. The use of the term equivalising implies a more “interanimalistic” (Merleau-Ponty 1961) approach than the more binarising zoo-/anthropo-morphism, as such equivalising suggests more of a two-way flow between humans and non-human animals.

The combination of both negative and positive attitudes towards ambiguity within the same article results in a mixed classification, but it is not only mixed articles that discuss intermediacy. A negative article also weighs in on the subject of intermediacy, and the coding “negative” means that it is negative in terms of the article’s ambiguity tolerance towards the intermediary.

Again, the response to ambiguity can vary in regards to these intermediates. It is important to emphasise that I was not coding negative attitudes towards animals/humans themselves – an article could very well be pro-animal and/or pro-human, and yet negative regarding intermediary states.

For the purposes of simplicity, when I use “ape”, I mean “great apes” (excluding humans, unless

specified); when I use “primate”, I mean “monkeys and apes and hominins, including humans”; when I use “NHP”, I mean “non-human primate”; when I use “animal”, I mean “all organic non-plant, non-fungal, non-bacterial life, excluding humans”, unless specified.

That said, I assert now that humans are certainly animals, primates and also apes, and more specifically chimpanzees. Taxonomic *splitters* are those who emphasise difference at the sub-species level; taxonomic *lumpers* are those who emphasise similarities at the sub-species level. As a *lumper* rather than a *splitter*, I nevertheless begrudgingly will bow to current fashion and use the term *Homo sapiens* (as opposed to *Homo sapiens sapiens*) to refer to modern humans and *Homo neanderthalensis* to refer to Neanderthals (as opposed to *Homo sapiens neanderthalensis*). That said, I consider Neanderthals to belong to the same species as modern humans, with moderns being the “modern” population variant.

Tab. 4. Coding examples for Human–Animal.

Negative

SOURCE: Independent No. 26	DATE 07.02.2000	INTERVIEWEE	AUTHOR Steve Connor (M)	EXPERT NOVICE	TM – TS/TE/TW – TD BG – BI – BT
INTERMEDIARIES: HUMANS ARE ORGANISMS HUMANS ARE ANIMALS HUMANS ARE MAMMALS HUMANS ARE PRIMATES HUMANS ARE MONKEYS HUMANS ARE APES OTHER PRIMATES ARE HUMANS OTHER ANIMALS ARE HUMANS ZOOONOSIS HYBRIDISM CHIMERISM INTERMEDIARIES VIA EVOLUTION ANTHROPOMORPHISATION ZOOMORPHISATION EQUIVALISATION XENOTRANSPLANTATION					
CLASSIFICATION NEGATIVE POSITIVE MIXED NEUTRAL		ARTICLE NOTES Another article that may be related to pathogen fears in terms of disease transmission and human in-group protection. Actual chimpanzee tissue is mentioned.			
ORIGIN OF AIDS MAY BE A 1950S BATCH OF POLIO DRUGS “FORTY-YEAR-OLD batches of polio vaccine are to be tested for HIV to discover if they were responsible for starting the Aids epidemic. Aids laboratories will try to establish whether HIV jumped from chimpanzees to humans as a result of using a vaccine that was made from chimp tissue. The vaccine batches have been stored at the Wistar Institute in Philadelphia since the late 1950s, when they were used as part of the institute's vaccination programme in the Belgian Congo. Clayton Buck, the chief administrative officer of the Wistar, said nine vaccine phials dating back to the period have been found in the institute's freezers, but only one is definitely known to have been used in the 1958- 59 trial. He said all nine samples will be tested by each of three separate Aids laboratories for HIV and the simian immunodeficiency virus (SIV), which naturally infects wild chimps. The scientists will also test the animal tissue used to make the vaccine to see whether it comes from chimps or another species of monkey. [...] two Wistar scientists originally involved in developing the polio vaccine, claim that only rhesus macaque monkeys were used. If so, this would undermine the chimp hypothesis as macques come from Asia and are not naturally infected with SIV. [...] Many Aids specialists have in the past dismissed the idea that polio vaccines used in Africa 40 years ago sparked the epidemic. However, recent research showing that the closest relative of HIV is a SIV that infects wild chimps has rekindled interest in the theory. Ed Hooper, author of The River: A Journey Back to the Source of HIV and Aids, believes that chimpanzees were used in vaccine development and has produced strong, albeit circumstantial, evidence that this triggered the Aids epidemic in humans. However, the latest estimate of when chimp SIV might have jumped to humans suggests that it occurred more than 20 years before the Congo vaccine trials.”					

Positive

SOURCE: Mail No. 58	DATE 02.10.2005	INTERVIEWEE	AUTHOR Philip Hensher (M)	EXPERT NOVICE	TM – TS/TE/TW – TD BG – BI – BT
INTERMEDIARIES: HUMANS ARE ORGANISMS HUMANS ARE ANIMALS HUMANS ARE MAMMALS HUMANS ARE PRIMATES HUMANS ARE MONKEYS HUMANS ARE APES OTHER PRIMATES ARE HUMANS OTHER ANIMALS ARE HUMANS ZOOONOSIS HYBRIDISM CHIMERISM					
INTERMEDIARIES VIA EVOLUTION ANTHROPOMORPHISATION ZOOMORPHISATION EQUIVALISATION XENOTRANSPLANTATION					
CLASSIFICATION NEGATIVE POSITIVE MIXED NEUTRAL		ARTICLE NOTES Equivalising via evolution (implied): “The monkeys are rhesus monkeys, very close to human beings”. Strongly positive, in context.			
A monkey puzzle “The image on each is of a monkey. The ‘apostles’ are all in profile, facing the largest of the monkeys, the Gold Monkey, who faces down the room. They are very similar paintings, highly contrasted. [...] slowly, a unique and noble beauty starts to impress itself. Initially, they seem like flat paintings, but the more you look at them the deeper the sense of illusion grows, the more impressive the throbbing, remote energy. Ofili got into terrible trouble at an earlier stage in his career for a painting of the Virgin Mary which struck many people as blasphemous. And, surely, a painting that alludes to the Last Supper using monkeys might seem hardly less offensive. But Ofili’s intentions are more subtle in fact, he seems to be a devoutly religious man. The monkeys are rhesus monkeys, very close to human beings, and through them Ofili may dramatise the animal nature of flesh. Moreover, Christianity is brought beautifully close to other world religions. There are African animist religions at work, and, clearly, the Hindu monkey-god Hanuman. In the awesome figure of the Gold Monkey at the end, Christ and Buddha mysteriously join with each other. Here is a profound religious experience, as well as for those of us not particularly devout an overwhelming artistic one. No one who saw them could possibly worry about any blasphemous intent; the complex meaning of the work of art dissolves in its extraordinary, and ultimately inexplicable physical beauty. You just have to surrender to it, and it’s a wonderful purchase for the Tate to have made.”					

Mixed

SOURCE: Times No. 87	DATE 09.10.2010	INTERVIEWEE	AUTHOR Giles Coren (M)	EXPERT NOVICE	TM – TS/TE/TW – TD BG – BI – BT
INTERMEDIARIES: HUMANS ARE ORGANISMS HUMANS ARE ANIMALS HUMANS ARE MAMMALS HUMANS ARE PRIMATES HUMANS ARE MONKEYS HUMANS ARE APES OTHER PRIMATES ARE HUMANS OTHER ANIMALS ARE HUMANS ZOONOSIS HYBRIDISM CHIMERISM INTERMEDIARIES VIA EVOLUTION ANTHROPOMORPHISATION ZOOMORPHISATION EQUIVALISATION XENOTRANSPLANTATION					
CLASSIFICATION NEGATIVE POSITIVE MIXED NEUTRAL		ARTICLE NOTES A mixed response in that there is a disavowal of the equalised behaviour, yet protection of the equalised chimpanzee-human intermediary.			
You damn fool, Charlie. Smoking isn't cool; Wheezing and coughing in his cage, nicotine patches hanging off his fur... yes, only an ape would take up fags "The funny thing when you look at pictures of Charlie chugging a snout (and I'm very much hoping they've stuck one in the middle of this column) is that you find yourself looking at two very different outdated phenomena - on the one hand a smoker, and on the other a wild animal trained to demean itself for the amusement of humans - and it is hard to say which of the two is the more potent image of Man's brutal and ignorant recent past. [...] "You damn fool, Charlie. Smoking isn't cool; Wheezing and coughing in his cage, nicotine patches hanging off his fur... yes, only an ape would take up fags [...] Whenever a smoker dies young I have a sympathy failure. [...] Death is a terrible business and upsets everyone you leave behind, and the very least you can do is remove yourself from culpability as far as possible to give them a good clean mourn, unsullied by anger or guilt. So the widely reported death of Charlie the Smoking Chimp, in a South African zoo last week, has given me a bit of a problem. "You damn fool, ape!" I shouted when I saw that he had passed. "You thought you were so cool, chugging away on your wretched tabs, and now you're dead at 52 and, like all your kind, expecting us to feel a pang!"					

Neutral

SOURCE: Eve. Standard No. 95	DATE 07.04.2010	INTERVIEWEE	AUTHOR Unknown	EXPERT NOVICE	TM – TS/TE/TW – TD BG – BI – BT
INTERMEDIARIES: HUMANS ARE ORGANISMS HUMANS ARE ANIMALS HUMANS ARE MAMMALS HUMANS ARE PRIMATES HUMANS ARE MONKEYS HUMANS ARE APES OTHER PRIMATES ARE HUMANS OTHER ANIMALS ARE HUMANS ZOONOSIS HYBRIDISM CHIMERISM INTERMEDIARIES VIA EVOLUTION ANTHROPOMORPHISATION ZOOMORPHISATION EQUIVALISATION XENOTRANSPLANTATION					
CLASSIFICATION NEGATIVE POSITIVE MIXED NEUTRAL		ARTICLE NOTES Equalisation via female gorillas receiving human pregnancy tests, neutrally presented.			
GORILLA WILL BE MISSED "They also believe Yeboah may have got Mjukuu, the youngest female, pregnant before he died, and have been administering human pregnancy tests to find out. Yeboah, 12, moved from the Boissière Du Doré zoo, near Nantes, France, in November to live with Zaire, Effie and Mjukuu. They needed male attention after silverback Bobby, 25, died in December 2008."					

2.3.2. Human–Machine

I used a NexisUK digital pool sourced from keywords, in this case articles that contained: “machine” AND “human”; “virtual reality” AND “human”; “robot” AND “human”; “computer” AND “human”; “internet” AND “human”; “digital animation” AND “human”; “gaming” AND “human”; “world wide web” AND “human”; those articles that used “prosthetic” OR “half human” OR “half man” OR “half woman” OR “half machine” in the same sentence as “human”; and articles that merely contained the words “cyborg” or “cybernetic” or “bionic man” or “bionic woman”. I reasoned this would give me a good “ambiguity pool” from which to sample, and it did.

The articles were collected on 28.06.2012 for 1995, with the searches for “cyborg” or “cybernetic” or “bionic man” or “bionic woman” in 1995 added to the tally on 04.09.2012; searches for 2000 on 01.10.2012; searches for 2005 on 17.07.2012, with the searches for “cyborg” or “cybernetic” or “bionic man” or “bionic woman” in 2005 added to the tally on 04.09.2012; and searches for 2010 on 17.07.2012, with the searches for “cyborg” or “cybernetic” or “bionic man” or “bionic woman” in 2010 added to the tally on 04.09.2012.

Intermediaries coded, while not exhaustive, include either explicitly or implicitly intermediate concepts such as enmeshment. Enmeshment goes “both” ways: machine-into-human (tiny submarines in arteries, human biotechnology and nanotechnology) and human-into-machine (virtual

reality; interactive enmeshed states such as encompassing internet experiences). Hybrid-states such as cyborgs, prosthetics and bionicity also were considered intermediate, as were metaphorical equivalisations of humans-as-machines or machines-as-humans and equivalisations where robots directly replace humans, suggesting interchangeability (*Tab. 3*).

Examples for the categorisations are provided in *Tab. 5*. Codings took the Human–Machine dynamic itself into consideration: if there were a sampled article that was pro-machine in terms of the intermediary, but also anti-machine in non-intermediary article sections, I would label that coding as positive, as the machine part of the intermediary (and therefore the change from the “essential” state of humanness itself) is therein regarded as a good thing.

I did not search on androids, but it is likely that my “cyborg” search-words would have found such androids. An android merely “resembles” a human by definition, whereas a “cyborg” is part human and part machine, potentially allowing for a greater ambiguity pool. Nor did I search on “mechanical”, but it is likely that such resulting articles would be picked up by “machine” results. I did not search on “machine gun”, as I initially was concerned that as it is always associated with lethal human violence this might be disproportionately negative in tone (though as noted this would not have mattered, as long as I had searched consistently for all four years). I did not search on “biotechnology” or “bioinformatics”, though most mentions of patenting of human genes (when I came across them via other keywords) presupposes a sense of intermediacy, as does biotechnology), and if the enmeshment was what I subjectively deemed sufficient then biotechnology mentions were coded when they appeared as results from other keyword searches. I included human cloning when it came up in the already-determined search results if, again, it was the result of biotechnology enmeshment. I did not use “genetic profiling” *per se* as a search intermediary, however, as there is no sense of intermingling, just tabulation. That said, when I came across via other keywords discussions of genetic profiling via the human genome or DNA profiling (computerising/electronically encoding human biology) I considered them to be intermediary forms and coded them thusly. I did not use “computer simulation” for an initial search term, though I suspect “virtual reality” would have caught most of these articles. I did, however, code simulation *itself* as an intermediary when I came across it, as it implies replacement and therefore equivalency.

Although “internet” and “world wide web” were used as keyword strings to source promising articles, just the mere mention of the “internet” or the “world wide web” was not enough for me to consider them as intermediaries, despite the human-computer interface. If, on the other hand, virtuality via virtual reality in connection to an interface was mentioned, then the articles were coded accordingly. I use the term “virtuality” here as shorthand for “aspects of virtual reality”.

I removed gaming references where the gaming referred to gambling and not computer games. I did not code articles referring to the corporation “Attica Cybernetics”, unless such articles directly

referred to cybernetics and not just a mention of the company name. However, when references to an academic institution from the department of cybernetics appeared, I did code them, because that implies the study of cybernetics and intellectual discussion of intermediacy – the gaming/software manufacturer on the other hand is a brand name and is being used differently. I did not use “cyberspace” as a search term for Human–Machine, but the “internet” and “world wide web” searches, along with the “cyborg” intermediary searches, should have picked up similarly relevant articles.

I included intermediary classifications where the author spoke figuratively as well as literally, such as when the author directly refers to humans as machines, or directly compares particular human abilities with a machine. The reason why I have coded “baby-making machines” as intermediaries but not the similarly-coded “war machines” or “propaganda machines” is because the baby machines generally are referring to human individuals – if the “war machine” was referring to an individual, then I would code it as an intermediary, accordingly (and the same for the non-intermediary nature of phrases such the “Nazi-party machine”).

I did not do a specific search on life-support machines, but when they showed up in the results I coded them as intermediaries, as they certainly involve bodily/physical enmeshment. I did not code “human shield” references, as they were not specifically mechanical. I did not search on “machinery” AND “human”, nor did I search on “automatons”. Robots, which I did search on, were a special case, as robots imply replacement and therefore equivalising and intermediary states by definition. I did not use “industrial robot” as a search term, though I suspect that I would have returned a great deal of articles on “replacement” if I had done so. That said, the total amount of articles is not relevant for my particular research on ambiguity tolerance, just searching consistency. (Another point regarding consistency: in 1995, the *Independent* ran a regular internet promotional column in which the Human–Machine dichotomy was unfailingly positive. When it came up in the samplings I included it every time, for consistency, and also because it still is a measure of authorial ambiguity tolerance when sampled.)

The wider “robot” search would, in any case, pick up any relevant articles on “industrial robots”. Similarly, I did not search on “automaton/s”. My justification for using “replacement” as a designator for intermediacy is because it indicates interchangeability and thus merging (categorical and otherwise). It implies that two categories are basically the “same thing”. Computers are in essence at times being referred to as human surrogates, as with robots.

I did not consider the mention of the word “computer” or in some cases “computer error” enough to justify an intermediary coding. Nor did I search on “artificial intelligence” or “cybersex”, though, in retrospect, this would have been useful in sourcing intermediary articles, as such terms imply either human-computer interaction or replacement (although I did not code references to “sex machines”

unless the machine aspect was discussed in a replacement context, as this is a common turn of phrase that primarily refers to the James Brown song lyric and not an intermediary in itself). However, such references were certainly coded as intermediary states when I came across them via other keyword searches if they exhibited sufficient individuated intermediacy.

Mere computer work was not enough to justify coding. For example, there were multiple references in multiple publications to a computer analyst in May/June 2000 being a paranoid schizophrenic (generally considered a negative association), but, as the articles never mentioned anything additional about his job, I did not code such articles. If there were an instance where a similar article went into more detail about the computer and described embodiment, enmeshment or human agency, I did code it as an intermediary.

I coded Human–Machine intermediaries when they are extensions/prosthetics (in either direction). See below in [App. 151] one such “positive”-coded example. I also coded as intermediaries articles where clothing itself was made up of robots and electronics. This too is enmeshment, particularly as clothing is very personal and “part of” a person, and this concept also is connected to the idea of prosthetics and extension (cf. Corrigan *et al.* 2010). See this “negative” coding below in [App. 146].

In terms of pop culture, I did not code the musical group “New York’s Secret Machines” and I disregarded the group GLC’s single “Half Man Half Machine” in the results, unless the cyborg aspects were in some way discussed further by the journalist.

I labelled human-prejudicial sentiments as HSC (“human superiority complex”), where the intended point of the article was to assert human superiority over machines. This was common, likely a form of infrahumanisation and is discussed at greater length in Chapter 4. Also, very occasionally, CSC (“computer superiority complex”) was asserted.

Tab. 5. Coding examples for Human–Machine.

Negative

SOURCE:Independent No. 146	DATE 03.04.2005	INTERVIEWEE	AUTHOR Janet Street-Porter(F)	EXPERT NOVICE	TM – TS/TE/TW – TD BG – BI – BT
INTERMEDIARIES: MACH-ENMESHMENT HUM-ENMESHMENT HUM-MACH HYBRIDS VIRTUAL REALITY REPLACEMENT BIOTECH PROSTHETICS INTERACTIVITY ROBOTS CYBORGS BIONICITY METAPHORICAL EQUIVALISATION HUMS-AS-MACHS MACHS-AS-HUMS					
CLASSIFICATION NEGATIVE POSITIVE MIXED NEUTRAL			ARTICLE NOTES Negative human-enmeshment and replacement intermediary associations.		
NO WONDER ILLITERATE YOUTH TURNS TO CRIME "This week, Adidas unveiled an "intelligent" running shoe, costing £175 a pair - apparently this must-have footwear contains a "brain" which reads the terrain you run on and adjusts the cushioning accordingly. Mr Pennant was arrested behind the wheel of his luxury car fiddling with its costly satellite navigation system as he endeavoured to drive from north London to Bristol - why learn to read a map when a robot can do it for you? In Mr Pennant's world, it is easy to see how gorgeous gadgetry and intelligent shoes have replaced the need to read letters, menus, bills and newspapers. When you earn £10,000 a week, there's always a hanger-on or a minion to do that kind of thing for you.					

Positive

SOURCE: Guard/Observer No. 151	DATE 02.06.2005	INTERVIEWEE	AUTHOR Mary Branscombe (F)	EXPERT NOVICE	TM – TS/TE/TW – TD BG – BI – BT

INTERMEDIARIES: MACH-ENMESHMENT HUM-ENMESHMENT HUM-MACH HYBRIDS VIRTUAL REALITY REPLACEMENT BIOTECH PROSTHETICS INTERACTIVITY ROBOTS CYBORGS BIONICITY METAPHORICAL EQUIVALISATION HUMS-AS-MACHS MACHS-AS-HUMS	
CLASSIFICATION NEGATIVE POSITIVE MIXED NEUTRAL	ARTICLE NOTES Generally positive in terms of the extension possibilities.
Online: Inside IT: Windows shopping: If your business software is going out of date, next year's launch of Office 12 is a tempting prospect but, says Mary Branscombe, don't ignore open source alternatives "Do you feel like a dinosaur for using Office 97 in 2005? Wait until Office 12 comes along next year. Bill Gates is promising "integration, simplification, and a new breed of software applications and services that manage complexity in the background, and extend human capabilities by automating low-value tasks and helping people make sense of complex data". Translation: a simpler interface will reveal more of the tools already in Office, and PowerPoint will turn your bullet points into sleek graphics. Also, Outlook will finally put tasks into the calendar view and let you choose times for them. There's also more control for administrators. The Information Rights Management feature that lets you choose who can view, print and forward documents will cover InfoPath as well as Word, Excel and PowerPoint. Admins will also be able to create central policies for expiring and archiving documents, and preset workflows for document approval. But don't expect all the new tools to be in Word and Excel. Office 12 is, like Office 2003, part of the Office System - a mixture of applications supported by services built into Windows Server 2003, SharePoint Portal Server and Live Communications Server. There are also rumours of new servers similar to Project Server, but for Excel, Visio and InfoPath, SharePoint will still be key for collaboration"	

Mixed

SOURCE: Mirror No. 114	DATE 24.09.1995	INTERVIEWEE	AUTHOR Malcolm Bradbury	EXPERT NOVICE	TM – TS/TE/TW – TD BG – BI – BT

INTERMEDIARIES: MACH-ENMESHMENT HUM-ENMESHMENT HUM-MACH HYBRIDS VIRTUAL REALITY REPLACEMENT BIOTECH PROSTHETICS INTERACTIVITY ROBOTS CYBORGS BIONICITY METAPHORICAL EQUIVALISATION HUMS-AS-MACHS MACHS-AS-HUMS	
CLASSIFICATION NEGATIVE POSITIVE MIXED NEUTRAL	ARTICLE NOTES A mixed response towards the intermediaries mentioned in the sense of encompassment by virtual reality. This article replaced another, when there were none available for sampling.
I HAVE SEEN THE FUTURE AND IT VIRTUALLY WORKS; PART TWO OF SERIES ON FUTURE OF EMPLOYMENT "Most of the futurologists who prospered in recent years predicted that, by the year 2000, we'd be happily living in a world of boundless, uninterrupted leisure, if we weren't founding space colonies on the moon. Leisure would be our reward for economic energy and invention, which would replace work with the new machine or the chip. Now prophets are more gloomy. They predict disasters - to the environment (global pollution, the ozone layers, over-population, epidemics), and to the social order (collapsing cities, the growth of the underclass, ever rising crime). The crisis in employment is one of the main reasons. It's now become apparent the problem of work and the technological revolution that helped cause it is structural and long-term. It's harder than ever to predict the Shape of Things To Come. By 2020, we could be on the sunlit uplands of a great leisure revolution, freed from most manual and domestic work by technological breakthroughs. Machines won't just do most of the work; they'll generate the economic energy, too. We, or our children, will live in the world of the endless shopping mall, with the world's designer goods at our disposal, shopping till we drop. Their kids in turn will live in the world of an expanding virtual reality. Screens and images will do the walking and the buying, and the technological production of music, movies, news and information will provide a wrap-around world. We will probably have solved many of the problems of pollution, with electric cars and self-destruct packaging. We'll be increasingly cautious about the environment, realising it's a destroyable resource. Meantime, cities will be vast, the world population exploding. They'll be hi-tech, multi-cultural and probably much more dangerous places, if the world of rich and poor continues to split. By 2020 technological change we're already seeing now will have worked through the system. It will have produced a knowledge revolution, based on the speed by which any information can be accessed and used, any transaction performed. It will be a world of screen and image, in which everything - education, entertainment, shopping - will be easily accessed. Because of the technologies we're letting into our homes now, the homes of the future will leak freely into the wider world. But the change in the system is bigger. It's a change in the balance of nations, races and genders. The centre of invention and economic growth is shifting, from Europe and the West toward the Pacific Rim. As old work dies, new work goes abroad. [...] By 2020, the world could be a better place for some. For the successful, it could offer unprecedented leisure, wealth, power to shop and travel. But success will be worth having only if society remains stable and there is enough work to provide the power to spend. We need to create work, because it means identity, rather than an aimless life. But the real lesson of the past is that all future prophecies are unreliable. We can see the big shapes of change and begin to sense the world our children will be living in. The one guarantee is that history will surprise us. That's the true Shape Of Things To Come."	

Neutral

SOURCE: Eve Standard No. 120	DATE 30.01.1995	INTERVIEWEE	AUTHOR (F) Sophia Sackville West	EXPERT NOVICE	TM – TS/TE/TW – TD BG – BI – BT

INTERMEDIARIES: MACH-ENMESHMENT HUM-ENMESHMENT HUM-MACH HYBRIDS VIRTUAL REALITY REPLACEMENT BIOTECH PROSTHETICS INTERACTIVITY ROBOTS CYBORGS BIONICITY <u>METAPHORICAL EQUIVALISATION HUMS-AS-MACHS</u> MACHS-AS-HUMS	
CLASSIFICATION NEGATIVE POSITIVE MIXED <u>NEUTRAL</u>	ARTICLE NOTES Holmes' machine qualities are presented in generally neutral terms.
Boxing the detective "Now, just as in Edwardian London when Arthur Conan Doyle's stories were serialised in Strand magazine, Holmes magnetises aficionados as though he were a living person. For Doyle he became a genie-like figure, his personal Frankenstein, whom he tried to kill in conflict with that "Napoleon of crime" Moriarty at the Reichenbach Falls, but whom he was forced to resurrect by popular demand. Yet this 'calculating machine', whose perfect observation and reasoning made him the model of all subsequent fictional detectives, is not himself an emphatic character: he treats human beings as specimens and is invariably patronising towards the worthy, slightly slow-witted Watson. Moreover, the stories are frequently incredible, riddled with contradictions, and the reader often has to take on trust the all-important detail on which the denouement hinges."	

2.3.3. Male–Female

I mined the NexisUK digital pool for articles that contained as keywords “manly” OR “womanly” OR “boyish” OR “girlish” OR “androgynous” OR “masculine” OR “feminine” OR “ambiguous” OR “mannish” OR “effeminate” OR “butch” AND gender (same paragraph); or the words “unknown” OR “identity” AND “gender” (same sentence); or the words “dandy” AND male (same sentence); or the stand-alone words “transvestite” OR “transsexual” OR “transgender” OR “shemale” OR “crossdresser” OR “cross-dresser” OR “genderbender” OR “gender-bender” OR “drag queen” OR “drag king” OR “tomboy” OR “intersex” OR “hermaphrodite” or “sissy” OR “ladette” OR “metrosexual”.

These articles were collected on 29.08.2012 for the years 1995 and 2000; and 30.08.2012 for the years 2005 and 2010. Examples for the categorisation are provided in *Tab. 6*.

Intermediaries coded, while not exhaustive, include either explicitly or implicitly intermediate sets of both transgenderism (transgender, transsexual, transvestite, she-male) and “non-conforming” gender identity (cross-dressing, gender-bending, androgyny, tomboy, sissy, dandy, metrosexual, butch, ladette, fluid gender, gender identity [usually mentioned in the context of gender non-conformity]), as well as intersex references (intersex, ambiguous gender, hermaphroditism); performative aspects (drag queen, drag king) and sex-reassignment surgery (sex-change) (*Tab. 3*) – see Chapter 7 for more discussion of these sets. I note that many terms are considered slurs, e.g., sissy, tranny, hermaphrodite, she-male.

I made the decision to do a portion of searches *within* the same paragraph, otherwise “male” and “female” came up too often (though when searched on within same sentence, this resulted in too few results). Similarly, I did not use “drag” as a search word in gender, as there were too many uses of the word as a verb.

I intended to search on “third sex”, but Nexis would not allow for a grouped set of “third sex”, and thus returned too many results (>3,000) for “third” + “sex” – though there probably were unlikely to be any significant returns on this search term, anyway, which was my justification for not searching on “ladyboys”, with the assumption that any returns also would be caught up in sweeps for “transvestite”, “transgender” or “transsexual”. Likewise, I could only search for “shemale” and not “she-male”, and could not search on “mama’s boy” or “big girl’s blouse” or “new lad”. I subsequently reasoned that any mention of the neologism “trans” or slang term “trannies” would be caught up in sweeps for “transgender” or “transsexual”, and ditto for “MTF” and “FTM” (for some reason, and luckily, “drag queens” and “drag kings” came up as individuated responses – perhaps because the

words “drag”, “queen” and “king” are rarer than “she” and “male”). Terms such as “trans* [trans-asterisk]”, “genderneutral”, “genderqueer”, “non-binary” and “GCS” (gender-confirmation surgery) were not in wide use in the popular media in 1995-2010 (particularly before 2005), and thus could not be consistently searched across all four years. That said, most of these terms similarly would be caught up in “transgender”, “transsexual” and “transvestite” sweeps.

I did, however, search “unknown” OR “identity” AND “gender” (same sentence) to get around the fact that I could not search on “unknown gender” or “gender identity” since Nexis changed its search settings as of late August 2012. I also did a search on “dandy” and “male” in the same sentence to avoid the different meaning that “dandy” has as an adjective as opposed to a noun. It is worth noting that there are very few (or too many – which meant that Nexis UK would not display the entire results) articles using simple “male”/“female”/“masculinity”/“femininity” designations. That said, I anticipated that the “trans-” searches would catch many article discussions about gender ambiguity within that particular context. I reasoned that this would give me a good “gender ambiguity pool”, and it did. I coded unqualified words such as “freakish” as “negative” in my codings; and the descriptor “controversial” was considered a “mixed” quality, as it usually appeared with both positive and negative associations. Similarly to the anthropocentric Human–Animal and Human–Machine alterities, there is generally a privileging of genderedness, via assumptions of either/or as opposed to non-binary, throughout the bulk of these articles. Therefore, if there were a sampled article that was, e.g., pro-non-binary in terms of the intermediary, but also anti-gender overall in non-intermediary article sections, I would label that coding as positive, as the non-binary part of the intermediary (and therefore the change from the “essential” state of genderedness itself) is therein regarded as a good thing.

Tab. 6. Coding examples for Male–Female.

Negative

SOURCE:Independent No. 218	DATE 01.07.2000	INTERVIEWEE	AUTHOR Severin Carrell (M)	EXPERT NOVICE	TM – TS/TE/TW – TD BG – BI - BT
INTERMEDIARIES:	TRANSGENDERISM DRAG QUEEN METROSEXUAL HERMAPHRODITISM	TRANSSEXUALISM DRAG KING BUTCH AMBIGUOUS GENDER	TRANSVESTISM ANDROGYNY LADETTE GENDER IDENTITY	CROSS-DRESSING TOMBOY SHE-MALE FLUID GENDER	GENDER-BENDING SISSY DANDY INTERSEX SEX-CHANGE
CLASSIFICATION NEGATIVE POSITIVE MIXED NEUTRAL	ARTICLE NOTES Negative gender-bending intermediary associations, e.g., sexual abnormalities.				
SURVIVAL OF ATLANTIC MARINE LIFE THREATENED “The Oskar conference has already put Britain under intense pressure to honour its commitment at the last conference, in Sintra, Portugal in 1998, to cut radioactive discharges to “near zero” and abandon nuclear reprocessing. The latest report will raise pressure on ministers to tackle other issues, such as hormone-disrupting compounds. These “gender benders”, routinely used in cosmetics, condoms and plastics, are known to cause sexual abnormalities and affect reproduction in shellfish and fish. They are also blamed for falling sperm counts among north European men.”					

Positive

SOURCE: Mail No. 202	DATE 02.07.1995	INTERVIEWEE Tracie	AUTHOR Jean Rafferty (F)	EXPERT NOVICE	TM – TS/TE/TW – TD BG – BI – BT
INTERMEDIARIES:	TRANSGENDERISM DRAG QUEEN METROSEXUAL HERMAPHRODITISM	TRANSSEXUALISM DRAG KING BUTCH AMBIGUOUS GENDER	TRANSVESTISM ANDROGYNY LADETTE GENDER IDENTITY	CROSS-DRESSING TOMBOY SHE-MALE FLUID GENDER	GENDER-BENDING SISSY DANDY INTERSEX SEX-CHANGE
CLASSIFICATION NEGATIVE POSITIVE MIXED NEUTRAL	ARTICLE NOTES Positive in general overall tone towards the transsexual intermediary, though the article is somewhat patronising in style. Nevertheless, transsexualism is portrayed as a happy state – and, interestingly, a further permutation of the intermediary where the article subject is portrayed as more essentially female than biological females.				
I used to be a man. Now I'm happily married to another woman; NIGHT & DAY/PERSONAL COLUMN "It's all been worth it for her. She wasn't much of a success as a man, you see: the survivor of two failed marriages, an endless stream of two-week jobs, and even a two-year stretch in prison when she got not a single visit or letter. She realised then that her life had to change. But she's supremely, confidently, triumphantly female, more so than any biological woman. Society has ways of making us gals doubtful. We're anxious about being too fat or anxious about being anxious; we're hysterics like OJ Simpson's high-powered woman prosecutor, Marcia Clark, or we're bovine breeders. If we haven't had children we're not real women and if we have had children we're not real people. Tracie doesn't waste her time on such self-deprecation. She doesn't even bother to girlyfy her voice. 'Why should I pretend to be something I'm not?' she says. 'I did that for 30-odd years.' She wanted to be female ever since she was tiny. She didn't want to be like her father, who was boring and never there. He worked so hard they only saw him on Friday nights, when he brought fish and chips and bars of chocolate home for them. He took Tracie and her sister out just the once. It was during the very cold winter of 1962, but he forgot their coats and scarves and gloves. 'I remember thinking then, 'Men are useless'', says Tracie. [...] Although she's been living as a woman for over seven years she had the operation only 18 months ago. She's still delighted with her brand-new woman's body and shows off a video of herself naked except for a John Major mask, protesting against the Government. 'When I became Tracie my whole life changed,' she says. 'Before, people would meet me and like me, but within two weeks they'd say, 'There's something not quite right about that one.' Now, every friend I've met since I changed I've kept. I'm stable, very stable. I like myself now.' She even says blithely that she has orgasms, which seems indecently quick to someone who's spent the last 15 years trying to find the G spot. But then who could begrudge her her happiness now, when she's gone through so much to be one of the girls? There wasn't £48,000 lying round on the mantelpiece at home. You just don't make that kind of money being a lifeguard or bouncer, which were the sort of things Stephen did for a living. Tracie had to go out and hustle for it, quite literally. She tried getting work with a temp agency, but knew it wasn't going to work when an employer called her in, knowing she was a transsexual, then laughed in her face - which strikes me as far more perverted than anything Tracie's ever done. She ended up working as a prostitute, as so many women do when there's nothing else left. 'There were no other transsexuals around at the time, so I was getting all the work. But I never had penetrative sex as a prostitute, only with women and I didn't enjoy that. For years I didn't have sex. I'd just end up crying because it made me feel like I was a man.' Now she has the happy, useful life she always wanted. She loves to stay in at night and look after whichever children she has staying with her. And she's madly in love with her girlfriend. 'She's so bloody pretty.'"					

Mixed

SOURCE: Mirror No. 258	DATE 06.03.2005	INTERVIEWEE	AUTHOR Maeve Quigley (F)	EXPERT NOVICE	TM – TS/TE/TW – TD BG – BI – BT
INTERMEDIARIES:	TRANSGENDERISM DRAG QUEEN METROSEXUAL HERMAPHRODITISM	TRANSSEXUALISM DRAG KING BUTCH AMBIGUOUS GENDER	TRANSVESTISM ANDROGYNY LADETTE GENDER IDENTITY	CROSS-DRESSING TOMBOY SHE-MALE FLUID GENDER	GENDER-BENDING SISSY DANDY INTERSEX SEX-CHANGE
CLASSIFICATION NEGATIVE POSITIVE MIXED NEUTRAL	ARTICLE NOTES Suggestion that passable, but not “un-passable”, transvestism is socially acceptable (perhaps because it retains gender categories?): “But only Larry Mullen managed to make the cut as a foxy lady. [...] And one person was particularly taken aback when he saw what the lads were up to - Bono's late father Bob Hewson. Bob was there at the shoot when the pictures were taken and wasn't too impressed at Bono's lipstick-laden antics. Bono said: “He reckoned that I looked like - and I quote - ‘A dirty-looking ejjit’.”.”.				
SO U2 CAN BE A DRAG QUEEN “Who's a pretty boy then? Well, definitely not Bono, the Edge, Adam or Larry that's for sure. Here are U2 as you have never seen them before - dressed in killer heels and sexy skirts. The lads got all dolled up for the video shoot for their classic single One. But only Larry Mullen managed to make the cut as a foxy lady. The photograph comes from celebrity snapper Anton Corbijn's new book U2&i which features some extraordinary and candid shots of the band. This drag shot was never used because the song was adopted by HIV sufferers in America and Bono felt the image was inappropriate. Bono said: “We were doing a lot of fundraising for AIDS organisations at the time saying this is not just a gay man's disease. “We felt we shouldn't use the images in the end. Basically, we bottled it.” Although hunky Larry Mullen looked gorgeous in a dress and lipstick, the rest of the band unfortunately didn't leave legendary drag queens Shirley Temple Bar or Mr Pussy quaking in their stilettos. And one person was particularly taken aback when he saw what the lads were up to - Bono's late father Bob Hewson. Bob was there at the shoot when the pictures were taken and wasn't too impressed at Bono's lipstick-laden antics. Bono said: “He reckoned that I looked like - and I quote - ‘A dirty-looking ejjit’.” Anton Corbijn's U2&i is published by Schirmer.”					

Neutral

SOURCE: Times No. 261	DATE 03.09.2005	INTERVIEWEE	AUTHOR Alyson Rudd (F)	EXPERT NOVICE	TM – TS/TE/TW – TD BG – BI - BT
INTERMEDIARIES:	TRANSGENDERISM DRAG QUEEN METROSEXUAL HERMAPHRODITISM	TRANSSEXUALISM DRAG KING BUTCH AMBIGUOUS GENDER	TRANSVESTISM ANDROGYNY LADETTE GENDER IDENTITY	CROSS-DRESSING TOMBOY SHE-MALE FLUID GENDER	GENDER-BENDING SISSY DANDY INTERSEX SEX-CHANGE
CLASSIFICATION NEGATIVE POSITIVE MIXED NEUTRAL	ARTICLE NOTES Neutral – note that this article is coded only as to the author’s opinion, rather than the solicited readers’ opinions, as they are explicitly stated not to be the author’s opinion.				
The Left Hand of Darkness “WE SAY... Alyson Rudd on The Left Hand of Darkness The main question prompted by your e-mails is whether The Left Hand of Darkness is too concerned with the politics of its day to be enjoyable now. Opinions vary, but I think Ursula K. Le Guin was sufficiently careful in her handling of such Sixties issues as feminism and drug-taking for the themes not to scream out that they are dated. The novel may take us to other worlds where society is organised differently, but I felt it said more about friendship and trust than the role of, say, women then or today. The story is told through the eyes of Genly Ai, an envoy to a planet known to his people as Winter. They might have been bolder when naming the planet, for Ai struggles to cope with its extreme temperatures. In fact the descriptions of the cold are among the best pieces of writing in the book. Winter’s people are capable of both fathering and bearing children. During Ai’s visit the King becomes pregnant. I suspect the King’s behaviour is many people’s favourite aspect of this novel. King Argaven’s madness and insecurity are painted beautifully by Le Guin. He was “a short figure in the reddish gloom, rather pot-bellied, very erect, dark and featureless in silhouette...less kingly, less manly than he looked at a distance. His voice was thin, and he held his fierce lunatic head at an angle of bizarre arrogance.”					

2.3.4. Heterosexual–Homosexual

I used a NexisUK digital pool sourced from the following keywords: “homosexual” OR “heterosexual” OR “bisexual” OR “ambiguous” OR “homosexuality” OR “heterosexuality” OR “bisexuality” OR “ambiguous sexuality” OR “gay” OR “straight” OR “fluid” OR “lesbian” OR “confused” AND “sexuality”.

The articles were collected on 22.08.2012; with the exception of the year 2005 collected on 21.08.2012, and the months October–December 2000 collected 22-23.12.2013. Examples for the categorisation are provided in *Tab. 7*.

I did not search on “pansexual” or “omnisexual”, though such articles likely would surface under “fluid sexuality” or “bisexuality” and I coded “pansexuality” as such when appearing in my sampled articles. I also did not search on “threesome” (which, unless entirely homosexual, always implies some degree of sexual ambiguity); perhaps I should have – though I suspect most answers would have been pejorative. That said, the level of pejoration is not relevant, as what I am measuring is the *change* in tolerance from year to year. I did not search on “homoerotic”/ism, assuming that searches on “homosexual”, “bisexual”, “gay” and “lesbian” will have sufficed.

Intermediaries coded, while not exhaustive, include either explicitly or implicitly intermediate sets: bisexual identity, bisexual behaviour, bisexual desire etc.; as well as pansexuality, omnisexuality, ambiguous sexuality, confused sexuality, chosen sexuality, sexual experimentation (when apt in a bisexual context), fluid sexuality, sexuality spectrum, and grey-area sexuality (cf. *Tab. 3*).

Replacements were month by month. I sampled from the “01 December” listings for *Daily Mail* when there were not enough articles to replace this paper, rather than going forward or backward 1-3 months (usually these with missing “0”s would not be sampled as they did not appear as “1

December” – I ended up sampling one “01 December, 1995” for *Daily Mail*, before then needing to revert to the “going forward or backward 1-3 months” system to code a third sample. When I went forward, I used the “01 January, 1996” for *Daily Mail* alongside a “1 January, 1996”, to ensure a coding as close as possible in time rather than the system clicking in at the 2-digit “10 January, 1996” as it has been done elsewhere in my coding where there were ample samples; ditto for *Evening Standard*. This ended up being a moot point for *Daily Mail* anyway, as there were no coded samples until after the 2-digit “10 January, 1996” on those occasions when this system was necessary.

The descriptor “controversial” (which comes up frequently in articles about homosexual behaviour) was considered a “mixed” quality, as it usually appeared with both positive and negative associations.

As for the other dichotomies, I did not code “Letters to the Editor” (LTEs). However, I did code advice columnists and their letters; I did not consider them in the same category as LTEs, and I also coded articles where the LTEs are been reprinted as part of a larger opinion article, as long as they were not labelled as LTEs.

In terms of data collection of articles that involve sexual orientation, there is a bias in that heterosexuality is prevalent and *assumed*. Therefore, often heterosexuality itself only comes up when discussing homosexuality, so it frequently is not discussed – or questioned in terms of any ambivalence – on its own terms. Therefore any investigation of ambiguity is already starting from a prone-towards-ambivalence (if not outright negativity) standpoint, since it will be in relation to those articles that discuss homosexual behaviour (as an aberration, usually) and not heterosexual behaviour (default). As mentioned, as long as I am consistent in my subjective biases through the years (which I was, cf. Section 2.2.1), this implicit ambiguity-negativity is not problematic. As with solely homosexual references, I did not include solely heterosexual references to sexuality in the sampling. Doing otherwise would have been the equivalent of coding all human (rather than machine) references in the Human–Machine (or Human–Animal) non-intermediates – impossible in terms of NexisUK searches, as it would have resulted in the “Too Many Results” screen pop-up. I did not consider articles that merely discussed the concealing of one’s sexuality, but did not elaborate or refer to “confusion” to relate to ambiguous sexuality unless it was entirely clear that said sexuality was viewed as ambiguous to others or one’s self. It should be noted here additionally that the common newspaper-phraseology of “admitting” one’s (almost always homo-/bi-) sexuality is in its very nature pejorative, linking homo-/bisexual identity with the admitting of a crime.

Similarly to what I did for the Human–Machine investigation, I found articles on the broad subjects of sexuality. Duplicate articles were deleted: I took out all repeated identical articles, even if they were on a different day (as I did for other dichotomies). As it is a common phrase, and I was seeking a pool of articles discussing intermediacy, I also did a search on “confused sexuality”. Once I had my

“intermediate pool” (hundreds of pages of separate articles per year), I coded those articles as to whether the intermediate sexuality states were considered positive, negative, neutral or mixed.

As with the Human–Machine dichotomy, codings took the societal Heterosexual–Homosexual dynamic itself into consideration. If there was a sampled article that was pro-gay in terms of the intermediary itself (for example an article lauding potential bisexuality as a “cure” for homosexuality), but also anti-gay in non-intermediary article sections, I would label that coding as positive in terms of the intermediary analysis, if the ambiguous part of the intermediary – here, the bisexually ambiguous sexuality, and therefore the change from the “essential” state of heterosexuality itself – is clearly being regarded as a good thing and not merely welded together conceptually with negative associations.

If I had an article with multiple sexual orientation references, I coded the entire article in terms of its attitude towards sexual ambiguity rather than piecemeal, as this more likely reflected the author’s general attitude towards sexual ambiguity. For example, if the intermediaries mentioned are positive, but other parts “anti-gay” and this is narratively woven to the sexually ambiguous section, then the entire article would have a mixed coding. My rationale here is that since ambiguity already is present, the article is ambiguous, and the whole of the article fits into the “intermediaries” portion – an intermediary being present implicitly means the article will be coded as an intermediary, even if there are non-intermediaries present too. It is also important to note that a non-ambiguity-tolerant author can be essentialist and non-homophobic – this often is the case. As mentioned above, though, if the article author makes a point of explicitly separating ambiguous sexuality from same-sex sexuality, I have coded it with the tone of the exception. For an example of this, see [App. 412] in the samples below.

I was careful to distinguish between bisexual appeal and bisexual behaviour/attraction. I did not code bisexual appeal, because it was not clear that the source desire was not monosexual (heterosexual/homosexual). For example, an individual could be attractive to both females and females (“bisexual appeal”), e.g., an attractive man could appeal to straight women (monosexuality) and gay men (monosexuality). That would be bisexual *appeal*, which would not be coded. If the attractive man in question desired both desirers back, then that would be bisexual *desire* (as it is clear that it is not monosexual), which would be coded. Here is an example from the wider article pool [BT03Dec95], an article with mere bisexual appeal (and therefore not sampled): “an actress whose appeal has enchanted both men and women with a sexuality that’s perpetually simmering (and often threatening to boil over).”

I did not code the anti-gay law code Section 28 concerns via the “promotion of sexuality” as automatic intermediaries, as promotions of sexuality could mean a favourable attitude towards a

fixed sexuality and not just experimentation (which, if experimentation is explicitly mentioned, I would then code, as that would indicate a more fluid sexuality).

Even when an article conflated gender and sexuality, if they specifically refer to confused sexuality, then I coded those articles, as they would still reflect a qualitative attitude on the part of the author towards ambiguous sexuality.

In the same way that the Human–Animal dichotomy contains descriptions that are not immediately obvious; or implicitly rather than explicitly expressed – i.e., every time a human is coded as an animal, primate or ape, this is an intermediary – many articles that I have sampled for the Heterosexual–Homosexual alterity do not mention bisexuality *per se* but *do* indeed describe bisexual behaviour. Such articles are coded accordingly, as the attitudes towards sexual intermediaries will still be present. It is the *mixing* of the dichotomy categories (here, heterosexual and homosexual) that results in an intermediary state.

Thus, if the famous person is known to be bisexual – like Oscar Wilde – yet only behaves homosexually in the article and is only referred to homosexually, then the article would *not* have that behaviour coded as an intermediary reference unless there were specific allusions to ambiguous sexuality by the author that the reader was intended to understand. Again, it is the authorial attitude towards ambiguity that interests me. In addition, it is enough that the article discusses sexuality intermediaries, and it does not matter if the person being described as showing bisexual sexual behaviour is identified as gay or bisexual (or even straight). What matters for my purposes is the journalist's attitudes towards ambiguous sexual behaviour or identity itself; the author doesn't need to believe in ambiguous sexuality, *per se* – just have an opinion regarding it. As a note, a disbelief in fluid sexuality is not uncommon (Brewster 2008). Essentialised sexuality is discussed in greater detail in Chapter 8.

There also are codings such as the not-particularly gay-positive article below in the examples [App. 409], where the “negative” aspect of homophobia outweighs the “positive” balance of the article's preferred sexuality-state of heterosexuality, yet the overall article tone towards ambiguous sexuality is clearly “positive”.

Indeed, it could be argued that the majority of similar Reverend Dr Hope articles (who famously described his sexuality as a “grey area”) in the more conservative newspapers smack more of homophobia than bi-positivity, even if they are disguised as that. I have coded them according to the system as described above.

I also coded references where sexuality is presented as a choice as sexually ambiguous, as it then implies ambiguity in terms of either a fully heterosexual or homosexual state of being. I also coded married people who then have same-sex relationships (or vice versa) as sexual ambiguity by way of

sequential bisexual behaviour, though the journalist may think of it as them discovering their “true” sexuality.

Tab. 7. Coding examples for Heterosexual–Homosexual.

Negative

SOURCE: Eve Standard No. 413	DATE 15.06.2000	INTERVIEWEE	AUTHOR Unknown	EXPERT NOVICE	TM – TS/TE/TW – TD BG – BI – BT
INTERMEDIARIES: BISEXUAL IDENTITY AMBIGUOUS SEXUALITY FLUID SEXUALITY		BISEXUAL BEHAVIOUR CONFUSED SEXUALITY SEXUALITY SPECTRUM	BISEXUAL DESIRE CHOSEN SEXUALITY GREY-AREA SEXUALITY	PANSEXUALITY SEXUAL EXPERIMENTATION	OMNISEXUALITY
CLASSIFICATION NEGATIVE POSITIVE MIXED NEUTRAL		ARTICLE NOTES Same-sex sexuality is spoken of positively in this exemplar article, but there is also the unchallenged assertion that believing in sexual ambiguity is "the outdated and ill-informed notion that homosexuality is a question of choice. The reality is that homosexuals have no choice - and no amount of hectoring or hypnosis can make us change", and so this was coded as "negative" in terms of sexual ambiguity in general article tone.			
Sir Elton attacks Cardinal's gay stance "SIR Elton John today publicly accused Cardinal Thomas Winning, Britain's senior Catholic, of ignorance over homosexuality. He claimed that the Cardinal's attitude explained why people were turning away from the Church. The singer was responding to an article by the Cardinal in last week's issue of The Spectator in which he said "gay sex is wrong, because such behaviour is not good for the human person". The Cardinal, who is Archbishop of Glasgow, also said: "Far from liberating a person it ensnares them in a lifestyle that can never respond to the deepest longings of the human heart." However, Sir Elton, in a letter in this week's issue of the magazine, claimed: "Cardinal Winning, and his ignorance, is totally representative of why people are turning away from the Church." [...] "As a gay man I am perfectly happy with my sexuality and my life. Like the cardinal I, too, have hope for our country. Over the years, Britain has proved itself to be a more tolerant and open-minded place to live. Gone is the outdated and ill-informed notion that homosexuality is a question of choice. The reality is that homosexuals have no choice - and no amount of hectoring or hypnosis can make us change"					

Positive

SOURCE: Eve Standard No. 409	DATE 12.04.1995	INTERVIEWEE	AUTHOR Unknown	EXPERT NOVICE	TM – TS/TE/TW – TD BG – BI – BT
INTERMEDIARIES: BISEXUAL IDENTITY AMBIGUOUS SEXUALITY FLUID SEXUALITY		BISEXUAL BEHAVIOUR CONFUSED SEXUALITY SEXUALITY SPECTRUM	BISEXUAL DESIRE CHOSEN SEXUALITY GREY-AREA SEXUALITY	PANSEXUALITY SEXUAL EXPERIMENTATION	OMNISEXUALITY
CLASSIFICATION NEGATIVE POSITIVE MIXED NEUTRAL		ARTICLE NOTES Positive in terms of grey-area sexuality.			
Kissing and telling “THE tumultuous story of Dr David Hope, the Bishop of London, has now had a happy ending. Dr Hope - who so recently had to endure a crude quasi-blackmail 'outing' attempt by the gay rights group Outrage – has been made Archbishop of York. Dr Hope gained the respect of the public when, after the bullying insinuations to which he was subjected, he made a dignified and candid statement to the effect that his sexuality was 'a grey area' – thus pre-empting any more intrusions. Dr Hope's elevation to his new position is being seen as a conciliatory gesture to the Anglo-Catholic strand in the Church of England. Certainly he, like his predecessor Dr Graham Leonard in London, is a conservative. He is known to be opposed to women priests and as principal of the Anglo-Catholic theological college of St Stephen's House, Oxford, from 1974 to 1985, he took a tough line on ordinands' morals. Dr Hope was right to resist 'outing' – though it is interesting to note that his reputation for Christian propriety, of a decidedly robust nature at that, has clearly not been in any way diminished by his thoughtful self-revelation. If only we can be adult about this subject, it is clear that it does not have to be as acrimonious or divisive as various militants or reactionaries seem to think. Sex and sexuality is not the be-all and the end-all: there are higher and more important issues with which our churchmen should be concerned. Men and women who have the serious task of justifying the ways of God to men should not allow themselves to be bogged down by the professional obsessions of single-issue agitators. So congratulations are in order for Dr David Hope, and best wishes for his new job at the see of York – and good wishes also for Dr John Habgood, the outgoing Archbishop of York, whose reputation for beneficent wisdom will be a tough act to follow.”					

Mixed

SOURCE: Guardian/Observer No. 412	DATE 02.02.2000	INTERVIEWEE	AUTHOR Jenny Broughton	EXPERT NOVICE	TM – TS/TE/TW – TD BG – BI – BT
INTERMEDIARIES: BISEXUAL IDENTITY AMBIGUOUS SEXUALITY FLUID SEXUALITY					
BISEXUAL BEHAVIOUR CONFUSED SEXUALITY SEXUALITY SPECTRUM		BISEXUAL DESIRE CHOSEN SEXUALITY GREY-AREA SEXUALITY		PANSEXUALITY SEXUAL EXPERIMENTATION BISEXUAL DESIRE	
CLASSIFICATION NEGATIVE POSITIVE MIXED NEUTRAL		ARTICLE NOTES Mixed response in terms of ambiguous sexuality – on one hand defends same-sex sexuality, while being ambiguous in tone towards a more fluid sexuality.			
The way out for gay Catholic priests “Section 28 sends a message to society that one group is of less value than others. It sends that message to gay and bisexual young people at a particularly vulnerable stage of their lives”					

Neutral

SOURCE: Times No. 381	DATE 05.03.2010	INTERVIEWEE	AUTHOR Kate Muir (F) Kevin Maher (M) Wendy Ide (F)	EXPERT NOVICE	TM – TS/TE/TW – TD BG – BI – BT
INTERMEDIARIES: BISEXUAL IDENTITY AMBIGUOUS SEXUALITY FLUID SEXUALITY					
BISEXUAL BEHAVIOUR CONFUSED SEXUALITY SEXUALITY SPECTRUM					
BISEXUAL DESIRE CHOSEN SEXUALITY GREY-AREA SEXUALITY					
PANSEXUALITY OMNISEXUALITY SEXUAL EXPERIMENTATION					
CLASSIFICATION NEGATIVE POSITIVE MIXED NEUTRAL			ARTICLE NOTES Neutral in tone towards the sexually ambiguous and bisexually desiring intermediaries.		
The ten things to watch out for this Oscars night "The Riddle of the Spanx The men's fashion war has escalated. On top of Tom Ford's post-Gucci restyle of Colin Firth from A Single Man, there is the introduction of bodytrimming shapewear. Lee Daniels, the director of Precious, confessed at the Directors' Guild Awards that he was wearing Spanx beneath his suit. Daniels, who is gay, also revealed that he was "questioning his sexuality", as he told Bigelow "your movie is as beautiful as your legs". A man to watch. Closely. Kate Muir"					

2.4. Statistics

For each dichotomy, I have given examples of articles that incorporate ambiguity and have been coded as “negative”, “positive”, “mixed” and “neutral”.

Chi-squared tests were performed to compare the degrees of ambiguity tolerance dichotomy-by-dichotomy and year-by-year. I did this to look at the differences in reporting response to ambiguity over the 16-year-period (1995–2010). Chi-squared tests calculate the difference between the expected results, i.e., what would be expected should the predictor variables have no effect on the response variables (null hypothesis) and the observed values (my counts). A p value of <0.05 means that the null hypothesis can be rejected and that the predictor variables have had a significant effect over the response variables (* = $p < 0.05$, ** = $p < 0.01$, *** = $p < 0.001$).

I organised my raw data counts into tables (*Appendix B*) and used the program R Version 3.0.3 (2014-03-06) (R Foundation for Statistical Computing, 2014) to create contingency tables (i.e., with reporting categories [positive, negative, etc.] in rows and years in columns) and data matrices. The code used can be found in *Appendix C*. From these contingency tables and matrices, I ran the chi-squared tests and produced p values and the residual differences between the observed results and the null hypothesis. The residuals are calculated as: (observed value - expected value) / square root (expected value); this shows which cells in a given matrix deviate the most from the values expected under the null hypothesis.

In addition, I undertook multinomial logistic regressions (*Tab. 13*, *Tab. 14*) that tested the following predictor variables (*Tab. 8*): year (4 categories), month (12 categories), newspaper format (2 categories), newspaper group (6 categories), political slant (2 categories), journalist gender (2 categories), journalist expertise (2 categories), binary (4 categories) and season (4 categories).

The journalist-gender tallies for all dichotomies by format, political slant and expertise are found in *Tab. 9*.

Tab. 8. Categorical variables used in the multinomial regressions.

Category	Variable
Years	1995, 2000, 2005, 2010
Months	January, February, March, April, May, June, July, August, September, October, November, December
Newspaper Format	Broadsheet, Tabloid
Newspaper	<i>Guardian, Independent, Times, Mail, Evening Standard, Mirror</i>
Political Slant	Conservative, Liberal
Journalist Gender	Male, Female
Journalist Expertise	Yes, No
Binary	Human-Animal, Human-Machine, Male-Female, Heterosexual-Homosexual
Season	Spring, Summer, Autumn, Winter

Tab. 9. Gender tallies for all dichotomies; broadsheets v tabloids; liberal v conservative; experts.

	HUMAN-MACHINE	HUMAN-ANIMAL	MALE-FEMALE	HET-HOMO
ALL				
Gender N/A	129	11	153	88
Gender Both	14	149	16	23
Gender Female	196	183	288	297
Gender Male	525	521	407	456
BROADSHEET				
Gender N/A	49	5	48	29
Gender Both	8	46	7	11
Gender Female	95	85	162	140
Gender Male	280	296	215	252
TABLOID				
Gender N/A	6	5	105	59
Gender Both	80	103	9	12
Gender Female	101	99	126	157
Gender Male	245	225	192	204
LIBERAL				
Gender N/A	47	4	60	34
Gender Both	8	45	10	9
Gender Female	108	83	158	166
Gender Male	253	237	192	217
CONSERVATIVE				
Gender N/A	82	6	93	54
Gender Both	6	104	6	14
Gender Female	88	101	130	131
Gender Male	272	284	215	239
EXPERT				
Gender Female	11	31	13	22
Gender Male	93	188	7	25

I was interested in the effect of the predictor variables on the response variable (there is one response variable, Reporting Type, and four categories within it: “negative”, “positive”, “mixed”, “neutral” [polynomial]). As within my “conservative” newspaper set I had two tabloids and one broadsheet (*Mail, Evening Standard, Times*); and respectively within my “liberal” set I had two broadsheets and one tabloid (*Guardian, Independent, Mirror*); the multinomial regression tested whether any results were due to “tabloidism” or “conservatism”. Although the hypothesised predictors of each dichotomy’s outcomes were multivariate, I also congregated dichotomies, newspaper groups, newspaper formats and political slants together to investigate potential overarching social trends (cf. *Fig. 1, Tab. 11*).

I looked at each dichotomy independently to find the Minimum Adequate Model (MAM – the most informative model that explains as much variation as possible) with the lowest number of predictor variables. I defined the MAM via the Akaike Information Criterion [AIC]. The AIC is a likelihood value that is penalised for the number of variables in a model and also rewards the goodness-of-fit ($AIC = 2k - 2\ln(L)$); where k is the number of estimated parameters in the model and L is the maximum likelihood value) For example, *Gender* and *Expert* are the most efficient predictor variables when explaining the variation reported in my samples from the Human–Animal dichotomy (see *Tab. 17*), and neither variable can be eliminated without raising the AIC. The MAM is derived by eliminating, one by one, variables that do not contribute significantly to the model, as long as their elimination does not result in a higher AIC value.

The multinomial logistic regressions were run in R Version 3.0.3 (2014-03-06) (R Foundation for Statistical Computing, 2014), using the package ‘nnet’ Version 7.3-9 (Venables & Ripley, 2015). The code I used is included in *Appendix C*.

Initially, I compared the categories within a variable using the default in R, i.e., against a baseline that was alphabetically based. The baseline against which the other categories were compared was as follows: April (month), Broadsheet (format), *Daily Mail* (newspaper), Conservative (political slant), Female (journalist gender), No (in relation to the yes/no question of journalist expertise), Heterosexual–Homosexual (binary) and Autumn (season). For *Year*, the earliest date was chosen as the baseline by coding it as “A1995”.

I also used an alternate baseline. The rationale for an alternate baseline was to change the perspective in the model, when using *Guardian* as a baseline, for example. In addition, when looking at congregated dichotomies, I specifically used the year 2000 as an alternate baseline choice due to the fact that there had seemed to be a “millennial effect” from my previous chi-squared tests across all dichotomies and, similarly, I shifted the “Binary” baseline to “Human–Machine” due to theories regarding millennial essentialism being related to the general human population recently having taught itself computer technology and the internet; I was testing specific hypotheses in both examples, which will be discussed further in Chapter 4.

To construct such an alternate baseline, I switched the baseline for the variables that were necessary for the congregated dichotomies MAM (*Binary*, *Year* and *Newspaper*; this was not done with *Gender* and *Expert*, as there is only one baseline possible with binomial categories). That is to say, rather than my original baseline of Heterosexual–Homosexual in 1995 with the baseline publication being *Daily Mail*, the alternative baseline differed with Human–Machine being the binary compared against; 2000 being the year compared against, and *Guardian* being the newspaper compared against.

Having established that the dichotomies differed from each other (*Tab. 11*), I analysed each dichotomy separately. I first ran a complete model for each dichotomy using all variables, and then derived the MAM for each dichotomy. Then, I looked at the coefficients to tell me in which direction that statistical difference in the MAMs was going, determined by the sign of the coefficients, i.e., whether there was more or less statistical significance. Finally, I varied the base level and ran additional multinomial logistic regressions, i.e., with different newspaper groups, etc., on those MAMs whose variables were not statistically significant yet necessary to the model, e.g., if removing a particular predictor variable from the MAM meant that the AIC rose, this suggested that that particular predictor variable was indeed a necessary part of the model even if no comparison of categories within that predictor variable was statistically significant. I also varied the base level when I was testing a hypothesis, as noted regarding the millennial shifts previously observed in the chi-squared tests (whereby I varied the year baseline to be 2000 as opposed to 1995).

3. RESULTS: “REWIRED OR REASSURED?”

The quantitative results of the newspaper analyses are presented as follows. Given their technical and complex nature, they should be read in conjunction with the summary of general findings at the end of this chapter.

3.1. Congregated Papers and Congregated Dichotomies

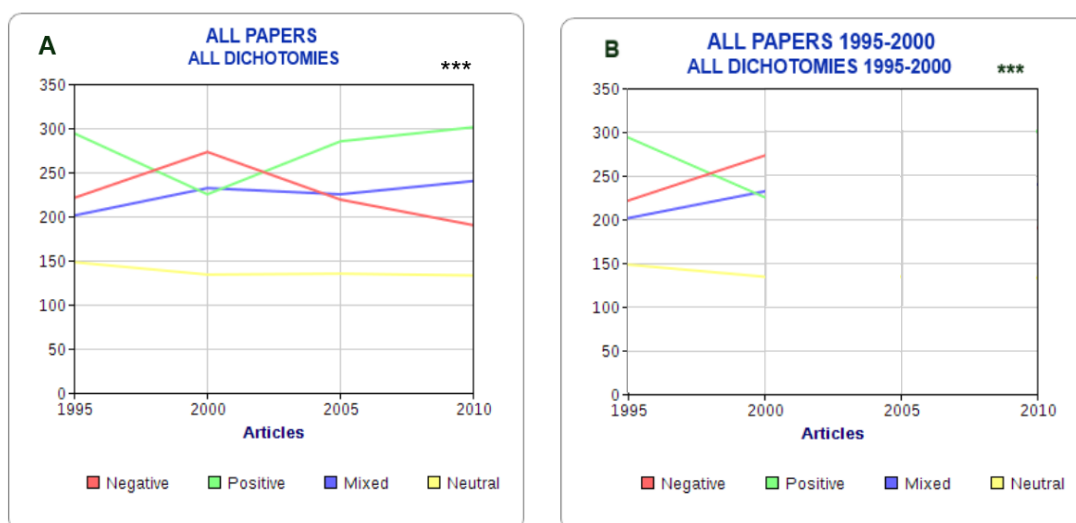


Fig. 1 (A). All six publications congregated; all dichotomies congregated. Visualisation of longitudinal trend in 1995-2010 newspaper articles (four years). Pearson's Chi-squared test – ALL DICHOTOMIES. X-squared = 33.861, df = 9, p-value = < .001. Fig. 1 (B). All six publications congregated; all dichotomies congregated. Visualisation of longitudinal trend in 1995-2000 newspaper articles (two years). Pearson's Chi-squared test – ALL DICHOTOMIES. X-squared = 17.562, df = 3, p-value = < .001.

Tab. 10. Residuals: All newspapers' and all dichotomies' tally count, congregated, year by year: column = Negative, Positive, Mixed and Neutral, as marked; row = [1] = 1995, [2] = 2000, [3] = 2005, [4] = 2010. All newspapers' and all dichotomies' tally count, congregated, two years only: column = Negative, Positive, Mixed and Neutral, as marked; row = [1] = 1995, [2] = 2000.

CONGREGATED DICHOTOMIES & CONGREGATED YEARS														
[1] [2] [3] [4]					[1] [2] [3] [4]					[1] [2] [3] [4]				
NEG [1,]	221	273	219	190	NEG [1,]	225.75	225.75	225.75	225.75	NEG [1,]	-0.316	3.144	-0.449	-2.379
POS [2,]	294	225	285	301	POS [2,]	276.25	276.25	276.25	276.25	POS [2,]	1.067	-3.083	0.526	1.489
MIX [3,]	201	232	225	240	MIX [3,]	224.50	224.50	224.50	224.50	MIX [3,]	-1.568	0.500	0.033	1.034
NEUT [4,]	148	134	135	133	NEUT [4,]	137.50	137.50	137.50	137.50	NEUT [4,]	0.895	-0.298	-0.213	-0.383
MATRIX					EXPECTED					RESIDUALS				

CONGREGATED DICHOTOMIES & CONGREGATED YEARS -- 2 YEARS ONLY (1995, 2000)

[1] [2]	[1] [2]	[1] [2]
NEG [1,] 221 273	NEG [1,] 247.0 247.0	NEG [1,] -1.654 1.654
POS [2,] 294 225	POS [2,] 259.5 259.5	POS [2,] 2.141 -2.141
MIX [3,] 201 232	MIX [3,] 216.5 216.5	MIX [3,] -1.053 1.053
NEUT [4,] 148 134	NEUT [4,] 141.0 141.0	NEUT [4,] 0.589 -0.589
MATRIX	EXPECTED	RESIDUALS

Tab. 11. Congregated dichotomies (Human–Animal, Human–Machine, Male–Female, Heterosexual–Homosexual) in a multinomial logistic regression. Abbreviations are as follows: (Inter.) = Intercept; HumAni = Human–Animal; HumMach = Human–Machine; MaleFem = Male–Female; HetHomo = Heterosexual–Homosexual; Lib = Liberal; Con = Conservative; Tab = Tabloid; Broad = Broadsheet; Y1995 = Year 1995 (etc.); Spr = Spring; Sum = Summer; Win = Winter; Aut = Autumn; ExpYes = journalist is an expert; ExpNo = journalist is not an expert; Fem = Female; Mail = *Daily Mail* and *Mail on Sunday*; Mirror = *Daily Mirror* and *Sunday Mirror*; Eve = *Evening Standard/News of the World/The Sun*; Guard = *The Guardian/Observer*; Indy = *Independent/Independent on Sunday*; Times = *Times/Sunday Times*. The normal baseline here is alphabetical and chronological: HetHomo, Con, Broad, Y1995, Aut, Fem, ExpNo, Mail. The alternate baseline is: HumMach, Con, Broad, Y2000, Aut, Fem, ExpNo, Guard. Values of statistical significance are colour-coded with their corresponding coefficients; and marginally statistically significant values are indicated in orange throughout.

CONGREGATED DICHOTOMIES

CONGREGATED DICHOTOMIES, NORMAL BASELINE

p-VALUES, ALL CONGREGATED VARIABLES, NORMAL BASELINE

	(Inter.)	HumAni	HumMach	MaleFem	Lib	Tab	Y2000	Y2005	Y2010	Spr	Sum	Win	Male	ExpYes	Mirror	Eve	Guard	Indy	Times
Mixed	0.816	0.305	0.625	0.624	0.500	0.100	0.064	0.035	0.025	0.252	0.645	0.949	0.193	0.239	0.118	0.235	0.632	0.327	0.841
Negative	0.877	0.724	0.001	0.478	0.830	0.071	0.086	0.127	0.339	0.682	0.281	0.049	0.879	0.000	0.648	0.904	0.982	0.666	0.402
Positive	0.556	0.030	0.035	0.937	0.417	0.213	0.390	0.381	0.165	0.668	0.197	0.199	0.115	0.889	0.347	0.184	0.681	0.612	0.478

AIC 6824.75

COEFFICIENTS, ALL CONGREGATED VARIABLES, NORMAL BASELINE

	(Inter.)	HumAni	HumMach	MaleFem	Lib	Tab	Y2000	Y2005	Y2010	Spr	Sum	Win	Male	ExpYes	Mirror	Eve	Guard	Indy	Times
Mixed	-0.064	0.194	-0.092	0.087	0.366	0.380	0.329	0.376	0.417	-0.205	-0.082	0.012	0.184	-0.218	-0.894	0.288	-0.163	-0.334	0.053
Negative	0.044	0.069	0.589	0.127	-0.123	0.440	0.300	0.269	0.180	0.074	0.194	0.361	0.021	-0.861	-0.273	0.029	-0.008	-0.156	-0.232
Positive	0.159	0.397	0.372	0.014	0.437	0.284	-0.147	0.147	0.243	0.074	0.221	0.228	-0.210	0.024	-0.526	0.319	-0.139	-0.170	0.184

CONGREGATED DICHOTOMIES, ALTERNATIVE BASELINE

p-VALUES, ALL CONGREGATED VARIABLES, ALTERNATIVE BASELINE

	(Inter.)	HetHomo	HumAni	MaleFem	Lib	Tab	Y1995	Y2005	Y2010	Spr	Sum	Win	Male	ExpYes	Mail	Mirror	Eve	Indy	Times
Mixed	0.983	0.624	0.144	0.357	0.504	0.385	0.063	0.797	0.640	0.253	0.647	0.947	0.193	0.239	0.303	0.057	0.078	0.405	0.714
Negative	0.142	0.001	0.008	0.013	0.826	0.375	0.085	0.860	0.525	0.682	0.281	0.049	0.879	0.000	0.559	0.763	0.553	0.487	0.711
Positive	0.676	0.035	0.891	0.053	0.420	0.360	0.394	0.098	0.034	0.665	0.196	0.198	0.115	0.888	0.570	0.235	0.140	0.869	0.577

AIC 6824.75

COEFFICIENTS, ALL CONGREGATED VARIABLES, ALTERNATIVE BASELINE

	(Inter.)	HetHomo	HumAni	MaleFem	Lib	Tab	Y1995	Y2005	Y2010	Spr	Sum	Win	Male	ExpYes	Mail	Mirror	Eve	Indy	Times
Mixed	0.013	0.092	0.287	0.179	0.363	0.254	-0.330	0.046	0.088	-0.204	-0.081	0.012	0.184	-0.218	0.286	-0.605	0.573	-0.170	0.213
Negative	0.930	-0.589	-0.520	-0.463	-0.127	0.274	-0.301	-0.032	-0.121	0.074	0.194	0.361	0.021	-0.861	0.172	-0.098	0.200	-0.147	-0.227
Positive	0.249	-0.372	0.025	-0.358	0.434	0.264	0.146	0.293	0.389	0.075	0.222	0.229	-0.210	0.024	0.156	-0.367	0.475	-0.032	0.319

3.1.1. Congregated Dichotomies and Years: Chi-squared

Fig. 1 (A) is a general result when all four dichotomies are tabulated together with no distinction, against multinomial response variables of negative/positive/neutral/mixed. The counts themselves can be seen in Tab. 10. Accordingly, there is a dip in positive codings in 2000 and a rise in negative codings in the same year. The negative codings then dip in 2005 and sink further in 2010. The

positive codings recover from their year-2000 nadir and then rise, and continue on the same trajectory in 2010. The mixed and neutral codings, on the other hand, appear relatively stable in this highly congregated view of a potential British ambiguity “zeitgeist”. The result is also highly statistically significant ($p < .001$).

Residuals cannot be measured in terms of statistical significance, but I will be describing differences between the expected and observed values ranging from >2 to <-2 as “substantially more” or “substantially fewer”; differences ranging from >1 to <-1 as “fewer” or “more”; and from $>.5$ to $<-.5$ as “slightly more” or “slightly fewer”. I generally will not be drawing attention to those residuals indicating slightly more/slightly fewer differences, though I will note them initially below when comparing the four-year and two-year residuals (cf. *Tab. 10*).

In the four-year test (*Fig. 1 (A)*), contrary to what would be expected by the null hypothesis (labelled here as “EXPECTED” in this table and subsequent tables), the residuals showed substantially more negative reports [1,2] in 2000 and substantially fewer negatives in 2010 [1,4]; substantially fewer positive reports in 2000 [2,2] and slightly more positive reports in 1995, 2005 and 2010; slightly fewer mixed results in 1995 [3,1]; slightly more neutral results in 1995; and slightly fewer neutral reports in 2000, 2005 and 2010.

As it difficult to be statistically specific about individual elements of the counts/years because the chi-squared test above takes into account all cells, I also tested for significance by limiting this analysis to just two years. A chi-squared test for this all-encompassing count (all dichotomies congregated, all newspapers congregated) from 1995–2000 ascertained that residuals were still significant ($p < .001$; cf. *Fig. 1-B*). In the two-year test (*Fig. 1-B*), contrary to what would be expected by the null hypothesis, the residuals showed fewer negative reports in 1995 [1,2] and more negative reports [1,2] in 2000; substantially more positive reports in 1995 [2,1] and substantially fewer positive reports in 2000; fewer mixed reports in 1995 [3,1] and more mixed reports in 2000 [3,2]; and slightly more neutral reports in 1995 and slightly fewer in 2000. Having established that the more limited two-year counts would reflect the four-year results, I then proceeded with four-year chi-squared tests for all remaining counts, to be backed up by the multinomial logistic regressions.

3.1.2. Congregated Newspapers, Dichotomy-by-Dichotomy

Dichotomy predictor variables are illustrated in *Tab. 20*, revealing that some dichotomies are more prone to fluctuation than others: specifically Heterosexual–Homosexual. Male–Female is the least prone to such volatility.

3.1.2.1. Human–Animal: Chi-squared

In *Fig. 2 (A)*, we have the same dip in positive codings and rise in negative codings in the year 2000 as seen in the congregated dichotomies data (cf. *Fig. 1*), with a corresponding recovery by 2005 and levelling-off in positive-towards-ambiguity responses in 2010.

Residuals in *Tab. 12* reveal that cells that deviate most are [1,2] and [2,2]. Specifically, there are substantially more negative reports in 2000 than would have been expected and substantially fewer positive reports in the year 2000 than would have been expected. There are no particular distinctions amongst the mixed and neutral reports across the years.

3.1.2.2. Human–Machine: Chi-squared

In *Fig. 2 (B)*, we have the same dip in positive codings and rise in negative codings in the year 2000 as seen in the congregated dichotomies data (cf. *Fig. 1*), with a corresponding recovery by 2005 and levelling-off in positive-towards-ambiguity responses in 2010.

The residuals in *Tab. 12* reveal cells that deviate most are [3,1] and [4,1]. Specifically, there are substantially fewer mixed reports and substantially more neutral reports in 1995 than would have been expected; there also are more negative and fewer positive counts than expected in 2000, and fewer neutrals than expected in both 2005 and 2010.

3.1.2.3. Male–Female: Chi-squared

In *Fig. 2 (C)*, the Male–Female dichotomy is relatively stable, with little fluctuation except for a moderate increase in mixed results in 2005, also indicated by the [3,3] residual in *Tab. 12*.

3.1.2.4. Heterosexual–Homosexual: Chi-squared

In *Fig. 2 (D)*, we have the same dip in positive codings and rise in negative codings in 2000 as seen in the congregated dichotomies data (*Fig. 1*), with a corresponding recovery by 2005 and a rise in positive-towards-ambiguity responses in 2010.

The residuals in *Tab. 12* reveal cells that deviate most are [1,2], substantially more negative reports in 2000 than should be expected; [1,4], substantially fewer negative reports in 2010 than should be expected; [2,2], substantially fewer positive reports in 2000 than should be expected; and [4,4], more neutral results in 2010 than should be expected. There are no particular distinctions amongst mixed reports.

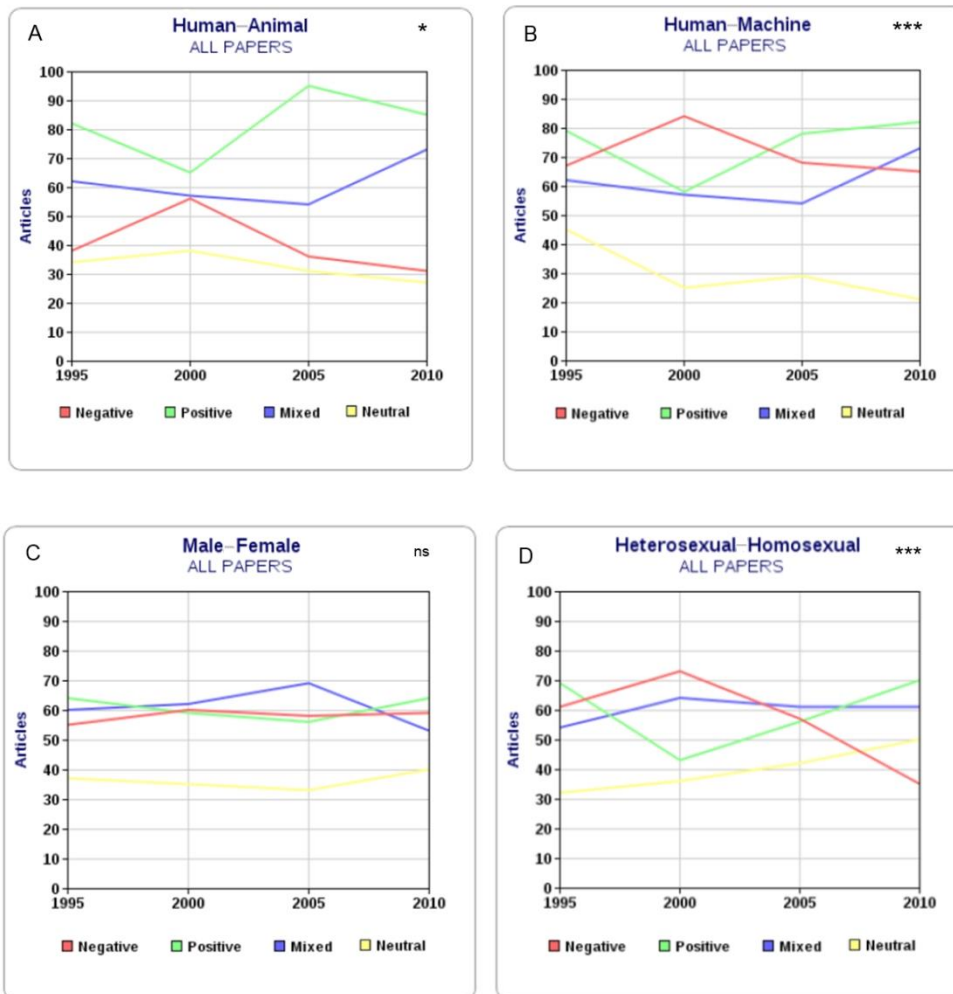


Fig. 2. Visualisation of all four dichotomies, all six publications congregated. Pearson's Chi-squared test – (A) Human–Animal X-squared = 19.971, df = 9, p -value = 0.018; (B) Human–Machine X-squared = 28.214, df = 9, p -value = < .001; (C) Male–Female X-squared = 3.88, df = 9, p -value = 0.919; (D) Heterosexual–Homosexual X-squared = 26.353, df = 6, p -value = < .001.

Tab. 12. Residuals: All newspapers' tally count, congregated, dichotomy by dichotomy and year by year. Columns and rows as in Tab. 10.

ALL PAPERS, HUMAN–ANIMAL																	
[1] [2] [3] [4]					[1] [2] [3] [4]					[1] [2] [3] [4]							
NEG	[1,]	38	56	36	31	NEG	[1,]	40.25	40.25	40.25	40.25	NEG	[1,]	-0.354	2.482	-0.669	-1.458
POS	[2,]	82	65	95	85	POS	[2,]	81.75	81.75	81.75	81.75	POS	[2,]	0.027	-1.852	1.465	0.359
MIX	[3,]	62	57	54	73	MIX	[3,]	61.50	61.50	61.50	61.50	MIX	[3,]	0.063	-0.573	-0.956	1.466
NEUT	[4,]	34	38	31	27	NEUT	[4,]	32.50	32.50	32.50	32.50	NEUT	[4,]	0.263	0.964	-0.263	-0.964
MATRIX					EXPECTED					RESIDUALS							

ALL PAPERS, HUMAN-MACHINE

[1] [2] [3] [4]	[1] [2] [3] [4]	[1]	[2]	[3]	[4]
NEG [1,] 67 84 68 65	NEG [1,] 71.00 71.00 71.00 71.00	NEG [1,] -0.474	1.542	-0.356	-0.712
POS [2,] 79 58 78 82	POS [2,] 74.25 74.25 74.25 74.25	POS [2,] 0.551	-1.885	0.435	0.899
MIX [3,] 25 49 41 48	MIX [3,] 40.75 40.75 40.75 40.75	MIX [3,] -2.467	1.292	0.039	1.135
NEUT[4,] 45 25 29 21	NEUT[4,] 30.00 30.00 30.00 30.00	NEUT[4,] 2.738	-0.912	-0.182	-1.643
MATRIX	EXPECTED	RESIDUALS			

ALL PAPERS, MALE - FEMALE

[1] [2] [3] [4]	[1] [2] [3] [4]	[1]	[2]	[3]	[4]
NEG [1,] 55 60 58 59	NEG [1,] 58.00 58.00 58.00 58.00	NEG [1,] -0.393	0.262	0.000	0.131
POS [2,] 64 59 56 64	POS [2,] 60.75 60.75 60.75 60.75	POS [2,] 0.416	-0.224	-0.609	0.416
MIX [3,] 60 62 69 53	MIX [3,] 61.00 61.00 61.00 61.00	MIX [3,] -0.128	0.128	1.024	-1.024
NEUT[4,] 37 35 33 40	NEUT[4,] 36.25 36.25 36.25 36.25	NEUT[4,] 0.124	-0.207	-0.539	0.622
MATRIX	EXPECTED	RESIDUALS			

ALL PAPERS, HETEROSEXUAL- HOMOSEXUAL

[1] [2] [3] [4]	[1] [2] [3] [4]	[1]	[2]	[3]	[4]
NEG [1,] 61 73 57 35	NEG [1,] 56.5 56.5 56.5 56.5	NEG [1,] 0.598	2.195	0.066	-2.860
POS [2,] 69 43 56 70	POS [2,] 59.5 59.5 59.5 59.5	POS [2,] 1.231	-2.139	-0.453	1.361
MIX [3,] 54 64 61 61	MIX [3,] 60.0 60.0 60.0 60.0	MIX [3,] -0.774	0.516	0.129	0.129
NEUT[4,] 32 36 42 50	NEUT[4,] 40.0 40.0 40.0 40.0	NEUT[4,] -1.264	-0.632	0.316	1.581
MATRIX	EXPECTED	RESIDUALS			

Tab. 13. Full model, including all variables, dichotomy by dichotomy (Human–Machine, Human–Animal, Male–Female, Heterosexual–Homosexual) in a multinomial logistic regression. Abbreviations as in Tab. 10. The normal baseline here is: Con, Broad, Y2000, Aut, Fem, ExpNo, Mail. The alternate baseline for Human–Machine is: Con, Broad, Y2000, Aut, Fem, ExpNo, Mail. The alternate baselines for Human–Animal and Male–Female are the same as for normal baselines. The alternate baseline for Heterosexual–Homosexual is Con, Broad, Y2000, Aut, Fem, ExpNo, Mail. Values of statistical significance are coloured to align with their corresponding coefficients; marginally statistically significant values are indicated in orange throughout.

ALL VARIABLES																
ALL VARIABLES, HUMAN-MACHINE																
p-VALUES, ALL VARIABLES, HUMAN-MACHINE, NORMAL BASELINE																
	(Inter.)	Lib	Tab	Y2000	Y2005	Y2010	Spr	Sum	Win	Male	ExpYes	Mirror	Eve	Guard	Indy	Times
Mixed	0.571	0.967	0.930	0.000	0.004	0.000	0.002	0.042	0.172	0.595	0.966	0.783	0.194	0.113	0.230	0.359
Negative	0.153	0.863	0.203	0.020	0.130	0.004	0.251	0.260	0.790	0.734	0.004	0.224	0.245	0.075	0.692	0.538
Positive	0.114	0.426	0.573	0.313	0.157	0.007	0.148	0.355	0.975	0.689	0.820	0.767	0.395	0.939	0.705	0.255
AIC 1678.975																
COEFFICIENTS, ALL VARIABLES, HUMAN-MACHINE, NORMAL BASELINE																
	(Inter.)	Lib	Tab	Y2000	Y2005	Y2010	Spr	Sum	Win	Male	ExpYes	Mirror	Eve	Guard	Indy	Times
Mixed	-0.216	0.010	-0.024	1.455	1.149	1.916	-1.353	-0.835	-0.591	0.178	-0.016	-0.099	0.688	0.439	-0.330	-0.301
Negative	0.478	-0.035	0.299	0.816	0.513	1.191	-0.446	-0.438	0.107	0.102	-1.078	-0.392	0.548	0.453	-0.097	-0.178
Positive	0.520	0.163	0.135	0.355	0.470	1.106	-0.559	-0.355	-0.012	-0.118	0.074	0.093	0.418	-0.020	0.089	0.316
p-VALUES, ALTERNATE BASELINES, ALL VARIABLES, HUMAN-MACHINE																
	(Inter.)	Lib	Tab	Y1995	Y2005	Y2010	Spr	Sum	Win	Male	ExpYes	Mirror	Eve	Guard	Indy	Times
Mixed	0.021	0.399	0.205	0.000	0.446	0.324	0.002	0.042	0.172	0.595	0.965	0.439	0.194	0.027	0.589	0.845
Negative	0.002	0.741	0.035	0.020	0.418	0.399	0.251	0.260	0.790	0.734	0.004	0.130	0.245	0.032	0.982	0.929
Positive	0.026	0.306	0.356	0.313	0.760	0.093	0.147	0.355	0.975	0.689	0.821	0.878	0.395	0.926	0.572	0.143
AIC 1678.975																
COEFFICIENTS, ALTERNATE BASELINES, ALL VARIABLES, HUMAN-MACHINE																
	(Inter.)	Lib	Tab	Y1995	Y2005	Y2010	Spr	Sum	Win	Male	ExpYes	Mirror	Eve	Guard	Indy	Times
Mixed	0.876	0.192	0.340	-1.456	-0.306	0.461	-1.353	-0.835	-0.591	0.178	-0.016	-0.280	0.688	0.620	-0.148	0.063
Negative	1.090	0.067	0.503	-0.816	-0.303	0.375	-0.446	-0.438	0.107	0.102	-1.079	-0.494	0.548	0.555	0.005	0.026
Positive	0.787	0.207	0.223	-0.355	0.115	0.750	-0.559	-0.355	-0.013	-0.118	0.073	0.049	0.418	0.024	0.134	0.405

ALL VARIABLES, HUMAN-ANIMAL																
p-VALUES, ALL VARIABLES, HUMAN-ANIMAL, NORMAL BASELINE																
	(Inter.)	Lib	Tab	Y2000	Y2005	Y2010	Spr	Sum	Win	Male	ExpYes	Eve	Guard	Indy	Times	
Mixed	0.826	0.989	0.026	0.731	0.918	0.213	0.555	0.357	0.946	0.058	0.131	0.673	0.508	0.520	0.186	
Negative	0.730	0.859	0.111	0.746	0.885	0.784	0.115	0.443	0.416	0.170	0.009	0.918	0.482	0.655	0.234	
Positive	0.242	0.964	0.015	0.433	0.529	0.747	0.077	0.185	0.380	0.955	0.910	0.571	0.618	0.802	0.792	
AIC 1826.19																
COEFFICIENTS, ALL VARIABLES, HUMAN-ANIMAL, NORMAL BASELINE																
	(Inter.)	Lib	Tab	Y2000	Y2005	Y2010	Spr	Sum	Win	Male	ExpYes	Eve	Guard	Indy	Times	
Mixed	0.088	0.008	0.601	-0.118	-0.037	0.448	0.211	0.321	0.023	0.571	-0.428	-0.200	-0.270	0.266	-0.510	
Negative	-0.147	-0.114	0.459	0.118	0.055	0.110	0.599	0.297	0.295	0.439	-0.841	0.050	-0.311	0.199	-0.494	
Positive	0.449	-0.027	0.640	-0.258	0.209	0.113	0.606	0.448	0.283	-0.016	0.030	-0.263	-0.198	0.102	-0.096	
p-VALUES, ALTERNATE BASELINES, ALL VARIABLES, HUMAN-ANIMAL																
(SAME AS FOR NORMAL BASELINE)																
COEFFICIENTS, ALTERNATE BASELINES, ALL VARIABLES, HUMAN-ANIMAL																
(SAME AS FOR NORMAL BASELINE)																

ALL VARIABLES, MALE-FEMALE

p-VALUES, ALL VARIABLES, MALE-FEMALE, NORMAL BASELINE

	(Inter.)	Lib	Tab	Y2000	Y2005	Y2010	Spr	Sum	Win	Male	ExpYes	Mirror	Eve	Guard	Indy	Times
Mixed	0.492	0.881	0.997	0.602	0.067	0.842	0.253	0.991	0.800	0.583	0.986	0.734	0.339	0.438	0.649	0.640
Negative	0.314	0.083	0.005	0.289	0.132	0.357	0.447	0.506	0.379	0.325	0.362	0.410	0.475	0.664	0.412	0.318
Positive	0.488	0.136	0.570	0.528	0.844	0.458	0.822	0.333	0.589	0.123	0.286	0.780	0.120	0.138	0.644	0.644

AIC 1624.601

COEFFICIENTS, ALL VARIABLES, MALE-FEMALE, NORMAL BASELINE

	(Inter.)	Lib	Tab	Y2000	Y2005	Y2010	Spr	Sum	Win	Male	ExpYes	Mirror	Eve	Guard	Indy	Times
Mixed	0.212	-0.033	0.001	0.190	0.658	-0.077	-0.410	0.004	0.094	0.150	0.011	-0.115	0.489	0.191	-0.108	0.128
Negative	0.308	-0.356	0.682	0.392	0.557	0.351	-0.279	0.250	0.330	-0.268	-0.641	-0.260	-0.350	0.112	-0.208	-0.278
Positive	0.214	0.335	-0.156	0.228	0.073	0.271	-0.081	0.360	0.203	-0.413	-0.702	0.095	0.834	0.347	-0.107	0.131

p-VALUES, ALTERNATE BASELINES, ALL VARIABLES, MALE-FEMALE

(SAME AS FOR NORMAL BASELINE)

COEFFICIENTS, ALTERNATE BASELINES, ALL VARIABLES, MALE-FEMALE

(SAME AS FOR NORMAL BASELINE)

ALL VARIABLES, HETEROSEXUAL-HOMOSEXUAL

p-VALUES, ALL VARIABLES, HETEROSEXUAL-HOMOSEXUAL, NORMAL BASELINE

	(Inter.)	Lib	Tab	Y2000	Y2005	Y2010	Spr	Sum	Win	Male	ExpYes	Mirror	Eve	Guard	Indy	Times
Mixed	0.239	0.068	0.615	0.787	0.871	0.634	0.264	0.926	0.188	0.969	0.909	0.082	0.477	0.186	0.599	0.844
Negative	0.460	0.300	0.059	0.922	0.848	0.033	0.590	0.257	0.091	0.923	0.248	0.848	0.735	0.986	0.323	0.872
Positive	0.119	0.322	0.768	0.015	0.483	0.619	0.617	0.305	0.304	0.387	0.452	0.376	0.128	0.208	0.411	0.808

AIC 1778.113

COEFFICIENTS, ALL VARIABLES, HETEROSEXUAL-HOMOSEXUAL, NORMAL BASELINE

	(Inter.)	Lib	Tab	Y2000	Y2005	Y2010	Spr	Sum	Win	Male	ExpYes	Mirror	Eve	Guard	Indy	Times
Mixed	0.348	-0.352	0.113	0.094	-0.057	-0.171	0.378	0.031	0.475	-0.010	-0.055	-0.536	0.331	0.307	-0.123	0.051
Negative	0.219	-0.192	0.421	-0.034	-0.066	-0.810	0.193	0.380	0.623	0.025	-0.614	0.053	-0.162	-0.004	-0.241	0.043
Positive	0.448	0.191	-0.069	-0.871	-0.234	-0.166	0.170	0.328	0.365	-0.216	0.326	-0.261	0.739	0.277	0.175	0.065

p-VALUES, ALTERNATE BASELINES, ALL VARIABLES, HETEROSEXUAL-HOMOSEXUAL

	(Inter.)	Lib	Tab	Y1995	Y2005	Y2010	Spr	Sum	Win	Male	ExpYes	Mail	Mirror	Eve	Indy	Times
Mixed	0.084	0.658	0.721	0.787	0.657	0.444	0.264	0.926	0.188	0.968	0.909	0.597	0.033	0.099	0.288	0.998
Negative	0.670	0.558	0.100	0.921	0.923	0.035	0.589	0.256	0.091	0.924	0.248	0.509	0.583	0.998	0.585	0.703
Positive	0.911	0.719	0.291	0.015	0.074	0.047	0.617	0.305	0.305	0.386	0.452	0.313	0.153	0.093	0.786	0.221

AIC 1778.113

COEFFICIENTS, ALTERNATE BASELINES, ALL VARIABLES, HETEROSEXUAL-HOMOSEXUAL

	(Inter.)	Lib	Tab	Y1995	Y2005	Y2010	Spr	Sum	Win	Male	ExpYes	Mail	Mirror	Eve	Indy	Times
Mixed	0.493	-0.097	-0.069	-0.094	-0.151	-0.264	0.378	0.031	0.475	-0.010	-0.055	0.130	-0.661	0.461	-0.430	-0.001
Negative	0.126	-0.137	0.320	0.034	-0.032	-0.776	0.193	0.381	0.623	0.025	-0.614	0.161	0.159	-0.001	-0.237	0.102
Positive	-0.033	0.078	-0.197	0.871	0.637	0.705	0.170	0.328	0.365	-0.216	0.326	-0.263	-0.411	0.476	-0.102	-0.324

Tab. 14. Congregated dichotomies, Minimum Adequate Models (MAMs) in a multinomial logistic regression. Abbreviations as in Tab. 10. The normal baseline here is alphabetical and chronological: HetHom, Y1995, Fem, ExpNo, Mail. The alternate baseline is: HumMach, Y2000, Fem, ExpNo, Guard. Values of statistical significance are colour-coded with their corresponding coefficients; marginally statistically significant values are indicated in orange throughout.

MINIMUM ADEQUATE MODELS														
CONGREGATED DICHOTOMIES, NORMAL BASELINE														
p-VALUES, MINIMUM ADEQUATE MODEL, CONGREGATED DICHOTOMIES, NORMAL BASELINE														
GENDER, EXPERT, NEWSPAPER, YEAR, BINARY														
	(Inter.)	HumAni	HumMach	MaleFem	Y2000	Y2005	Y2010	Male	ExpYes	Mirror	Eve	Guard	Indy	Times
Mixed	0.240	0.224	0.650	0.614	0.053	0.032	0.021	0.202	0.208	0.055	0.298	0.316	0.071	0.088
Negative	0.004	0.806	0.001	0.468	0.094	0.130	0.359	0.897	0.000	0.110	0.898	0.007	0.001	0.002
Positive	0.006	0.021	0.034	0.946	0.409	0.366	0.156	0.107	0.918	0.638	0.235	0.892	0.750	0.501
AIC 6813.989														
COEFFICIENTS, MINIMUM ADEQUATE MODEL, CONGREGATED DICHOTOMIES, NORMAL BASELINE														
	(Inter.)	HumAni	HumMach	MaleFem	Y2000	Y2005	Y2010	Male	ExpYes	Mirror	Eve	Guard	Indy	Times
Mixed	0.270	0.226	-0.085	0.090	0.343	0.381	0.429	0.179	-0.232	-0.558	0.247	-0.212	-0.379	-0.361
Negative	0.647	0.047	0.596	0.130	0.292	0.267	0.172	0.018	-0.854	-0.394	0.030	-0.571	-0.720	-0.667
Positive	0.610	0.416	0.374	0.012	-0.141	0.152	0.248	-0.214	0.018	-0.117	0.280	-0.028	-0.065	-0.139
CONGREGATED DICHOTOMIES, ALTERNATIVE BASELINE														
p-VALUES, MINIMUM ADEQUATE MODEL, CONGREGATED DICHOTOMIES, ALTERNATE BASELINES														
	(Inter.)	Het_Homo	HumAni	MaleFem	Y1995	Y2005	Y2010	Male	ExpYes	Mail	Mirror	Eve	Indy	Times
Mixed	0.205	0.650	0.108	0.369	0.053	0.830	0.644	0.202	0.208	0.316	0.179	0.050	0.414	0.470
Negative	0.000	0.001	0.004	0.012	0.094	0.891	0.530	0.897	0.000	0.007	0.466	0.011	0.481	0.653
Positive	0.001	0.034	0.817	0.050	0.409	0.098	0.034	0.107	0.918	0.892	0.709	0.181	0.848	0.573
AIC 6813.989														
COEFFICIENTS, MINIMUM ADEQUATE MODEL, CONGREGATED DICHOTOMIES, ALTERNATE BASELINES														
	(Inter.)	Het_Homo	HumAni	MaleFem	Y1995	Y2005	Y2010	Male	ExpYes	Mail	Mirror	Eve	Indy	Times
Mixed	0.315	0.085	0.311	0.175	-0.343	0.039	0.087	0.179	-0.232	0.212	-0.346	0.459	-0.167	-0.149
Negative	0.963	-0.596	-0.549	-0.466	-0.292	-0.025	-0.119	0.018	-0.854	0.571	0.177	0.601	-0.149	-0.095
Positive	0.815	-0.374	0.042	-0.363	0.141	0.293	0.389	-0.214	0.018	0.028	-0.089	0.308	-0.037	-0.110

3.1.3. Congregated Dichotomies: Multinomial Regression

When congregated dichotomies are tested together (Tab. 14), a lower incidence in negative codings in the Heterosexual–Homosexual dichotomy becomes apparent when compared to Human–Animal and Human–Machine (where there is statistical significance), but no such effect when compared to Male–Female. There also is a lower incidence in positive codings in Heterosexual–Homosexual when compared to Human–Animal and Human–Machine (both of which have statistical significance). There are lower incidences of mixed, negative and positive codings as compared to neutral for 2000, 2005 and 2010, all of statistical or borderline statistical significance. Experts are less likely to respond negatively than non-experts once variation introduced by all the other predictor variables is accounted for. I tested for *Year* as categorical variable as opposed to interval data; as I am interested in time thresholds (are particular events/times acting differently), *Year* is more logically treated as a category.

In the multivariate analysis, an alternate baseline also was tested. When dichotomies are congregated in the normal MAM baseline (Tab. 13), there is a statistically significant higher incidence

in “mixed” codings in 2005 and 2010 compared to 1995, though only marginal in 2000. And although the *Season* variable is never a part of any of MAMs, when we look at the congregated dichotomies in *Tab. 11*, we see a significant rise in “winter” codings being negative as opposed to “autumn”; and a strong decline in *Expert* codings being negative.

Since *Binary* is a statistically significant predictor variable when dichotomies were congregated, implying differences in reporting between dichotomies, I also analysed each variable separately (*Tab. 17-20*). When we use Heterosexual–Homosexual as the baseline (*Tab. 14*), in statistical significance terms the Heterosexual–Homosexual dichotomy differs from both Human–Machine and Human–Animal but not Male–Female, so that suggests that the potentially linked sexual-orientation (Heterosexual–Homosexual) and gender (Male–Female) dichotomies behave in more similar ways (cf. Rieger & Savin-Williams 2012).

Using 1995 as the baseline, all statistically significant differences imply an increase in mixed reporting from neutral. *Mirror* is statistically significantly less likely to have a “mixed” response. The other five newspapers are more middle-of-the road in this context (*Tab. 14*).

3.2. Liberal vs Conservative

3.2.1. Liberal vs Conservative: Chi-squared

I ran chi-squared tests to cross-compare the results, starting with the three liberal papers versus the three conservative papers. First, I looked at all liberal papers congregated, and all conservative papers congregated.

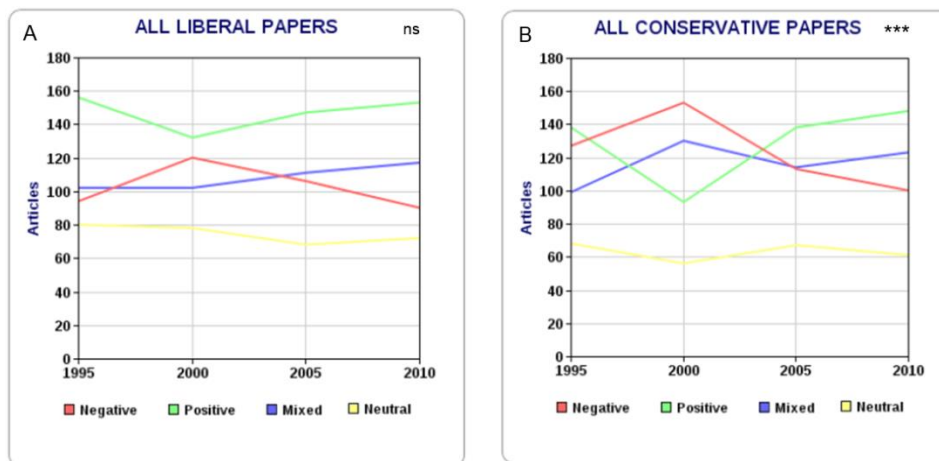


Fig. 3. Visualisation of all four dichotomies congregated; all three liberal publications congregated and all three conservative publications congregated. Pearson's Chi-squared tests via R for (A) all liberal papers congregated and all dichotomies congregated (X-squared = 10.385, df = 9, *p*-value = 0.32); followed by (B) all conservative papers congregated and all dichotomies congregated (X-squared = 32.707, df = 9, *p*-value = < .001).

Tab. 15. Residuals: All liberal and conservative newspapers' tally count, congregated. Columns and rows as in Tab. 10.

LIBERAL PAPERS, CONGREGATED

[1]	[2]	[3]	[4]	[1]	[2]	[3]	[4]	[1]	[2]	[3]	[4]			
NEG [1,]	94	120	106	90	NEG [1,]	102.5	102.5	102.5	102.5	NEG [1,]	-0.839	1.728	0.345	-1.234
POS [2,]	156	132	147	153	POS [2,]	147.0	147.0	147.0	147.0	POS [2,]	0.742	-1.237	0.000	0.494
MIX [3,]	102	102	111	117	MIX [3,]	108.0	108.0	108.0	108.0	MIX [3,]	-0.577	-0.577	0.288	0.866
NEUT [4,]	80	78	68	72	NEUT [4,]	74.5	74.5	74.5	74.5	NEUT [4,]	0.637	0.405	-0.753	-0.289
MATRIX				EXPECTED				RESIDUALS						

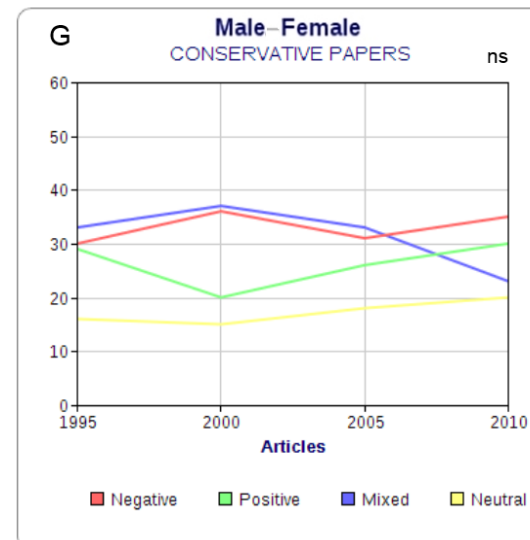
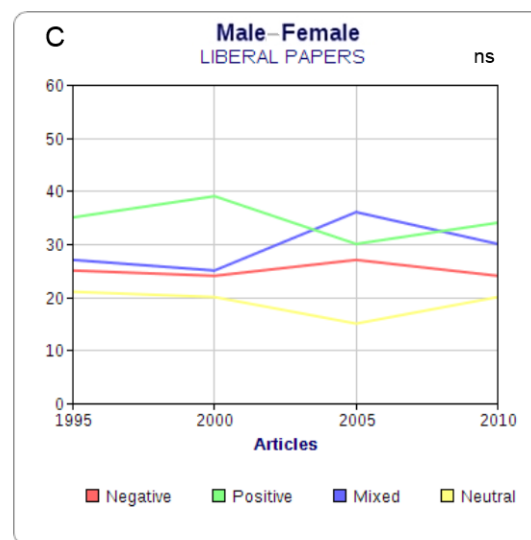
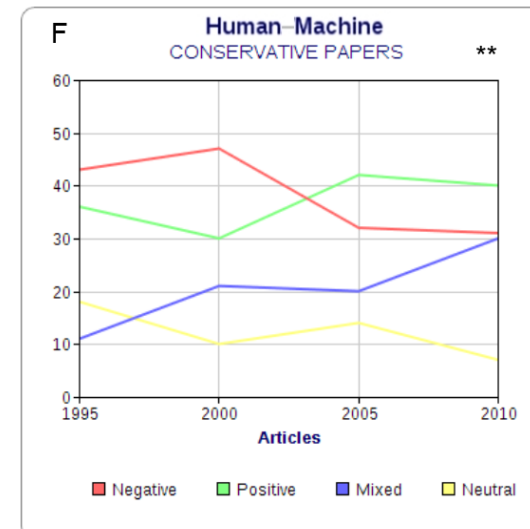
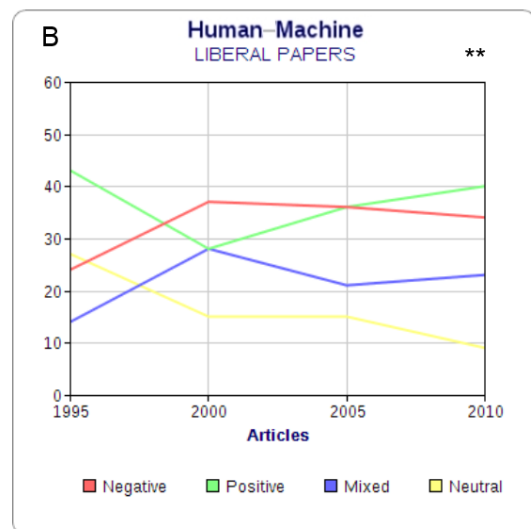
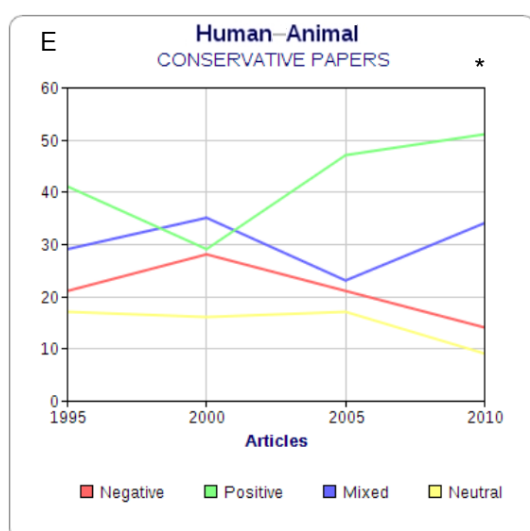
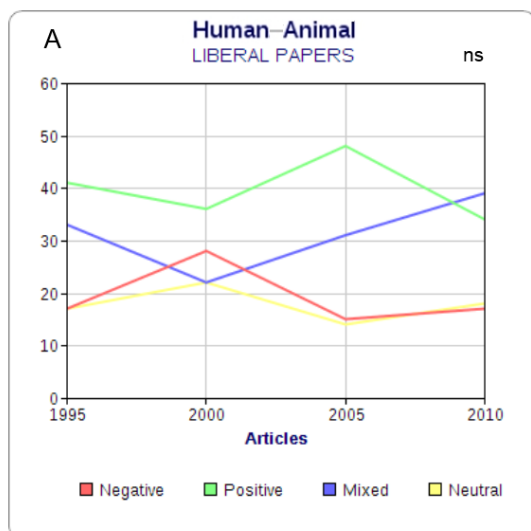
CONSERVATIVE PAPERS, CONGREGATED

[1]	[2]	[3]	[4]	[1]	[2]	[3]	[4]	[1]	[2]	[3]	[4]			
NEG [1,]	127	153	113	100	NEG [1,]	123.25	123.25	123.25	123.25	NEG [1,]	0.337	2.679	-0.923	-2.094
POS [2,]	138	93	138	148	POS [2,]	129.25	129.25	129.25	129.25	POS [2,]	0.769	-3.188	0.769	1.649
MIX [3,]	99	130	114	123	MIX [3,]	116.50	116.50	116.50	116.50	MIX [3,]	-1.621	1.250	-0.231	0.602
NEUT [4,]	68	56	67	61	NEUT [4,]	63.00	63.00	63.00	63.00	NEUT [4,]	0.629	-0.881	0.503	-0.251
MATRIX				EXPECTED				RESIDUALS						

In Fig. 3 (B), the congregated conservative papers show more fluctuation in terms of ambiguity tolerance than in (A), the congregated liberal papers. It seems to be conservative papers that are driving the change.

Similarly, when we look at the residuals in Tab. 15, amongst the congregated liberal papers there is little deviation, though an increase in negative reports in 2000 [1,2] with a corresponding decrease in positive reports in the same year [2,2], compared to the null hypothesis. There also is a slight decrease in negative reports in 2010 [1,4]. On the other hand, when we look at the congregated conservative newspaper residuals in Tab. 15, we see that, compared against what would be expected by the null hypothesis, there are substantially more negative reports in 2000 [1,2] and substantially fewer negative reports in 2010 [1,4]; substantially fewer positive reports in 2000 [2,2] and more positive reports in 2010 [2,4]; fewer mixed reports in 1995 [3,1] and more mixed reports in 2000 [3,2]; and little fluctuation in the neutral reports during all years.

With the unknown cause of millennial essentialism in mind, I looked at the liberal–conservative dichotomy more closely. I kept the liberal papers and conservative papers congregated, but now looked at each separate dichotomy (Fig. 4, (A), (B), (C), (D), (E), (F), (G), (H)).



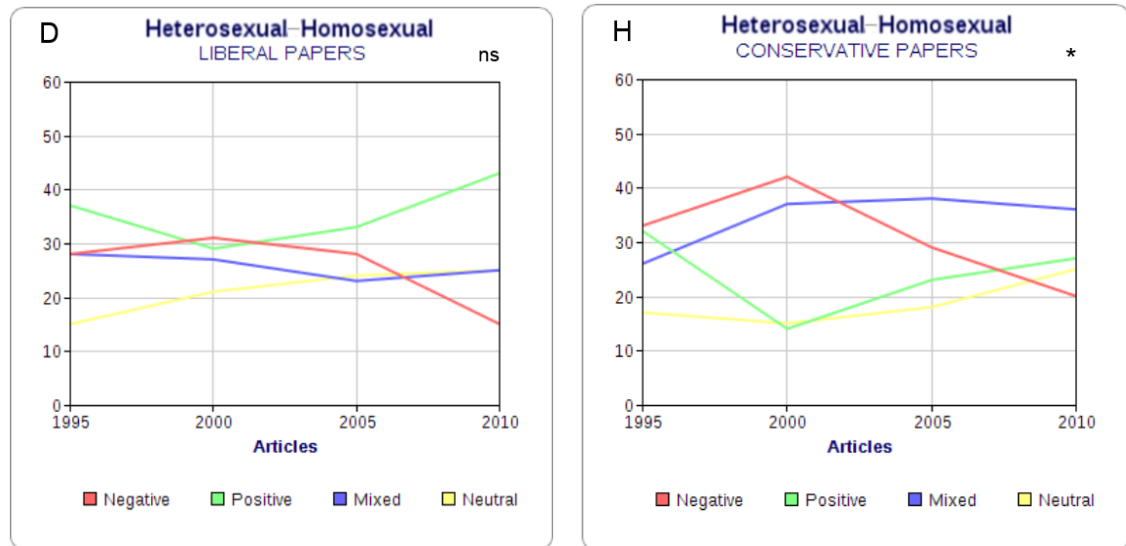


Fig. 4. Visualisation of all three liberal publications congregated, using Pearson's Chi-squared tests via R: (A) Human-Animal (X-squared = 14.984, df = 9, p -value = 0.091); (B) Human-Machine (X-squared = 22.153, df = 9, p -value = 0.008); (C) Male-Female (X-squared = 4.925, df = 9, p -value = 0.841) and (D) Heterosexual-Homosexual (X-squared = 12.446, df = 9, p -value = 0.189), with all four dichotomies viewed separately; and then all three conservative publications congregated (E) Human-Animal (X-squared = 17.272, df = 9, p -value = 0.044); (F) Human-Machine (X-squared = 21.698, df = 9, p -value = 0.009); (G) Male-Female (X-squared = 7.354, df = 9, p -value = 0.6) and (H) Heterosexual-Homosexual (X-squared = 21.0492, df = 9, p -value = 0.012).

Tab. 16. Residuals: All liberal and conservative newspapers' tally count, congregated, dichotomy by dichotomy. Columns and rows as in Tab. 10.

LIBERAL PAPERS, HUMAN- ANIMAL											
[1] [2] [3] [4]				[1] [2] [3] [4]				[1] [2] [3] [4]			
NEG [1,]	17	28	15	17	NEG [1,]	19.25	19.25	19.25	19.25	NEG [1,]	-0.512
POS [2,]	41	36	48	34	POS [2,]	39.75	39.75	39.75	39.75	POS [2,]	0.198
MIX [3,]	33	22	31	39	MIX [3,]	31.25	31.25	31.25	31.25	MIX [3,]	0.313
NEUT[4,]	17	22	14	18	NEUT[4,]	17.75	17.75	17.75	17.75	NEUT[4,]	-0.178
MATRIX				EXPECTED				RESIDUALS			
CONSERVATIVE PAPERS, HUMAN- ANIMAL											
[1] [2] [3] [4]				[1] [2] [3] [4]				[1] [2] [3] [4]			
NEG [1,]	21	28	21	14	NEG [1,]	21.00	21.00	21.00	21.00	NEG [1,]	0.000
POS [2,]	41	29	47	51	POS [2,]	42.00	42.00	42.00	42.00	POS [2,]	-0.154
MIX [3,]	29	35	23	34	MIX [3,]	30.25	30.25	30.25	30.25	MIX [3,]	-0.227
NEUT[4,]	17	16	17	9	NEUT[4,]	14.75	14.75	14.75	14.75	NEUT[4,]	0.585
MATRIX				EXPECTED				RESIDUALS			

LIBERAL PAPERS, HUMAN-MACHINE

[1] [2] [3] [4]					[1] [2] [3] [4]					[1] [2] [3] [4]				
NEG [1,]	24	37	36	34	NEG [1,]	32.75	32.75	32.75	32.75	NEG [1,]	-1.528	0.742	0.567	0.218
POS [2,]	43	28	36	42	POS [2,]	37.25	37.25	37.25	37.25	POS [2,]	0.942	-1.515	-0.204	0.778
MIX [3,]	14	28	21	23	MIX [3,]	21.50	21.50	21.50	21.50	MIX [3,]	-1.617	1.401	-0.107	0.323
NEUT[4,]	27	15	15	9	NEUT [4,]	16.50	16.50	16.50	16.50	NEUT [4,]	2.584	-0.369	-0.369	-1.846
MATRIX					EXPECTED					RESIDUALS				

CONSERVATIVE PAPERS, HUMAN-MACHINE

[1] [2] [3] [4]					[1] [2] [3] [4]					[1] [2] [3] [4]				
NEG [1,]	43	47	32	31	NEG [1,]	38.25	38.25	38.25	38.25	NEG [1,]	0.768	1.414	-1.010	-1.172
POS [2,]	36	30	42	40	POS [2,]	37.00	37.00	37.00	37.00	POS [2,]	-0.164	-1.150	0.821	0.493
MIX [3,]	11	21	20	30	MIX [3,]	20.50	20.50	20.50	20.50	MIX [3,]	-2.098	0.110	-0.110	2.098
NEUT[4,]	18	10	14	7	NEUT [4,]	12.25	12.25	12.25	12.25	NEUT [4,]	1.642	-0.642	0.500	-1.500
MATRIX					EXPECTED					RESIDUALS				

LIBERAL PAPERS, MALE-FEMALE

[1] [2] [3] [4]					[1] [2] [3] [4]					[1] [2] [3] [4]				
NEG [1,]	25	24	27	24	NEG [1,]	25.0	25.0	25.0	25.0	NEG [1,]	0.000	-0.200	0.400	0.200
POS [2,]	35	39	30	34	POS [2,]	34.5	34.5	34.5	34.5	POS [2,]	0.085	0.766	-0.766	0.085
MIX [3,]	27	25	36	30	MIX [3,]	29.5	29.5	29.5	29.5	MIX [3,]	-0.460	-0.828	1.196	0.092
NEUT[4,]	21	20	15	20	NEUT [4,]	19.0	19.0	19.0	19.0	NEUT[4,]	0.458	0.229	-0.917	0.229
MATRIX					EXPECTED					RESIDUALS				

CONSERVATIVE PAPERS, MALE-FEMALE

[1] [2] [3] [4]					[1] [2] [3] [4]				[1]	[2]	[3]	[4]		
NEG [1,]	30	36	31	35	NEG [1,]	33.00	33.00	33.00	33.00	NEG [1,]	-0.522	0.522	-0.348	0.348
POS [2,]	29	20	26	30	POS [2,]	26.25	26.25	26.25	26.25	POS [2,]	0.536	-1.219	-0.048	0.731
MIX [3,]	33	37	33	23	MIX [3,]	31.50	31.50	31.50	31.50	MIX [3,]	0.267	0.979	0.267	-1.514
NEUT [4,]	16	15	18	20	NEUT [4,]	17.25	17.25	17.25	17.25	NEUT [4,]	-0.300	-0.541	0.180	0.662
MATRIX					EXPECTED				RESIDUALS					

LIBERAL PAPERS, HETEROSEXUAL-HOMOSEXUAL														
[1] [2] [3] [4]					[1] [2] [3] [4]					[1] [2] [3] [4]				
NEG [1,]	28	31	28	15	NEG [1,]	25.50	25.50	25.50	25.50	NEG [1,]	0.495	1.089	0.495	-2.079
POS [2,]	37	29	33	43	POS [2,]	35.50	35.50	35.50	35.50	POS [2,]	0.251	-1.090	-0.419	1.258
MIX [3,]	28	27	23	25	MIX [3,]	25.75	25.75	25.75	25.75	MIX [3,]	0.443	0.246	-0.541	-0.147
NEUT[4,]	15	21	24	25	NEUT[4,]	21.25	21.25	21.25	21.25	NEUT[4,]	-1.355	-0.054	0.596	0.813
MATRIX					EXPECTED					RESIDUALS				

CONSERVATIVE PAPERS, HETEROSEXUAL-HOMOSEXUAL														
[1] [2] [3] [4]					[1] [2] [3] [4]					[1] [2] [3] [4]				
NEG [1,]	33	42	29	20	NEG [1,]	31.00	31.00	31.00	31.00	NEG [1,]	0.35	1.975	-0.359	-1.975
POS [2,]	32	14	23	27	POS [2,]	24.00	24.00	24.00	24.00	POS [2,]	1.63	-2.041	-0.204	0.612
MIX [3,]	26	37	38	36	MIX [3,]	34.25	34.25	34.25	34.25	MIX [3,]	-1.40	0.469	0.640	0.299
NEUT [4,]	17	15	18	25	NEUT [4,]	18.75	18.75	18.75	18.75	NEUT [4,]	-0.40	-0.866	-0.173	1.443
MATRIX					EXPECTED					RESIDUALS				

3.2.2. Human–Animal: Chi-squared, Liberal vs Conservative

For the Human–Animal dichotomy (see *Fig. 4, (A), (E)*), both liberal and conservative newspapers start at relatively similar levels in terms of number of articles per category, and both have the familiar dip in positive codings alongside the rise in negative codings for 2000, followed by a stark recovery in the case of the conservative newspapers. Interestingly, the liberal papers do not maintain the new positivity after what might seem an initial “defence” of Human–Animal ambiguity in 2005. In addition, the liberal papers do not show as extreme of a dip in 2000 as do the conservative papers for this particular dichotomy. In terms of mixed and neutral codings, in liberal newspapers there is a dip in codings in 2000 followed by a more gradual increase in 2005 and 2010, and the opposite is true for conservative newspapers in 2000, with an observed rise in 2000, a dip in 2005 and then a second rise in 2010.

When we look at the residuals in *Tab. 16*, we see that amongst the Human–Animal congregated liberal papers that, compared to the expected values of the null hypothesis, there is a substantial increase in negative reports in 2000 [1,2]; an increase in positive reports in 2005 [2,3]; a decrease in

mixed reports in 2000 [3,2] and an increase in mixed reports in 2010 [3,4]; and an increase in neutral reports in 2000 [4,2].

On the other hand, when we look at the congregated conservative newspaper residuals in *Tab. 16*, we see that, compared to the expected values of the null hypothesis, there is an increase in negative reports in 2000 [1,2] and a decrease in negative reports in 2010 [1,4]; a substantial decrease in positive reports in 2000 [2,2] and an increase in positive reports in 2010 [2,4]; a decrease in mixed reports in 2005 [3,3]; and a decrease in neutral reports in 2010 [4,4]. Indeed, when we look at the chi-squared test and not the residuals, only for the conservative papers is the variation statistically significant.

Tab. 17. Human–Animal dichotomy, Minimum Adequate Model (MAM) in a multinomial logistic regression. Abbreviations as in *Tab. 10*. The normal baseline here is alphabetical and chronological: Fem, ExpNo. The alternate baseline is the same as for the normal baseline. Values of statistical significance are colour-coded with their corresponding coefficients; and marginally statistically significant values are indicated in orange throughout.

MINIMUM ADEQUATE MODEL, HUMAN-ANIMAL				
p-VALUES, MINIMUM ADEQUATE MODEL, HUMAN-ANIMAL, NORMAL BASELINE				
GENDER, EXPERT				
	(Inter.)	Male	ExpYes	
Mixed	0.051	0.094	0.036	
Negative	0.260	0.179	0.000	
Positive	0.000	0.772	0.700	
AIC 1791.52				
COEFFICIENTS, MINIMUM ADEQUATE MODEL, HUMAN-ANIMAL, NORMAL BASELINE				
GENDER, EXPERT				
	(Inter.)	Male	ExpYes	
Mixed	0.497	0.491	-0.554	
Negative	0.304	0.420	-1.061	
Positive	1.016	-0.079	-0.096	

3.2.3. Human–Animal: Multinomial Regression, MAM

To achieve the MAM, necessary variables are gender and expert (*Tab. 17*). In terms of the MAM for Human–Animal, there is a decrease of “mixed” and a decrease of “negative” relative to “neutral” in articles written by experts compared to those written by non-experts. There is a very small decrease in positive reportings by males as compared to females, and a slightly more substantial increase in mixed and negative codings by males as compared to females (though not statistically significant, gender is still a contributing variable to the Human–Animal MAM).

3.2.4. Human–Machine: Chi-squared, Liberal vs Conservative

For the Human–Machine dichotomy (*Fig. 4, (B), (F)*), we see that mixed codings start at roughly the same level for both liberal and conservative papers then show a rise in 2000 followed by a general levelling-off; that there are more neutral liberal codings than there are neutral conservative codings;

that there is a higher level for positive codings for liberal papers in 1995, and a significantly different starting point for negative codings in terms of the Human–Machine dichotomy in 1995, with the conservative papers having substantially more of a percentage of negative articles right from the beginning. We see the now-usual rise-in-negatives/dip-in-positives in both liberal and conservative newspapers in 2000, though the rise is not as stark amongst conservative newspapers here – possibly because it was already at such a high “negative” level. With both negatives and positives, we once again observe the rise in positives/dip in negatives in 2005 and 2010, with a slight gradual increase (liberal papers) or a levelling-off (conservative papers).

When we look at the residuals in *Tab. 16*, we see that amongst the Human–Machine congregated liberal papers that, compared to the expected values of the null hypothesis, there is a lack of negative reports in 1995 [1,1]; a decrease in positive reports in 2000 [2,2]; a decrease in mixed reports in 1995 [3,1] and an increase in mixed reports in 2000 [3,1] and a substantial surplus in neutral reports in 1995 [4,1] and a decrease in neutral reports in 2010 [4,4].

On the other hand, when we look at the congregated conservative newspaper residuals in *Tab. 16*, we see that, compared to the expected values of the null hypothesis, there is an increase in negative reports in 2000 [1,2] and decreases in negative reporting in 2005 and 2010 [1,3], [1,4]; a decrease in positive reports in 2000 [2,2]; a substantial lack of mixed reports in 1995 [3,1] and a substantial increase in mixed reports in 2010 [3,4]; and a lack of neutral reports in 1995 [4,1].

Tab. 18. Human–Machine dichotomy, Minimum Adequate Model (MAM) in a multinomial logistic regression. Abbreviations as in *Tab. 10*. The normal baseline here is alphabetical and chronological: Con, Y1995, Fem, ExpNo. The alternate baseline is: Con, Y2000, Fem, ExpNo. Values of statistical significance are colour-coded with their corresponding coefficients; marginally statistically significant values are indicated in orange throughout.

MINIMUM ADEQUATE MODEL, HUMAN-MACHINE								
p-VALUES, MINIMUM ADEQUATE MODEL, HUMAN-MACHINE, NORMAL BASELINE								
GENDER, EXPERT, POLITICS, YEAR								
	(Inter.)	Lib	Y2000	Y2005	Y2010	Male	ExpYes	
Mixed	0.058	0.776	0.001	0.007	0.000	0.444	0.798	
Negative	0.071	0.327	0.032	0.202	0.009	0.597	0.002	
Positive	0.069	0.767	0.297	0.185	0.009	0.700	0.954	
AIC 1671.445								
COEFFICIENTS, MINIMUM ADEQUATE MODEL, HUMAN-MACHINE, NORMAL BASELINE								
GENDER, EXPERT, POLITICS, YEAR								
	(Inter.)	Lib	Y2000	Y2005	Y2010	Male	ExpYes	
Mixed	-0.783	-0.082	1.391	1.065	1.810	0.250	-0.092	
Negative	0.610	-0.255	0.737	0.426	1.084	0.154	-1.128	
Positive	0.611	-0.077	0.363	0.437	1.073	-0.112	0.019	
p-VALUES, MINIMUM ADEQUATE MODEL, ALTERNATE BASELINES, HUMAN-MACHINE								
GENDER, EXPERT, POLITICS, YEAR								
	(Inter.)	Lib	Y1995	Y2005	Y2010	Male	ExpYes	
Mixed	0.132	0.776	0.001	0.408	0.364	0.444	0.798	
Negative	0.000	0.327	0.032	0.399	0.432	0.597	0.002	
Positive	0.009	0.767	0.297	0.841	0.110	0.700	0.954	
AIC 1671.445								
COEFFICIENTS, MINIMUM ADEQUATE MODEL, ALTERNATE BASELINES, HUMAN-MACHINE								
GENDER, EXPERT, POLITICS, YEAR								
	(Inter.)	Lib	Y1995	Y2005	Y2010	Male	ExpYes	
Mixed	0.608	-0.082	-1.391	-0.326	0.419	0.250	-0.092	
Negative	1.347	-0.255	-0.737	-0.311	0.347	0.154	-1.128	
Positive	0.974	-0.077	-0.363	0.075	0.711	-0.112	0.019	

3.2.5. Human–Machine: Multinomial Regression, MAM

To achieve the MAM, necessary variables are *Gender*, *Expert*, *Political Leaning* and *Year* (Tab. 18). In terms of the MAM for Human–Machine – looking at the Human–Machine binary on its own – 1995 differs most from the other years, and when 1995 was used as a baseline year, all codings increased away from neutral (“positive”, “negative” and “mixed” alike). Thus, we can state that, matching the pattern with the chi-squared tests (see Fig. 2, (B)) from 1995 to 2000, there is an increase in negative compared to neutral codings, and an increase in mixed compared to neutral codings. There is also a statistically significant decrease in negative codings compared to neutral when articles are written by experts.

Despite contributing to the Human–Machine MAM, the influence of author gender does not reach statistical significance for any one comparison. Overall, the trends are for male author reporting to be more mixed, more negative and less positive than neutral compared to that of female authors. Similarly, *Political Leaning* and *Year* do not reach statistical significance but are necessary parts of the Human–Machine MAM – and this is the only dichotomy-specific MAM where, indeed, *Political Leaning* is necessary.

3.2.6. Male–Female: Chi-squared, Liberal vs Conservative

The chi-squared results for the Male–Female dichotomy (Fig. 4, (C), (G)) does not show statistical significance for either the liberal papers, $p\text{ value} = 0.841$; or for the conservative papers, $p\text{-value} = 0.6$. The neutral codings are steady throughout all four year-points for both liberal and conservative papers. The mixed codings also do not differ much, except for the rise in liberal papers in the year 2005, which then levels off. Negative codings remain remarkably steady throughout all four years for the liberal papers, and the same for the conservative papers, with a very slight rise in 2000 – though this, combined with a similar drop in positive codings in 2000, indicates that even this very steady dichotomy may be exhibiting to a much lesser degree the patterns observed over time in the other dichotomies. That said, there is also a very slight rise in positive codings in the year 2000 for liberal papers, which goes against the pattern that has been observed elsewhere.

When we look at the residuals in Tab. 16, we see that amongst the Male–Female congregated liberal papers that, compared to the expected values of the null hypothesis, there are only very slight differences: a slight decrease in mixed reports in 2000 [3,2] and an increase in mixed reports in 2005 [3,3]; and a slight decrease in neutral reports in 2005 [4,3]. There are no particular distinctions amongst the negative or positive reports.

On the other hand, when we look at the congregated conservative newspaper residuals in *Tab. 16*, we see that, compared to the expected values of the null hypothesis, there is a decrease in positive reports in 2000 [2,2]; a slight increase in mixed reports in 2000 [3,2] and a decrease in mixed reports in 2010 [3,4]. There are no particular distinctions amongst the negative or neutral reports

Tab. 19. Male–Female dichotomy, Minimum Adequate Model (MAM) in a multinomial logistic regression. Abbreviations as in *Tab. 10*. The normal baseline here is alphabetical and chronological: Fem, ExpNo, Broad. The alternate baseline is the same as for the normal baseline. Values of statistical significance are colour-coded with their corresponding coefficients; marginally statistically significant values are indicated in orange throughout.

MINIMUM ADEQUATE MODEL, MALE-FEMALE				
p-VALUES, MINIMUM ADEQUATE MODEL, MALE-FEMALE, NORMAL BASELINE				
GENDER, EXPERT, FORMAT				
	(Inter.)	Male	ExpYes	Tab
Mixed	0.081	0.618	0.804	0.726
Negative	0.115	0.259	0.291	0.005
Positive	0.000	0.108	0.312	0.783
AIC 1597.918				
COEFFICIENTS, MINIMUM ADEQUATE MODEL, MALE-FEMALE, NORMAL BASELINE				
GENDER, EXPERT, FORMAT				
	(Inter.)	Male	ExpYes	Tab
Mixed	0.406	0.132	-0.150	0.093
Negative	0.367	-0.298	-0.733	0.747
Positive	0.830	-0.419	-0.657	-0.073

3.2.7. Male–Female: Multinomial Regression, MAM

To achieve the MAM for the Male–Female dichotomy (*Tab. 19*), necessary variables are *Gender*, *Expert* and *Format*. In terms of the MAM for Male–Female, only *Format* shows a statistically significant effect here, with an increase in negative codings by tabloids when it comes to the Male–Female dichotomy.

Despite contributing to the Male–Female MAM, the influence of author gender does not reach statistical significance for any one comparison. Overall, the trends are for male-author reporting to be more mixed, more negative and less positive than neutral compared to that of female authors. Similarly, *Expert* also contributes to the Male–Female MAM, but does not reach statistical significance for any one comparison. Overall, the trends are for Male–Female *Expert* reporting to be less mixed, less positive and less negative than neutral compared to that of non-*Expert* authors.

3.2.8. Heterosexual–Homosexual: Chi-squared, Liberal vs Conservative

In terms of the chi-squared results, far more fluctuating than the Male–Female dichotomy is the Heterosexual–Homosexual dichotomy when contrasting liberal and conservative newspapers (*Fig. 4, (D), (H)*). Both liberal and conservative newspapers start out at quite similar levels in terms of article count per category in 1995. Though there is the familiar dip in positive and rise in negative codings in 2000 followed by positive recovery and negative downwards trajectory in 2005 and 2010, nevertheless the shifts are not radical and the liberal newspapers are relatively steady over the next 16 years in terms of negative/positive/neutral/mixed classification. This is not the case for the conservative newspapers, where both mixed and neutral codings show a moderate general increase over the years, but also where the negative year-2000 rise (followed by oft-noted decrease and levelling-off in 2005 and 2010) and positive year-2000 dip (followed by the oft-noted recovery and moderate upward trend in 2005 and 2010) are both stark. When comparing liberal and conservative newspapers side-by-side (*Fig. 4, (G),(H)*) for this dichotomy, it is clear that there are some interesting shifts concerning this alterity over time and regarding tolerance towards ambiguity. This will be addressed further in Chapters 4 and 8.

When we look at the residuals in *Tab. 16*, we see that amongst the Heterosexual–Homosexual congregated liberal papers that, compared to the expected values of the null hypothesis, there is an increase in negative reports in 2000 [1,2] and a substantial decrease in negative reports in 2010 [1,4]; an decrease in positive reports in 2000 [2,2] and an increase in positive reports in 2010 [2,4]; a lack of neutral reports in 1995 [4,1] and a slight increase in neutral reports in 2010 [4,4]. There are no particular distinctions amongst the mixed reports.

On the other hand, when we look at the congregated conservative newspaper residuals in *Tab. 16*, we see that, compared to the expected values of the null hypothesis, there is a substantial increase in negative reports in 2000 [1,2] and a substantial decrease in negative reports in 2010 [1,4]; a surplus of positive reports in 1995 [2,1] and a substantial decrease in positive reports in 2000 [2,2] and a decrease in positive reports in 2005 [2,3]; a lack of mixed reports in 1995 [3,1]; a slight decrease of neutral reports in 2000 [4,2] and an increase of neutral reports in 2010 [4,4].

Tab. 20. Heterosexual–Homosexual dichotomy, Minimum Adequate Model (MAM) in a multinomial logistic regression. Abbreviations as in Tab. 10. The normal baseline here is alphabetical and chronological: Fem, ExpNo, Mail, Y1995. The alternate baseline is: Fem, ExpNo, Guard, Y2000. Values of statistical significance are colour-coded with their corresponding coefficients; marginally statistically significant values are indicated in orange throughout.

MINIMUM ADEQUATE MODEL, HETEROSEXUAL-HOMOSEXUAL											
p-VALUES, MINIMUM ADEQUATE MODEL, HETEROSEXUAL-HOMOSEXUAL, NORMAL BASELINE											
GENDER, EXPERT, NEWSPAPER, YEAR											
	(Inter.)	Male	ExpYes	Mirror	Eve	Guard	Indy	Times	Y2000	Y2005	Y2010
Mixed	0.107	0.939	0.898	0.049	0.503	0.688	0.146	0.864	0.781	0.947	0.677
Negative	0.017	0.938	0.250	0.770	0.685	0.133	0.038	0.349	0.929	0.876	0.034
Positive	0.144	0.370	0.435	0.912	0.135	0.213	0.299	0.763	0.015	0.487	0.617
AIC 1767.493											
COEFFICIENTS, MINIMUM ADEQUATE MODEL, HETEROSEXUAL-HOMOSEXUAL, NORMAL BASELINE											
	(Inter.)	Male	ExpYes	Mirror	Eve	Guard	Indy	Times	Y2000	Y2005	Y2010
Mixed	0.644	0.019	-0.062	-0.902	0.311	-0.164	-0.595	-0.069	0.096	-0.023	-0.149
Negative	0.936	0.020	-0.610	-0.120	-0.193	-0.637	-0.862	-0.382	-0.030	-0.054	-0.797
Positive	0.596	-0.222	0.337	-0.050	0.725	0.525	0.425	0.130	-0.871	-0.232	-0.166
p-VALUES, MINIMUM ADEQUATE MODEL, HETEROSEXUAL-HOMOSEXUAL, ALTERNATE BASELINE											
GENDER, EXPERT, NEWSPAPER, YEAR											
	(Inter.)	Male	ExpYes	Mail	Mirror	Eve	Indy	Times	Y1995	Y2005	Y2010
Mixed	0.134	0.939	0.898	0.688	0.103	0.299	0.287	0.810	0.781	0.723	0.476
Negative	0.506	0.939	0.250	0.133	0.227	0.363	0.602	0.547	0.930	0.944	0.036
Positive	0.525	0.370	0.435	0.213	0.166	0.658	0.791	0.318	0.015	0.073	0.046
AIC 1767.493											
COEFFICIENTS, MINIMUM ADEQUATE MODEL, HETEROSEXUAL-HOMOSEXUAL, ALTERNATE BASELINE											
GENDER, EXPERT, NEWSPAPER, YEAR											
	(Inter.)	Male	ExpYes	Mail	Mirror	Eve	Indy	Times	Y1995	Y2005	Y2010
Mixed	0.576	0.019	-0.061	0.164	-0.738	0.475	-0.431	0.095	-0.096	-0.119	-0.245
Negative	0.269	0.020	-0.611	0.637	0.517	0.444	-0.225	0.255	0.030	-0.023	-0.766
Positive	0.250	-0.222	0.337	-0.525	-0.574	0.200	-0.099	-0.395	0.871	0.639	0.705

Tab. 21. Heterosexual–Homosexual dichotomy, Minimum Adequate Model (MAM) in a multinomial logistic regression, with alternative newspaper baselines. Abbreviations as in Tab. 10. The normal baseline here is alphabetical and chronological: Fem, ExpNo, Mail, Y1995. The alternate baseline is: Fem, ExpNo, Guard/Mail/Mirror/Eve/Indy/Times (newspaper baseline differs accordingly, Guard baseline also found above in Tab. 20 but replicated here for ease of comparison), Y2000. Values of statistical significance are colour-coded with their corresponding coefficients; marginally statistically significant values are indicated in orange throughout.

MINIMUM ADEQUATE MODEL, HETEROSEXUAL-HOMOSEXUAL, NEWSPAPER-BY-NEWSPAPER ALTERNATE BASELINES												
p-VALUES, MINIMUM ADEQUATE MODEL, HETEROSEXUAL-HOMOSEXUAL, ALTERNATE BASELINE (GUARDIAN BASELINE, 2000)												
GENDER, EXPERT, NEWSPAPER, YEAR												
	(Inter.)	Male	ExpYes	Mail	Mirror	Eve	Indy	Times	Y1995	Y2005	Y2010	
Mixed	0.134	0.939	0.898	0.688	0.103	0.299	0.287	0.810	0.781	0.723	0.476	
Negative	0.506	0.939	0.250	0.133	0.227	0.363	0.602	0.547	0.930	0.944	0.036	
Positive	0.525	0.370	0.435	0.213	0.166	0.658	0.791	0.318	0.015	0.073	0.046	
AIC 1767.493												
COEFFICIENTS, MINIMUM ADEQUATE MODEL, HETEROSEXUAL-HOMOSEXUAL, ALTERNATE BASELINE (GUARDIAN BASELINE, 2000)												
GENDER, EXPERT, NEWSPAPER, YEAR												
	(Inter.)	Male	ExpYes	Mail	Mirror	Eve	Indy	Times	Y1995	Y2005	Y2010	
Mixed	0.576	0.019	-0.061	0.164	-0.738	0.475	-0.431	0.095	-0.096	-0.119	-0.245	
Negative	0.269	0.020	-0.611	0.637	0.517	0.444	-0.225	0.255	0.030	-0.023	-0.766	
Positive	0.250	-0.222	0.337	-0.525	-0.574	0.200	-0.099	-0.395	0.871	0.639	0.705	
p-VALUES, MINIMUM ADEQUATE MODEL, HETEROSEXUAL-HOMOSEXUAL, ALTERNATE BASELINE (INDEPENDENT BASELINE, 2000)												
	(Inter.)	Male	ExpYes	Mail	Mirror	Eve	Guard	Times	Y1995	Y2005	Y2010	
Mixed	0.706	0.940	0.898	0.146	0.500	0.048	0.286	0.184	0.781	0.722	0.476	
Negative	0.912	0.939	0.250	0.039	0.079	0.165	0.602	0.248	0.929	0.944	0.036	
Positive	0.693	0.369	0.435	0.299	0.241	0.499	0.791	0.441	0.015	0.073	0.046	
AIC 1767.493												
COEFFICIENTS, MINIMUM ADEQUATE MODEL, HETEROSEXUAL-HOMOSEXUAL, ALTERNATE BASELINE (INDEPENDENT BASELINE, 2000)												
	(Inter.)	Male	ExpYes	Mail	Mirror	Eve	Guard	Times	Y1995	Y2005	Y2010	
Mixed	0.145	0.019	-0.061	0.595	-0.307	0.906	0.431	0.526	-0.096	-0.120	-0.245	
Negative	0.044	0.019	-0.610	0.862	0.742	0.669	0.225	0.480	0.031	-0.023	-0.766	
Positive	0.151	-0.222	0.337	-0.425	-0.475	0.300	0.099	-0.296	0.871	0.639	0.705	

p-VALUES, MINIMUM ADEQUATE MODEL, HETEROSEXUAL-HOMOSEXUAL, ALTERNATE BASELINE (TIMES BASELINE, 2000)												
	(Inter.)	Male	ExpYes	Mail	Mirror	Eve	Guard	Indy	Y1995	Y2005	Y2010	
Mixed	0.077	0.940	0.898	0.863	0.062	0.399	0.810	0.184	0.781	0.723	0.476	
Negative	0.179	0.939	0.250	0.349	0.525	0.690	0.546	0.248	0.930	0.944	0.036	
Positive	0.721	0.370	0.435	0.764	0.672	0.197	0.319	0.441	0.015	0.073	0.046	
AIC 1767.493												
COEFFICIENTS, MINIMUM ADEQUATE MODEL, HETEROSEXUAL-HOMOSEXUAL, ALTERNATE BASELINE (TIMES BASELINE, 2000)												
	(Inter.)	Male	ExpYes	Mail	Mirror	Eve	Guard	Indy	Y1995	Y2005	Y2010	
Mixed	0.671	0.019	-0.061	0.069	-0.833	0.380	-0.095	-0.526	-0.096	-0.120	-0.245	
Negative	0.524	0.020	-0.610	0.382	0.262	0.189	-0.255	-0.480	0.030	-0.023	-0.767	
Positive	-0.146	-0.222	0.337	-0.129	-0.179	0.595	0.395	0.296	0.871	0.639	0.705	
p-VALUES, MINIMUM ADEQUATE MODEL, HETEROSEXUAL-HOMOSEXUAL, ALTERNATE BASELINE (DAILY MAIL BASELINE, 2000)												
	(Inter.)	Male	ExpYes	Mirror	Eve	Guard	Indy	Times	Y1995	Y2005	Y2010	
Mixed	0.052	0.940	0.897	0.049	0.503	0.688	0.146	0.864	0.781	0.723	0.476	
Negative	0.017	0.939	0.250	0.770	0.684	0.133	0.039	0.349	0.930	0.944	0.036	
Positive	0.512	0.370	0.436	0.911	0.135	0.213	0.299	0.763	0.015	0.073	0.046	
AIC 1767.493												
COEFFICIENTS, MINIMUM ADEQUATE MODEL, HETEROSEXUAL-HOMOSEXUAL, ALTERNATE BASELINE (DAILY MAIL BASELINE, 2000)												
	(Inter.)	Male	ExpYes	Mirror	Eve	Guard	Indy	Times	Y1995	Y2005	Y2010	
Mixed	0.740	0.019	-0.062	-0.902	0.311	-0.164	-0.595	-0.069	-0.096	-0.120	-0.245	
Negative	0.906	0.020	-0.611	-0.120	-0.193	-0.637	-0.862	-0.382	0.030	-0.023	-0.766	
Positive	-0.275	-0.222	0.336	-0.050	0.725	0.524	0.425	0.130	0.871	0.640	0.705	

p-VALUES, MINIMUM ADEQUATE MODEL, HETEROSEXUAL-HOMOSEXUAL, ALTERNATE BASELINE (EVE/SUN/NOTW BASELINE, 2000)												
	(Inter.)	Male	ExpYes	Mail	Mirror	Guard	Indy	Times	Y1995	Y2005	Y2010	
Mixed	0.019	0.940	0.898	0.503	0.017	0.299	0.048	0.399	0.781	0.723	0.476	
Negative	0.127	0.939	0.250	0.684	0.879	0.364	0.165	0.690	0.930	0.944	0.036	
Positive	0.335	0.370	0.435	0.135	0.109	0.659	0.499	0.197	0.015	0.073	0.046	
AIC	1767.493											
COEFFICIENTS, MINIMUM ADEQUATE MODEL, HETEROSEXUAL-HOMOSEXUAL, ALTERNATE BASELINE (EVE/SUN/NOTW BASELINE, 2000)												
	(Inter.)	Male	ExpYes	Mail	Mirror	Guard	Indy	Times	Y1995	Y2005	Y2010	
Mixed	1.051	0.019	-0.061	-0.311	-1.213	-0.475	-0.906	-0.380	-0.096	-0.120	-0.245	
Negative	0.712	0.020	-0.610	0.194	0.074	-0.443	-0.669	-0.188	0.030	-0.023	-0.766	
Positive	0.450	-0.222	0.337	-0.725	-0.774	-0.200	-0.299	-0.595	0.871	0.639	0.705	
p-VALUES, MINIMUM ADEQUATE MODEL, HETEROSEXUAL-HOMOSEXUAL, ALTERNATE BASELINE (MIRROR BASELINE, 2000)												
	(Inter.)	Male	ExpYes	Mail	Eve	Guard	Indy	Times	Y1995	Y2005	Y2010	
Mixed	0.698	0.940	0.898	0.049	0.017	0.103	0.500	0.062	0.781	0.723	0.476	
Negative	0.034	0.938	0.250	0.771	0.880	0.227	0.079	0.525	0.930	0.944	0.036	
Positive	0.421	0.369	0.435	0.912	0.109	0.166	0.241	0.672	0.015	0.073	0.046	
AIC	1767.493											
COEFFICIENTS, MINIMUM ADEQUATE MODEL, HETEROSEXUAL-HOMOSEXUAL, ALTERNATE BASELINE (MIRROR BASELINE, 2000)												
	(Inter.)	Male	ExpYes	Mail	Eve	Guard	Indy	Times	Y1995	Y2005	Y2010	
Mixed	-0.162	0.019	-0.061	0.902	1.213	0.738	0.307	0.833	-0.096	-0.119	-0.245	
Negative	0.786	0.020	-0.610	0.120	-0.073	-0.517	-0.742	-0.262	0.030	-0.023	-0.767	
Positive	-0.325	-0.222	0.337	0.049	0.774	0.574	0.475	0.179	0.871	0.640	0.705	

3.2.9. Heterosexual–Homosexual: Multinomial Regression, MAM

To achieve the MAM, necessary variables are *Gender*, *Expert*, *Newspaper* and *Year* (Tab. 19). Although gender and expert make up the MAM, none of the comparisons reach statistical significance, though males and non-experts have slightly more negative and mixed codings. When changing the year baseline to 2000 in the Heterosexual–Homosexual MAM, there is a statistically significant decrease in negative codings in 2010 compared to 2000; a statistically significant decrease in positive codings in 2000 when compared to 1995; a statistically significant decrease in positive codings in 2000 compared to 2010; and the year 2010 is less likely to have negative codings than the year 2000 (Tab. 21). These three findings complement the Heterosexual–Homosexual congregated residuals in Tab. 12, where the three cells that deviate the most are [1,2] (substantially more negative reports in 2000 than should be expected); [1,4] (substantially fewer negative reports in 2010 than should be expected); and [2,2] (substantially fewer positive reports in 2000 than should be expected).

Individual newspapers play their role in the Heterosexual–Homosexual MAM. When using *Daily Mail* newspaper as a baseline (Tab. 21), we find that *Mirror* is less likely to report mixed codings, and that *Independent* is similarly less likely to report negative codings. When using *Guardian/Observer* as an alternate baseline, although there is no statistically significant direct comparison, we see that all but *Independent* are more likely to report negatively than *Guardian/Observer*; and that all but *Evening Standard/Sun/News of the World* are less likely to report positively than *Guardian/Observer*.

There was statistical significance to both Political Leaning and Format in the complete dichotomy models (Tab. 13), but not in the MAMs (Tab. 20). As mentioned above, “Format” only appeared as a contributing MAM variable in one of the dichotomies, and that was Male–Female (Tab. 19).

One can state that yes, tabloids are less ambiguity-tolerant than broadsheets according to the multivariate analysis (cf. *Tab. 11*), but those results are not statistically significant. However, since that trend is across multiple different dichotomies, it does suggest a pattern of “tabloidism” – that said, conservatism is also a non-statistically significant trend suppressing ambiguity tolerance when looking at the complete model (again, not the MAM), where only *Evening Standard* was more negative than *Mail* (cf. *Tab. 14*).

3.3. Broadsheets vs Tabloids

3.3.1. Congregated Broadsheets and Tabloids: Chi-squared

With my results suggesting an across-the-board millennial effect, it became clear that I should try to separate a tabloid versus broadsheet effect: due to the unequal amounts in liberal/conservative newspaper allocations, it was difficult to ascertain whether it was conservatism or tabloidism that was associated with the millennial dip. So I next compared all tabloids versus all broadsheets, with all dichotomies congregated together (*Fig. 5*).

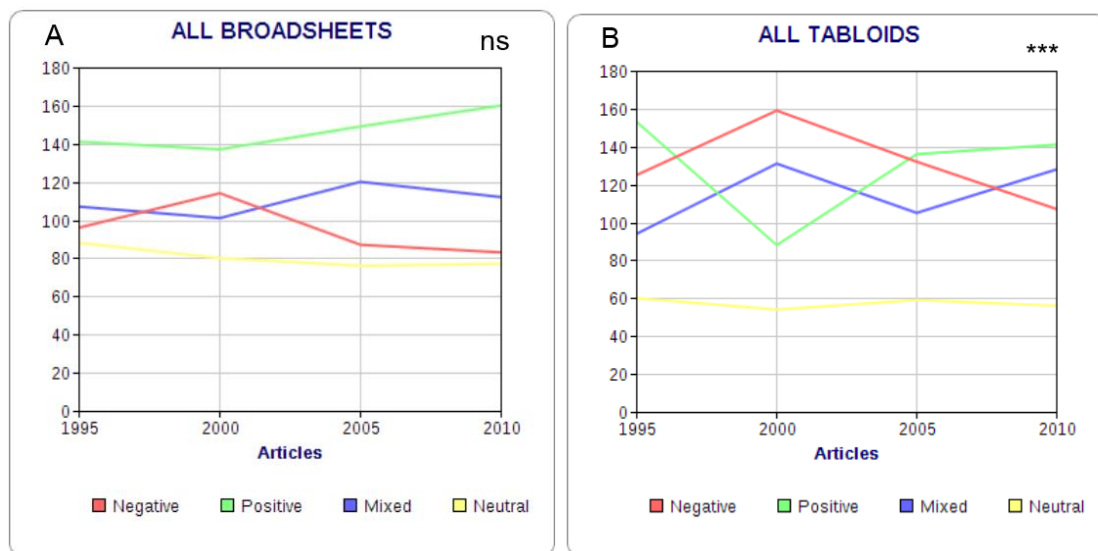


Fig. 5. Visualisation of all dichotomies congregated and Pearson's Chi-squared test; (A) all three broadsheet publications congregated (X-squared = 10.973, df = 9, p -value = 0.278); and (B) all three tabloid publications congregated (X-squared = 38.419, df = 9, p -value = < .001).

Tab. 22. Residuals: All broadsheet and tabloid newspapers' tally count, congregated. Columns and rows as in Tab. 10.

BROADSHEETS, CONGREGATED														
[1] [2] [3] [4]					[1] [2] [3] [4]					[1] [2] [3] [4]				
NEG [1,]	96	114	87	83	NEG [1,]	95.00	95.00	95.00	95.00	NEG [1,]	0.102	1.949	-0.820	-1.231
POS [2,]	141	137	149	160	POS [2,]	146.75	146.75	146.75	146.75	POS [2,]	-0.474	-0.804	0.185	1.093
MIX [3,]	107	101	120	112	MIX [3,]	110.00	110.00	110.00	110.00	MIX [3,]	-0.286	-0.858	0.953	0.190
NEUT [4,]	88	80	76	77	NEUT [4,]	80.25	80.25	80.25	80.25	NEUT [4,]	0.865	-0.027	-0.474	-0.362
MATRIX					EXPECTED					RESIDUALS				

TABLOIDS, CONGREGATED														
[1] [2] [3] [4]					[1] [2] [3] [4]					[1] [2] [3] [4]				
NEG [1,]	125	159	132	107	NEG [1,]	130.75	130.75	130.75	130.75	NEG [1,]	-0.502	2.470	0.109	-2.077
POS [2,]	153	88	136	141	POS [2,]	129.50	129.50	129.50	129.50	POS [2,]	2.065	-3.646	0.571	1.010
MIX [3,]	94	131	105	128	MIX [3,]	114.50	114.50	114.50	114.50	MIX [3,]	-1.915	1.541	-0.887	1.261
NEUT [4,]	60	54	59	56	NEUT [4,]	57.25	57.25	57.25	57.25	NEUT [4,]	0.363	-0.429	0.231	-0.165
MATRIX					EXPECTED					RESIDUALS				

Here we see that the tabloid graph fluctuates much more than the broadsheet graph, though it is still not possible to say that the millennial essentialism is being driven by “tabloidism” (read: the sensationalist nature of tabloid publishing (Sparks & Tulloch 2000), which would lend itself to more extremes of classifications on the part of the journalist) due to the fact that the tabloids are weighted at a ratio of 2:1 in terms of conservative to liberal publications, and therefore I could not rule out political slant as the drive behind these more extreme fluctuations by looking at chi-squared tests alone, which spurred the initial need for the multinomial regression. Notably, the neutral classifications are steady for both broadsheets and tabloids; mixed designations rise for tabloid newspapers in 2000 and dip again in 2005 and then rise in 2010; the broadsheets show the usual negative rise (and a miniscule positive dip) in 2000, while the tabloids show a much more extreme negative rise and positive plummeting.

When we look at the residuals in Tab. 22, we see that amongst the congregated broadsheets that, compared to the expected values of the null hypothesis, there is a substantial increase in negative

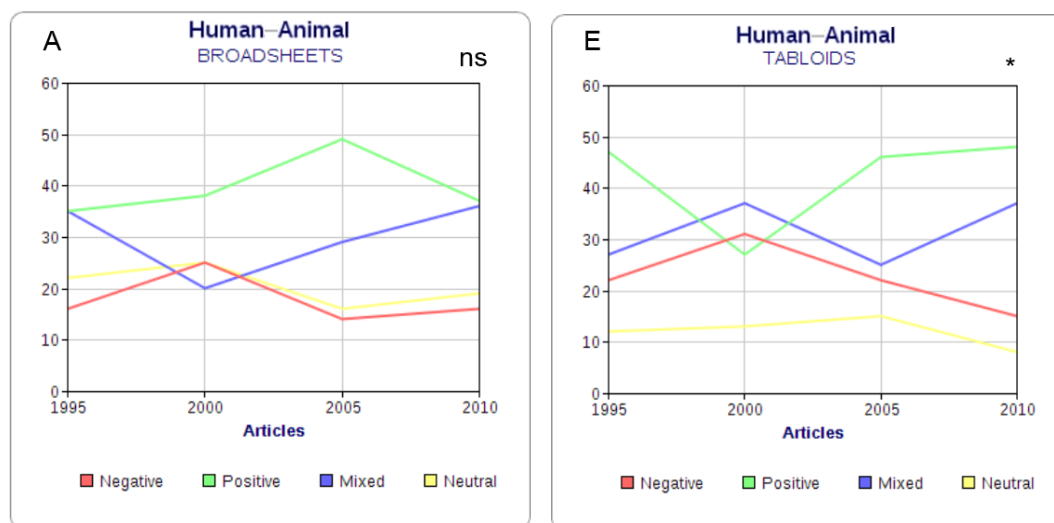
reports in 2000 [1,2] and a decrease in negative reports in 2010 [1,4]; and an increase in positive reports in 2010 [2,4].

On the other hand, when we look at the congregated tabloids residuals in *Tab. 21*, we see that compared to the expected values of the null hypothesis, there is a substantial increase in negative reports in 2000 [1,2] and a substantial decrease in negative reports in 2010 [1,4]; a substantial surplus in positive reports in 1995 [2,1] and a (very) substantial decrease in positive reports in 2000 [2,2] and an increase in positive reports in 2010 [2,4]; a substantial lack of mixed reports in 1995 [3,1] and an increase in mixed reports in 2000 [3,2] and an increase in mixed reports in 2010 [3,4]; and limited fluctuation amongst the neutral reports for all years.

3.3.2. Broadsheets and Tabloids: Multinomial Regression

As stated above, to achieve the MAM for the Male–Female dichotomy alone (*Tab. 18*), the necessary variables were *Gender*, *Expert* and *Format*. In terms of the MAM for Male–Female, only *Format* showed a statistically significant effect, with an increase in negative codings by tabloids when it came to the Male–Female dichotomy. The other dichotomies lacked *Format* (“liberal” or “broadsheet”) as part of their MAM, and thus could not be analysed in this manner. The next section addresses therefore the chi-squared tests alone.

3.3.3. Congregated Newspapers, Dichotomy-by-Dichotomy



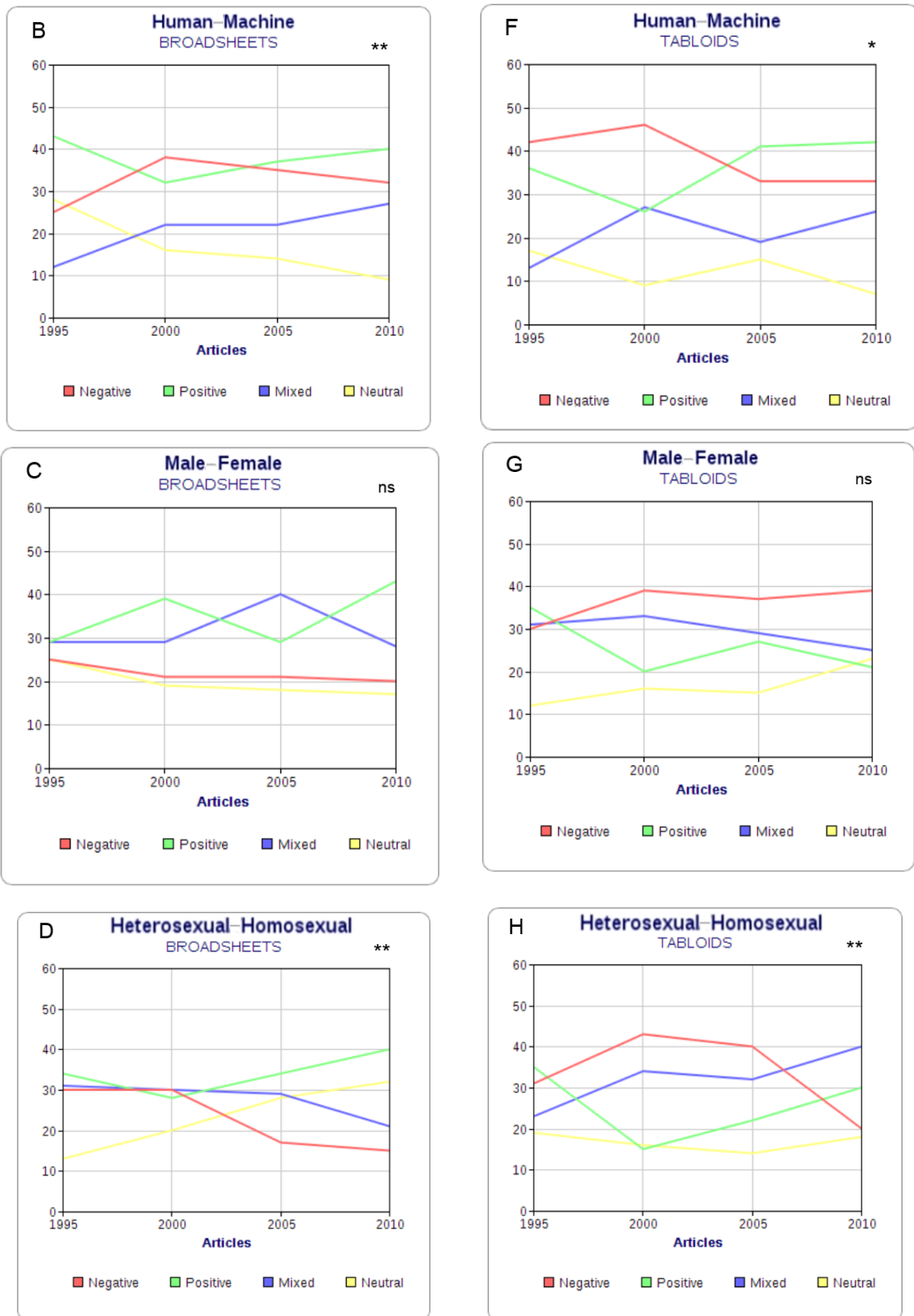


Fig. 6. Visualisation of all dichotomies separated; all three broadsheet publications congregated; and all three tabloid publications congregated. Matrix and Pearson's Chi-squared tests via R for all broadsheet papers congregated, all dichotomies viewed separately: (A) Human-Animal X-squared = 14.681, df = 9, p -value = 0.1; (B) Human-Machine X-squared = 21.948, df = 9, p -value = 0.009; (C) Male-Female X-squared = 10.062, df = 9, p -value = 0.346 and (D) Heterosexual-

Homosexual X-squared = 22.224, df = 9, *p*-value = 0.008. This was followed by all tabloid papers congregated, all dichotomies viewed separately: (E) Human–Animal X-squared = 18.995 df = 9, *p*-value = 0.025; (F) Human–Machine X-squared = 19.51, df = 9, *p*-value = 0.021; (G) Male–Female X-squared = 12.179, df = 9, *p*-value = 0.203; and (H) Heterosexual–Homosexual X-squared = 24.212, df = 9, *p*-value = 0.004.

Tab. 23. Residuals: All broadsheet and tabloid newspapers' tally count, congregated, dichotomy by dichotomy. Columns and rows as in Tab. 10.

BROADSHEETS, HUMAN–ANIMAL															
[1] [2] [3] [4]				[1] [2] [3] [4]				[1] [2] [3] [4]							
NEG [1,]	16	25	14	16	NEG [1,]	17.75	17.75	17.75	17.75	NEG [1,]	-0.415	1.720	-0.890	-0.415	
POS [2,]	35	38	49	37	POS [2,]	39.75	39.75	39.75	39.75	POS [2,]	-0.753	-0.277	1.467	-0.436	
MIX [3,]	35	20	29	36	MIX [3,]	30.00	30.00	30.00	30.00	MIX [3,]	0.912	-1.825	-0.182	1.095	
NEUT [4,]	22	25	16	19	NEUT [4,]	20.50	20.50	20.50	20.50	NEUT [4,]	0.331	0.993	-0.993	-0.331	
MATRIX				EXPECTED				RESIDUALS							

TABLOIDS, HUMAN–ANIMAL															
[1] [2] [3] [4]				[1] [2] [3] [4]				[1] [2] [3] [4]							
NEG [1,]	22	31	22	15	NEG [1,]	22.5	22.5	22.5	22.5	NEG [1,]	-0.105	1.791	-0.105	-1.581	
POS [2,]	47	27	46	48	POS [2,]	42.0	42.0	42.0	42.0	POS [2,]	0.771	-2.314	0.617	0.925	
MIX [3,]	27	37	25	37	MIX [3,]	31.5	31.5	31.5	31.5	MIX [3,]	-0.801	0.979	-1.158	0.979	
NEUT [4,]	12	13	15	8	NEUT [4,]	12.0	12.0	12.0	12.0	NEUT [4,]	0.000	0.288	0.866	-1.154	
MATRIX				EXPECTED				RESIDUALS							

BROADSHEETS, HUMAN–MACHINE															
[1] [2] [3] [4]				[1] [2] [3] [4]				[1] [2] [3] [4]							
NEG [1,]	25	38	35	32	NEG [1,]	32.50	32.50	32.50	32.50	NEG [1,]	-1.315	0.964	0.438	-0.087	
POS [2,]	43	32	37	40	POS [2,]	38.00	38.00	38.00	38.00	POS [2,]	0.811	-0.973	-0.162	0.324	
MIX [3,]	12	22	22	27	MIX [3,]	20.75	20.75	20.75	20.75	MIX [3,]	-1.920	0.274	0.274	1.372	
NEUT [4,]	28	16	14	9	NEUT [4,]	16.75	16.75	16.75	16.75	NEUT [4,]	2.748	-0.183	-0.671	-1.893	
MATRIX				EXPECTED				RESIDUALS							

TABLOIDS, HUMAN-MACHINE

[1] [2] [3] [4]					[1] [2] [3] [4]				[1] [2] [3] [4]					
NEG [1,]	42	46	33	33	NEG [1,]	38.50	38.50	38.50	38.50	NEG [1,]	0.564	1.208	-0.886	-0.886
POS [2,]	36	26	41	42	POS [2,]	36.25	36.25	36.25	36.25	POS [2,]	-0.041	-1.702	0.788	0.955
MIX [3,]	13	27	19	26	MIX [3,]	21.25	21.25	21.25	21.25	MIX [3,]	-1.789	1.247	-0.488	1.030
NEUT [4,]	17	9	15	7	NEUT [4,]	12.00	12.00	12.00	12.00	NEUT [4,]	1.443	-0.866	0.866	-1.443
MATRIX					EXPECTED				RESIDUALS					

BROADSHEETS, MALE-FEMALE

[1] [2] [3] [4]					[1] [2] [3] [4]				[1] [2] [3] [4]					
NEG [1,]	25	21	21	20	NEG [1,]	21.75	21.75	21.75	21.75	NEG [1,]	0.696	-0.160	-0.160	-0.375
POS [2,]	29	39	29	43	POS [2,]	35.00	35.00	35.00	35.00	POS [2,]	-1.014	0.676	-1.014	1.352
MIX [3,]	29	29	40	28	MIX [3,]	31.50	31.50	31.50	31.50	MIX [3,]	-0.445	-0.445	1.514	-0.623
NEUT [4,]	25	19	18	17	NEUT [4,]	19.75	19.75	19.75	19.75	NEUT [4,]	1.181	-0.168	-0.393	-0.618
MATRIX					EXPECTED				RESIDUALS					

TABLOIDS, MALE-FEMALE

[1] [2] [3] [4]					[1] [2] [3] [4]				[1] [2] [3] [4]					
NEG [1,]	30	39	37	39	NEG [1,]	36.25	36.25	36.25	36.25	NEG [1,]	-1.038	0.456	0.124	0.456
POS [2,]	35	20	27	21	POS [2,]	25.75	25.75	25.75	25.75	POS [2,]	1.822	-1.133	0.246	-0.936
MIX [3,]	31	33	29	25	MIX [3,]	29.50	29.50	29.50	29.50	MIX [3,]	0.276	0.644	-0.092	-0.828
NEUT [4,]	12	16	15	23	NEUT [4,]	16.50	16.50	16.50	16.50	NEUT [4,]	-1.107	-0.123	-0.369	1.600
MATRIX					EXPECTED				RESIDUALS					

BROADSHEETS, HETEROSEXUAL-HOMOSEXUAL

[1] [2] [3] [4]					[1] [2] [3] [4]				[1] [2] [3] [4]					
NEG [1,]	30	30	17	15	NEG [1,]	23.00	23.00	23.00	23.00	NEG [1,]	1.459	1.459	-1.251	-1.668
POS [2,]	34	28	34	40	POS [2,]	34.00	34.00	34.00	34.00	POS [2,]	0.000	-1.028	0.000	1.028
MIX [3,]	31	30	29	21	MIX [3,]	27.75	27.75	27.75	27.75	MIX [3,]	0.616	0.427	0.237	-1.281
NEUT [4,]	13	20	28	32	NEUT [4,]	23.25	23.25	23.25	23.25	NEUT [4,]	-2.125	-0.674	0.985	1.8146
MATRIX					EXPECTED				RESIDUALS					

TABLOIDS, HETEROSEXUAL-HOMOSEXUAL														
[1] [2] [3] [4]					[1] [2] [3] [4]					[1] [2] [3] [4]				
NEG [1,]	31	43	40	20	NEG [1,]	33.50	33.50	33.50	33.50	NEG [1,]	-0.431	1.641	1.123	-2.332
POS [2,]	35	15	22	30	POS [2,]	25.50	25.50	25.50	25.50	POS [2,]	1.881	-2.079	-0.693	0.891
MIX [3,]	23	34	32	40	MIX [3,]	32.25	32.25	32.25	32.25	MIX [3,]	-1.628	0.308	-0.044	1.364
NEUT [4,]	19	16	14	18	NEUT [4,]	16.75	16.75	16.75	16.75	NEUT [4,]	0.549	-0.183	-0.671	0.305
MATRIX					EXPECTED					RESIDUALS				

3.3.4. Human–Animal: Chi-squared

As I did for the liberal–conservative dichotomy, I then divided the results into separate dichotomies (Fig. 6). For the Human–Animal broadsheet-tabloid findings (A, E), there is a negative rise in 2000 and a gradual decrease in 2005 and 2010 for both broadsheets and tabloids. Interestingly, the broadsheets show a steadying rather than the “essentialist” dip in positive codings in 2000, then an increase in 2005 followed by a dip in 2010, whereas the tabloids show again stronger dips in positivity (with corresponding rise in negativity) in 2000, followed by a strong recovery in subsequent years. The mixed responses dip in 2000 for this Human–Animal dichotomy for the broadsheets, yet rise for the tabloids; the neutral assessments remain fairly steady for both broadsheets and tabloids.

When we look at the residuals in Tab. 23, we see that amongst the congregated broadsheets for Human–Animal that, compared to the expected values of the null hypothesis, there is an increase in negative reports in 2000 [1,2]; an increase in positive reports in 2005 [2,3]; a decrease in mixed reports in 2000 [3,3] and an increase in mixed reports in 2010 [3,4]; and an increase in neutral results in 2000 [4,2] .

On the other hand, when we look at the residuals in Tab. 23, we see that amongst the congregated tabloids for Human–Animal that, compared to the expected values of the null hypothesis, there is an increase in negative reports in 2000 [1,2] and a decrease in negative reports in 2010 [1,4]; a slight surplus in positive reports in 1995 [2,1] and a substantial decrease in positive reports in 2000 [2,2]; an increase in mixed reports in 2000 [3,2] and a decrease in mixed reports in 2005 [3,3] and an increase in mixed reports in 2010 [3,4]; and a decrease in neutral reports in 2010 [4,4].

3.3.5. Human–Machine: Chi-squared

In terms of the Human–Machine dichotomy (*Fig. 6, (B), (F)*), the usual patterns of year-2000 negative-rise and positive-dip, followed by negative-plummet and positive-soar apply to both broadsheets and tabloids. The mixed and neutral codings look similar for both broadsheets and tabloids, and show similar patterns for both with a slight rise in 2000 for the mixed and then a levelling-off, and a slight decrease in 2000 for the neutral codings, followed by a levelling-off.

When we look at the residuals in *Tab. 23*, we see that amongst the congregated broadsheets for Human–Machine that, compared to the expected values of the null hypothesis, there is a lack of negative reports in 1995 [1,1] and an increase in negative reports in 2000 [1,2]; a lack of positive reports in 2000 [2,2]; a substantial lack of mixed reports in 1995 [3,1] and an increase in mixed reports in 2010 [3,4]; and a substantial lack of neutral results in 1995 [4,1] and a decrease in neutral reports in 2010 [4,4].

On the other hand, when we look at the residuals in *Tab. 23*, we see that amongst the congregated tabloids for Human–Machine that, compared to the expected values of the null hypothesis, there is an increase in negative reports in 2000 [1,2]; a decrease in positive reports in 2000 [2,2]; a lack of mixed reports in 1995 [3,1] and an increase in mixed reports in 2000 [3,2] and 2010 [3,4]; a surplus of neutral reports in 1995 [4,1] and a decrease in neutral reports in 2010 [4,4].

3.3.6. Male–Female: Chi-squared

For the Male–Female dichotomy (*Fig. 6, (C), (G)*), both the negative and the neutral codings show very little fluctuation across all years, though there is a slight rise in year-2000 negative codings in tabloids (*F*), and that applies to both broadsheets and tabloids. This is also the case for the mixed codings by the tabloids, though the broadsheet mixed codings (*C*) show a rise in 2005 and then a return to the first, steadier level. For the broadsheet positive codings (*C*), there is a rise in 2000, a subsequent dip in 2000, and another rise in 2010. For the tabloid positive codings (*G*), there is the usual dip in the year 2000, followed by a slight recovery in 2005, and then a slight downward trajectory towards 2010.

When we look at the residuals in *Tab. 23*, we see that amongst the congregated broadsheets for the Male–Female dichotomy that, compared to the expected values of the null hypothesis, there is a lack of positive reports in 1995 [2,1] and a decrease in positive reports in 2005 [2,3] and an increase in positive reports in 2010 [2,4]; a increase in mixed reports in 2005 [3,3]; and a surplus of neutral results in 1995 [4,1]. There are no particular distinctions amongst the negative reports.

On the other hand, when we look at the residuals in *Tab. 23*, we see that amongst the congregated tabloids for the Male–Female dichotomy that, compared to the expected values of the null hypothesis, there is a lack of negative reports in 1995 [1,1]; a surplus of positive reports in 1995 [2,1] and a decrease in positive reports in 2000 [2,2] and a decrease in positive reports in 2010 [2,4]; and a lack of neutral reports in 1995 [4,1] and an increase in neutral reports in 2010 [4,4].

3.3.7. Heterosexual–Homosexual: Chi-squared

The tabloids show much greater overall fluctuation for the Heterosexual–Homosexual dichotomy (*D*, *H*), for the broadsheets (*D*) are remarkably stable when it comes to this dichotomy until the 2005–2010 time period (noted to be a time of great political change for gay rights, which will be addressed in Chapter 8), where negative codings drop and stay down, mixed codings drop and stay down and neutral assessments rise moderately as do positive codings. Conversely, there is a great increase in negative codings and a plummet in positive codings in 2000, as per the tabloids (*H*), which then follows the common pattern of the positives moderately increasing as we approach 2010, and the negatives very slightly decreasing in 2005, and then dropping sharply in 2010. The mixed assessments in (*H*) remain steady to 2005 and then rise in 2010. The Heterosexual–Homosexual neutral codings remain steady.

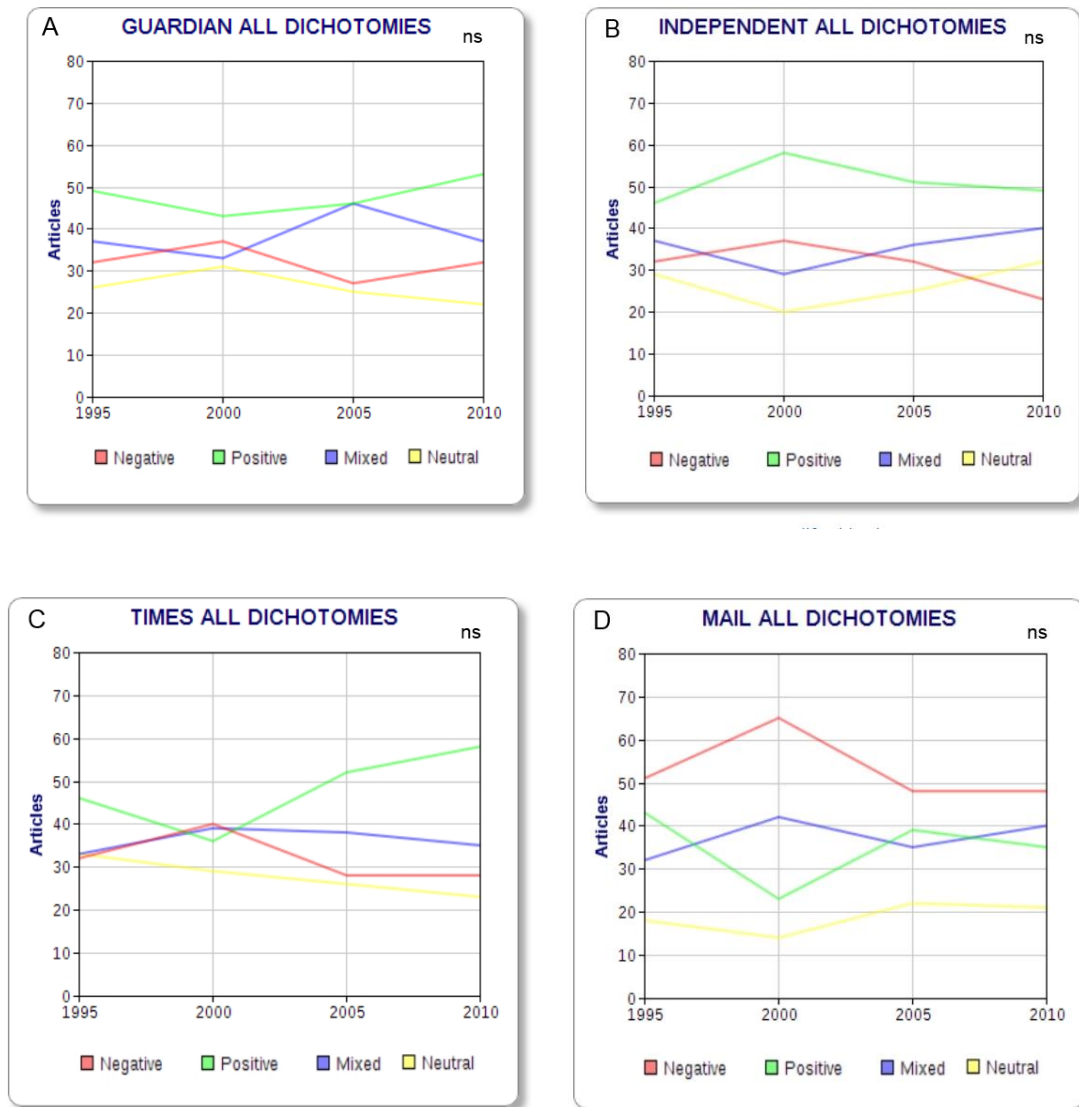
When we look at the residuals in *Tab. 23*, we see that amongst the congregated broadsheets for the Heterosexual–Homosexual dichotomy that, compared to the expected values of the null hypothesis, there is a surplus of negative reports in both 1995 and 2000 [1,1], [1,2] and a decrease in negative reports in both 2005 and 2010 [1,3], [1,4]; a decrease in positive reports in 2000 [2,2] and an increase in positive reports in 2010 [2,4]; a decrease in mixed reports in 2010 [3,4]; and a substantial lack of neutral results in 1995 [4,1], followed by increases in neutral reports in both 2005 and 2010 [4,3], [4,4].

On the other hand, when we look at the residuals in *Tab. 23*, we see that amongst the congregated tabloids for the Heterosexual–Homosexual dichotomy that, compared to the expected values of the null hypothesis, there are increases in negative reports in both 2000 and 2005 [1,2], [1,3] and a substantial decrease in negative reports in 2010 [1,4]; a surplus of positive reports in 1995 [2,1] and a substantial decrease in positive reports in 2000 [2,2] and an increase in positive reports in 2010 [2,4]; and a lack of mixed reports in 1995 [3,1] and an increase in mixed reports in 2010 [3,4].

3.4. Individual Newspapers

3.4.1. Chi-squared: Individual Newspapers

To see whether there were particular newspapers more prone to essentialism than others, I also ran chi-squared tests for each separate paper with all dichotomies congregated together (*Fig. 7*).



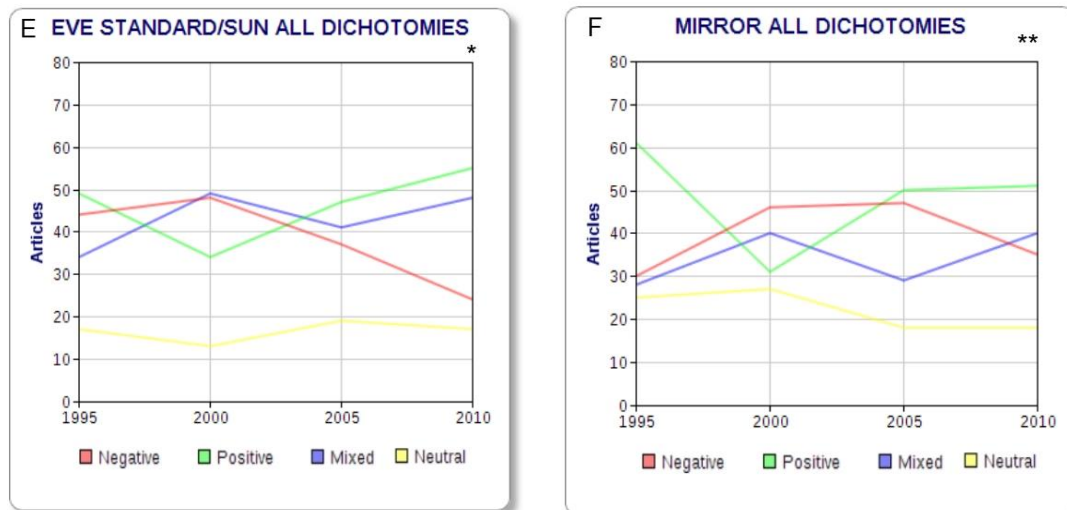


Fig. 7. Visualisation of all newspapers separated; all dichotomies congregated. Matrix and Pearson's Chi-squared tests via R for all as follows: (A) *Guardian* (X-squared = 6.697, df = 9, p-value = 0.668); (B) *Independent* (X-squared = 9.707, df = 9, p-value = 0.375); (C) *Times* (X-squared = 11.1, df = 9, p-value = 0.269); (D) *Mail* (X-squared = 13.887, df = 9, p-value = 0.126); (E) *Evening Standard/Sun* (X-squared = 18.322, df = 9, p-value = 0.032); (F) *Mirror* (X-squared = 21.924, df = 9, p-value = < .001).

Tab. 24. Residuals: All dichotomies congregated and the newspaper tally counts: *Guardian/Observer*; *Independent/Independent on Sunday*; *Times/ Sunday Times* ; *Daily Mail/Mail on Sunday*; *Evening Standard/News of the World/Sun*; *Mirror/Sunday Mirror*. Columns and rows as in Tab. 10. Final sub-table details publication-specific attitudes towards ambiguity: averaged yearly newspaper tally counts (all years congregated; all dichotomies congregated), using expected values sourced from Tab.10, divided by the number of publications (6).

ALL DICHOTOMIES, GUARDIAN											
[1] [2] [3] [4]				[1] [2] [3] [4]				[1] [2] [3] [4]			
NEG [1,]	32	37	27	32	NEG [1,]	32.00	32.00	32.00	32.00	NEG [1,]	0.000
POS [2,]	49	43	46	53	POS [2,]	47.75	47.75	47.75	47.75	POS [2,]	0.180
MIX [3,]	37	33	46	37	MIX [3,]	38.25	38.25	38.25	38.25	MIX [3,]	-0.202
NEUT [4,]	26	31	25	22	NEUT [4,]	26.00	26.00	26.00	26.00	NEUT [4,]	0.000
MATRIX				EXPECTED				RESIDUALS			
NEG [1,]	0.000	0.883	-0.883	0.000							
POS [2,]	0.180	-0.687	-0.253	0.759							
MIX [3,]	-0.202	-0.848	1.253	-0.202							
NEUT [4,]	0.000	0.980	-0.196	-0.784							

ALL DICHOTOMIES, INDEPENDENT											
[1] [2] [3] [4]				[1] [2] [3] [4]				[1] [2] [3] [4]			
NEG [1,]	32	37	32	23	NEG [1,]	31.0	31.0	31.0	31.0	NEG [1,]	0.179
POS [2,]	46	58	51	49	POS [2,]	51.0	51.0	51.0	51.0	POS [2,]	-0.700
MIX [3,]	37	29	36	40	MIX [3,]	35.5	35.5	35.5	35.5	MIX [3,]	0.251
NEUT [4,]	29	20	25	32	NEUT [4,]	26.5	26.5	26.5	26.5	NEUT [4,]	0.485
MATRIX				EXPECTED				RESIDUALS			
NEG [1,]	0.179	1.077	0.179	-1.436							
POS [2,]	-0.700	0.980	0.000	-0.280							
MIX [3,]	0.251	-1.090	0.083	0.755							
NEUT [4,]	0.485	-1.262	-0.291	1.068							

ALL DICHOTOMIES, TIMES														
[1] [2] [3] [4]					[1] [2] [3] [4]				[1] [2] [3] [4]					
NEG [1,]	32	40	28	28	NEG [1,]	32.00	32.00	32.00	32.00	NEG [1,]	0.000	1.414	-0.707	-0.707
POS [2,]	46	36	52	58	POS [2,]	48.00	48.00	48.00	48.00	POS [2,]	-0.288	-1.732	0.577	1.443
MIX [3,]	33	39	38	35	MIX [3,]	36.25	36.25	36.25	36.25	MIX [3,]	-0.539	0.456	0.290	-0.207
NEUT [4,]	33	29	26	23	NEUT [4,]	27.75	27.75	27.75	27.75	NEUT [4,]	0.996	0.237	-0.332	-0.901
MATRIX					EXPECTED				RESIDUALS					

ALL DICHOTOMIES, MAIL														
[1] [2] [3] [4]					[1] [2] [3] [4]					[1] [2] [3] [4]				
NEG [1,]	51	65	48	48	NEG [1,]	53.00	53.00	53.00	53.00	NEG [1,]	-0.274	1.648	-0.686	-0.686
POS [2,]	43	23	39	35	POS [2,]	35.00	35.00	35.00	35.00	POS [2,]	1.352	-2.028	0.676	0.000
MIX [3,]	32	42	35	40	MIX [3,]	37.25	37.25	37.25	37.25	MIX [3,]	-0.860	0.778	-0.368	0.450
NEUT [4,]	18	14	22	21	NEUT [4,]	18.75	18.75	18.75	18.75	NEUT [4,]	-0.173	-1.096	0.750	0.519
MATRIX					EXPECTED					RESIDUALS				

ALL DICHOTOMIES, EVENING STANDARD														
[1] [2] [3] [4]					[1] [2] [3] [4]					[1] [2] [3] [4]				
NEG [1,]	44	48	37	24	NEG [1,]	38.25	38.25	38.25	38.25	NEG [1,]	0.929	1.576	-0.202	-2.304
POS [2,]	49	34	47	55	POS [2,]	46.25	46.25	46.25	46.25	POS [2,]	0.404	-1.801	0.110	1.286
MIX [3,]	34	49	41	48	MIX [3,]	43.00	43.00	43.00	43.00	MIX [3,]	-1.372	0.914	-0.304	0.762
NEUT [4,]	17	13	19	17	NEUT [4,]	16.50	16.50	16.50	16.50	NEUT [4,]	0.123	-0.861	0.615	0.123
MATRIX					EXPECTED					RESIDUALS				

ALL DICHOTOMIES, MIRROR														
[1] [2] [3] [4]					[1] [2] [3] [4]				[1] [2] [3] [4]					
NEG [1,]	30	46	47	35	NEG [1,]	39.50	39.50	39.50	39.50	NEG [1,]	-1.511	1.034	1.193	-0.716
POS [2,]	61	31	50	51	POS [2,]	48.25	48.25	48.25	48.25	POS [2,]	1.835	-2.483	0.251	0.395
MIX [3,]	28	40	29	40	MIX [3,]	34.25	34.25	34.25	34.25	MIX [3,]	-1.067	0.982	-0.897	0.982
NEUT [4,]	25	27	18	18	NEUT [4,]	22.00	22.00	22.00	22.00	NEUT [4,]	0.639	1.066	-0.852	-0.852
MATRIX					EXPECTED				RESIDUALS					

**PUBLICATION-SPECIFIC ATTITUDES TOWARDS AMBIGUITY:
ALL DICHOTOMIES, ALL YEARS, AVERAGED NEWSPAPER TALLY COUNTS**

	NEG.	EXP./RES.	POS.	EXP./RES.	MIX.	EXP./RES.	NEUT.	EXP./RES.
<i>Guardian</i>	32	37.63/-0.92	47.75	46.04/+0.22	38.25	37.42/+0.14	26	22.92/+0.64
<i>Independent</i>	31	37.63/-1.08	51	46.04/+0.73	35.5	37.42/-0.31	26.5	22.92/+0.75
<i>Times</i>	32	37.63/-0.92	48	46.04/+0.29	36.25	37.42/-0.19	27.75	22.92/+1.01
<i>Mail</i>	53	37.63/+2.51	35	46.04/-1.63	37.25	37.42/-0.03	18.75	22.92/-0.87
<i>Evening Standard</i>	38.25	37.63/+0.1	46.25	46.04/+0.03	43	37.42/+0.91	16.5	22.92/-1.34
<i>Mirror</i>	39.25	37.63/+0.26	48.25	46.04/+0.33	34.25	37.42/-0.52	22	22.92/-0.19

By examining the residuals in *Tab. 24*, we see that the most fluctuating newspaper was the liberal-leaning *Mirror*, followed by the conservative *Evening Standard* and the conservative *Mail*; then followed by *Guardian*, *Independent* and *Times*, the latter three at roughly the same level of fluctuation. The final sub-table of *Tab. 24* is used as an exercise to show averaged ambiguity levels newspaper-by-newspaper (e.g., in this averaged tabulation *Independent* has the fewest negative as well as the most positive responses to ambiguity, and vice versa for *Mail*), but does not distinguish years and dichotomies, and thus will not be the intended referral for *Tab. 24* unless specified.

3.4.1.1. *Guardian/Observer*

With *Guardian/Observer* (A), there is a slight dip in positive codings in the year 2000, followed by a general upwards moderate recovery; a moderate rise in negative codings in 2000 followed by a dip and then a levelling off in subsequent years; an increase in mixed results in 2005 and a steadiness for neutral results across all four years. It is worth mentioning that positive attitudes start out on a high level, which is interesting when compared to the positive starting point for a more conservative broadsheet such as *Times* (C) or, more notably, the tabloid *Mail* (D).

When we look at the residuals in *Tab. 24*, we see that amongst the congregated dichotomies for *Guardian* that, compared to the expected values of the null hypothesis, there is an increase in mixed reports in 2005 [3,3]. All other fluctuations are not particularly notable.

3.4.1.2. *Independent/Independent on Sunday*

Independent, however, shows far more anomalous (when compared to all other publications) positivity in 2000 then dips slightly and levels off in the subsequent years, with only a slight rise in negative codings for the same year (which then move gradually downwards in 2005 and 2010). Unlike *Guardian*, *Independent*'s mixed results rise in 2010.

When we look at the residuals in *Tab. 24*, we see that amongst the congregated dichotomies for *Independent* that, compared to the expected values of the null hypothesis, there is an increase of negative reports in 2000 [1,2] and a decrease in negative reports in 2010 [1,4]; an increase in positive reports in 2000 [2,2] (notably “bucking the trend”, as mentioned above); a decrease in mixed reports in 2000 [3,2]; and a decrease in neutral reports in 2000 [4,2] and an increase in neutral reports in 2010 [4,4].

3.4.1.3. *Times/Sunday Times*

Times (C) shows more of the pattern of millennial negative-rise/positive dip than *Independent*, *Guardian* and *Mirror*, with quite extreme shifts after that point, with positive levels increasing in 2005 and 2010; and a similar downwards trajectory for the negative codings that then levels off. The mixed codings do not show much shift; and the neutral codings are not as volatile as the negative or positive codings, either.

When we look at the residuals in *Tab. 24*, we see that amongst the congregated dichotomies for *Times* that, compared to the expected values of the null hypothesis, there is an increase of negative reports in 2000 [1,2]; a decrease in positive reports in 2000 [2,2] and an increase in positive reports in 2010 [2,4]; no particular fluctuation in the mixed reports; and a surplus of neutral reports in 1995 [4,1] and a decrease in neutral reports in 2010 [4,4].

3.4.1.4. *Daily Mail/Mail on Sunday*

Mail (D) is a high-octane version of *Times (C)*, with higher extremes of the millennial negative-rise/positive dip; nothing too remarkable in terms of the neutral codings, and an increase in mixed codings in 2000 that then levels off in the years thereafter.

When we look at the residuals in *Tab. 24*, we see that amongst the congregated dichotomies for *Mail* that, compared to the expected values of the null hypothesis, there is an increase of negative reports in 2000 [1,2]; a surplus of positive reports in 1995 [2,1], a substantial decrease in positive reports in 2000 [2,2]; and a decrease in neutral reports in 2000 [4,2].

3.4.1.5. *Evening Standard/News of the World/Sun*

Evening Standard/Sun (E) looks very like these two as well, albeit with much lower negative starting points than *Mail (D)*. Like *Times (C)*, *Evening Standard's* positive ratings increase as we approach 2010, and the negative ratings plummet.

When we look at the residuals in *Tab. 24*, we see that amongst the congregated dichotomies for *Evening Standard* that, compared to the expected values of the null hypothesis, there is an increase of negative reports in both 1995 and 2000 [1,1], [1,2] and a substantial decrease in negative reports in 2010 [1,4]; a decrease in positive reports in 2000 [2,2] and an increase in positive reports in 2010 [2,4]; a lack of mixed reports in 1995 [3,1] and slight increases in mixed reports in both 2000 and 2010 [3,2], [3,4]; and a slight decrease in neutral reports in 2000 [4,2] and a slight increase in neutral reports in 2005 [4,3].

3.4.1.6. *Mirror/Sunday Mirror*

Finally, *Mirror* (*F*) also shows this observed millennial negative-rise/positive-dip (sharply in both cases), with mixed codings fluctuating throughout and neutrals staying relatively steady. Of note here is the fact that *Mirror* starts with positive codings on a very high level, which it then recovers – though never surpasses – in 2005 and 2010, after the “millennial dip”. The negative codings were steady from 2000 until 2005, which was unusual, but then eventually fell in 2010. *Mirror*, a liberal tabloid, shows a similar pattern of fluctuation in ambiguity tolerance as the rest of the conservative papers, perhaps due to its tabloid nature, as the complete-model MAM suggests that it is tabloidism that drives this effect rather than conservatism (cf. *Tab. 11*).

When we look at the residuals in *Tab. 24*, we see that amongst the congregated dichotomies for *Mirror* that, compared to the expected values of the null hypothesis, there is a lack of negative reports in 1995 [1,1] and an increase in negative reports in both 2000 and 2005 [1,2], [1,3]; a surplus in positive reports in 1995 [2,1] and a substantial decrease in positive reports in 2000 [2,2]; a lack of mixed reports in 1995 [3,1] and increases in mixed reports in both 2000 and 2010 [3,2], [3,4] and a decrease in mixed reports in 2005 [3,3]; and an increase in neutral reports in 2000 [4,1].

3.4.2. Individual Newspapers: Multinomial Regression

Only for the Heterosexual–Homosexual MAM (*Tab. 20*) was “Newspaper” statistically significant. There is discussion above on the role individual newspapers play in this context in the sub-section 3.2.9., headed “Heterosexual–Homosexual: multinomial regression, MAM”.

3.5. Seasonality

3.5.1. Seasonality: Chi-squared

Finally, I ran a test for seasonality, *Fig. 8*, below. Seasonality was investigated as there are some indications that seasons affect both human moods and behaviour (Morken 2001, Meyer *et al.* 2016), and this potentially might influence ambiguity tolerance. I decided not to compare winter-to-summer for seasonality, since there were so many substitutions 3 months previous or later, but rather autumn to spring.

In terms of Seasonality, there was no statistical significance when dichotomies and years were congregated and “autumn” was compared against “spring”, though it suggests that “spring” may elicit slightly more positive codings towards ambiguity than “autumn” though not, again, of statistical significance (p value = 0.216).

When we look at the residuals in *Tab. 25*, we see that when testing for a seasonality effect that, compared to the expected values of the null hypothesis, there is a lack of negative reports in “autumn” [1,1] and an increase in negative reports in “spring” [1,2]; no particular fluctuation amongst the positive reports; a surplus of mixed reports in “autumn” [3,1] and a decrease in mixed reports in “spring” [3,2]; and no particular fluctuation amongst the neutral reports. A potential seasonality effect was investigated further in the multinomial regression, below.

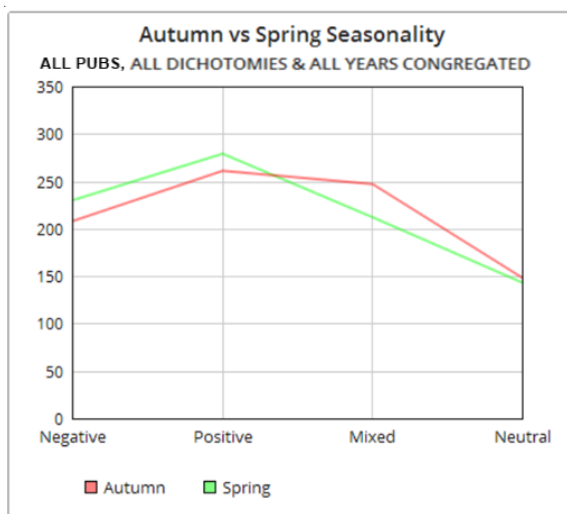


Fig. 8. Visualisation of seasonality predictor variable for all dichotomies, publications and years congregated, all publications congregated and all years congregated (X-squared = 4.459, $df = 3$, p -value = 0.216).

Tab. 25. Residuals: Seasonality, all dichotomies and all years congregated, comparing Autumn (row, [1]) to Spring (row, [2]); column = Negative, Positive, Mixed and Neutral.

SEASONALITY			
[1] [2]		[1] [2]	
NEG [1,]	208 230	NEG [1,]	219.0 219.0
POS [2,]	261 279	POS [2,]	270.0 270.0
MIX [3,]	247 212	MIX [3,]	229.5 229.5
NEUT [4,]	148 143	NEUT [4,]	145.5 145.5
MATRIX		EXPECTED	
		RESIDUALS	
		NEG [1,]	-0.743 0.743
		POS [2,]	-0.547 0.547
		MIX [3,]	1.155 -1.155
		NEUT [4,]	0.207 -0.207

3.5.2. Seasonality: Multinomial Regression

In terms of the multivariate analysis, there was a seasonal statistically significant increase in negative reports in *Tab. 11* in the complete model of congregated dichotomies, which had an increase in negative reports as compared to neutral in “winter”. In addition, when all variables were congregated for the complete model of Human–Machine dichotomy (*Tab. 13*), “spring” and “summer” experienced an increase in mixed reports when compared to neutral codings.

Via further investigation of the MAMs, though, we see that these effects disappear. The *Seasonality* variable was not statistically significant in the complete model multinomial regression MAM for congregated dichotomies (cf. *Tab. 14*), and “spring”/“summer” increase in mixed reports disappeared in the Human–Machine MAM as well (cf. *Tab. 18*).

As mentioned above in the chi-squared seasonality section, however, there were in any case too many potentially cross-seasonal substitutions to justify comparing “winter” and “summer” categories and, regardless, the complete-model MAM results were not statistically significant.

3.6. Summary

Some major findings of the results section suggest underlying causes, which will be explored and discussed in subsequent chapters.

3.6.1. Infrahumanisation

- At the time of the *millennium*, something “big” happens to the British public’s general tolerance: for all dichotomies, and all newspapers, the Year 2000 sees a dip in positive codings and a notable rise in negative codings, i.e., a noticeable millennial decrease in ambiguity tolerance. The negative codings then dip in 2005 and sink further in 2010, while the positive codings recover from their 2000 nadir and then continue to rise to their original level again. Mixed and neutral codings, on the other hand, appear relatively stable.
- The *Male–Female dichotomy* is the most stable of all four dichotomies. The resilience to temporal change suggests that concepts around gender dichotomy are less volatile than those connected to the other three dichotomies, and also suggests potential underlying hard-wired psychological mechanisms for this gender-specific distinction.
- *Males* embody less ambiguity tolerance than females. Even though the *Gender* variable is not statistically significant, it cannot be removed without raising the AIC, and the general trend of males being less ambiguity tolerant than females, with an increase in mixed and negative responses, holds steady across the four dichotomies. It is difficult to say whether this would be culturally influenced or “hard-wired” (or both), as studies comparing ambiguity tolerance in males and females have had varying results.
- The two dichotomies protecting the human ingroup (Human–Animal dichotomy and Human–Machine) behave in more similar ways than the potentially linked sexual-orientation (Heterosexual–Homosexual) and gender (Male–Female) dichotomies, supporting theories that we may operate with “outgroup schemata” as well as gender schemata.

3.6.2. Ultrahumanisation

- The *Heterosexual–Homosexual* dichotomy is the most volatile, with strong reactions both in terms of tolerance and intolerance of sexual ambiguity throughout the 16-year period and a steady increase towards greater tolerance after 2000. This suggests that essentialising or categorising sexuality in black-and-white terms is not hard-wired.
- *Seasonality* does not affect ambiguity tolerance, according to the chi-squared results. A statistically significant increase in negative codings in the complete model also falls away in the complete-model congregated-dichotomies MAM, suggesting that other factors correlated with seasonality have stronger influence.
- *Experts* embody more ambiguity tolerance than non-experts. In all years, for all four dichotomies, being an expert meant a decreased response in mixed reactions and a decrease in negative reactions towards ambiguity. This also would match studies that show that the more college-educated an individual is, the less likely they are to be sexist, racist, xenophobic and homophobic (and essentialist/ambiguity-intolerant).

- General interpretation of the millennial result finding: our brains are not permanently rewired due to factors such as technological advances. Instead, the millennium effect might be summarised as follows: "We got scared, then we adjusted, now we're open to ambiguity again": thus, reassured as opposed to rewired.

4. THE MILLENNIUM: “SLEEP TIGHT, DON’T LET THE MILLENNIUM BUGS BITE”

4.1. Millennial-Angst

In this chapter, I discuss temporal millennial patterns that are independent from the four classic dichotomies investigated in this thesis, alterities examined in more detail in Chapters 5, 6, 7 and 8.

I tested temporality over a 16-year period in five-year intervals – 1995, 2000, 2005, 2010 – covering the Western September 11th-period, millennial economic turmoil and war-time; I therefore reasoned that the landmark year of 2000 and the years following might show reactive patterns. I was correct. In 1995, we were comfortable grouping ourselves with fellow apes, cyborgs and bisexuals. In 2000, something shook that tolerance on a cataclysmic level. Why tremors, why then? Why did we become less tolerant towards these intermediate sets? Why did our gender ambiguity tolerance stay relatively stable?

Language, meant here as a meaning-laden reciprocal communication system, is the mechanism by which humans verbalise how they categorise objects and concepts; such statements reveal patterns of thought, both inclusionary and exclusionary. Language has been argued to “create” societies’ presumptions (Whorf 1956). Language also *reflects* cultural mores. It is not a reach to suggest that if we think of certain groups as belonging and others as not belonging to a set, that we become prejudiced – we “pre-judge”. Infracategorisation that allows for ingroup/outgroup sortal categorisation – both dichotomising and essentialist – might be based on perceived natural-kind categorisations, and Franco-American anthropologist Scott Atran suggests a cognitive adaptation (1998). Some studies postulate that we act in exclusional terms first to protect our ingroup and rationalise *post hoc*, after the fact (Haidt 2013). Such *post hoc* rationalisation is not contradictory to constructivism – the tendency towards essentialising could exist first, which various cultures then justify in varying ways. If we have a tendency to protect our own ingroup only under threat, our “adaptive bias” won’t kick in until a fear-state is present. Still, if we conceive of our prejudices before we have words for them, this also may reflect different causal processes than those suggested by Sapir and Whorf. In either case, prejudices may be related to ingroup/outgroup distinctions, a theory that has strong empirical support (Aosved & Long 2006, Hubbard & de Visser 2015). What we are not – the “outgroup”, the other – is of less worth. Following this line of reasoning, in a patriarchal *heteronormative* (“taken-for-granted social and sexual arrangements in a heterosexual world-view”, Bettcher 2014:3) context such as Western culture on which my research was based (Hughes & Hughes 2001, Henslin 2001, Strozier 2002, Ciccociola & Palmeri 2012), non-human animals (and machines) are worth less than humans, females are worth less than males, and homosexuals are worth less than heterosexuals. Note that I conflate in this thesis Western cultures – particularly US/UK; cross-cultural patterns are well-established (Chadha & Kavoori 2000, Sznycer *et al.* 2012, Lindoso 2012, Foster 2014).

My results in Chapter 3 show that in three out of four dichotomies, essentialism is sensitive to cultural change (Fig. 2), further suggesting that some concepts of reality and, therefore, scientific discourse, are flexible, though this does not mean that the ability and/or tendency to categorise is not a predisposition. In the case of gender (the two categories children essentialise most being gender and age: Gelman 2003), it even may be a hard-wired adaptation.

Potential “zeitgeist” cultural shifts may inform some of the questions detailed in this chapter’s opening paragraph, and here are some possibilities from the perspective of a white, middle-class female Westerner whose birth at the beginning of the 1970s meant that she spent her teens in the 1980s, her 20s in the 1990s and her 30s in the post-millennial “noughties”. This temporal and geographical setting is relevant, as it could be reasonably argued that I can function as a young adult “everyman” (or “everywoman”) for the time period 1995–2010.

In 1995, that first year of my codings, the general ambience was one of freedom and an aspiring towards internationalism (UNDP 1994; Goldmann 1997). The Cold War was over, and for the first time since 1945 – due to the ultimate success of the Gorbachev-backed Soviet political wave called *glasnost* – the looming spectre of global nuclear war had faded, as had the immediate shock of the fall of the Iron Curtain. It was certainly the first time in my own life that I did not believe that all humanity would perish in imminent full-scale thermonuclear conflict. To put it more bluntly, fresh into my mid-20s, it was novel to feel safe. *We as humans* felt safe. We extended our human hand down from the sky to embrace the apelike Other (albeit an “other” with a remarkably similarly shaped hand). And rather than the power differential of a Sistine god to a mere mortal, we drew the ape up to our celestial cloud: not only were we *apes*, we included other apes into our own fold as well; we dealt with liminal categories surprisingly well. Similarly for sexuality: masculine/feminine grunge rocker Kurt Cobain had died the previous year, but had sung lyrics like “*What else should I say / Everyone is gay*” (Vultaggio 2015) and in some ways that typified the social climate. There was new hope for AIDS with antiretroviral drugs (Pickrell 2006). Additionally, technology was novel and exciting in the West: it was becoming commonplace for young people to have their own home-computers; there was a buzz about “virtual reality” games and CD-ROMs.

Right-wing governments were on the retreat. This meant a lead-up to power-shifts in terms of politics, e.g., the second term of President Clinton in the US, the Social Democrats in power in Germany, then-popular New Labour in the form of Tony Blair gearing up in the UK. Not long after the Berlin Wall had come down, there was a softening of boundaries – quite literally. This easing of both visible and conceptual borders is reflected clearly in my 1995 results, where the mass media were fairly comfortable grouping humans with fellow animals and even machines, gender-blenders like *tomboys* and *New Men* amongst the squares (to some extent); bisexuals included along with the straights (and gays): them with “us”.

I note that throughout all four years in the congregated dichotomies (*Tab. 11*), mixed responses fluctuate more than either negative or positive responses, and in a sense this is an “ambiguous response to ambiguity”. Although the “mixed” category is functioning in binary terms as a so-called “wastebasket category”, it may be better understood as a different way to show shades of grey rather than black-or-white responses whilst still coding within a binomial system. It is interesting that “mixed” is where we see the most fluctuation. According to *Tab. 10*, the year with the fewest mixed responses to ambiguity was 1995 and the year with the most 2010. As both 1995 and 2010 were in relative terms very positive towards ambiguity; *Tab. 10* further suggests that it was primarily the expected values for mixed attitudes that changed towards positive in 1995, and that it was primarily the expected values for negative responses that changed toward both positive and mixed responses in 2010. Keeping the high level of mid-1990s categorical ambiguity tolerance in mind, the change that followed from 1995–2000 was dramatic. Why this sudden swing? Here are some possible explanations.

4.1.1. Chiliasm and Pathogen-Avoidance

The year 2000 was not just any year: it was the millennium, the second of only two such years post-Christ in the Western calendar. A “turn of the century” (*fin de siècle*) denotes cultural anticipation and change (Schaffer 2007); a *fin de millénaire* is an even more prominent event – so much so that there was a movement associated with the first: chiliasm, aka Chilianism (literally: “belief in the 1000”), and a rash of associated doomsday cults (Glaber 985/1989). This 1000 CE wave of millennial angst was heavily connected with the Christian belief in the Second Coming of the messiah, and thus the end of the world (“as we know it”...). And, it has its corollaries in the second turn-of-the-millennium. Anglo-American religious scholar Phillip Jenkins points out how, gearing up to the turn of the century, newspapers themselves were more likely to refer to mass suicides as “doomsday” cults, whereas a decade earlier in the 1970s, they would have been referred to as “satanic” cults (2000). Whether the newspapers reflected or created the public tension regarding the year-2000 doomsday cults, echoing debates between determinists and constructivists, is difficult to say.

The public fear of the “millennium bug”, for example, also could be understood as a modern-day chiliasm equivalent, complete with potentially hard-wired pathogen-avoidance mechanisms in the forms of distaste for “bugs” embodied by metaphorical insects (coincidentally or not). This code in all binary computers allegedly lacked the ability to change numerals denoting years from “19XX” to “20XX”. As a result, planes would drop from the sky, the global stock market collapse and nuclear reactors melt down – if such computers were not made “millennium-ready” prior to 1 January, 2000. The employment of computer programmers to fight the “millennium bug” was considered common

sense by most modern businesses, though considered easy money by many programmers themselves (Mitchell 2009). Unsurprisingly, the dreaded millennium bug never emerged in any substantial way.

4.1.2. Economic Crises and War-States

There was a global economic crash in 1998 that led to US national headlines such as “Top financial analysts, policy makers and economists assess the vulnerabilities in the international financial system, whether the worst of the '98 crisis is over, and – is the U.S. in harm's way?”, with leading economists and investors expressing great unease (PBS 1999). Adding to this, a general sense of fright and danger – in Western terms – clearly manifested itself after US President George Bush Jr's controversial election *coup d'état* in December 2000 and after the September 11th attacks the following year in New York City, with the global aftermath ushering in more shaky times geopolitically and economically (Gardner 2008).

There are some similar 2000 patterns that have been observed in other studies (*Fig. 9*). UK left-wing sentiment plummeted in 2000 – again, this could reflect a war state and political unease. Also in the UK, negative attitudes towards homosexuality sharply rose ca.2000, then recovered. And further afield: American worrying regarding global warming peaked ca.2000; there was an increase in American murders gearing up towards the millennium; the American willingness to accept a female president suddenly dipped directly before 2000, the popularity of homophobic and misogynist rap music soared in 2000; and in Italy xenophobic language towards the Roma also underwent an upwards surge in 2000 (although nothing compared to 2008). It is likely that the millennial shift in ambiguity tolerance that I am observing can be analysed in a global, multi-national context, though I leave that to future research.

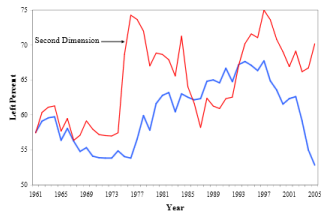


Figure 2: Two Dimensions of Policy Sentiment in the United Kingdom

Attitudes toward Homosexuality

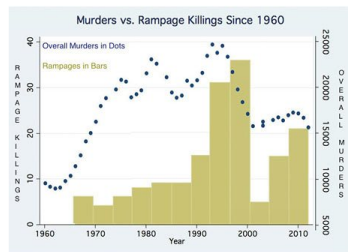


Fig. 9. T-B, L-R: Left-wing policy sentiment in the UK (Stimson 2006); Western attitudes towards homosexuality (Wilkinson 2010); Gallup poll on global warming fears (Jones 2011); Murder and rampage killings (Enten 2012); Attitudes towards female presidents (Malone 2016); Homophobic and misogynist rap lyrics (Powell-Morse 2014); Roma representation in Italian media (Tewksbury-Volpe 2012).

Regardless, these patterns perhaps indicate that people felt less “safe” at the millennium, and that this then may have provoked a fear-state, which then potentially triggered the protection of the human ingroup (cf. Section 4.6.6.). Thus, around 2000, we again started to emphasise the boundaries between ourselves and non-human primates, machine-intermediaries and bisexuals (though not much more than usually between males/females).

4.1.3. Infiltration of Human Ingroup

Quite a few seminal “biological determinist” popular science texts were published around the turn of the last century, and given a great deal of publicity in the media (Ridley 1999, Buss 2000, Pinker 2002). High-profile scientific studies that drew on our close relatedness to other primates worked their way into the public consciousness. The most iconic of these was the draft of the Human Genome Project – finished in late 2000, published in February of 2001, with its imminence trumpeted for quite a few months previous to that (NHGRI 2000). The same draft sequencing for the chimpanzee genome was scheduled for 2005. The potentiality for evidence of closer inter-relatedness between humans and chimpanzees was highlighted, evidence which then perhaps resulted in a “tightening of boundaries” against category-blurring. The Human Genome Project ultimately dealt a blow for human uniqueness proponents: “Rather than the 100,000 or so genes that had been confidently predicted, there seemed to be only around 31,000 sequences coding for chains of amino acids – which compares to [...] 20,000 for a nematode worm” (Rose 2006:19).

Also at the same time, the narrative of *evolutionary psychology* rose to prominence – a discipline that could be understood – or misunderstood – as a resurrection of “biological determinism” (the idea that one’s environment has little effect on one’s behaviour; that it is our genetic makeup that determines our behaviour, talents etc.). Books on this topic of evolutionary psychology were outselling their social-constructivist counterparts that emphasised the environmental malleability of human behaviour (Williams 2000).

Could these published works and academic studies have influenced the sampled journalists? Or, conversely, were the journalists writing at this time reflecting an already-ambiguity-intolerant society? Or, perhaps most interestingly, were the “biologically determinist” book authors also justifying observed essentialism *post hoc*?

4.1.4. Technophobia

More than latter-day chiasm and geopolitical shifts were occurring. The cultural-paradigm-changing internet took off in the late 1990s with its ensuing variety of “information” both enriching and bewildering (Zakon 1993–2011). This might be partly responsible for the tightening of borders

regarding categories: people had an unprecedented amount of opinions and alleged facts at their fingertips. This method of popularising information also may have served to promote “group-think” at the same time as it offered alternatives to more mainstream theories. Furthermore, humans can train themselves to have new automatic responses to new stimuli (Pavlov 1927). Journalist-theorist Nicholas Carr argues that exactly this was done as a result of exposure to search engines such as Google and the astronomical uptake in internet and personal computer use since the late 1990s (2008). According to Carr, we trained ourselves to become better essentialists: making quicker categorical choices, for example, when we searched terms on Google. However: if our brains were being re-wired to become more essentialist, as Carr argues – and this is perhaps suggested in my year-2000 results across three out of four dichotomies – that this occurred at all suggests that societal concepts of reality are indeed flexible.

What is more, there was another potential ingroup protection trigger via that same astronomical Internet growth. The radical changes in new technology that took place in the late 1990s, including the widespread use of the World Wide Web and the internet, occurred *first* against the background of a shaky geopolitical environment, then potentially could have provoked a generalised fear state and an ingroup protective response against machines (Brosnan 1998) – including the rash of millennium-bug fears. Furthermore, multifactorial causes including all, some or none of these may be present.

This might explain the highly significant p -value of $< .001$ for the Human–Machine dichotomy’s varying rates of ambiguity tolerance (*Fig. 2 (B)*), particularly in regard to the year 2000. A negative reaction to technology changes also would explain results that show that after we first resorted to essentialist and stereotyped thinking, we – the human in-group – then socially adjusted and relaxed that fear in post-millennial years (*Fig. 1 (A)*; *Fig. 2*). Perhaps relatedly, in terms of biotechnology, opposition to genetically modified food also has softened since 2001 (cf. Pew Research 2006). *Fig. 2* therefore shows that ambiguity change is more likely to be a result of ingroup protection (thus potentially adaptive) than “re-wired”, Google-trained (implicitly plastic) brains, and this is supported by my analyses of both the Human–Machine (*Fig. 2 (B)*) and the Human–Animal dichotomies (*Fig. 2 (A)*). As the Human–Animal dichotomy is a non-technology-related dichotomy for the most part (bioresearch aside), it effectively functions as a control group to the Human–Machine dichotomy when examining human ingroup protection patterns. I previously have observed that phraseology describing Human–Animal intermediary states did *not* become more integrative as we approached the millennium – quite the opposite. Both dichotomies (along with the Heterosexual–Homosexual dichotomy) underwent very similar processes.

More importantly, reactions to Human–Machine ambiguity adjusted back to tolerant in 2005 and 2010, matching patterns with the congregated dichotomies, as did both the Human–Animal and Heterosexual–Homosexual patterns (the outlier dichotomy Male–Female to be discussed in Chapter 7). If the low-ambiguity-tolerant Human–Machine results of the year 2000 are due to the fact that we

had truly “re-trained” our brains to be essentialist, as Carr argues, then there should have not been a subsequent adjustment across three dichotomies towards less essentialism in the following years once we became more familiar with the new technology: though exactly this happened (*Fig. 1 (A)*; *Fig. 2*).

4.2. Animal-Angst

I predicted that in a war-time and economic crisis period, we would be more critical of animals in general, but particularly (due to infiltration fears, Martínez *et al.* 2012) in terms of Human–Animal intermediaries. I anticipated a millennial backlash against evolutionary theory specifically, as the discipline highlights gradualism.

From 1995 to 2010, based on the congregated-dichotomies logistic regression (*Tab. 11*), Human–Animal chi-squared test values (*Fig. 2 (A)*) and Human–Animal chi-squared residuals (*Tab. 12*), there is a clear trend towards a diminishing of ambiguity tolerance towards intermediaries, most manifested in 2000, and then a stark recovery. Again, in shaky times, we protect our ingroups more (be they males, white people, humans or heterosexuals) (Aosved & Long 2006, Capozza 2009).

Formal biology acknowledges humans as both primates and animals, and also classifies humans as one of the five great apes, belonging to the family Hominidae (although occasionally Hominidae is described as being made up of “humans and great apes”). In the wider public mind, however, it could be argued that humans are often not only not considered *apes*, but also not considered to be *animals* at all (Martínez *et al.* 2012, Debate.org 2016). Consequently, when we start discussing closely related species, such as chimpanzees or Neanderthals, things get shakier in terms of our compartmentalisation, and we often get more *precise* about our definitions (Morton *et al.* 2009). My analysis clearly reveals that, as the zeitgeist gets more tremulous geopolitically but more precise scientifically, Human–Animal ambiguity tolerance plummets. As previously noted, there also was a plethora of human-exceptionalist scientific texts and popular science books published ca.2000 (Ridley 1999, Buss 2000, Pinker 2002).

4.3. Cyborg-Angst

I predicted millennial ambiguity fears associated with virtual reality machines and “cyborgs” (hybrids between humans and machines, therefore “unnatural kinds”) – and I predicted that the internet would provoke a new type of technophobia associated with unclear boundaries; I also predicted a social shift to people in the relatively wealthy West wanting food and body products to

be more “natural” and a backlash against technological “manipulations” such as genetically modified food.

There is a dip in the year-2000 Human–Machine dichotomy, following the same pattern as for all four dichotomies congregated (*Fig. 1 (A)*), and also following similar patterns in ambiguity tolerance in 2005 and 2010 across all individual dichotomies save Male–Female (*Fig. 2*).

Millennial reactions to technology are salient. There are new ambiguity fears associated with virtual reality machines and cyborgs (hybrids between humans and machines, therefore potentially “unnatural kinds” via “monstrous hybridity”, cf. Jacobs 1992) where none existed before – in 1995, Western culture was not as saturated by technology in the all-consuming manner that originated in the late 1990s culture and has persisted since (Carr 2008). In particular, ca.2000 the internet seemed to evoke (or provoke) a new type of technophobia associated with unclear boundaries and (possibly threatening) extensions of the self (Sterne 2000).

For the Human–Machine dichotomy alone, *Year* was a necessary multinomial regression variable to achieve the MAM (*Tab. 18*), i.e., the “year” from which the articles originate was salient. Another indication that *Year* is salient for the Human–Machine MAM is seen when an alternative baseline to year-2000 is used (also *Tab. 18*): 1995 differs most from the other years, but when used as an alternate baseline year, all codings increased away from neutral (“positive”, “negative” and “mixed” alike). This matches the pattern with Human–Machine congregated newspapers chi-squared tests (*Fig. 2 (B)*), where from 1995 to 2000 there is an increase in negative compared to neutral codings, and an increase in mixed compared to neutral codings. This is notable in terms of potential fear-based ingroup protection in the advent of year-2000 millennial new technology; there also were more generalised, less concrete fears such as the contagion via the millennium “bug” already noted (cf. Douglas 1966) and dystopic fears of machines replacing humans – as well as agency assignments concerning artificial intelligence, group-behaviour and dehumanisation theories, all discussed further in Chapter 6.

Indeed, the use of organic foods (“natural”) rose sharply too in 2000, perhaps also in part due to anti-GM pathogen fear (fears shown to have some validity, Dona & Arvanitoyannis 2009) and technophobia. The organic food industry is now a huge industry in the Western world (Pollan 2006). There is an upswing in “natural” farmers’ markets in both the UK and the US (Young 2011); an upswing in alternative (herbal, less clinical) medicine; an upswing in low-technology intentional communities/communes (Hemenway 2006) (some, called doomers, explicitly based on human-extinction fears, see Cobb 2007). This also could be due to the public being better informed regarding new technology as time goes on, but the initial infrahumanist reaction was still present. We therefore see potential connections again between technophobia, infrahumanisation, mortality salience and natural/unnatural cognitive categorisations.

4.4. Bisexual-Angst

I predicted that economic and global uprest would enable more essentialist reasoning concerning sexual orientation categories as “real”, natural-kind entities, and that bisexuality would be seen as threatening. I thus predicted an upsurge in “people are born gay” articles, with more negativity directed towards all homosexual behaviour (not just – but especially – bisexual behaviour).

From 1995 to 2010 (*Fig. 2 (D)*; *Tab. 12*; *Tab. 14*), the Heterosexual–Homosexual dichotomy experienced an upsurge in essentialised binarised categorisations. Bisexuality, the resultant hybrid category of the two social “natural-kind” categories therefore potentially was seen as threatening, starting roughly in 2000, compounded by larger-set homophobic responses in the same year (cf. *Fig. 9*). In the UK, there were indeed more black-and-white categorisations of sexuality in 2000, with less ambiguity tolerance of bisexuality and more socially conservative negativity towards homosexuality in general, as well (cf. *Fig. 2 (D)*).

Notably, the Heterosexual–Homosexual dichotomy is the most volatile dichotomy of the four in terms of ambiguity tolerance. This suggests that essentialising or categorising sexuality in black-and-white terms is not hard-wired, and shows flexibility regarding the concept of sexual orientation altogether, including a steady increase towards greater Western tolerance towards homosexual behaviour in general after the year 2000 (cf. *Fig. 9* and *Fig. 10*).

In 2010, the responses defaulted to the neutral category due to an easing in negative responses towards ambiguity (*Tab. 12*). Not only did we react less *negatively* to ambiguous sexual behaviour, we reacted more *neutrally*, suggesting less category protection and ultimately less homophobic responses to the outgroup: malleability, not concreteness. This likely reflects societal changes such as the gearing-up towards legalisation of same-sex marriage in the UK (2013) and the USA (2015), though a marriage backlash also may have occurred (*Fig. 9*); the below USA graph (*Fig. 10*) shows very similar patterns to my millennial dip (“the increase in support [for same-sex marriage] has been reasonably steady since about 2004” (Silver 2013), as do the general attitude trends towards homosexuality in the UK (cf. *Fig. 9*).

Fig. 10. Support of US same-sex marriage trends (Silver 2013).

4.5. Gender-Confidence

I predicted a rise in biological explanations for differentiated male and female behaviour, and less tolerance of (though probably greater mention of) gender ambiguity. I predicted males and females, and even post-operative transsexual males and females, would be portrayed as essentially male or essentially female during the millennial time-period, with many media discussions regarding uncomfortable gender ambiguity (perhaps multiple negative media references to “gender-blurring” such as the concept of the New Man or the heterosexual male dandy newly christened “metrosexual”, or the tomboyish heterosexual female “Ladette”). In the year-2000 time slice, I therefore also expected fewer explanations based on social constructivism, and a backlash against the wider set of “females” (alongside an even more negative assessment of intermediaries).

However, other than showing a minimal millennial effect, in general terms the Male–Female dichotomy-tolerance stays stable: Male–Female (*Fig. 2 (C)*; *Tab. 12*) has little fluctuation except for a moderate increase in mixed results in 2005. Ambiguity tolerance has a non-significant dip in 2000 and non-significant subsequent recovery in 2005 and 2010.

Gender remains stable in newspaper portrayals: neither liberal nor conservative papers show statistical significance (*Fig. 4, (C), (G)*). Tabloid/broadsheet format is salient in Male–Female alone (*Tab. 19*), with an increase in “negative” codings. Tabloids perhaps are more often seen as the “voice of the people”, opposed to “elite” broadsheets (Bird 1992, Zelizer & Allan 2010), perhaps indicating adherence to a gendered status quo.

Hypotheses as to why this dichotomy stayed comparatively stable and the others (*Fig. 2 (A)*; *(B)*, *(D)*) did not are discussed in Chapter 7.

4.6. Categorical Variables

In addition to specific dichotomies, my research also investigated categorical variables (*Tab. 8*). The following sections discuss the *Political Leaning*, *Format*, *Gender*, *Expert*, *Newspaper*, *Binary* and *Season* variables, with *Year* and *Month* integrated where relevant into the wider discussion.

4.6.1. Liberals and Conservatives

Political Leaning was tested to see whether those who are conservative are less ambiguity tolerant than liberals (Jost *et al.* 2003, Kanai *et al.* 2011), and vice versa; I predicted that my results would show these same patterns.

For all dichotomies, in *Fig. 3 (B)* the congregated conservative papers show more fluctuation in terms of ambiguity tolerance than in *(A)*, the congregated liberal papers, as do the congregated residuals in *Tab. 15*. Conservative papers therefore might be more essentialist during event-specific time periods or as a result of political climates (both cultural effects). The “essentialising conservative” would fit in well with inhumanisation theory, as additional studies suggest that conservatives react more to fear than liberals do (Castelli & Carraroa 2011).

When looking at the liberal/conservative chi-squared results and residuals for separated dichotomies (*Fig. 4, (A-H); Tab. 16*), the Human–Animal dichotomy chi-squared results show that only for the conservative papers was the variation statistically significant (*Fig. 4, (A), (E)*), here suggesting that conservatives might have stronger feelings about what constitutes an animal or human: potential ingroup protection. The Human–Animal MAM, on the other hand, shows no particular significance (*Tab. 17*).

For the Human–Machine liberal/conservative chi-squared results and residuals (*Fig. 4, (B), (F)*), though mixed codings start at roughly the same level, in 1995 there are more neutral liberal codings than neutral conservative codings and a higher level for positive codings for liberal papers. Additionally, the conservative papers have substantially more negative articles right from the beginning, suggesting that conservatives potentially are protecting the human ingroup even in the “liberal” year of 1995. Furthermore, of all four dichotomies, for liberal papers only Human–Machine was statistically significant in showing the millennial pattern, whereas for conservative papers three-quarters of the dichotomies (all but Male–Female) were significant (*Fig. 4*). Indeed, for the Human–Machine dichotomy alone, *Political Leaning* as well as *Year* was a necessarily variable to achieve the MAM (*Tab. 18*): conservatism is related to Human–Machine ambiguity intolerance and also too to the “year” from which the articles originate: the most salient year being 2000, but the differences between all four year-points also stark.

The Male–Female chi-squared and residual results (*Fig. 4, (C), (G); Tab. 16*) do not show statistical significance for either liberal or conservative papers. As with the other dichotomies, *Gender* and *Expert* are contributing variables to the Male–Female MAM (*Tab. 19*), but not statistically significant.

The Heterosexual–Homosexual liberal/conservative chi-squared results and residuals (*Fig. 4, (D), (H); Tab. 16*) follow the millennial-dip/recovery pattern (the familiar pattern also seen in the multinomial Heterosexual–Homosexual MAM (*Tab. 20*). However, liberal/conservative binarism is substantially more fluctuating, as similarly noted for the larger Heterosexual–Homosexual dichotomy results (*Fig. 2(D)*): conservative papers driving this volatility more than liberal papers. By investigating the residuals (*Tab. 16*), we further see that liberal papers specifically become more ambiguity-positive and much less ambiguity-negative (read: less essentialist) by 2010, where conservative papers merely become more ambiguity-neutral. Neutrality might normally suggest less category-protection, but in this specific variable analysis the conservative papers did not become notably more ambiguity positive.

My overall results, therefore – even when accounting for “tabloidism” (cf. *Fig. 5, Tab. 19*) – support research arguing that conservatives are less ambiguity tolerant and more reactive to external social factors – potentially fear-invoking situations such as economic or war threats – than liberals.

Why? A connection to neurobiological phenomena has been suggested. A particular part of the brain, the amygdala, is associated with fear and disgust processing. More politically conservative people are not only found to be more prejudiced, but fear and disgust emotions are more activated in such individuals and they also possess more grey matter in their amygdalae (Castelli & Carraroa 2011, Kanai *et al.* 2011). In addition, more liberal politics are associated with a larger anterior cingulate cortex (ACC) section of the brain (Kanai *et al.* 2011). *Theory of Mind* (ToM) also is linked with heightened activity in the ACC (Vogeley *et al.* 2001). The ACC monitors uncertainty and conflicts, and “it is conceivable that individuals with a larger ACC have a high capacity to tolerate uncertainty and conflicts, allowing them to accept more liberal views” (Kanai *et al.* 2011:678). Exploring this possibility does not require accepting categorically that conservatives are “less evolved”, or that left-wingers have more developed brains, rather that some humans possibly rely more on prefrontal cortex categorisations than on “amygdala” categorisations.

The same chicken-egg discussion remains as to whether liberalism causes the lack of grey matter surrounding the amygdala and heightened ACC activity, or whether one’s “natural” open-mindedness is a result of a changing brain (cf. Jost *et al.* 2003). More radically, so-called “male brains” and “female brains” (Baron-Cohen 2004, Brizendine 2007) might be more the result of environmental factors and perhaps we then “grow our own brains” through more environmental processes than we often consider. Such an assumption of “brains we can change” would require

the amygdala to be sensitive to particular environmental conditions. There is evidence for this. One indicator for such post-natal plasticity of brain functions is the finding that individuals who work in “mechanised” environments such as the military share brain traits with abused children, e.g., the amygdala and the anterior insula, which are involved in threat detection and pain anticipation (McCrory *et al.* 2011, Teicher *et al.* 2011). Thus, physical changes in the brain could reflect neural coping mechanisms (*Ibid.*). Perhaps also there is a connection to a dissociative coping behaviour in adults who have experienced abuse – known as “splitting” (black-and-white thinking; Klein 1946: directly related to dichotomising and essentialism). These are just guesses, however, and the research I will leave to the neuroscientists. As a general tendency, however, political conservatism is associated with “intolerance of ambiguity, [as well as lack of] openness to experience, mortality salience and system instability” (Jost *et al.* 2003:366; see also Thorisdottir & Jost 2011, Mooney 2012).

Why might stereotyped and categorical thinking make life easier? If faced with a dangerous situation, stereotyping can save a life if the situation fits a familiar pattern. However, this is only if the threat is familiar. If unfamiliar, we need to be flexible and *not* classify according to previously accepted, crude categories. But more complex analysis causes cognitive load, which can be distracting and therefore we have to be careful not to become *too* open-minded, for we could end up dead (Grossman 1995). Too prejudiced and essentialising, and we could end up with the same result, if we react with aggression and antagonism.

The link between conservatism and ambiguity intolerance in my results (*Fig. 3 (A) (B); Tab. 14; Fig. 4, (A-H); Tab. 16; Tab. 18*) may well, as Haidt proposes, suggest that conservatives are operating under more cognitive load (2013), but conservatives also are more likely to believe in God (Pew Research 2012), and thinking of a god apparently decreases stress and anxiety for those who believe in a god (though thinking of a god stresses atheists, on the other hand) (Inzlicht & Tullett 2010). Engaging in stereotyped thought patterns is a coping mechanism when we are experiencing high cognitive load (Biernat *et al.* 2003). Additionally, while a belief in an angry – not benevolent – god is associated with numerous mental illnesses (Silton *et al.* 2014), such angry-god believers (who tend to be conservative) were able to solve Stroop (reaction-time interference) problems more easily (*Ibid.*), perhaps due to stereotyping shortcuts and diminished cognitive load. Ambiguity tolerance in general seems to stress us out (conservatives also are generally happier, Napier & Jost 2008), so one’s political orientation has both costs and benefits, e.g., anxiety can be maladaptive in some circumstances, but also be a *benefit*, as it alerts us to our mistakes – and believing in a god seems to buffer *against* anxiety in some cases (Inzlicht *et al.* 2009) (conservatives may be happier, but they are also more anxious/fearful, Laber-Warren 2012). To summarise in terms of common-sense thinking, conservatism and liberalism may just embody different life strategies regarding who else belongs in their ingroup. Notably, as there have been found additional and likely related correlations

between believing in God and anti-immigrant attitudes (Holbrook *et al.* 2015), conservatives also are more likely to be anti-immigrant – anti-*outgroup*.

4.6.2. Tabloids and Broadsheets

I had asymmetry in terms of publication format for both broadsheets (2 liberal, 1 conservative) and tabloids (2 conservative, 1 liberal); my prediction was that as broadsheets are information-rich (Sparks & Tulloch 2000), they might show more ambiguity tolerance.

When we look at congregated dichotomies and residuals, yet directly compare broadsheets to tabloids (*Fig. 5, Tab. 22*), it is clear that tabloids fluctuate much more (p -value = $<.001$) than broadsheets (p -value = 0.278), though tabloids also are weighted at a ratio of 2:1 in terms of conservative to liberal publications, which spurred the initial need for the multinomial regression. In terms of the MAM for *Format*, only for the generally inflexible Male–Female dichotomy was there a statistically significant effect, with an increase in negative codings by tabloids (*Tab. 19*). This was not shown to any significant degree in the chi-squared results (*Fig. 6, (C), (G)*). The other dichotomies lacked *Format* as part of their MAM, and thus could not be analysed in a multinomial regression.

Male–Female *Format* salience could be due to the encroaching of female journalists writing on gendered subjects – the ratio of the entirety of known-authorial-gender articles was 964F/1909M, with similar trends for all broadsheet (482F/1043M) and tabloid authors (483F/866M): roughly twice as many male journalists overall – but with the Male–Female dichotomy-specific broadsheet (162F/215M) and tabloid (126F/192M) author-gender-divide less extreme (*Tab. 9*). Whether due to culture or biology (or *both*), some evidence suggests that males generally are less ambiguity-tolerant than females (Fisher 2011, Mendoza 2011, Weissenstein *et al.* 2014: but see Erten & Topkaya 2009, Kamran 2011), and male journalists might be more inclined to protect their “territory”. Tabloids (*Format*) may exhibit more of a conservative tendency of lower ambiguity tolerance (Amodio *et al.* 2007) than broadsheets when ingroup threat (by females) is salient, as perhaps indicated by tabloid significance in the gender-resonating Male–Female dichotomy.

In terms of the chi-squared and residual results in the remaining dichotomies, for the Human–Animal dichotomy (*Fig. 6 (A), (E)*), the broadsheets show a steadying rather than “essentialist” dip in positive codings in 2000 and a millennial dip pattern in the residuals (*Tab. 23*), but nothing out of the ordinary. Broadsheets are more measured in reportage generally (Pennock 2000), so this is not surprising.

In terms of the Human–Machine dichotomy (*Fig. 6, (B), (F)*), the usual pattern of negative-2000 rise/positive-dip, followed by negative plummet and positive soar, applies to both broadsheets and tabloids. The tabloids, however, drop their positive codings more starkly than the broadsheets in

2000 – and also react ambiguously to ambiguity in 2000 (*Tab. 23*). Neutrality is where the formats sharply divide: broadsheets had very low neutrality codings for both 1995 and 2010 (where they were more likely to take positive attitudes towards ambiguity), and tabloids had high neutrality codings in 1995 but a decrease in 2010, perhaps associated with overall tabloid volatility. Tabloids are information-poor compared to broadsheets (Sparks & Tulloch 2000), so even with the previously theorised “tabloidism effect”, the real driver could be “expert”-level information-richness, as opposed to non-expert; along with, potentially, the additional conservatism-associated cognitive load discussed above, seen especially here in the Human–Machine dichotomy (*Tab. 18*).

For the Heterosexual–Homosexual dichotomy (*Fig. 6 (D),(H)*), the tabloids fluctuated much more: broadsheets (*D*) are remarkably stable until the 2005–2010 time period (noted to be a time of great political change for gay rights, cf. *Fig. 9, Fig. 10*), when negative codings drop and stay down, mixed codings drop and stay down, and neutral assessments rise moderately as do positive codings. For the Heterosexual–Homosexual dichotomy, in addition to strong millennial patterns, the tabloids (*H*) are only moderately more ambiguity-tolerant until 2010, when negative codings drop sharply. This suggests, perhaps, that the tabloids are being strongly affected by cultural debates surrounding homosexual behaviour.

Across all dichotomies, tabloids are less generally ambiguity-tolerant than broadsheets according to the multivariate analysis (*Tab. 11*), but – although there is a pattern of “tabloidism” – those results are not statistically significant. As noted in Chapter 3, conservatism also is a non-statistically significant trend suppressing ambiguity tolerance when looking at the complete model (again, not the MAM) (*Tab. 11*, cf. *Tab. 21*). As also noted, the most pronounced fluctuations in ambiguity-tolerance also were tied to tabloids (“tabloid volatility”) and the most volatile individual title is the liberal *Mirror* followed by the more conservative *Evening Standard* and *Mail* (cf. *Tab. 21, Tab. 24*).

4.6.3. Gender

I looked at gender in terms of article-author to establish whether there were any patterns of male ambiguity tolerance versus female, suspecting that there might be a male-ambiguity-intolerant pattern due to several studies I researched (Fisher 2011, Mendoza 2011, Weissenstein *et al.* 2014).

Despite contributing to the Male–Female MAM (*Tab. 19*) (*Gender* cannot be removed without raising the AIC), the influence of author gender does not reach statistical significance for any one comparison, though the general trend of males being less ambiguity tolerant than females holds steady across the four dichotomies. Overall, the trends are for male-author reporting to be more mixed, more negative and less positive than neutral compared to that of female authors. Similarly, the Male–Female dichotomy is the most stable of all four dichotomies, with little fluctuation.

In terms of such female ambiguity tolerance – and although lower ambiguity tolerance has been linked to males (Fisher 2011, Mendoza 2011, Weissenstein *et al.* 2014) – this challenges evolutionary psychology, as ambiguity tolerance has been associated with risk-taking (Furnham & Marks 2013), and risk-taking is considered a “masculine” trait (Wilson & Daly 1985, Van Vugt *et al.* 2007). However, perhaps the risk environments differ by gender, with females taking more psychological risks and males more physical ones – or, more likely, as much of the gendered ambiguity tolerance literature is ambiguous itself (Erten & Topkaya 2009, Weissenstein *et al.* 2014), we may not be observing hardwired gendered behavioural traits but instead flexibly cultural ones.

4.6.4. Expertise

I looked at expertise level to see if one was more or less ambiguity tolerant when in a position of authority and/or status; I expected that ambiguity tolerance would be greater as one would have more information, as studies show that the more education one has, the more tolerant one is (Bobo & Licari 1989).

As the chi-squared tests were not run with male/female or expert/non-expert comparisons, *Gender* and *Expert* were looked at solely in the multinomial regression. Being an *Expert* embodies more ambiguity tolerance than being a non-*Expert*, once variation introduced by all the other predictor variables is accounted for (cf. *Tab. 11, Tab. 14*). When we look at the congregated dichotomies MAM, we see a strong decline in the *Experts'* codings being negative. For all years, for all four dichotomies, being an expert means a decreased response in mixed reactions and a decrease in negative reactions towards ambiguity. This is not too surprising, as the more information you have, the more you can be nuanced about a subject. Cognitive load decreases the more knowledge you have, and this is why children are theorised to have more cognitive load than adults (Alibali & Siegler 2004) – potentially also why children therefore are more essentialist (cf. Gelman 2003).

As noted, *Expert* is not only a necessary part of the congregated dichotomies MAM (*Tab. 11*) (like *Gender*, this variable category cannot be removed without raising the AIC), but also a necessary variable for every individual dichotomy, too (*Tab. 17-20*). For the Human–Machine MAM (*Tab. 18*), there is a statistically significant decrease in negative codings compared to neutral when articles are written by experts. Perhaps people defer more to computer scientists than they do biologists or gender- and sexuality-experts. That said, the Human–Machine ratio of known male (525) to known female authors (196) was 33.5% and 27.8% higher than for the Male–Female and Heterosexual–Homosexual dichotomies, respectively (cf. *Tab. 9*): people may just be deferring more to *male* experts within a “masculine” field like computer science than they do female experts in “feminine” fields of study, potentially exhibiting sexist attitudes towards female authority. Then again, we had

less “folk-knowledge” of computer science at the millennial time in question; even so, a gender interpretation cannot be ruled out.

Expert does not reach statistical significance for any other individual dichotomy MAM. In the congregated dichotomy MAM, there was a decrease of “mixed” and a decrease of “negative” relative to “neutral” in articles written by experts compared to those written by non-experts (indeed for all separate dichotomy models). The overarching trends were that experts and females are more ambiguity-tolerant than non-experts and males (*Tab. 14*).

It is possible that as experts know more, they have less cognitive load, and are less likely to be essentialist under stress. This would also match studies that show that the more college-educated an individual is, the less likely they are to be sexist, racist, xenophobic and homophobic (and essentialist/ambiguity-intolerant) (Bobo & Licari 1989). Furthermore, conservative politics are associated with more amygdala-based fear responses (and potentially therefore more stereotyped [essentialist] thinking, Schreiber 2013).

This also would correlate with studies that suggest that conservatives typically know “less”, e.g. are less likely to be experts. However, as noted previously, Haidt argues that conservatives also are operating under more requirements (dichotomies such as “sanctity/degradation”) when evaluating issues than liberals (Haidt 2013). Perhaps therefore conservatives, like children, are more likely to be experiencing cognitive load, resulting in less ambiguity tolerance. In my own chi-squared results, not just non-experts but also conservatives are likely to be less ambiguity tolerant, even having accounted for the tabloidism that drives the ambiguity intolerance. Tabloids are considered to be less substantial (and therefore information-poor) compared to broadsheets (Sparks & Tulloch 2000), so even with the tabloidism the real driver could be “expert”-level information-richness, as opposed to non-expert with, potentially, a conservatism-associated cognitive load.

When we look at the residuals (*Fig. 4(B)(F)*) for Human–Machine liberal and conservative papers separately – recalling that only for Human–Machine did *Expert* experience exhibit a comparative decrease in negative coding compared to non-*Expert*, in addition to the overall MAM necessity for *Expert* shared by other dichotomies – we see that the millennial dip works differently. There is a higher “starting point” for ambiguity tolerance for liberal papers in 1995: the positive reports decrease, but the mixed reports increase. Whereas for the conservative papers, it is the negative reports that increase in 2000, with only a moderate decrease in positive reports. Theoretically, then, although there may still exist the male ingroup protection potential noted above, we now may have more information via the internet; as more people are experts, we move ever towards tolerance.

Finally, there is a theory called the Two-Step Flow Theory (Lazarsfeld *et al.* 1944) that suggests that it is not article content that influences people, but rather whether one is an opinion leader

(potentially an *Expert*). This theory gains support from studies that suggest that humans (Henrich & Gil-White 2001) (and chimpanzees, Hopper *et al.* 2011) defer to those of higher status. In a patriarchal culture such as the West (Lewontin *et al.* 1984, Henslin 2001, Ciccodicola & Palmeri 2012), this may mean that that sublimating one's status to men is submitting to "higher status", aka leaders/experts. It would be interesting to explore in future research whether females are more likely to do this to male experts than males to male experts (or males/females to female experts).

4.6.5. Individual Newspapers

I initially predicted that due to information-richness the most ambiguity-tolerant publication would be a broadsheet and not a tabloid; and due to political leaning it would be a liberal paper and not a conservative one: leaving either the *Independent* or the *Guardian*. Similarly, I predicted that the *Mail* (a conservative tabloid) would be the least ambiguity-tolerant of all six publications.

To see whether there were particular newspapers more prone to essentialism than others, I ran chi-squared tests for each separate paper with all dichotomies congregated together (*Fig. 7*), as well as a multinomial regression. Other than the liberal/conservative, tabloid/broadsheet patterns already discussed, of note is the *Times* (C), which shows more of the pattern of millennial negative-rise/positive dip, with quite extreme shifts after that point, with positive levels rising sharply in 2005 and 2010; and a similar downwards trajectory for the negative codings that then levels off. There was a change of editorship in 2002 from Peter Stothard to Robert Thomson (2002-2007), so that might account for some of the changes (some argue that Thomson's links with Australian media owner Rupert Murdoch meant that under Thomson's editorship *Times* became more "tabloid"-esque, Auletta 2011). All broadsheets are, however, more neutral on average when congregating all years and all dichotomies, and by this congregated measurement *Independent* is, in keeping with its name, both the most positive and least negative towards ambiguity of all newspaper publications analysed (cf. final sub-table, *Tab. 24*). Interestingly in terms of ambiguity-positivity, in one of the multinomial analyses (*Tab. 21*) conservative tabloid set *Evening Standard/Sun/News of the World* was the most likely of all publications to be directly positive towards ambiguity (followed by *Guardian*) using a *Guardian*-based alternative baseline, though it was also the most negative (save the *Mail*) using a *Mirror*-based alternative baseline in another (also *Tab. 21*). The *Mirror*, a liberal tabloid, shows a similar pattern of fluctuation in ambiguity tolerance as the rest of the conservative papers, perhaps populism (popular "truth"/mass opinion led by experts) enforces infrahumanisation more than conservatism does; that said, the least ambiguity-tolerant newspaper was, as I predicted, the *Mail*. Indeed, the chi-squared tests and regressions show how seldom reportage for *all* newspapers studied is truly "neutral".

The Heterosexual–Homosexual binary was the most generally volatile of all dichotomies, and only for the Heterosexual–Homosexual MAM was *Newspaper* salient. As touched on previously, this may suggest links between specific publications and bias (both negative and positive) in reports on bisexual behaviour. Moreover, as noted, the most pronounced fluctuations in ambiguity-tolerance also were tied to tabloids (“tabloid volatility”), with the most volatile being the liberal *Mirror* followed by the more conservative *Evening Standard* and *Mail*.

4.6.6. Binaries

Binary was a statistically significant predictor variable when dichotomies were congregated, implying differences in reporting between dichotomies (*Tab. 14*). When using Heterosexual–Homosexual as the baseline (also *Tab. 14*), in statistical significance terms the Heterosexual–Homosexual dichotomy differs from both Human–Machine and Human–Animal but not Male–Female, so that suggests that the potentially linked sexual-orientation (Heterosexual–Homosexual) and gender (Male–Female) dichotomies behave in more similar ways: potentially due to the explicit priming effect of “human”-related articles and subsequent protection of the human ingroup for Human–Machine and Human–Animal. Similarly, I hypothesise Male–Female and Heterosexual–Homosexual are linked due to the implicit gender construct of the latter, and elaborate more on this in Chapters 7 and 8.

4.6.7. Seasonality

All twelve months were grouped into four seasonal sets to measure potential seasonal effects noted by previous researchers, e.g., I predicted that there was a possibility of humans being more ambiguity-tolerant in spring (Kurlansik & Ibay 2012); or humans perhaps following “mating seasons” (Markey & Markey 2013), and therefore seasonality possibly reflecting “xenophobic pregnant women” theories (due to first-trimester pathogen risks) (Navarrete *et al.* 2007).

In terms of the multivariate analysis, there was a seasonal statistically significant increase in negative reports in *Tab. 11* in the complete model of congregated dichotomies, which has an increase in negative reports as compared to neutral in “winter”; and, in Human–Machine full model (*Tab. 13*), with “spring” and “summer” showing an increase in mixed reports when compared to neutral codings. These effects disappear in the complete model multinomial regression MAM for congregated dichotomies (*Tab. 14*), and the “spring”/“summer” increase in mixed reports disappears in the Human–Machine MAM as well (*Tab. 18*), suggesting that other factors correlated with seasonality have stronger influence – most likely to be *Gender*, *Expert*, *Newspaper*, *Year* or *Binary*, since these were the congregated MAM variable requirements (*Tab. 14*).

4.7. The Millennial Effect, Applied

With reference to this salient “millennial effect” potentially rooted in reactions to stressful environments, I shall now discuss the four specific dichotomies. I shall frequently refer to 437 exemplars of the 3,456 articles coded from my initial mining exercise: 384 selected quotes (publication (x6) x coding (x4) x year (x4) that I deemed interesting or that showed typical repeated themes such as human fears regarding robot replacements. There are an additional 53 articles from the larger article pool that I also discuss in this thesis text. This total of 437 exemplars is included in *Appendix A* for reference, and the exemplars are noted in the larger text by number, e.g. [App. 1].

I note that I am not attempting a full academic exploration of these four dichotomies or of related intellectual arenas, e.g., robotics, primatology, kin selection, gender studies, etc., but rather I am using examples from these and other fields to illustrate my own findings.

4.8. Summary

4.8.1. Infrahumanisation

- Millennial drive for ingroup protection possibly linked to societal shakiness (economy, war etc.); accounts for year 2000 minimisation of the “human” ingroup, where we “animalise” (or “other”) when under stress. Humans inclusive until 2000, then draw boundaries between humans and other animals; humans and machines; and heterosexuals and homosexuals – then five years later integration again. This might be due to “millennial hype”, aka Chiliasm, or, as I hypothesise, it may be due to concurrent societal shakiness.
- Same ambiguity-tolerance pattern across multiple dichotomous concepts suggests temporally bound wide-ranging social pattern as result of ingroup protection (thus potentially adaptive) rather than “re-wired” Google-trained brains; also suggests that people “think” *en masse*.
- Human–Machine regressions suggest we may be treating males as “experts” in male-dominated fields e.g., computer science, more than we do for females in female-dominated spheres such as Gender Studies – this would make sense in a patriarchal system where males have higher status (leaders = experts). Furthermore, males appear to exhibit more essentialism in male-dominated fields, thus protecting the male-dominated fields more than females protect female-dominated fields. Finally, *Format* salience for the Male–Female MAM suggests that male tabloid journalists might be exhibiting ingroup protection behaviour against females in a gender-specific context.
- The Heterosexual–Homosexual dichotomy is the alterity most affected by cultural shifts. Cross-cultural Western homophobia, xenophobia, murder-rates, homophobic- and misogynist rap lyrics and global-warming fears show infrahumanisation spikes against minorities also matching my own millennial results.
- Rash of millennium-bug fears potentially associated with fear of (here: machine-based) disease contagion, associated with ingroup protection.
- Millennial and post-millennial upswing in farmers’ markets, organic food and herbal alternative medicine potentially connected to infrahumanisation mechanisms.
- My results support research arguing that conservatives are less ambiguity tolerant and more reactive to external social factors – fear-invoking situations such as economic or war threats – than liberals.
- More concentrated effort in 2000 by conservative papers to distinguish between humans and non-human animals.
- More millennial dips shown by tabloids than broadsheets.
- *Mixed responses* to ambiguity are the most variable, compared to negative, positive or neutral: we appear to have an “ambiguous” response to ambiguity.

4.8.2. Ultrahumanisation

- Public attitudes towards “unnatural”, non-organic genetically modified food became more positive after 2000 (though this potentially also could be due to being better informed).
- Public attitudes towards homosexual behaviour in general show increased positivity after 2000

(though my analysis stops in 2010, other studies indicate inhumanist homophobic backlashes in 2013, 2015 – at a time when same-sex marriage was legalized in the UK and the US).

- Compared to conservative newspapers, liberal newspapers are more ambiguity tolerant. The multinomial regression, however, suggests that it is the “tabloidism” that makes a particular paper ambiguity-intolerant as opposed to its political leaning. Moreover, the most pronounced fluctuations in ambiguity tolerance also are tied to tabloids (“tabloid volatility”), with the most volatile being the liberal *Mirror* followed by the more conservative *Evening Standard* and *Mail*. This suggests that, rather than political views, tabloidism (potentially class) drives an increased desire to protect one's ingroup. Another explanation might be that tabloids are considered to be less substantial (and therefore information-poor) compared to broadsheets, so even with the tabloidism the real driver could be “expert”-level information-richness, as opposed to non-expert with an additional conservatism-associated cognitive load.

5. HUMAN-ANIMAL: “ANIMAL DEMOCRACY, NOT ANIMAL KINGDOM”

5.1. Other Animals as Non-Kin: “Marvels and Miracles – But Not Mates”



Fig. 11. “Garden of Earthly Delights” by Hieronymus Bosch. Detail, ca.1500.

“Dawkins shows me a computer program he has designed that ‘morphs’ a series of Lalla’s drawings of our ancestors. Before my eyes a reptile skull turns into an ape’s, turns into a Neanderthal’s, becomes Hom sap [sic]. It is the miracle that made us” [App. 7]

5.1.1. Animality as Insult

For this dichotomy chapter, we travel a generalised infrahumanist route to our magnified non-animal selves, via non-human animals, non-human apes and extinct hominins, then shift the focus to expand outwards again – ultrahumanistly – from our animal selves. “Our animal selves” is a fine place to begin. As I am most interested in the borderlines that trigger infrahumanisation, I will be concentrating on the closest liminal spaces: mammals at the expense of other animals; chimpanzees and bonobos at the expense of other apes; Neanderthals at the expense of other ancient hominins.

The words we use to distinguish ourselves from other animals are significant. Even ca.1995, some journalists in my samplings emphasised our *lack* of kinship: “You have mankind on the one side of the river, and apes on the other. It’s called evolution, and that river we crossed was Politeness” [App. 389]; or “He favours the straight, linear path, with occasional detours into the dual carriageway when he wants to get a counterpoint between, say, primatology and the monkey tricks of human beings” [App. 386]. We see similar patterns by various journalists (cf. Fig. 2 (A)). sBut the

opposite slant of positive Human–Animal assessments also can be found frequently, as can mixed or (more rarely) neutral weighings-up. When journalists speak metaphorically, they reveal implicit attitudes towards animality, as in the following example: “ ‘A new type of human animal [...] raw and undeveloped; his vitality is immense, but purposeless, and hence sometimes malignant. His keynote is vacuity; he is an animated but artificial puppet.’ [...] an energetic but grotesque embodiment of the new world.” [App. 62]. Thus, humans are animals: explicitly quoted. The Human–Animal here is described ambiguously: “raw and undeveloped”, both “energetic” and “grotesque”. This represents a good example of a “mixed” assessment.

Who is the animal also is a matter of perspective (Boccatto *et al.* 2008); technically, we are the “animal” and prey to imaginary monsters such as Dracula the Vampire. We aren't comfortable as meat, understandably, be it to fictional bloodsuckers, serial killers, cannibals or predator animals. Subsequently, we have fear responses, artificially induced (Euijin 2013) or genuine (Lee & DeHart 2007). Historically, probably pre-historically, cannibalism is taboo, with some notable exceptions of culturally transmitted practices such as in Papua New Guinea (Raffaele 2006). Perhaps this is why discussion of its widespread, cross-cultural occurrence in the human fossil record has been suppressed (Taylor 2005). We find this fear/taboo quality reflected in many articles: “I will try to get any type of bushmeat they want as long they can pay for it. If you want a human head I can bring it to you.” [App. 42].

“Animal” often is used in metaphorical terms to disparage, subhumanise and dehumanise (Peterson 2013). There is ambivalence and fear associated with “becoming animal”, from tales of wildmen and sasquatches (Sykes 2014) to animalistic humans having acquired rabies (Baer 1991). Here is an example from my own codings: “WHO ARE THE REAL animals [...] Police believe that [animal rights] fanatics like Ablewhite pose the ‘single biggest threat to UK plc.’ ” [App. 52]. Animality applied towards other humans has been an insult since written records began (Bell & Naas 2015). Even French philosopher Jacques Derrida in his defence of the animal – *The Beast and the Sovereign* – falls prey to it, though humorously: “those pretending to the throne, of all [political] families stroke the cow's rear end [...] in a crowd in which it would be harder than ever to tell a beast from a sovereign” (2009:284).

Monkeys and apes are favourite media go-to slurs (Most 2008): “[H]e did not realise that his lecture on evolution would end with the newspapers making a monkey out of him.” [App. 4]. Or here: “Just like the chants of football hooligans bent on violence, the collective boo recalls our primate ancestors when they were spoiling for a fight [...] compared with these howling monkeys [of the crowd] she looks like a winner” [App. 74]. It is clear in these last example that humans are “monkeys” via evolution – and in this appraisal *both* humans and monkeys are negatively presented.

5.1.2. Animal Pathogen Avoidance

Implicit fears of pathogens and disease feature in many negative codings, e.g., “HIV jumped from chimpanzees to humans as a result of using a vaccine that was made from chimp tissue.” [App. 26]; “hamsters injected with the kidney culture developed cancer. The cause, it turned out, was a monkey virus” [App. 27]; “BRITAIN ACTS TO KEEP OUT JUNGLE PLAGUE [which] spreads from insects to bats and from bats to monkeys which in turn can infect humans. Western experts say the disease makes Aids ‘look like a common cold’.” [App. 5]. There are echoes here of public fears over HIV/AIDS disease transmission from gay men to “innocent” men in the 1980s (Thompson 1998), with the latter example implying that (“even”) chimpanzees are valued more highly by the 1983 *Daily Mail* than dehumanised gay men (“AIDS: Why must the innocent [chimpanzees] suffer?”, *Ibid.*:71) or even in the 1983 “liberal” *Sunday Mirror* (“Torture of [non-gay-male] innocents: Chimps in ‘sex plague tests’”, *Ibid.*:71).

Our avoidance of “germs”, etc., as dirty (perhaps explaining the use of pollution beliefs observed and discussed by Mary Douglas, cf. Douglas 1966) may be part of a larger pathogen-avoidance mechanism (even though bacteria are vital for our immune systems and our organelles known as mitochondria likely evolved from bacteria). Due to our shared physiology with other animals and especially other primates, contracting a *zoonosis* (a disease transmitted from non-human animals to humans, such as Ebola, HIV or the common cold) is a true risk. Nevertheless, one wonders how many of the fears are truly rational, or if they are as hyperbolic as modern fears attributed to feral European wolves (Bjerke 2001, Marvin 2012), which may have more to do with the animality of the outgroup.

5.1.3. Chimeras and Xenotransplantation

Cross-overs, as exemplified by Human–Animal chimeras (the original Chimera being found in Ancient Greek mythology with a lion’s head and body, extra goat-head on its back and still another snake-head topping off its tail, Peck 1898) normally make people uneasy (Murray 2010). Thus, in the late-1990s, there were generally horrified reactions to the so-called Vacanti mouse forced to grow a human “ear” on its back (actually cow cells in a biodegradable human-ear-shaped scaffolding) (Cao 1997), and probably only a portion of it due to sympathy for the mouse in question. Yet, despite such fears, journalists “rejoice” when the other-ed category of animal (or machine, or homosexual, or female) can help the wider human ingroup. This occurs even when discussing normally repellant

Human–Animal chimeras: “We are all too familiar with the bad side of science – here is a cause for rejoicing. [...] Put simply, what the scientists [...] have done is to find a way to trick the human immune system of the primate, like us and monkeys, into accepting an organ from a pig. Until now we could not transplant animal organs because no pharmacologist could prevent our immune system from rejecting them.” [App. 10].

By their very nature, chimeras are associated with ambiguity. In biology, chimeras result from two fertilised eggs fusing into a single developing embryo. In folk taxonomy, chimeras are creatures concocted from parts of different animals: such as the mythical sphinx; or a hybrid such as the half-goat, half-sheep “geep”; or animals with part-human parts, e.g., rabbits with human cells (Chen *et al.* 2003) or sheep with 40% human livers (Zanjani *et al.* 2009). On one hand, chimeras can offer humans more medical knowledge; and xenotransplantations such as inserting pig heart-valves can save human lives: “Canadian doctors are planning to inject diabetic patients with cells from the pancreas of pigs after experiments on animals showed that a single such injection can dispense with the need for daily insulin shots.” [App. 9].

On the other hand, we typically are averse to the idea of mice with human ears on their furry backs, or to baboon blood donations to humans (Murray 2010) and to chimeras and xenotransplantation in all their manifold, unpredictable forms, as this would mean “embracing a bleak, lawless philosophy of progress in which helpless, nascent life is butchered to repair the old and withered, and deranged boffins dream of fusing humans with chimpanzees” [App. 51]. Here are two similar voices: “Later, however, we saw the same doctor transfixed like H.G. Wells’s Dr Moreau over the infinite possibilities of foetal transplants (‘We have made chimeras. Bone marrow chimeras. Human to sheep, human to monkey, human to mouse. And they work every time, as long as you do it at the right time in gestation.’)” [App. 3]; “What’s within our grasp now is the kind of genetic manipulation dreamt of in myth and nightmare [...]. Like children without a nightlight, we are afraid to bring forth the kind of dark forces we see in Frankenstein’s creation.” [App. 14].

A dilemma becomes apparent, in that we might justify the use of non-human primates for biomedical research precisely *because* they are so similar to us, while at the same time shy away from using other humans for this purpose. Articles on behaviour or physiology in common between non-human primates and humans also engage in this subhumanising inclusive/exclusive approach: “To prevent the monkeys’ immune system reacting against the pig cells, the implants were enclosed in a membrane made of a seaweed extract before being injected into the stomach. Blood tests showed that the monkeys started to produce insulin.” [App. 9].

5.1.4. Taxonomy and Border Control

Thus, the ways we label and conceive of ourselves as organic beings are interesting and important

for our discussion – sometimes we emphasise differences to other animals and deny our similarities even while we might exploit such relatedness. When considering these distancing mechanisms, we also have to consider both the *folk taxonomy* of specific cultures, i.e., a vernacular naming system, as well as scientific taxonomy. While laypersons typically think that biologists know what they are talking about when lumping organisms into “species”, this concept itself is far from being an objective one: “The grouping of individuals into ‘taxonomic’ entities is of necessity arbitrary because organisms are variable and thus no two identical individuals exist. The Latin word species can be loosely translated as ‘kind’ or ‘form’. Researchers try to classify individuals into ‘kinds’ on the basis of the relative similarity of their characteristics. Species are created in our minds, and any *a posteriori* justification of such creations is bound to be imperfect” (Henneberg 2003:1; cf. Hey *et al.* 2003).

In any case, formal biology acknowledges humans as both primates and animals, and also classifies humans as great apes, belonging to the family Hominidae – although very occasionally Hominidae is described as being made up of “humans and great apes”. To generalise, it is scientifically accepted that humans are one of the five great apes (Groves 2005). But it also can be successfully argued that in folk taxonomy, humans are often not only *not* considered apes, but also often not considered to be *animals* or primates at all: “[s]cientists have identified millions of different viruses which infect humans, animals, plants and even bacteria” [App. 175]; “experiments that had been performed on apes, which showed how similar primate intelligence is to human intelligence” [App. 56]. In the introduction, it was argued that likely we think of “species” as a *natural-kind category*, i.e., one that is not arbitrary (Khalidi 2013). Dogs, whales, pigs – anything other than ourselves equals “animal”, and this includes other humans whom we animalise pejoratively. Yet by doing so, we often implicitly acknowledge our links to non-human animals or to humans whom we treat as non-human animals. The simple fact that zoonosis exists implies that we are an animal, too: “Aids [...] jumped as SIV in chimpanzees to humans” [App. 29].

Other animals to whom we are related can be considered biological intermediaries via evolution. An article coded as “mixed” reflects that tension, in that the evolved intermediary is seen as both controversial and important: “THE study of ancient human beings is [...] most riven by dispute, and a find as significant as a purported new species was always likely to provoke much controversy [...] In the case of *Homo floresiensis*, the scale of the argument has matched the potential importance of the fossils” [App. 63]. Or here, a “neutral” assessment that still acknowledges the intermediacy: “The skeletons – the most complete hominids palaeontologists have ever found from the period – offer a glimpse of a time when ape-like creatures were evolving into the first bona fide humans” [App. 91].

The Human–Animal articles, therefore, include in-between states that are not immediately obvious as bald-faced metaphorical animality. In addition to chimeras and figurative speech, intermediacy occurs every time a human is referenced as a primate, ape or hominin, as these evolutionary intermediaries involve a mixing of distinct categories. I am not stating that categories associated with

the Human–Animal dichotomy, while of the “natural kind”, are “true”. I am actually stating the contrary: that, like “race”, we treat humans and animals as if they are distinct, in this case oppositional, sets and that this is temporally bound (cf. *Fig. 2 (A)*); that intermediaries such as hominins, metaphorical zoomorphs and anthropomorphs, non-human members of the family Hominidae (chimpanzees, bonobos, gorillas and orangutans), chimeras and xenotransplants (individuals of human majority or non-human-animal majority) blur the boundaries between those two oppositional sets. I am additionally stating that because our categorisation is flexible – as the analyses of a temporal slice from 1995–2010 reveal – that this suggests a highly cultural influence (cf. *Fig. 1*).

When we magnify the Human–Animal dichotomy, move in closer and discuss close genetic relatives of modern humans, things additionally become more threatening in terms of our compartmentalisation – just as they do with “lifelike” robots. This tension is known as the *uncanny valley*, a term coined by Masahiro Mori (1970/2012). The robotics professor thus explains the revulsion humans feel when robots come close to being perceived as humans, but not quite – and the way in which humans are more comfortable with beings either clearly robotic or clearly human. While this concept will be discussed in more detail in Chapter 6, it applies to humans and animals. We get more precise about our “human” definitions when species get closer (Wildman *et al.* 2003). If a chimpanzee is an “animal”, and we are closely related to chimpanzees, doesn’t that make us an animal, too, despite the folk taxonomies of our culture? At what point do our ancestors, having diverged from the proto-chimpanzee/human lineage, stop being animals and instead become humans? Are we an ape? Are we indeed a chimpanzee, as some assert (Diamond 1992)? If we are not, why not?

It is evident that Human–Animal distinctions – even via my own need to define terms – are ambiguous (Groves 1996, Wildman *et al.* 2003). If we have clear definitions against encroaching ambiguity, it feels more secure. Natural-kind categorisation in humans is possibly an adaptation, or at the very least a consistent socially constructed system that allows for ingroup/outgroup sorting. The thing that we are not – the “outgroup”, the Other – is of less worth (Castano & Kofta 2009; see also “logocentrism”: Klages 1929, Derrida 1967, Bryson 1998, Prasad 2007). Following this reasoning, non-human great apes are worth less than humans. Though, likely due to their close genetic relationship to us, apes are possibly more esteemed than other animals (Small 2012) – pets excepted, whom we likely consider kin (cf. below). Still, our fellow great apes are deemed as “different”, as “not us”. Interestingly, multiple studies suggest that stereotyping individuals treat social groups as natural kinds (Rothbart & Taylor 1996, Gelman 2003, Morton *et al.* 2009). This is significant when we look at the chequered mutual history with our fellow apes.

Is the essentialising disavowal of our own ape-iness connected to our uneasiness with Human–Animal classification? These designated social groups seen as real types by the stereotyping

individual *could* be animals – or, when we protect the concept of human uniqueness – they could be groups found within the human-being set itself, such as homosexuals, or the poor, or white men. You find this categorical animalising mechanism – known as dehumanisation or subhumanisation – even in more esoteric disciplines such as philosophy, theology and semiotics. Derrida equivalised humans and animals metaphorically, while describing the autopsy of an elephant and an on-looking king: “It’s a very fine word, a fine verbal animal, curiositas, for a seminar such as ours, and it’s a verbal animal, a vocable that, according to one of the traditions that is occupying us and that we are analysing, we will perhaps set to work. A curious vocable of burden [...] the two great living beings, the one surviving and the other become cadaveric object at the disposal of the other” (2009:377). We all recognise his allusion, because we all know that animals are meant to work for us precisely as beasts of burden. We know from the get-go that they are slaves and we are masters, and they can be made use of for our health, entertainment or as human proxies so we don’t get hurt, such as the American, French and Soviet rhesus monkeys that were made to fly to their deaths as astronauts. Or rather – we have been taught that this exploitation is socially acceptable (Singer 1975). It is here worth mentioning that it was the chimpanzee Ham who was the first hominid in space in a successful return-trip in January 1961, beating the human Yuri Gagarin by 3 months.

Here is a quote from an article defining non-human primate research as explicit slavery – while at the same time distinguishing between humans and primates: “ ‘They did what?’ our great-grandchildren will ask. Experimenting on primates will seem barbaric, like slavery or the burning of heretics, both of which at one time seemed like good ideas, and were sanctioned by religion.” [App. 79]. Or another article, mixed in its sentiment, which refers to live pigs being used in explosives tests, which, according to the UK’s MoD has “led to improvements in body armour and the medical treatment of soldiers injured by roadside bombs [...]. But animal welfare activists criticised the ‘unethical’ practice of causing ‘massive mutilation and injury’ to the pigs” [App. 88].

Returning to the subject of taxonomy, perhaps the word *species* seems definite, but it is not. While some scientists reject the concept of species altogether (Mallet 1998), as noted, population biology treats species as a natural-kind category (Hey *et al.* 2003, Hey 2006, 2011). The Linnaeus model of taxonomic classification, its daughter system of comparative morphology and its great-grandchild system of DNA-based phylogenetics have convinced the public – in folk taxonomy and biological science alike – that “species” is a true, unalterable thing with a barrier that cannot be crossed. No wonder there is cognitive dissonance when closely related organisms exhibit similar behaviour as ourselves – perhaps, people think, we/they are the same thing, after all.

So-called species barriers *can* be crossed. Recent studies of reticulate evolution include examples of “back-breeding” as well as inter-species and even inter-generic reproduction (Bhakare & Smetacek 2010). There are multiple – and often useful – ways in which different scientists themselves define species (Mallet 1998): biological; cladistic; cohesion; morphological; phylogenetic; ecological;

evolutionary; genealogical; general lineage; genotypic cluster criterion; phenetic; polytypic; population; recognition; rank-free taxonomy (etc.). Since we are dealing here with biological classifications, it is the biological species concept (“groups of actually or potentially interbreeding natural populations, which are reproductively isolated”, Mayr 1942:120) and its popular understanding of interbreeding, interfertile populations with which I am concerned.

This is not to suggest that “species” can cross-breed at will. In terms of interfertility, there are discrete groups. Even so, like lions and tigers – and *Homo sapiens* and Neanderthals; and early *Homo* and early *Pan* – some species of whales and dolphins have successfully interbred in the sense that they produced fertile offspring. And, despite the ancient Latin saying *cum mula peperit* (“when the mule foals”, equivalent to “when hell freezes over”, Fehilly *et al.* 1984), as noted in the introduction even the purportedly infertile horse-donkey offspring called a mule can give birth to fertile offspring (Rong *et al.* 1985), begging the question whether one individual “Miracle Mule” alone should count as having passed the species barrier, and be officially either “horse” or “donkey” (or both simultaneously). And, if so, is it only female and not male mules that can be called either “horses” or “donkeys”, since it seems to be only female mules that occasionally can produce fertile offspring (Chandley *et al.* 1974, Rong *et al.* 1985, Ryder *et al.* 1995)? “Miracle Mules” – are they outliers or relevant intra-/inter-species individuals?

When we withdraw the magnifying glass a bit to our taxonomical kingdoms of life, there is not even agreement between the Old and New World as to whether there are four, or six, kingdoms of organisms, as exemplified by the 2014 discovery of a new mushroom-shaped sea creature that fit into none of the regular phyla (Just *et al.* 2014) – phyla that biologists appear to, at least on some level, consider natural-kind categories in the same manner that many biologists unquestioningly consider species as natural-kind categories (Sober 2008). The counterargument is that one should not dismiss so-called universals (here, “kingdoms” of life) just because exceptions exist (Brown 1991).

One response might be that if something doesn’t fit the (artificial) system, we *make* it fit the (artificial) system, as scientist Jorgen Olesen points out in reference to the mushroom-shaped creature: “We think it belongs in the animal kingdom somewhere; the question is where.” (Rincon 2014:2). This type of typing (I am aware of the irony) is cumbersome; when we force concepts and beings into pre-made systems, this does not adhere to the gradualism that species-sceptic Charles Darwin himself, along with co-discoverer Alfred Russel Wallace, proposed (Darwin 1859, Browne 2002). Unless rooted in an all-life-is-related paradigm (and so then this mushroom creature must fit *somewhere*), such forced taxonomies are limiting; this is not liminality.

In particular, the Human–Animal distinction between humans, chimpanzees and bonobos is of interest along these very lines, as many of the boundary enforcements are subject to interpretation:

“THERE IS SOMETHING very odd about *Homo sapiens*. Unlike other animals, we have no brother and sister species to share our world. [...] But we are home alone, the only two-legged intelligent primate on planet Earth.” [App. 25]. I will lightly mention here that even the bipedal description can be challenged: 19% of captive bonobo locomotion is terrestrially bipedal in a food-gathering context (Vervaecke *et al.* 2011) – and we will return to implied assessments regarding primate cognitive capacity. In a wider Human–Animal distinction, we can be amused yet also disturbed by hybridity, as long as it doesn’t come too close in the uncanny valley sense: “[T]his little film showed how traditional human courting and nuptial behaviour is mirrored in the natural world. [...] In fact, the more [the film] banged on about the great qualities of loyal, sturdy, protective male animals, the more fed up I became, the more I frowned and bit my lip.” [App. 3].

5.1.5. Meat, Otherness and Zoos

Perhaps even the rise in Animal Studies programmes at universities and think-tanks (Taylor & Twine 2014) and discourse on “animal viewpoints” within the agricultural industries indicates a gap, rather than a link, between humans or animals, since humans are often posited to the side of these theories and courses, rather than an integral animal as human beings themselves. Academic Jonathan Burt on the other hand argues that we are on the brink of “fetishising the human” by putting the human often at the centre of Animal Studies or in our pictures of animals (2004; see also *Fig. 17*). The counterargument to the counterargument might be that humans are animals and cannot be separated from that category, as much as some Animal Studies academics might like them to be. As humans, we are not threatened by the clearly improbable hybrid or clearly (non-predator, non-niche-competitor) animalistic/humanistic hybrid, though we might be amused (Gelman 2003) – while we seem repulsed by mice with human ears, and frightened by werewolves (wolf-humans), vampires (bat-humans) and gorgons (snake-humans). We quickly bring up the drawbridge: we perhaps can attribute human qualities such as “voice” to birds, for example, though then we must clarify that a “voice” is not the same as “speech” such as humans have – despite the occasional push towards the (possibly always unknown) non-human animal perspective (“Happy milk: The voices of animals in the Swedish dairy industry’s communication”, Linné 2012). In short, we generally prefer unambiguity.

Sometimes the connections *are* ambiguous: is art made from meat sadistic psychopathy (“This Artist Uses Meat as His Medium: Dominic Episcopo’s red and raw images capture the spirit of Americana”, Smith 2013), or detachment, or critical comment, or respectful sacrifice? Is fur coming back into fashion (“Fur Is Flying Again: Animal skins, and their opponents, are resurgent”, Giacobbe 2012) a result of more Human–Animal border control, or an act of “becoming” an animal, an acknowledgment of human animality? The recent increase in stories regarding the ferality of indigenous people, with blurred boundaries and intersubjectivity (Woodward 2014) – is this animalising minorities, or is it at last privileging them? We see things are not as straightforward as might be expected.

One very straightforward tangible is aforementioned meat itself. Most humans eat non-human animals: “You have just dined, and however scrupulously the slaughterhouse is concealed in the graceful distance of miles, there is complicity” – Ralph Waldo Emerson (Emerson 1860:4). Another poet, Alfred Tennyson, had a famously unsympathetic description of nature as “red in tooth and claw” (Tennyson 1849) and this applies too to humans: our canine-teeth and fingernails are equally red; our teeth adapted to generalised dentition and therefore omnivorousness. Yet morality is applied to human meat-eating, since we are aware that we cause suffering (as are, likely, other species who hunt, such as chimpanzees, Bruskotter 2013). Still, we dehumanise some animals enough to eat them. With a few rare exceptions, we do not eat other humans unless desperate and starving or in extreme war circumstances: at the very least, we usually do not eat our close kin as meat as opposed to ritual. We do not normally eat our pets, often considered to be family members. Koreans, who traditionally have consumed dogs, have separate breeds for pet-dogs and meat-dogs (Podberscek 2009).

That said, there is arguably a certain status derived from forbidden-/experimental-/“sport-eating” in itself, as bushmeat popularity continues underground (“Congolese chimpanzees face new ‘wave of killing’ for bushmeat”, Randerson 2010); as adventurous but expensive London insect-eating nights abound (“Are Britain’s foodies ready to eat insects?”, Hickey 2015); and as Japanese humans and Western tourists regularly risk their lives sampling poisonous seafood (“Japanese men fall ill after eating pufferfish”, AFP 2015) alongside many other ingested toxins or stimulants, just like other animals take drugs to heighten sensory experiences (“Nature’s junkies: Drugs, alcohol, and why animals use them”, Stallard 2015): “A makeover is too late for the red colobus of the Ivory Coast, the first primate to become extinct for three centuries. It was a victim not of cuteness but cuisine hunted down and served in Ivorean restaurants as a delicacy.” [App. 40].

Just as we in the contemporary West do not generally shame other animals for their drunkenness or criminality, animals are not usually assigned moral culpability attached to meat-eating or hunting (exceptions include some fringe Animals Rights groups, Verchot 2014), even though many non-human teeth, beaks and paws run just as red, or even redder: “But haven’t [...] chickens simply traded one predator for another – weasels for humans? [...] It’s brutal out there. A bear will eat a lactating ewe alive, starting with her udders” (Pollan 2006:321). Michael Pollan, writer of *The Omnivore’s Dilemma*, goes on to point out that the highly predatory nature of carnivorous animals poses a “problem” for some animal rights activists, perhaps because the carnivorous nature of some animals makes them more human, rather than us more animal. As Pollan puts it, “a deep current of Puritanism runs through the writings of the animal philosophers, an abiding discomfort not just with our animality, but with the animals’ animality, too” (*Ibid*).

Humans, chimpanzees and bonobos hunt for status and possibly for pleasure, not just sustenance (Stanford 2001). We are conscious that we cause pain to other beings and we still continue (or

perhaps, that is partially *why* we continue). This question of consciousness is vital. Primatologist Jane Goodall has pointed out that the traditional behaviourism approach denied consciousness to animals, as animals are not able to speak to us. Marion Stamp Dawkins (2012) argues that assuming consciousness in non-human animals is anthropomorphism – though she also points out that the same un-provable limits apply to human consciousness as well. Although generally measured in her arguments, Dawkins ignores gradualist arguments in human evolution in terms of behaviour – for example, under parsimonious principles, there are fewer steps to assuming chimpanzee consciousness then disavowing it as a human-only derived state in terms of Occam's Razor (early nominalist William of Ockham, ca.1310; see also Calarco 2008).

Some posthumanist theorists deny animals the right to what they consider “faces” in the sense that humans have faces, and there are (semi-)vegetarians who draw the line here, too. That is to say, they will eat “animals without faces” such as scallops or mussels. Surely here is a corollary to ultimate dehumanisation techniques that deny the right to individuality, instead seeing humans as objects or mass groups (Fiske 2009). On the other hand, it likewise could be argued that saying that all animals are alike; a deer is the same as a scallop – is also a stereotyping approach, as ethicist James Rachels has suggested (Rachels 1989; see also Pollan 2006).



Fig. 12. Animals conceived by those who had never seen them: © UCL 2015 Grant Museum exhibition “Strange Animals”.

Regardless, even when we conceive of animals as beings separate from ourselves, our stereotypes can shift (cf. Fig. 2 (A); Tab. 12) – as evidenced by a publicity blurb for the exhibition “Strange

Creatures: The Art of Unknown Animals" at UCL's Grant Museum. It alludes to "a change in entire worldviews reflected in the way particular images changed over time", as, e.g., evidenced in "the practice of taxidermy, where skins were shipped back to Europe and fleshed-out to recreate the animal based on a few notes. It's also true of modern dinosaur toys, which have been copying outdated images of fossil species for over a century" (UCLPCE 2015:1-2). This statement suggests that, in addition to prototyped human conspecifics, humans also conceive of a perfect prototype of a kangaroo/lion/rhinoceros/elephant/rabbit/apatosaurus, to which no animal can fully belong: an essentialised animal.

When we essentialise our own species, we tend to employ infrahumanisation and human exceptionalism to confine other "animals" to a reserved space. Interestingly, wild animals – and not tame ones – were massacred in Roman coliseums (Derrida 2009), alongside "barbarians", such humans being considered sub-human (Hubbard 2015). Like Roman circuses, zoos are "places of spectacle, theaters – as, indeed, were insane asylums" (Derrida 2009:283). Still, there are different ways of locking individuals up as "one allows the beasts to reproduce" in the zoological park, while "one prevents the humans from doing so" in the psychiatric hospital (*Ibid.*:299). Relatedly, the "animalistic spectacle" in Roman circuses included forced copulations between "barbarian" females and asses and wild cats, where the scent of animals in heat was spread on these non-consenting women to increase the spectacle "enjoyment" by "better" humans (Mannix 1958). Bestiality is a good example of where Human–Animal distinction/essentialism is enforced in strong terms of disgust. Bestiality is maladaptive unless there are potential survival advantages forged by close bonds with, say, dogs/horses, though bestiality from the zoophile viewpoint perhaps might be considered "ultrahumanist" in the sense that the non-human animals are considered "human" enough to mate with – yet due to lack of consent and therefore lack of empathy (and objectification mechanisms, cf. Harris & Fiske 2006), zoophilia is closer to *zoophobia*.

Here it is the participating human who is disparaged, not the animal. Nevertheless, this was not always the case, given examples of crucifying lions in Roman circuses or putting horses on trial in medieval England (Srivastava 2007). Rather than a tribute of ascribed humanity (Baudrillard 1993), these death penalties reflect a cognitive distancing that allows exploitation or killing without invocations of empathy – perhaps again much closer instead to infrahumanising forms of zoophobia. Even sex between humans can be animalised, such as when human homosexual sex is condemned because of its alleged animality, something "dirty" animals do. That said, we observe *post hoc* reasoning in every aspect, as homosexual and non-procreative heterosexual sex also are criticised for a lack of animality and therefore unnaturalness (Bagemihl 1999, Sommer 2006).

In any case, our relationship with other animals generally remains quite flexible – as exemplified by the shift in attitude displayed in newspaper articles in the approach to the year 2000 (cf. *Fig. 2 (A)*). Human–Animal ambiguity patterns are very similar to other seemingly unrelated dichotomies

(Human–Machine, Heterosexual–Homosexual, cf. *Fig. 2 (B)* and *Fig. 2 (D)*).

With animal specificities, societal shakiness could account for the minimisation of the “human” ingroup, where we “animalise” when under stress those who do not belong to us (Haslam 2006), a mechanism made great use of during genocide, war, slavery, sexual exploitation, etc. Even near-identical groups such as Neanderthals were outgrouped during the same millennial time-period, and, for example, often were considered to not have language (Klein & Edgar 2002), until Neanderthals, too, were discovered to have the FOXP2 gene associated with linguistic ability. Similarly, chimpanzees are frequently denied linguistic capacity in both the popular media and scientific articles. The cognitive arena is particularly sensitive in terms of defining the human-animal interface and there exist infrahumanist patterns even in the more “open” 2010s: just when studies of cetacean intelligence revealed interesting results (White 2012), dolphin intelligence has (predictably) been contested in the wider press: “Not so clever now, Flipper! Experts say dolphins’ whistling isn’t really language, and they may be no smarter than chickens or even WORMS” (Buchdal 2013: *Daily Mail*, emphasis by original journalist). Language is clearly an important *human* tool when we try to keep animals in a confined space. For example, according to the documentary *Blackfish* (dir. Gabriela Cowperthwaite, USA 2013), captive orcas for the theme park Seaworld have very specific language applied to their lives that avoids other associations: they live in “modules”, not “homes”; trainers are taught not to touch them initially and to avoid any skin-to-skin contact.

Still, there are conscious attempts to counteract such approaches. Thus, the French phenomenological philosopher Maurice Merleau-Ponty uses the term *interanimality* in his work *The Visible and the Invisible* (1961). This interanimality – interaction between humans and non-human animals – argues that *all* humanity is animality. This, on one hand, questions less radical integrative terms such as *zoomorphism* (treating humans as animals) and *anthropodenialism* (the denial of human traits in non-human animals, de Waal 1997). It also questions, on the other hand, human-privileging terms such as *anthropomorphism* (treating animals as humans) and *human uniqueness* (humans differ from other animals in a separate way than other animals do from their fellow animals): “We’re primates, of course, but we’re also very different” [App. 89].

Such semantic considerations are lent some support from the Sapir-Whorf theory, which suggests that language limits (or determines) thought, according to early American linguist Edward Sapir and his student Benjamin Lee Whorf (1956). Perhaps seemingly minor linguistic shifts can indeed shape thought and concepts: it is interesting that women often are animalised in negative contexts (Rodríguez 2009, Roylance *et al.* 2016).

Some sympathy towards interanimality can easily be identified in journalistic pieces: “A video of chimps ‘grieving’ and a claim that creatures crave privacy suggest that animals share human emotions [and that] human emotions can be assumed within the animal species as well.” [App. 73].

Not unexpectedly, differential levels of interanimality are reflected in the language used towards human animality as discussed by PETA activists and hunters (Cook 2014). The linguist Guy Cook further theorises that human exceptionalism is perhaps a prerequisite for being a hunter (*Ibid.*) – certainly expertise-level knowledge of the hunted animal often is (Marvin 2005). In the famous scene of whales nursing their young in Herman Melville's 1851 masterpiece *Moby Dick*, we first find equivalisations between whales and humans: "The lake, as I have hinted, was to a considerable depth exceedingly transparent; and as human infants while suckling will calmly and fixedly gaze away from the breast, as if leading two different lives at the time; and while yet drawing mortal nourishment, be still spiritually feasting upon some unearthly reminiscence; – even so did the young of these whales seem looking up towards us, but not at us, as if we were but a bit of Gulf-weed in their new-born sight. Floating on their sides, the mothers also seemed quietly eyeing us" (Melville 1851:386).

Despite these realisations, there is never a moment that Ishmael the hunter sees his common humanity with the whales and thus renounces his plans to kill. He *continues* to kill. The closeness with humanity, then the veering-away-from, makes the act all the more painful: "When by chance these precious parts in a nursing whale are cut by the hunter's lance, the mother's pouring milk and blood rivallingly discolour the sea for rods. The milk is very sweet and rich; it has been tasted by man; it might do well with strawberries" (Melville 1851:389).

We have so far come across various controllings-of-boundaries, be they animality leveled as insults, fear of species/categorical blurring and taxonomical tussles, pathogen fears, power relationships, the playing-down of shared or different abilities in other species, crude-or-wondrous spectacles or dehumanisation. All of these distinctions can be summed up thusly: "The group I belong to is the most human; if you threaten it or scare me in any way, I will demote you to what-is-not-human. In essence, I may decide that you are a bad human, therefore sub-human, therefore animal."

These observations lend themselves to a further thought: Are we alone in this stance? This begs the questions whether chimpanzees are chimp-exceptionalists, dolphins are dolphin-exceptionalists, etc. How would we be viewed from the point of view of a crow or monkey? Do they think in terms of themselves ("people") versus other animals? Do they think in terms of male/female, heterosexual/homosexual? Do non-human animals essentialise machines as non-organic beings? In any case, it is very difficult for us to arrive at conclusions here, given that we can hardly experience the qualia/consciousness of another human being (Dawkins 2012), let alone that of a bat (Nagel 1974).

Still, however the non-human animals in general and bats in particular might be less or more alien to us, our close relatives hold our attention in a particular way: the "apes" – and particularly the chimpanzees.

5.2. Other Apes as Non-Kin: “Ruthless Killers, Deranged Experiments, Diseased Jesters”



Fig. 13. “Orangutan Strangling a Borneo Savage” sculpture by Emmanuel Fremiet (1895); © George Bryson 2013.

“It’s hard to imagine anything more serious than a few teacups being thrown around at the zoo. But despite their comical popular image, mankind’s closest cousins in the animal world are merciless killers with a taste for gang warfare.” [App. 76]

5.2.1. Relatives, But Not Persons

We often deny our ape kin. Jane Goodall writes that she was originally prevented, as a scientist, in referring to chimpanzees as “she” or “he”, and was told that she should be using the pronoun “it” (Goodall 2007). The NASA chimp No. 65 only received the name “Ham” upon his successful live return-trip from space (Haraway 1989). Yet at the same time we invoke our kinship through linked genetic language – “close kin”, “brothers”, “cousins”, “distant relatives”, “closest living relatives”. I recorded 575 such kin-invoking examples amongst 1995–2010 UK newspaper articles discussing humans as animals, primates, apes or chimpanzees (*Appendix D*). Thus unfolds what looks almost like a “taxonomic debate” over whether, once having “admitted” our animality, humans are indeed chimpanzees (or bonobos), apes or primates. The popular media clearly play with our relatedness, but in quite ambiguous ways.

One sampled article uses the term chimpanzee to denigrate contestants in a game show: “TV psychologists pore over the poor souls, reducing them to the status of chimps stuck in a human zoo. [...] Derek is in the unfortunate position of being father to a dozen children. Or should that be semi-trained chimpanzees?” [App. 54]. On the other hand, that cross-species equalisation is possible in both directions comes up in the following – although the article makes sure to add a warning:

“‘OUGH ough’ means ‘I’m starving.’ ‘Her, hmmm, her’ means ‘Delicious!’ ‘Eee ah ough!’ means ‘This is really crazy!’ With Richard Brassey’s new book ‘How To Speak Chimpanzee’ [...] you can practically become a chimpanzee, particularly since he shows you the faces to go with the words. The publishers say it is the phrase book no human should be without. But be careful – the opposite may be true. Chimps foolish enough to learn sign language found they couldn’t communicate with other chimps any more.” [App. 39]. Similarly, a relevant zoo article was coded as a “mixed” response – where the equivalised chimpanzees are “cheeky” and have “dads” (and human names), but also are described as fugitives and delinquents, and “dangerous” [App. 66]. Interestingly, humanness might be applied to non-human primates when they display “negative” qualities such as drunkenness, smoking, gambling and public masturbation: “the widely reported death of Charlie the Smoking Chimp [...] has given me a bit of a problem. ‘You damn fool, ape!’ I shouted when I saw that he had passed. ‘You thought you were so cool, chugging away on your wretched tabs, and now you’re dead at 52 and, like all your kind, expecting us to feel a pang!’ ” [App. 87].

5.2.2. Parodies, But Not Persons

Often, however, non-human primates are portrayed as diseased jesters/slaves/children/objects, not at all dissimilar to individuals from different ethnic groups, religions, sexualities etc. (Haraway 1989). Thus, we like to distance ourselves by considering others “dirty” (Douglas 1966). Fears of dangerous pathogens are associated with ingroup/outgroup system justifications: “bush meat poses a real health threat as monkeys and apes carry many tropical diseases that can be passed on the humans” [App. 90]. Zoonosis can be a real threat to humans, but the consequences for the non-human side are similarly severe and not just from catching potentially lethal human colds: “A SAFARI park monkey colony was shot dead yesterday after a bug that can kill humans was found in their blood. The 215 rhesus macaques had the Simian Herpes B Virus. They were gunned down by six marksman with silenced .22 rifles. Chris Webster, boss of Woburn Safari Park [...] said: ‘We had no alternative. Staff were in tears when we told them.’ ” [App. 30].

There are clear links here between “othering”, infrahumanisation (Demoulin 2008, Most 2008, Castano & Kofta 2009) and exploitation (Wrenn 2014). As noted, the fact that those who stereotype treat social groups as natural kinds (Rothbart & Taylor 1996, Gelman 2003, Morton *et al.* 2009) also might shed light on our mutual history with our fellow apes, characterised by uneasiness about Human–Animal classification.

Great apes occupy a curiously liminal position, as they can be property or (semi-)persons (Ross *et al.* 2011). On the one hand, they are treated as pets and zoo animals, not full “people”, and thus as owned objects. Like other non-human-primates, they can be commodities, in 1995 as much as in 2016: “Companies listed provide products and services for nonhuman primates in biomedical

research, including housing and caging, environmental enrichment items, handling and restraint devices, and nutritional supplies” (Primate Infonet 2016:1); “AGI specializes in providing specific-pathogen-free (SPF) nonhuman primate models to the biomedical research community” (Alpha Genesis Inc. 2016:1). I note that humans also have been used as in such biomedical research: the mentally disabled and the poor (“Sterilizing the sick, poor to cut welfare costs: North Carolina's history of eugenics”, ABC News, 2011; “Eugenics and racial biology in Sweden and the USSR: contacts across the Baltic Sea”; Rudling 2014).

5.2.3. Human Exceptionalism

On the other hand, there is the debate about non-human personhood. What makes a person? Once upon a time in the West it was non-poor white male humans. Male black slaves were, in the New World, at least, only considered a *fraction* of a person in 1783 (3/5, to be exact, Finkelman 2013), and all women regardless of race were not considered persons, even in fractional terms. Under modern Shari'a law in fundamentalist Islam, the legal word of a woman is worth exactly half that of a man (UNICEF 2011). Similar modes of discrimination are at work with respect to non-human personhood: the cultural (and scientific) view that non-human primates are not persons is still the prevalent view.

One argument in favour of personhood in at least great apes has been performance criteria, i.e., the recognition that these primates share not only behavioural and morphological, but also intellectual similarities. Since 2010, apes have been increasingly credited in terms of traits previously “reserved” for humans, such as ToM, deceit, potentially language (Genty *et al.* 2015), advanced communication (Bohn & Tomasello 2015) or consciousness and empathy (Bekoff 2014). And yet these traits all have been contested, and human “superiority” emphasised. Throughout the 16 years surveyed, amongst the sampled articles, proponents of human uniqueness have had their agenda served: “Uncharitable chimps [...] It seems that chimpanzees and humans are different from each other in one important respect: chimps don't give a monkey's about their friends. US researchers discovered the lack of altruism in an experiment that allowed chimps to provide food for just themselves or for a fellow ape as well. Most went for the selfish option.” [App. 53]. Here another example, with a more sceptical stance: “Do other primates, notably chimpanzees, point like us? If we alone among the primates extend our finger in a pointing gesture, does the explanation lie in the special anatomy of the human hand or does it lie in our human ability to think of our visual environment as a space that we perceive in common with one another?” [App. 44].

Clearly, we often see chimpanzees denied ToM capacity, despite long-time evidence for it (Premack & Woodruff 1978). However, experiments are open to interpretation, and depending on one's inclinations, one may lean towards one or the other side. It is telling that results that, at first glance, look favourable in terms of cognitive abilities of non-human apes, might receive an altogether

different explanation. For example, chimpanzees were found to invent novel solutions to problems instead of direct copying when both human children and chimpanzees were tested in retrieving food by stabbing tools into a small box. The human children repeated steps that were clearly unnecessary (Horner & Whiten 2005). However, instead of crediting the chimpanzees with the gift of effectiveness, they were instead demoted to not having a proper capacity to imitate. Though chimpanzees have their defenders, too: indeed, primatologist de Waal refers to this last article bluntly as evidence that “young chimps are smarter than children” (de Waal 2014:200).

Semantics are often employed to keep chimpanzees apart. We see it when psychologists label similar behaviours as “traditions” in chimpanzees and “culture” in humans, as noted by Andrew Whiten: “[F]or those happy to treat culture as a synonym for tradition, a phrase such as ‘cultural evolution in chaffinch song’ will [be unproblematic]. For others, human culture involves so much that cannot be reduced to the existence of a tradition that they prefer to define culture more restrictively, at one extreme applying criteria such as language and symbolism, which limit culture to humans alone: animals have traditions – humans have culture” (Whiten 2005:52).

All this is not to say that we are not different from other apes and they from us, and they from each other. For example, all great apes – apart from humans, unless you count making our beds, and maybe you should – build nests or sleeping platforms anew every night (Stewart & Pruett 2013). We do not know exactly why they do it: perhaps for parasite or predator avoidance; perhaps to protect REM dream-sleep. As for other differences, common chimpanzees have a less paedomorphic (childlike) appearance than bonobos (Lieberman *et al.* 2007); bonobo males cope with stress in different hormonal ways than other great apes (Wobber *et al.* 2010). Orangutans live solitarily; gorillas, humans, bonobos and chimps do not; gorillas are largely folivorous; humans, chimpanzees and bonobos are not.

Potentially, scholars and laypersons with low ambiguity tolerance stress the differences and not the similarities when it comes to classifying non-human great apes, and particularly stress the differences regarding chimpanzees and bonobos: those most closely related to us.

5.3. Other Hominins as Non-Kin: “Little to Offer Modern Humans Except Competition”

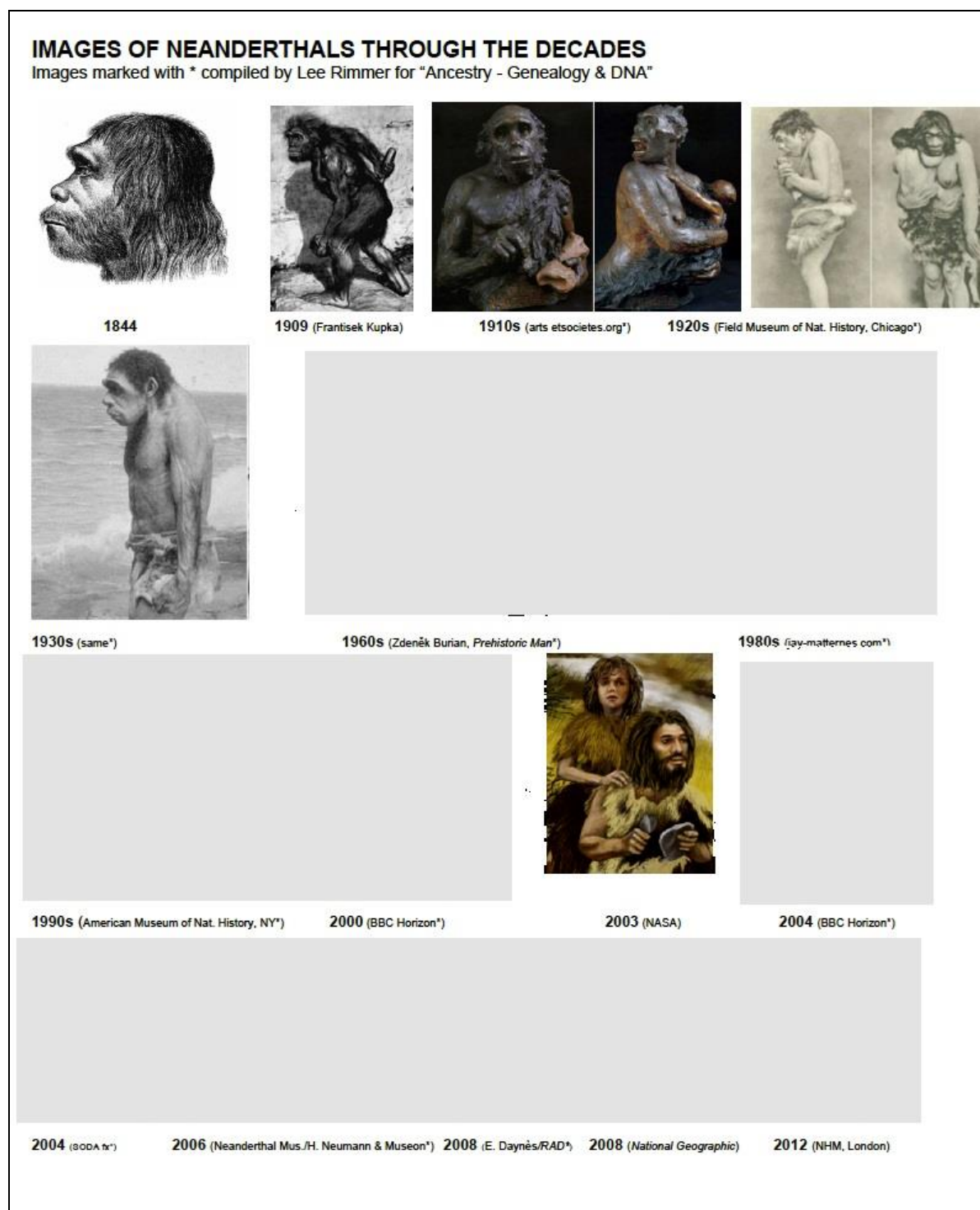


Fig. 14. The increasing humanity of Neanderthal images, 1844-2012. Early Neanderthal prototype (1844); Frantisek Kupka (1909); artetsocietes.org* (1910); Field Museum of Natural History, Chicago* (1920s); Field Museum of Natural History, Chicago* (1930s); “Prehistoric Man”: © Zdenk Burian, * (1960s); © jay-mattnes.com* (1980s); © American Museum of Natural History, New York* (1990s); © BBC Horizon* (2000); NASA (2003); © BBC Horizon* (2004); © SODA fx* (2004); © Neanderthal Museum/H. Neumann & Museon* (2006); E. Daynes/RAD* (2008); © National Geographic (2008); © Natural History Museum, London (2012). Images marked with * compiled by Lee Rimmer for “Ancestry – Genealogy & DNA”.

“ ‘Neanderthals had little to offer modern humans except competition,’ he states in British Archaeology. ‘The attitude may have been to kill first, ask questions later. For too long we have regarded the extinction of Neanderthals as a chance historical accident. Rather, [...] their disappearance may have been the result of the modern human race’s first and most successful deliberate campaign of genocide.’ ” [App. 25]

5.3.1. Denial of Interbreeding Capacity

The quote above dates to 2000, when the more-or-less accepted scientific story maintained that Neanderthals and modern humans were fundamentally different and had not interbred. Neanderthals also were conceived as lacking symbolic thought, the great revolution of the modern human mind. Behaviour considered ritualistic in modern humans was generally explained away in popular depictions of Neanderthals. One well-known example is the disputed “hippie” image of potential flower-sprinkling evidence on a grave in Shanidar in Iraq (Trinkaus 1983). While this 1970s revisionism necessitated some change in the stereotype of the brute Neanderthals (Solecki 1975), the evidence was downplayed ca.2000: “Burials are rare, displaying no evidence of ritual or ceremony, and may just have been done to remove the unpleasant smell of a decomposing body from their living space” (Hamilton 2005:86, citing Klein & Edgar 2002). Prominent cognitive scientists such as Philip Lieberman (1971) have always denied the capability of speech to Neanderthals, based on what they felt was a lack of a fully human vocal tract (2007). Fully modern humans, as per the widespread consensus, had evolved in Africa and were “undiluted”. Subscribing to multiregional theories of origin was/is considered tacitly racist.

Thus, ca.2000 the traditional view of a Neanderthal as a primitive pre-human follows the same dehumanising patterns displayed nowadays towards other ethnic groups (Azoulay 2009), e.g., primitivism, low intelligence, lack of sophisticated thinking, lack of language and symbolic thought.

However, some had posited the possibility of hybridism since the early 1970s, amongst them palaeoanthropologists Erik Trinkaus and Milford Wolpoff. Indeed, several mixed-trait remains had been found as far back as 1952 when a 32,000-year-old skull from Muierii in Romania was discovered alongside other skeletal remains with mosaic characters. Other mosaic finds followed from the early 1990s, with a child skeleton from Lagar Velho in Portugal in 1998 discovered by archeologist João Zilhão’s team receiving particular attention. There also was the interesting fact of a more “modern” Châtelperronien (not Mousterian) toolkit associated with Neanderthals via a 36,000-year-old skeleton at Saint-Césaire exhumed in 1979 (*National Geographic* 2008). Genetic studies slowly also pointed into the direction of interbreeding. Red hair and pale skin was to be associated with the MC1R gene found in Neanderthals (Lalueza-Fox *et al.* 2007), complementing a 2001 study led at Oxford by Rosalind Harding (Oxford Blueprint 2001). Later, the discovery of the language-related FOXP2 gene in the genetic makeup of Neanderthals came as a particular surprise to some (Krause *et al.* 2007).

Finally, the Neanderthal genome sequencing in 2010 (Green *et al.* 2010) showed rather conclusively that interbreeding had indeed been consummated. What is more, a few years later modern human incursion into the Neanderthal lineage 100,000 years ago also was revealed (Kuhlwilm *et al.* 2016): the interbreeding had gone in both directions. Nowadays, for those wanting to find out their personal Neanderthal admixture, mail-order DNA tests such as 23AndMe now include the option to tell you the percentage (“Find Your Inner Neanderthal”, Scotth 2016).

When Neanderthal hybridisation is discussed, boundary reinforcement to modern humans regularly pops up. In scientific circles since the late 1990s/early 2000s, it once more became the convention to refer to *Homo neanderthalensis* rather than *Homo sapiens neanderthalensis* – explicitly calling them a separate species rather than a sub-species of an archaic form that also includes as a separate sub-species modern humans, which had been the convention by many scientists throughout the 1990s (Tattersall & Schwartz 1998). Thus, while one can always find subhumanising theories regarding Neanderthals since their discovery, there was in the late 1990s perhaps a (re)emergence of infrahumanist attitudes. When a *Telegraph* article detailed the fact that modern humans not only interbred with Neanderthals but also with a newly discovered extinct species Denisovans (“Siberians share DNA with ancient human species”, 2011), one commenter called “Sargam” points out that being a hybrid *per se* would be a survival disadvantage due to cultural taboos and suggests – plausibly – that hybrid children would have been shunned. Another poster (“Robinmatyjasek”) similarly draws attention to the harassment suffered by the offspring of WWII “enemy” German soldiers and French or Norwegian mothers (Simonsen 2006).

5.3.2. Hominin Pathogen Avoidance and Othering

Not surprisingly, a suite of ailments and illness also has been associated with modern-human cross-breeding that – as with animals and apes – blatantly follows infrahumanist attitudes in terms of pathogen avoidance. One BBC press report bluntly states “Neanderthals gave us disease genes”: “They passed on variants involved in type 2 diabetes, Crohn's disease and – curiously – smoking addiction” (Rincon 2014).

The 2010 coding called the two-species theory into question. Nevertheless, a multiplicity of newspaper articles denied close genetic and behavioural links, likely due to a fear of mixing with a hominin so close to us (Ghirotto *et al.* 2011). An article from 2010 on early *Homo sapiens* after the coding of the genome does not mention the recent genome results and appears to put up boundaries even between modern and ancient *Homo sapiens*: “THE PROOF THAT CAVEMEN LOVED TO GO CLUBBING ... EACH OTHER [...] THEY are rarely depicted as gentle, refined creatures. And now scientists have evidence that cavemen really were the violent and competitive knuckleheads we see in films and cartoons. A study of fossilised remains suggests our ancestors had far higher levels of the male sex hormone testosterone than we do. If confirmed, the findings mean they were more

aggressive and promiscuous than modern men – and that thousands of years of evolution have had a civilising influence on the human race.” [App. 397].

5.3.3. Primitivism

The commonality of modern humans with Neanderthals is not always embraced: “Similarities between the DNA of modern people and Neanderthals are more likely to have arisen from shared ancestry than interbreeding, a study reports” (“Neanderthal breeding idea doubted”, BBC News 2012). Indeed, numerous scientific articles after the 2010 discovery emphasised difference, such as a 2012 journal article suggesting that “Neanderthals and modern humans have different ontogenetic pathways and developmental patterns” (Martín-González 2012, supporting Gunz 2010). In 2014, four years after the DNA coding, there were investigations into whether it was merely the “big eyes” of Neanderthals that accounted for their larger brains than moderns (comparatively), and thus correlating with fewer social networks and potentially reduced cognition (Marshall 2013). Similarly, evidence of symbolic thought, such as criss-crossed lines cut into stone carried out 40,000 years ago in a cave in Gibraltar (Rodríguez-Vidal 2014), was called into question by journalists: “Do proponents of Neanderthal art truly believe that these early humans had thought through all the possibilities of picture-making and consciously decided that abstract art was the ultimate form of expression? Or were they just making lines? [...] A line may or may not be ‘abstract art’. A beautiful picture of a horse cannot be mistaken for anything except what it is – the human brain working at its best” (Jones 2014:2).

Certainly, we have come some way since the 1866 suggestion by naturalist Ernst Haeckel to call Neanderthals *Homo stupidus* (Wolpoff & Caspari 1997). Still, we have barriers up.

5.4. Other Hominins as Kin (Sometimes): “Infants, Pair-Bonding, Love”

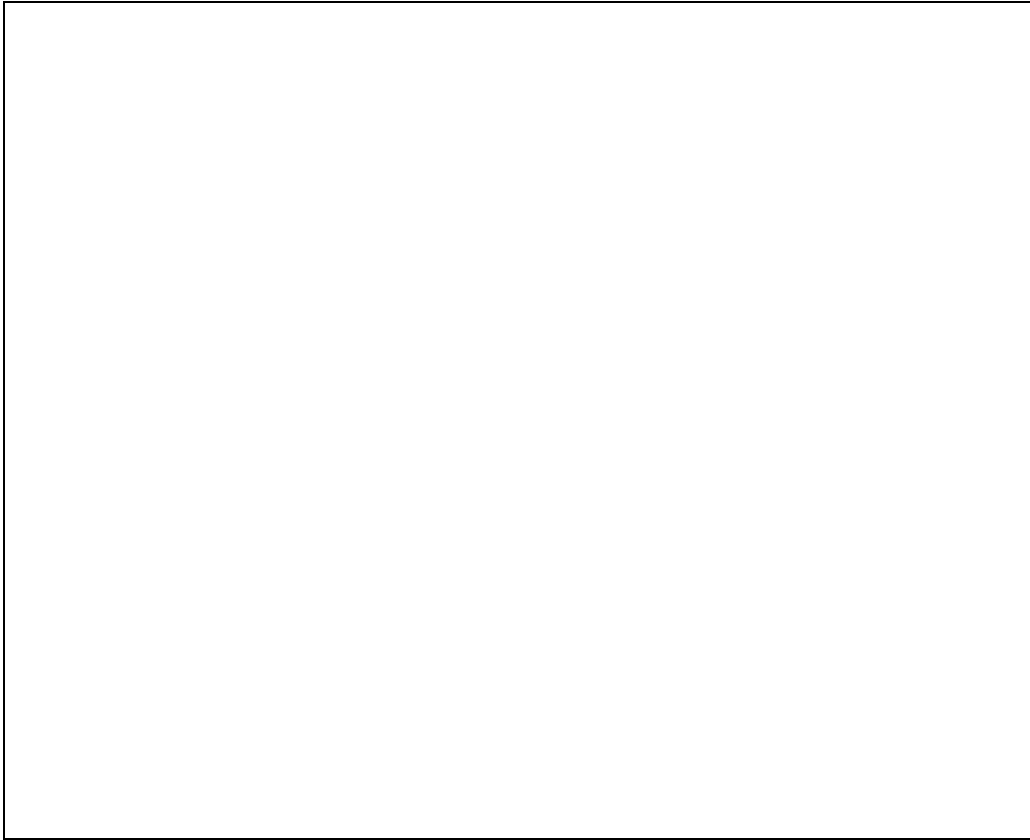


Fig. 15. A Neanderthal reconstruction in modern clothes; modern human and Neanderthal reconstruction seeing eye-to-eye: all images © Neanderthal Museum in Mettmann, Germany.

“One impractically large hand-axe suggests that he [Homo heidelbergensis] made things not simply for use, but for display; and from this we can guess at the advent of new and sophisticated powers of communication, perhaps the origins of speech. And sharp cuts on animal bones are evidence that H heidelbergensis butchered meat to feed others – with the implication of dependent infants, of pair-bonding, of love.” [App. 38]

5.4.1. Behaviour and Cognition

It is important to remember that – as with our other intermediaries via evolution, our fellow modern humans and our fellow apes – that there is great behavioural variability in other hominins.

Neanderthals likely did not act “as Neanderthals” – they likely acted as modern human individuals/groups (Shea 2003). We see this variability when we acknowledge symbolic representation amongst Neanderthals (shells, art etc.). Toolkits, for example, as Shea argues, are not consistent in the ancient archaeological record of modern humans, and indeed the disappearance of particular practices after the divergence of *Homo sapiens* actually indicates that this makes the behaviour *less* likely to be a derived trait. As Shea points out: “[F]inds of mineral pigments, perforated beads, burials and artifact-style variation associated with Neanderthals

challenge the hypothesis that symbol use, or anything else for that matter, was responsible for a quality of behavioral modernity unique to *Homo sapiens*. [...] If behavioral modernity were both a derived condition and a landmark development in the course of human history, one would hardly expect it to disappear for prolonged periods in our species' evolutionary history." (Shea 2011:5).

Modern human beings indeed have had long periods with no "development" in their material culture, and sometimes have lost tool capabilities previously gained, as in the case of the ancient and isolated Tasmanian populations (Taylor 2010, Shea 2011). Amongst the sampled articles regarding general extinct hominins, there is excitement as well as "interanimality", not just infrahumanisation: ("In the case of *Homo floresiensis*, the scale of the argument has matched the potential importance of the fossils" [App. 63]), and this was no different when discussing *Homo erectus*: "signs of intellectual originality first emerged with the manufacture of the first stone tools" [App. 25]; "the larger, cleverer *Homo habilis* and *Homo erectus*" [App. 38]. But hedging appears obvious when it comes to the much-more-closely related Neanderthals (here, with an implied non-humanity: "Before my eyes a reptile skull turns into an ape's, turns into a Neanderthal's, becomes Hom sap [sic]." [App. 7]) – perhaps due to category confusion regarding whether we should embrace Neanderthals as kin, or discard them as non-kin, an ambiguous challenge that often happens when people are facing new categorical challenges (Dale *et al.* 2007): "Dividing *Homo sapiens* into modern and archaic or premodern categories and invoking the evolution of behavioral modernity to explain the difference has never been a good idea. Like the now-discredited scientific concept of race, it reflects hierarchical and typological thinking about human variability that has no place in a truly scientific anthropology." (Shea 2011:12). Shea above references the same patterns found in my own results (cf. Fig. 2 (A), Tab. 12, Fig. 4 (A) & (E), Tab. 16, Fig. 6 (A) & (E) and Tab. 23). Like these results, Fig. 14 shows a progress of Neanderthal inclusion: additionally suggesting cultural influence on otherwise seemingly "concrete"/natural-kind categories.

As noted, we ignored or explained away what seemed to be suggestive signs in the fossil and *material culture* (the physical evidence that a culture makes or has made in the past) records of Neanderthal/*Homo sapiens* interbreeding until we had concrete DNA evidence (very recently, in 2010) (Green *et al.* 2010, Orlanda *et al.* 2011). Perhaps this was related to the ultimate fear of the other, ourselves as "animal". Europeans and Asians have now been shown to have up to 4% Neanderthal genetic contribution, averaging 2.4% (Green 2010), and potentially up to 20% in gene clusters having to do with skin colour and hair colour (Vernot & Akey 2013).

In terms of shared behaviour, art indeed is associated with Neanderthals: Arcy-sur-Cure Neanderthal bones were found in sediment that contained "pierced animal teeth and ivory rings" (Hall 2008); another Châtelperronian-level site was associated with Neanderthals at Grotte du Renne (Zilhão 2010); manganese crayons potentially used for decoration have been acknowledged to be found in Neanderthal assemblages that have been already discovered for decades (Soressi & d'Errico 2007);

pigment-stained seashells have been found by João Zilhão from two separate sites in Spain: Cueva de los Aviones “perforated cockle shells with pigment, horse bone with pigment on the tip”) and Cueva Antón (“orange hematite- and goethite-painted shell”, essentially, “sparkly red pigment”) (2010:72); and in 2014 what was acknowledged by most scientists as Neanderthal abstract art was found in Spanish caves (Rodriguez-Vidal 2014).

Zilhão even suggests that Neanderthals may have taught modern humans about art in the first place: “If we were talking about people in the Copper Age, we would conclude that the incomers got them from the locals. Why should we have a different logic for Neandertal things?” (Zilhão 2010:75). The timing of this last article by Zilhão in *Scientific American* is interesting in itself, presented as “Did Neandertals think like us? João Zilhão defends his controversial view that our oft-maligned relatives shared our cognitive abilities”, and published one month after the evidence that humans interbred with Neanderthals was published. Just two years previous to that, red painted handprints that have since been attributed to Neanderthals and dated at 40,800 years old (Than 2012) were described by *National Geographic* as being by modern humans because, in addition to the dating, only modern humans did “art” (Hall 2008). We similarly see that descriptions for non-human animals might be very problematic if the argument is circular and culture becomes only that which humans do (Sommer & Parish 2010).

By November 2010, the popular press such as the *Guardian* and *Telegraph* were emphasising Neanderthal human qualities now that it had been proven that they were definitely intimately related to Europeans and Asians: “Uluzzian Neanderthals were creative, inventive and adaptable” (Kaufman 2010) and even engaged in marine-based fine dining, including dolphins and seals (“Neanderthal man lived on seafood far earlier than previously thought”, Govan 2011). By December 2010, *New Scientist* was proclaiming on its cover: “Your inner Neanderthal: We’re one species, not two.” (Adler 2010). Their potential musical abilities and a controversial bone flute were referenced; the fact that Neanderthals made glue; the fact that there might be a single gene (RUNX2) that causes a suite of Neanderthal traits such as brow ridges and barrel-chested bodies. In the same article, what now read like minority opinions asserting Neanderthal potential lack of capabilities weighed in, with archaeologist Steven Mithen suggesting that Neanderthals could not create complex symbolic objects and lacked “cognitive fluidity” and archaeologist Paul Mellars suggesting that modern humans had better brains and better technology: “The Neanderthals were playing against a better team” (*Ibid.*).

Primatologists, perhaps due to lacking the human-uniqueness paradigm of archaeologists, were more relaxed, as this editorial for the Primate Society of Great Britain’s November 2011 publication *Primate Eye* shows: “So, lots of us are part-Neanderthal. It’s amazing how much that little sentence can evoke. Most paleoanthropologists have long accepted that Neanderthals were a separate species than ours, *Homo sapiens*. [...] Only now we find out that (except for African humans) he’s a

bit of an ancestor as well. I, for one, welcome this news. [...] When I teach introductory lessons about non-human primates, I take great pains to emphasise that they are NOT ‘partial people’ or ‘lesser’ organisms. This is an attempt to nip a certain type of thinking in the bud; the idea that we, *Homo sapiens*, are the pinnacle of creation.” (Rae 2011).

5.4.2. New Hominins and Taxonomy

The 2000s and the 2010s have been extremely exciting in terms of hominin discoveries: there was proof of modern humans interbreeding with not only Neanderthals but also with an entirely new human branch called Denisovan (Hawks 2013). Moreover, in 2003, a new “dwarf” species called *Homo floresiensis* (the “Hobbit”) (Falk *et al.* 2005) was discovered, possibly having survived from an island population of *Homo erectus* boat-makers and artists (Luskin 2012, Joordens 2015). It is worth noting here that the scientific establishment has for some time been aware that *Homo erectus* must have been sea-farers: “which was startling because elsewhere *H. erectus* had left behind little material culture to suggest that it was anywhere near capable of making watercraft” (Wong 2005). DNA advances also threw new light on a 1989 find of ancient humans called the Red Deer people (Curnoe *et al.* 2015) and, in 2015, a newly discovered hominin called *Homo naledi* (Dirks *et al.* 2015). As the palaeoanthropological discussions continue regarding species bifurcation between Neanderthals and modern humans, for those inclined to “lumping” rather than “splitting”, a 2013 find suggested that two previously concrete “species” of hominin – *Homo habilis* and *Homo rudolfensis* – should be subsumed into the greater category of *Homo erectus* (Lordkipanidze *et al.* 2013).

5.4.3. Acceptance of Interbreeding Capacity

Yet fear of contamination (cf. Douglas 1966) by the Hominin Other continued. There had been widespread scientific reluctance to consider the possibility that part of the genetic make-up of living New Guineans might be in part ancient non-*Homo sapiens* DNA (doing so was explicitly considered to be racist; cf. Caspari & Wolpoff 1996), despite the work of scientists Wall, Lohmueller and Plagnol (Wall 2009), though due to DNA analysis we now know that the ancient Neanderthal-like hominin Denisovan makes up part of modern Aboriginal and Melanesian admixture (Reich *et al.* 2010, Callaway 2011) and .2% of mainland Asian admixture (Prüfer 2013) (and apparently my own admixture too, according to my maternal 23andme DNA analysis [likely due to trace Native American ancestry]).

Why would having ancient DNA be an insult, unless we have long-standing prejudices that we who exist today in the West are the “improved” versions? Yet there are ultrahumanist trends. There is a

recent fad for “palaeo-diets”, i.e., eating like a caveman/cavewoman (Fitzgerald 2014). The Chinese, in addition, proudly claim *Homo erectus* ancestry/admixture as a badge of “Chinese exceptionalism” and so-called racial pride (Liu 2012, Ren 2013). Perhaps after an initial category-adjustment and human-boundary reinforcement (“Whether the Neanderthals were wiped out by brighter moderns or starved out in unequal competition for resources remains to be settled.” [App. 390]), we now are revelling in a shared “humanity”; an ultrahumanisation post-Neanderthal genome sequencing. Thus, samplings regarding the *Homo floresiensis* discovery seem to elicit positive codings, as noted above. Though as additionally noted, “hobbits” are not as close to modern humans as Neanderthals, and even as the Chinese exceptionalists embrace *erectus*, they simultaneously form non-*erectus* outgroups by exclusion.

It should be interesting to see how infrahumanisation proceeds now that, as mentioned, scientists have discovered modern human DNA in Siberian Neanderthals, showing that the interbreeding went in both directions (Kuhlwilm *et al.* 2016) and now that there is chat in the mainstream media about the ethics of cloning Neanderthals for medical and academic research. Indeed, at an open debate at UCL in 2012 (“Should We Clone Neanderthals?”), I heard geneticist Mark Thomas publicly claim that one wouldn’t need to work as hard as actual cloning a Neanderthal – that a back-breeding programme made up only of modern humans would result in a Neanderthal in not so many generations. Could the average layperson without priming even distinguish, for example, between Neanderthals and modern humans, as in *Fig. 15*? We’re much more than close kin to Neanderthals. They are us.

5.5. Other Apes as Kin (Sometimes): “We Are Part of the Primate Continuum”

Fig. 16. Top, L-R: 2013 Danceclub flyer, London, © Passing Clouds; “Yes, I Have Gone Ape” certifications, © Go Ape climbing group. Centre: flyer for political art group, © Guerilla Girls. Bottom, L-R: Daily Mail 2008, © Barry Bland/Barcroft Media; “Human-Chimp Evolution Dialogue”, © <http://www.evolutionnews.org>.

“We are not alone. We are part of the continuum, all 300 of us. Primates all: the mandrill, the angwantibo, the hairy-eared mouse lemur, the red-tailed sportive lemur, the golden-headed lion tamarin, the white-nosed bearded saki, the muriqui, the crab-eating macaque, the mandrill, the hoolock gibbon, the gorilla, the chimpanzee, the Archbishop of Canterbury and me. And you.”
[App. 81]

5.5.1. Actual and Potential Interbreeding Capacity

So yes, we interbred with Neanderthals. What might seem more surprising is that we also interbred with members of the chimpanzee/bonobo clade for at least 1.5 million years (but likely longer) *after* our divergence from what is called a “last common ancestor” (LCA; Patterson 2006). This hominid intermingling is not a singular occurrence: 1% of the modern chimpanzee genome is made up of ancient bonobo DNA (de Manuel *et al.* 2016).

While not more than genetic evidence is left for these millions of years of intimate inter-species interaction, “humanzees” or “chumans” make for good material in science fiction (cf. Michael

Crichton's 2006 novel *Next*). While generally considered to violate the "biological species concept", cross-generic fertility is indeed not always impossible. Although humans have 23 chromosome pairs and chimpanzees have 24, making potential cross-fertilisation difficult, various scholars of human evolution have suggested that extant chimpanzees and humans could still feasibly breed – amongst them palaeontologist Richard Leakey (in conversation with Richard Dawkins) in the documentary film *The Genius of Charles Darwin: The Fifth Ape* (dir. Russell Barnes & Dan Hillman 2008; see also McNulty 1981). Alleged experiments in post-WWII China and Russia are rumoured to have resulted in pregnancies, if not full-term offspring (Pain 2008): "A female chimpanzee in a medical research laboratory became pregnant after being inseminated with a man's sperm. The laboratory was later smashed up by the Red Guard and the chimp died" (Sykes 2014).

For the record, experiments with human and ape inter-fertility – described by my undergraduate anthropology professor Bill Workman at University of Alaska Anchorage as the "most damnable and interesting experiment imaginable" – are banned under academics ethics rules. A representative of the Scottish Council on Bioethics argued for legal proscriptions against the creation of such hybrids as "the resulting creature could raise ethical dilemmas, such as whether it would be treated as human or animal, and what rights it would have" (*Scotsman* 2008). These concerns are probably not farfetched. Indeed, a paper of an IVF experiment indicates that gibbon (small apes) oocytes were successfully fertilised by human sperm in a test tube – and then destroyed. Notably, monkey oocytes (baboons, squirrel monkeys, rhesus monkeys) were not fertilised using the same method (Bedford 1977).

In any case, modern humans are a hybrid species of contemporary humans, Neanderthals, Denisovans, other archaic humans and, even further back, chimpanzees. Hybrid offspring and the connection to essentialism is significant, because then we cannot not assign an individual "purely" to one set or another. In terms of other mixtures such as mules, "wolphins" (whales x dolphins), pizzlies (polar x grizzly bears) and conceptual humanzees, we are venturing outside the stereotypes and prototypes. These hybrids represent shared sets and not distinct sets (cf. Wittgenstein 1953). This causes increased cognitive load, including slower mental processing and stress (Gilbert 1989) – as exemplified in the following article: "How, then, can we cope with chimpanzees, bonobos and humans having 99 per cent of their DNA in common? [...] To be strictly fair, we must put them in the same family as ourselves and acknowledge that they, like us, are hominids." [App. 81].

5.5.2. Taxonomy

This leads to the question of why chimpanzees/bonobos and humans are included in alternative genera (*Pan* vs *Homo*). Regardless of interbreeding potential, if other species shared 99.4% of nonsynonymous DNA, they would be included in the same genus – in this case as either *Homo*

troglodytes/Homo paniscus or with us becoming *Pan sapiens* (Groves 1996, Wildman 2003). *Pan sapiens* as a name means wise chimpanzees, a shift that we as humans might find a trifle embarrassing (Hof & Sommer 2010). Given the historical precedence of the genus *Homo* – as introduced by Carolus Linnaeus in the 18th century – the chimpanzees and bonobos more likely would see their names changed to *Homo troglodytes/Homo paniscus*, respectively. I have casually asked classes of students whether they would prefer to have “*Homo troglodytes*” (including chimpanzees in our genus) or “*Pan sapiens*” (dismissing our genus altogether and joining chimpanzees in theirs) over a period from 2010-2015, and the former was almost universally preferred, year after year. Studies on status support this status-retention tendency as well (Jackman 1994, Jost *et al.* 2000, Chapais 2015).

5.5.3. Behaviour and Cognition

Another divider showing recent cross-overs is that of cognition. While there is debate about the degree to which human and non-human mental landscapes overlap, over the last few decades there has been a notable shift in the willingness to ascribe human-like thought processes to non-humans, and primates in particular. This has been labelled the “cognitive turn” of ethology (Griffin 1976). On the proximate level, mirror neurons are implicated to be of significance for many thought processes that allow minds to learn and develop empathy and intentionality. These neurons “fire up” when a human either does a specific action, or observes another human doing that action. Exceptionalists maintain that mirror neurons are specific to humans, while others suggest that non-human primates possess them too (Rizzolatti & Craighero 2004; Ferrari *et al.* 2006, for macaques) or even rats (Castro 2011, Takano & Ukezono 2014). Yet others suggest that mirror neurons are artefacts of the general motor system (Dinstein *et al.* 2008).

In any case, the last 2-3 decades saw the compilation of an impressive catalogue of potential human-like cognitive abilities displayed by non-human apes, as seen in *Tab. 26*. Ape-ape communication frustration may go in both directions: orangutans mime to communicate to other apes (including humans) to express their desires, particularly when the receiver has not understood their intentions in the first instance: “ ‘My impression is that they think we are idiots for not getting a perfectly clear request, and then a bit disgusted that they actually have to spell it out for us,’ Dr Russon said” [App. 396; cf. Russon & Andrews 2011]. A 2008 *National Geographic* quote refers to efforts to analyse the vocalisations of Kanzi, the human-enculturated bonobo at the Great Ape Trust, who “may be speaking English words, just too fast and high-pitched for us to decode” (Morell 2008:2; see also Greenspan & Shanjer 2004). Given such evidence, even the not-very-ambiguity-tolerant *Daily Mail* may muddy the waters: “And now the final barrier between humans and the animal world appears to be blurring with the revelation that apes can indeed communicate using speech.” [App. 396].

Tab. 26. Cognitive abilities shared with humans displayed by non-human apes.

Potential Human-like Cognitive Abilities Displayed by Non-Human Apes
● a tendency to copy more prestigious individuals in both chimpanzees and humans (Chapais 2015, Russon 2004); ● chimpanzees understand analogy (Premack & Woodruff 1978); ● gorillas and chimpanzees can use 1,000+ human words in sign language or computer languages, and distinguish between the past and the present (Wayman 2011, Patterson 1978); ● vocalisations in chimpanzees and bonobos are meaning-laden (Clay 2011, Gillespie-Lynch <i>et al.</i> 2014); ● non-human primates practice charity (Brosnan 2010), generosity (Hare & Kwetuenda 2010) and go on strike (Brosnan 2010); ● apes and other primates “invent” new techniques that can quickly catch on in group situations (Gruber <i>et al.</i> 2015); ● chimpanzees, like humans, practice self-medication (Fowler <i>et al.</i> 2007); ● apes, along with other primates such as Japanese macaques, have quick cultural learning through watching and imitating (Kawamura 1959); ● gibbons sing using the same techniques as trained human soprano singers (Koda <i>et al.</i> 2012); ● orangutans, amongst numerous other primates, are shown to exhibit culture (van Schaik <i>et al.</i> 2003); ● humans may rescue apes, and apes may rescue humans, in a mutual extension of extra-specific empathy (Goodall 1993).

Discoveries of non-human cognitive abilities (cf. Tab. 26) also inspire efforts in terms of an “archaeology of the mind” (cf. Panksepp & Biven 2012). For example, composite tool-use in chimpanzees (using hammers and anvils), and flexible, context-driven refinements of those tools (Sakura & Matsuzawa 1991) mean that we now have to re-consider whether tool assemblages found in the hominin fossil record may actually have been made instead by non-human apes: “The recent re-classification of several Oldowan pieces previously categorised as subspheroids or spheroids [...] hint that Plio-Pleistocene hominins also re-used pounding tool-kits that may have yielded the first unintentional flaking episodes. These provocative similarities between chimpanzee and hominin pounding stone-tools suggest the possibility of a phase of technology prior to the Oldowan that calls for further investigation” (Carvalho *et al.* 2009:113).

There is evidence for symbolic thought. Thus, a wild chimpanzee was observed wearing fur of a killed colobus monkey as a necklace around the throat after a hunt (Sommer & Parish 2010). Moreover, there are the famous dances of wild chimpanzees, for example when strong rain falls (de Waal 2014) or in front of waterfalls (Bekoff 2007). Juvenile chimpanzees have been seen to make pretend nests and to carry sticks with them, perhaps as dolls (Kahlenberg & Wrangham 2010).

Orangutan juveniles have been observed making leaf dolls (Holland 2008). Similarly, captive chimpanzees have engaged in feeding “pretend” bugs not only to their dolls but also to their human trainers, and also “pretend-eating” the imaginary insects when offered them back by the humans (Romain 2009). Multiple additional examples point to imagination and fantasy in chimpanzees: imaginary pull-toys by the domestically reared chimpanzee Viki; dolls nursed by signing apes such as the gorilla Koko (Gómez & Martín-Andrade 2005, Goldman 2013); pictorial competence of symbols (Persson 2008).

There also is overlap in terms of the “human” tendency to stereotype and essentialise. Gorillas and orangutans recently studied by Jennifer Vonk divided what I would term natural kinds (“insects, reptiles, fish, birds, and mammals”) into different sets (Vonc 2010, 2013). Chimpanzees may essentialise gender: “Possibly, our chimpanzees operate with a gender construct, i.e., retrieve information based on real-life interactions with the depicted individuals, which helps them decide to which sex they belong” (de Waal & Pokorny 2008:103; see also Phillips *et al.* 2010).

5.5.4. Implications of Personhood: Bioresearch

Evidence for shared cognitive abilities has recently led to bioresearch on great apes – which often explicitly includes euthanasia, vivisection and pain research, infections with HIV, hepatitis etc. – being banned in countries such as Austria, Germany, Netherlands, New Zealand, Sweden and the United Kingdom. Yet only in Autumn 2015 did the USA (the biggest source and exploiter of apes for bioresearch) finally merge its chimpanzee listings and list both captive and wild chimpanzees as endangered, meaning bioresearch was now illegal (Kaufman 2015). The US federal government under the auspices of National Institutes of Health (NIH) is currently transferring its chimpanzees into sanctuaries (Dizard 2013), with 50 individual chimpanzees still in labs, and approximately 1,000 privately owned chimpanzees. In 2014, U.S. pharmaceutical giant Merck & Co. joined approximately 20 other similar companies in banning all great ape “provisioning” (HSUS 2014).

In terms of time-line, it is interesting that the bioresearch changes went full-steam ahead from 2011. Perhaps the time was finally ripe. Ten years after the millennium changeover, we were highly open to the grey area again (cf. *Fig. 1*). Yet in pockets of Western societies, a tendency towards expansion, perhaps even potential ultrahumanisation, can be identified throughout all decades. For example, when Ham the Astrochimp died in 1983, NASA initially intended to have Ham stuffed and displayed. However, public outcry meant that instead only his skeleton was removed for display and his other remains were buried at the International Space Hall of Fame, complete with a eulogy commemorating Ham’s important work for NASA by acceleration physicist Colonel John Paul Stapp (Roach 2010). There also is metaphorical applied positivity, such as “cheeky monkeys”, and positive humans-as-apes references, in playful, political and pointed uses (cf. *Fig. 16*). Moreover, we engage

in “evolutionary medicine” in the context of the evolved biology of modern humans (Trevathan 2007) in a positive sense of “animalising” ourselves. So it is important to bear in mind that not all human-as-ape references are irredeemably negative.

This also is the agenda of the “Declaration on Great Apes”. The initiative demands to grant basic rights to at least some non-humans (Wise 2000): “We propose the extension of rights allowance in an equal way to all great primates: human beings, chimpanzees, bonobos, gorillas and orangutans. The principles that guide the relationship with great primates are: 1. Right to Life [...] 2. Individual freedom protection [...] 3. Prohibition of torture” (Cavalieri & Singer 1993). This call is based on the “Declaration of the Rights of Man and of the Citizen” passed by France's National Constituent Assembly in August 1789, itself influenced by philosopher Jean-Jacques Rousseau's 1762 “Social Contract” parsing authoritarian and public rights and rules.

Philosopher Singer was one of the first to unsarcastically link human slavery to animal oppression (see also Gompertz 1824); the production of meat as equal to that of human slavery; and the Animal Liberation movement as the equivalent to the Civil Rights Movement and Women's Liberation movement. Chapter One of *Animal Liberation* is titled as follows: “All Animals are Equal... or why supporters of liberation for Blacks and Women should support Animal Liberation too” (1975). The earlier sarcastic (and woman-animalising) riposte intended as an argument against women's rights was from Thomas Taylor satirical publication entitled *A Vindication of the Rights of Brutes* (1792): “Brutes are equal to men. It only now remains (and this must be the province of some abler hand) to demonstrate the same great truth in a similar manner, of vegetables, minerals, and even the most apparently contemptible clod of earth.” (Macdonald & Scherf 1997:14).

Much has happened in terms of fighting discrimination of other humans since the 18th century. Post-2000, we do see societal shifts in the conceptualisation of non-human animals. Our ultrahumanisation appears to be expanding (AAMC 2006), and with publications by autistic scientist Temple Grandin's perspectives on animal behaviour soaring in publicity and book-sales, perhaps all that was needed was a shift in perspective, exactly what Grandin, with her non-neurotypical brain and observations, offered (Grandin & Johnson 2005). Societal shifts also are echoed in my chi-squared results (*Fig. 2 (A)*; *Tab. 12*) and the multivariate analysis (*Tab. 17*). A 2010 newspaper article maps out potential trajectories: “We do not know how animals experience the world, but doctors once assumed new-born babies could not feel pain; that is an awful warning. It seems ethical to assume sentience, and extend rights rather than limit them. [...] Maybe though, even in 50 years, we will still be experimenting on rats. There are limits to empathy, which is why rights need to be enshrined in law; rats cannot wear this little monkey's human expression” [App. 79].

5.6. Other Animals as Kin (Sometimes): “Non-Human Persons”



Fig. 17. L-R: Book cover for *Adventures in Kinship with All Life* by J Allen Boone; “Animals [including humans] entering Noah’s Ark” by Bassano, late 1500s.

“DOLPHINS are so intelligent they should be given the same status as humans, scientists are recommending. [...] Experts say it is now time for dolphins to be treated as ‘non-human persons’ after research showed their brains have many features associated with high intelligence. [...] [they] qualify for moral understanding as individuals.’ ” [App. 82]

5.6.1. Links, Not Divisions

When it comes to taxonomy, we are prone to think of divisions. But we are by no means bound to think this way – rather, we could sign up to a paradigm of inter-connectedness with others in the animal kingdom based on shared traits rather than diverging ones, similar to conceptual philosophical constructs in, e.g., Hinduism or Buddhism (Gaietto 2014), sociological theories (Hyde 2005) or the gradualist sets theorised by Wittgenstein (1953). We could, indeed, attempt to construct an animal democracy (or at the very least, a *representative* democracy), rather than an animal kingdom with our species as self-crowned kings and queens. To move towards such egalitarianism, we must retreat from the human exceptionalism.

Donna Haraway (1989) has interpreted primatology as a liminal state between anthropology and zoology. To take a monkey/non-monkey example, one could similarly suggest that the primate called the tarsier occupies a liminal state between prosimians and monkeys, which at least partly explains the poor creature’s history of clumsy taxonomic classification (Rosa *et al.* 1996). In the same vein, ancestral vs derived behavioural traits are not straightforward. For example, some non-primate animals have some characteristics we associate mainly with humans and occasionally with other

primates. Thus, the varying distinctions (and potential denial of convergent evolution) made between “birdsong” and “music” (cf. Araya-Salas 2010, Reinhart 2016) echo the shifting boundaries regarding human language and non-human ape communication – and the exceptionalist assertion that there are “just six groups of animals with complex, learned vocalisations: songbirds, hummingbirds, parrots, cetaceans, bats and humans” (Douglas 2014:37). Arguments have always been made against attributing “music” to birds, such as lack of sufficient harmonisation (Araya-Salas 2012). Yet, the reverse tendency also is found, when a layperson ultrahumanises whales: “Off Kaikoura, New Zealand, I swam with 300 dusky dolphins zooming around me [which are] fond of humans singing to it which led to the silly sight of this puny Englishman floundering in the Pacific while yodelling to a dolphin” [App. 395].

The example of music creation/appreciation is but one of many behaviours we likely share with other animals. In any case, the human exceptionalist approach has become increasingly difficult to defend, including the “humans are exceptional in the ways in which they are exceptional” approach. We can, at times, go the other way and become (non-human) “animal exceptionalists” – as espoused in Jean-Jacques Rousseau’s “back-to-nature” paradigm (1750). Non-human animals in these conceptualisations transcend human viewpoints. (Relatedly, 20% of humans would rather spend time with non-humans: “Americans Prefer Dogs – but Dream of Tigers, Giraffes”, Subramanian 2013.)

We observe interanimalistic positivity as detailed by philosopher Emmanuel Levinas: “But there is something in our attraction to an animal. In the dog, what we like is perhaps his cheerful character. As if he were strong, cheerful, powerful, full of life [...] Children are often loved for their animality. The child is not suspicious of anything. He jumps, he walks, he runs, he bites. It’s delightful” (1988:172/2004). Such positivity is also reported over a century ago in Brehm’s *Life of Animals*: “In the old German mythology the Wolf [...] is rather venerated than detested; when Christianity takes the place of pagan mythology [...] the animal becomes the ghost-like Wolf of nursery fables, a monster who is alternately Man and Wolf” (1895:191). Although there is evidence that cultures lash out at wild wolves in times of economic or social-role stress (Todd 1992, Anahita & Mix 2006; see also Marvin 2012) – perhaps pointing to pet dogs as a subhumanised family outgroup when times are tough – wolves are never fully cross-historically/cross-culturally associated with evilness, possibly due to humans’ very close, co-evolved, fictional-kin relationship with dogs (Persson *et al.* 2015). And, from the dog’s point of view and not just our own, dogs might well see humans themselves positively as family, as revealed by MRI scans and scent-tests (Berns *et al.* 2015). Animals also show friendship adaptations outside their own or the human species: a hippopotamus with a tortoise (Bekoff 2007); gorillas such as Koko with her famous kitten All-Ball (Patterson 1978).

Some studies investigate the ways in which we attribute mental states to not just imaginary quasi-animals, but to existent non-human animals: including a general tendency to mentalise more with mammals than with birds and invertebrates (which follows kinship theory – we are more related to

guinea pigs than termites [Clarke *et al.* 2012; cf. Hamilton 1971]; other study results suggest we mentalise more with primates than other animals [cf. Kempster 2001] and perhaps most of all with other great apes, “overrepresented” in primate-focussed UK media articles [Most 2008]).

Humans may even feel, like transgender people do with biological sex, that they have been born into the wrong body, i.e., into the wrong species. This condition is sometimes called *species dysphoria* (Lupa 2007). The terms “bestiality” and “zoophilia” likewise indicate that animals are (sexually) preferred by some humans over other humans (Earls & Lalumière 2009). Internet sites abound where humans identify as *otherkin*, sometimes extant animals, sometimes extinct animals such as dinosaurs, sometimes entirely impossible animals such as dragons and unicorns, sometimes entirely impossible/improbable beings such as angels, space aliens and cartoon characters (Kirby 2009). Otherkin, when considered carefully, is not very different to non-human apes playing with imaginary pull-toys or eating imaginary bugs – perhaps fanciful, perhaps an extension of empathy and intentionality into the non-tangible. Related cases of “clinical werewolfism” (my term), aka *clinical lycanthropy*, have been investigated as a form of mental illness (Garlipp *et al.* 2004), but could also be viewed in a more ultrahumanist sense. The animal-avoidance of the Abrahamic religious trio of Judaism, Christianity and Islam aside (Meng 2009), speaking more generally there are numerous associations between religious rituals and non-human animality, which often involve “becoming” a non-human animal (Waldau & Patton 2006), particularly shamanism (Eliade 1951), with German prehistoric cave art evidence such as the lion-headed, human-bodied Löwenmensch figurine suggesting such hybrid symbolism even 40,000 years ago (Bailey 2013).

We can certainly conceive of ourselves as animal – indeed, the ancient Greek word *theriomorph* means “becoming an animal”. In Western countries, sexual-fetish, relationship and social movements called *furrydom* consist of *furries* and/or *furverts*, where the animalised self (sometimes cartoon-modelled animal-self), usually enacted through role play and costume, is of prime importance (Gerbasi *et al.* 2008). Species dysphoria, otherkin and furries reflect aspects of “morphological freedom”, freedom over the physical parameters of our own bodies – a paradigm that will also feature in the Human–Machine and Male–Female chapters.

It is not always the “fear” and/or the disgust of the Animal Other that sets people in opposition. For example, people could be anti-xenotransplantation because they relate to and identify with the *animal* intermediary. Animal behaviourist Marc Bekoff’s quote is apt here: “Traditionally, animal research involving cognition, behaviour and emotion ends with the death of the animal so the brain can be cut up, blended or otherwise analysed. But it seems strange to me that scientists would consider it normal to kill a mind to study a mind” (2007:147). The tie-in with bioresearch sometimes triggers a protective response in humans, in the same way that we don’t want our close kin to face danger. In this 2000 article on xenotransplantation, the sympathy lies very much with the baboons: “Captured in the wild, these baboons wait to be flown to Britain, where their hearts will be removed

and be replaced by organs from genetically modified pigs. Then they will die. Why is this medical experiment, yet to save a single human life, kept secret by law? [...] Bad news for the baboons, who can only wait and scream" [App. 391]. Other articles equivocate, as in this "mixed" response from 2005: "The leap in the number of GM and mutant creatures created for animal research will shock animal welfare groups [...] But scientists said the reason for the rise reflected breakthroughs in genetics to find cures for life-threatening diseases" [App. 394].

5.6.2. Fictional Kin

Perhaps we need to engage in large-scale "family"-imprinting where we force ourselves to invest in other animals as kin – "fictive kinship" (aka "fictional kinship") being a term first used by the American ethnologist Edward Curtis in 1913. Animals probably *need* to be considered kin in order to save them from us the humans – which renders the *Great Ape Project* more popular than a *Grey Mice Project* would be. Due to likely hard-wired – yet still malleable – infrahumanisation responses (cf. *Fig. 2 (A)*; *Tab. 12*; *Tab. 13*), PETA's argument that animals are special unto themselves probably will not work in terms of convincing the majority of people that it is worth saving such animals. Therefore this is unlikely to be the right way to go about animal rights in pragmatic terms, unless it is a two-pronged strategy that on the one hand emphasises animal-uniqueness and, on the other, emphasises kinship (and therefore potential usefulness) with us, the human animal.

Even the hyper-utilitarian moral philosopher Peter Singer admits that he would find it difficult to employ utilitarian philosophy and the ending of another's human life when it came to his own mother, who had Alzheimer's: "Perhaps it is more difficult than I thought before, because it is different when it is your mother" (de Waal 2014, citing Specter 1999). This is a tribute to the power of kinship from the very man who under utilitarian principles had made controversial statements regarding human lives of less-sentient humans (Singer 1993).

Paul Taylor suggests a theory of biocentrism, where "humans are members of the Earth's Community of Life in the same sense and on the same terms in which other living things are members of that Community" (1986:99-100). That noted, Singer's personalised experience reflects similar tensions amongst those who study and politicise non-human animals: the well-known 2012 Minding Animals conference was attended both by radical vegan groups and the Dutch meat industry members. Similarly, often the most successful wildlife preservation programmes in my home state of zAlaska are those invested in by hunting and fishing groups (Russ 1997). Ultrahumanisation might have a glass wall that stops empathetic responses if we stress that we are animals (Capozza *et al.* 2009) – but although it may be regarded as either cynical or pragmatic, ultrahumanisation is a technique that might work in stopping needless suffering and extinction risk by landscape

eradication, bioresearch and bushmeat if we stress that other animals are “people” in the sense that they have worth (read: usefulness to us, humans) – the Dayak headhunters killing orangutans as proxy humans notwithstanding (Hof & Sommer 2010).

How far can we expand our conceptual ultrahumanisation? Michael Pollan (2006) argues that North Americans are literally part corn, or at least the Carbon-13 isotopes of carbon that make up their hair and fingernails. This is because these are sourced from corn or animals that ate corn. Ironically, while Mexicans are stereotyped for being corn-eaters – the Chiapas indeed call themselves “People of the Corn” – they have a more varied diet than Americans and Canadians and eat animals who more likely to have eaten grass.

The best and most effective solution in terms of human and animal rights might thus indeed be to trick our brains into thinking that we are near-kin. Francesca Zunino (2013) theorises that we can connect all life, including plant life (not just corn) – including concepts of the human, the animal and the divine – into one syncretic identity. With this, it seems that we are arriving at a new panentheism (as opposed to mere pantheism) that posits that the “divine” is in all life and un-life – this ultra-ultrahumanisation might well be the vastest in kinship conceptualisation.

5.7. Summary

5.7.1. Infrahumanisation

- Inclusive/exclusive approach to near-human categories: we exploit non-humans (dehumanised humans, hominins, primates, animals) for research or work *because* so similar to us and therefore useful, but not allowed full humanity.
- Murderers and soldiers dehumanise and/or dissociate in order to kill con-specifics, potentially many human hunters and consumers do same to eat meat.
- Gradualist evidence for essentialism in non-human apes: great apes have pictorial competence of symbols; orangutans and gorillas conceptualise with biological categories; strong suggestion that chimpanzees essentialise gender; chimpanzees distinguish not only “chimpanzee” category but can distinguish symbolic chimpanzee faces from human faces; multiple examples of symbolic thought in non-human apes (and other animals), including imaginary friends.
- Bestiality maladaptive unless potential survival advantages forged by close bonds with dogs/horses but bestiality from zoophile viewpoint perhaps considered “ultrahumanist” – yet due to lack of consent we likely sexually interact with animals due to *lack* of empathy: zoophilia therefore closer to *zoophobia*.
- Corollary between semi-vegetarians only eating “animals without faces” (e.g., scallops or mussels) and dehumanisation techniques, where dehumanising individual denies the right to individuality.
- Studies indicate that female humans in particular seem to be animalised.
- Infrahumanisation mechanism made great use of during genocide, war, slavery, sexual exploitation, etc. (prejudice might facilitate survival and reproduction).
- Moving goalposts regarding definitions of speech, tool-making and, more recently, types of learning and types of traditions/culture that explicitly exclude non-human apes.
- Documented rise in Animal Studies programmes/think-tanks may indicate gap, rather than link, between humans or animals, since humans often posited to side, rather than an integral animal as *Homo sapiens*.
- Multiple references to disease transmission between humans and non-human primates – possible fears of dangerous pathogens, associated with ingroup/outgroup system justifications.
- We struggle first to think of humans as animals at all, before distinctions of “ape” and “animal”; we’re wrestling with two separate natural-kind categories, cognitive load: so we exclude chimpanzees, our “closest kin”.
- When Neanderthal hybridisation is discussed, (modern) human boundary reinforcement pops up via dehumanisation/subhumanisation, even in scientific press: traditional view of Neanderthals as primitive pre-humans follows same dehumanising patterns that humans display towards other ethnic groups (and towards non-human apes), e.g., low intelligence, primitivism, lack of sophisticated thinking, lack of language and symbolic thought.
- Having ancient DNA admixture (which we all have, even “non”-Neanderthal “pure” Africans) is no insult unless we have long-standing prejudices that *Homo sapiens* is the “improved” evolutionary version, which is not how evolution works.

5.7.2. Ultrahumanisation

- Intermediaries including evolutionary biological intermediaries such as hominins and non-human apes, metaphorical zoomorphs and anthropomorphs, chimeras and xenotransplants blur boundaries between oppositional sets and this is temporally bound: categorisation is flexible from the years 1995–2010 – my results suggest strong cultural influence.
- Forcing concepts/beings into pre-made systems does not adhere to Darwinian gradualism.
- Human exceptionalists do not always “other” non-human animals to degrade them – people could be anti-xenotransplantation because they relate *too* much to the animal intermediary; 20% of Americans prefer animal company to human company.
- Fewer steps (more parsimonious and therefore more scientifically rigorous) to assuming chimpanzee consciousness then disavowing it as human-only derived state.
- To accept that other animals have personhood traits, it may be important to acknowledge animals as kin, as (moderately) difficult for us to commit atrocities against human kin. If we can conceive of animals as kin, as we do pets, greater chances of saving animals from extinction/bioresearch (and possibly meat-eating – we usually don’t eat animals we consider pets).
- Humans mentalise more with mammals than with birds and invertebrates (which follows the Hamiltonian kinship model of humans investing more in kin) – e.g., humans are more related to guinea pigs than termites).
- Neanderthals likely did not act “as Neanderthals” – they likely acted as modern human individuals/groups (similarly, non-human great apes have individuated personalities).
- Modern human beings have had long periods with no “development” in their material culture, and in some cases have lost tool capabilities previously gained when not necessary; apes too may lack particular skills because they have lack of need.
- Some humans are species-dysphoric, feel that their natural selves are other animals/beings, as opposed to *Homo sapiens*.
- If we become more integrative, far more likely that we’d allow other apes to become “low-functioning” humans (*Homo troglodytes/paniscus*) than the inverse (humans becoming “high-functioning” *Pan sapiens*), as great apes, including humans, don’t like to lose status.
- Perhaps we need large-scale “family”-imprinting, fictional kinship exercises where we artificially force ourselves to invest in other animals, including non-related humans, as partial kin – a two-pronged strategy that one hand emphasises other-animal-uniqueness (so doesn’t trigger inhumanist attitudes) and on the other emphasises (potentially utilitarian) kinship with us, the human animal.
- Evidence has emerged that dogs see humans as family, with positive associations; non-human animals show friendship adaptations outside their own or the human species: a hippopotamus with a tortoise; gorillas such as Koko with her kitten All-Ball.
- We’re prone to thinking of divisions, but new paradigm of interconnectedness with animals based on shared traits rather than diverging ones would be a conceptual shift: linking rather than separating.
- *Panentheism* posits that the “divine” is in all life and un-life: this ultra-ultrahumanisation might well be the vastest in animal (and non-organic) kinship conceptualisation.

6. HUMAN–MACHINE: “(UN)NATURAL SELECTION”

6.1. Machines and Non-Organic Matter as Non-Kin: “Icy Computers and Dead Digital Doppelgängers”

Fig. 18. Hiroshi Ishiguro's self-created robot double: “the robotic doppelganger looks like a creepy waxen mummy... its dead eyes cold [...] part cyborg, part real doll, part Shigeru Miyamoto, part Dracula. It is horrible. It hates you.” (Brownlee 2007:1).

“We have got through those 2,000 years of potential suicide of the species because we have had a warm religion of the heart, as well as an icy computer in our head.” [App. 124]

In a similar journey to the last chapter, we shall travel herein an infrahumanist route from “pure” machines towards blended human–machine cyborgs, then expand outwards again – though this time ultrahumanistly – from such machine-adjacent selves.

6.1.1. Uncanny Valley: Agency and Threat

Do we consider robots as kin, friends or tools? We like robots who look a bit like us (Normile 2014) but not too much (Dautenhahn *et al.* 2005), for that might read as an evolutionarily dishonest signal. These helpers – the word robot comes from the Czech for “forced labour” – are clearly Other, just as we are “clearly” human beings. As well as our replacements – as noted previously, robots can be considered to be intermediaries due to exactly this quality of intentional replacement – robots also are tacitly intended to be our slaves. The answer to the question, though, varies. We do see indications of fluctuating ambiguity tolerance in the Human–Machine dichotomy, and low-ambiguity tolerance (essentialising) is correlated with sub/dehumanisation (Sidanius 1985, Yoder *et al.* 2007, Bain *et al.* 2009). At times we assign agency to robots, just as for non-human animals; but at other times we deem uncontrollable, unpredictable androids (“humanlike” robots in morphology and behaviour) more threatening than robots in general (Saygin *et al.* 2012). An agency detection system

refers to the way animals detect purpose and sentience in others, and is theorised to have evolved as a functional protection device against predators; psychologists Kurt Gray and Daniel Wegner argue that a brain module known as an *agency detection device* is hyperactive in applying agency to potential threats, which would make sense in functional evolutionary terms, possibly even explaining cross-cultural human belief in the supernatural (2010; see also Barrett & Keil 1996, Atran 2004).

Are these agency assignments apt, or is this mere anthropomorphism (or theomorphism, as Gray and Wegner might argue)? Mechanical slaves that are not alive are safer, for if alive they then could think, reason and, potentially, cause us harm. Tools turned against their makers – arguably projection when considering our chequered human record of stewardship towards the planet that “made” (evolved) us. Robotly discomfort takes measurable forms. When robots get too close, we are uncomfortable with ambiguity; the uncanny valley being the revulsion/uncanniness/eeriness humans feel when robots come close to being perceived as humans, with humans more comfortable with beings either clearly robotic or clearly human (Mori 1970/2012, Tinwell 2015). Eeriness/uncanniness is, for the purposes of this thesis, defined as “mysterious, strange, or unexpected as to send a chill up the spine” (Poliakoff *et al.* 2013:998).

Then too, there are differences not only in threat perception, but also in uncanny valley perception between general robots and the more human-formed (but less tolerated) androids (Mathura & Reichling 2016). As alluded to, the uncanny valley is likely the same mechanism as the Human–Animal infrahumanisation discussed in conjunction with chimpanzees and Neanderthals – the closer you get but fall short, the more tightly drawbridges will be drawn up against you (though not more speedily – uncanniness needs to be observed over time, Harris & Fiske 2008). Though why we would react most to adjacent categories rather than far-away ones? Perhaps infrahumanisation is rooted in hard-wired niche protection, where we protect our environmental niche most from those “almost” like us – indeed, the foundations of natural selection are based on the idea of sub- and intra-species competition between individuals in identical niches (Darwin 1859): the survival of the fittest we see forged against similar but not directly related rivals potentially may be manifested here as border-control against intermediary states (animal or mechanical “sub”-humans).

6.1.2. Technophobia

When we create such sub-humans as visually accessible objects in the form of ourselves – as opposed to solely imaginary ones, i.e., via storytelling – and yet these objects do not live (although sometime we react to them as if they do indeed live, i.e., when we visually experience films, plays, pornography, art, sculptures, robotics, video games, virtual reality or play), we call them variously characters, portraits, statues, avatars, androids, robots and dolls. Many of the qualities in them to which we react most negatively are “dead” or “inhuman” eyes (Snyder 2011). This also is interesting

in reference to Chapter 5, as we are more likely to react well to other apes when the whites of their eyes look more like our own (Kobayashi & Kohshima 2001). It seems that we may be using eyes as a proxy for “dead” or “alive”; see this chapter’s opening quote [App. 124] – decidedly negative towards humanity’s part “machine self” (an “icy computer”, a rather death-like description).

Technophobia – the fear of complex devices such as machines, computers and robots – is a standard self-protective fear useful in its origin, as most phobias are (Öhman *et al.* 2001, Öhman & Mineka 2001), and likely has at least partly to do with our hard-wired capacity to be repulsed or frightened by death, a mechanism discussed shortly. This makes sense in terms of pathogen and predator avoidance. It takes an equally strong selective force (the bonding emotion called love, say) to overcome such hard-wired mechanisms, e.g., chimpanzee mothers carrying dead infants for weeks, or the care humans take with the bodies of near kin, or sometimes with fictional kin such as friends (including non-human pets).

6.1.3. Detection Mechanisms

According to psychologists Wang and Quadflieg, we draw complex social inferences and attribute agency by two main brain networks: both a brain network that functions as a facial recognition system known as the *Person Perception Network* (PPN); and a “mentalising” network (MTN) by which we attribute agency (Wang & Quadflieg 2015). Both networks endow mental states onto an object. Neuroscientist Ayse Saygin also argues that agency attribution takes place via the mechanism of the *Action Perception System* (APS), which evaluates movement. A human should move a particular way, and non-standard movement violates our brain’s predictions (Saygin *et al.* 2012). Computer scientists Karl MacDorman and Hiroshi Ishiguro (*Fig. 18*) further theorise that an android’s jerky movements are frightening precisely because they suggest a loss of bodily control (2006).

Our perception of a human-human interaction versus a human-robot interaction seems based more on PPN than MTN – that is to say, less to do with the application of agency. In Wang and Quadflieg’s investigations, humans felt more “eerie” in Human-Robot interactions than in Human-Human interactions, as expected, but assigning agency did not seem to be related: there was less reliance on mind attributions when interacting with robots – possibly the robot in question already was seen as “non-organic” (Wang & Quadflieg 2015). Wang and Quadflieg suggest that a counterargument to the eeriness result might be that perceivers have more experience with Human-Human interactions, or that the robots lack facial details and human expressions (*Ibid.*). There also is an effect called repetition suppression, which involves predictability – once an object is no longer a threat, there is a “reduced neural response to a repeated stimulus” (Saygin *et al.* 2012:416 [citing Henson & Rug 2003, Grill-Spector *et al.* 2006, Krekelberg *et al.* 2006]). Saygin *et al.* additionally suggest that three-

dimensional robots (they cite Sanchez-Vines & Slater 2005) have “presence” that 2-D interaction lacks. In some sampled articles, the attributions of agency to some machines extend to discussion of the positively murderous: “[A] ‘smart’ (i.e., fully computerised) building murders its inhabitants. This is, of course, but a novel twist on 2001’s homicidal HAL 9000, a computer that murdered almost the entire crew of a spacecraft” [App. 111].

6.1.4. Mortality Salience

In addition to movement-perception, potentially connected to predator/prey reactions, the suggestion of death associated with uncanny androids analysed in terms of the *mortality salience hypothesis* (one is aware that one’s own death is inevitable) has been shown to have some validity in experiments (MacDorman & Ishiguro 2006; cf. *Fig. 19*). Humans are frightened of life (when dangerous, aka predators) and death (when dangerous, aka disease). The mortality salience hypothesis is in turn connected to *terror management theory*, which theorises that humans use a variety of methods to cognitively manage their terror of death whilst still desiring to live (Greenberg & Pyszczynski *et al.* 1986, Pyszczynski & Greenberg *et al.* 1999), including greater ingroup protection (Pyszczynski *et al.* 2003). We see cultural suggestion of this in the Human–Machine alterity via a quote by animation director Andy Jones: “[I]t can get eerie. As you push further and further, it begins to get grotesque. You start to feel like you’re puppeteering a corpse” (Weschler 2002:4) or in the television show *Doctor Who* (“The Robots of Death: Part Four”): “Leela: Doctor, what is robophobia? Doctor Who: It’s an unreasoning dread of robots. You see, most living creatures use non-verbal signals. Body movement, eye contact, facial expression, that sort of thing [...] While these robots are humanoid, presumably for aesthetic reasons, they give no signals. It’s like being surrounded by walking, talking dead men.” (Boucher 1977).

Fig. 19. Reproduced image showing spectrum of discomfort with the human-shaped living/non-living, visualisation taken from Masahiro Mori (1970). Energy 7 (4): 33-35. Trans. Karl F. MacDorman and Takashi Minato: “Valley of Familiarity”.

In terms of movement and group-predictability, perhaps our struggle to categorise creates even more fear (Schoenherr & Burleigh 2015), rather than us merely reacting to the anthropomorphised object's intent – though there is a lack of medial prefrontal cortex activation in both single-broom and group-broom cases, we react more slowly to a singular oddly behaving broom in Disney's *The Sorcerer's Apprentice* sequence from the 1940 animated feature film *Fantasia* when compared to a swarm (or perhaps the collective noun is a "sweep") of anthropomorphised brooms (Harris & Fiske 2008). As the authors put it: "This points to differences in thinking about the mind of a person versus an object [...] One can imagine an army of brooms menacing the sorcerer's apprentice, without thinking of their minds as humanly complex" (*Ibid.*:221). Harris and Fiske additionally point out that anthropomorphising entire object categories ("an army of brooms") activates both fear and empathy parts of the brain (*Ibid.*), possibly due to empathy perhaps being necessary to understand one's "enemy", too.

Psychologist Frank Pollick suggests ways in which the uncanny valley might be activated: dubbed speech leading to perceptual mismatches (research shows that even young children prefer subtitling to dubbed speech); the incongruence between a human clown's real expression and a painted-on expression; and the condition known as Capgras syndrome where it is feared that people, and sometimes things and environments, are replaced by duplicates (2009). As MacDorman and Ishiguro put it, it is "easy to see [...] how partially disassembled androids could play on subconscious fears of reduction, replacement, and annihilation [...] Since most androids are copies of actual people, they are Doppelgänger and may elicit a fear of being replaced, on the job, in a relationship, and so on." (2006:17).

It is worth noting that even if one is aware of the status of the machine/robot/android in question, that this does not necessarily reduce the uneasy reactions that Pollick observed in the case of clowns (Austin & McCann 1996). Distal (abstract) fear reactions could be produced (Lakoff & Johnson 1980), and indeed distal responses in terms of mortality salience have been shown to have credence (MacDorman & Ishiguro 2006). We see this mortality salience metaphorically perhaps even in concepts such as a "deadman's switch" or a "deadman's alarm", mechanical functions in vehicles, ships and even computers that go into action after a particular time period if a human being is incapacitated (DesVergers 2012).

In addition to mortality salience, distal or concrete, and the potential predator-prey movement predictability results, also key is the social context by which we interpret agency. In one study of human infants, investigators ostensibly studied infant reactions to pro-social behaviour (infants prefer it) (Hamlin & Wynn 2011), yet another reading of this study is that infants experience an emotional reaction to non-living simulacra of human beings and distinguish such animated puppets from inanimate pincers, to which infants do not apply agency (Hamlin *et al.* 2011), as doctoral student Declan Tomàs Clowry argued at the 2013 London Evolutionary Research Network conference

(2013). Studies also suggest that humans hold humanoid robots accountable to some extent for harm that such robots cause, yet not entirely: “less accountable than they would a human, but more accountable than they would a [vending] machine” (Kahn *et al.* 2012:39; see also Gaudiello *et al.* 2015). This ambiguity in terms of social context persists even with dogs (societally co-evolved with humans, Persson *et al.* 2015), who react to social cues more from robots than to robot morphology (Gosling *et al.* 2003, Marcarelli 2015).

6.1.5. Uncanny Valley: Non-Living and Threat

Yet morphological context is relevant in terms of infrahumanisation. Surgery and injuries aside, we can't tell what is on the deep inside of things even in humans without digital scanning, and so we are reliant on external boundaries and context to let us know whether an object is alive or dead, threat or friend. Here we see in the appendix articles not only the generally negative machine-enmeshment (via body-scanner) scenario, but also precisely this fear of the unknown and (perhaps) the futility of finding out “what makes a person tick”, an entirely apt machine-metaphor in this context: “In one of the camps they have a body scanner so you can really see what the person looks like naked to see if they are hiding anything. ‘To humiliate the detainee they will put a woman on the machine – small things like this to mess with their mind and demoralise them, dehumanise them.’ ” [App. 174].

Objects do not need to be alive to threaten: anyone who grows up in natural-disaster-prone areas as I did in Alaska knows that there are multiple threats to humans which do not live, such as rivers, lakes, oceans, hurricanes, cyclones, tornados, landslides, earthquakes, avalanches, floods, volcanoes, tsunamis, etc. Many of these are anthropomorphised (Waytz *et al.* 2010a) and most are unpredictable, and likely much of our modern fears to do with animals and objects different than ourselves is not being able to have a good prediction regarding behaviour based on morphology and biological category concepts (essentialism). Other intelligent animals are threatening and unknown in this aspect, and – if recognised – so too would be robots. (We don't react nearly as strongly to inhuman hands as we do inhuman faces, Poliakoff *et al.* 2013.) Yet human-shaped robots to whom we do not attribute agency puzzle us. On one hand, our brains may be primed to react to certain shapes with danger or lust or repulsion (Öhman *et al.* 2001). But “non-living” status makes us treat human-shaped objects that are not in fact human as something qualitatively different than other human-shaped objects to whom we *do* attribute agency, e.g., video representations. A foreigner effect also is present with robots, whereby we treat them in dehumanising ways (Bryson 2010), just as we do human foreigners whom we consider non-kin (Murrow & Murrow 2015). Some psychologists theorise that humans dehumanise in two ways, via either animal de/subhumanisation or automata dehumanisation towards the non-living (Haslam 2006); although I find this distinction unnecessarily limiting, it does (interestingly) invoke a dichotomisation between organic and non-

organic states – such parsing of dehumanisation therefore may itself be due to our hard-wired essentialist tendencies.

Robot scientist David Hanson argues against an inherent uncanny valley (“creating an uncanny effect just depends on the quality of the aesthetic design, regardless of the level of realism” (2006:1). Hanson suggests that an uncanny response could be “caused by simple logical inconsistency, in essence causing a double-take, a rapid error-check” (Hanson 2005:7). That said, most studies (Poliakoff *et al.* 2013; even Hanson’s own results with human “sliding identity morphs”, Hanson 2005) support the uncanny valley hypothesis to some extent. There are similarly uncanny associations with fake breasts, facial plastic surgery (Sung 2007, Choo & O’Daniel 2016) and with the ability (or not) to recognise dead bodies in photographic representations (Lenman & Nichol森 2005). As noted, uncanny valleyhood may be just another (automaton-specific) name for potentially hard-wired infrahumanisation mechanisms.

6.1.6. Sexual and Romantic Objects

On the subject of fake breasts and female objectification, sometimes we do not react with fear to humanoid proxies but rather sexual desire. *Agalmatophilia*, aka the “Statue Syndrome”, where sexual desire is felt towards human representations (usually statues, White 1978) is considered rare, with only six cases recorded in the last 200 years (Scobie & Taylor, writing in 1975); “youths have sometimes masturbated before statues, and even before the image of the Virgin” (White 1878, citing Ellis 1917:188). Yet if we extend the ostensibly rare statue paraphilia to the modern popularity of “RealDolls” (a commercial brand of sex dolls) and to video, TV, film and comic book representations, we have many more examples. RealDolls are again, like animals for zoophiles, mainly the non-human targets of male fixations (Richardson 2015), as are nearly all sexual fetishes (Darcangelo 2008). That said, one women’s magazine survey indicated that 33% of females watch online pornography (Sandhu 2015); and as mainly heterosexual females engage in “shipping” (the term comes from “relationshiping”; that is to say, writing and creating art for elaborate, often highly sexual, predominantly male homosexual romantic narratives about [non-homosexual] characters from film, TV and cartoons, FFN Research 2011), a reductivist view suggesting that fetishism is a solely male response is not so simple. Consumption of pornography and fan-fiction, aka slash fiction, are both similar to agalmatophilia, albeit with motion in the former case – and all are potentially “maladaptive”.

It is possible that we simply respond to organic/non-organic signals and that androids that are human-shaped (or dolls, statues, puppets, digital facsimiles or gripping emotional fictional narratives involving imaginary personae) trigger our hard-wired sexual and emotional triggers, not just our non-

organic alarm sensors. In this sense, these androids and their ilk are “passing” as human. Though one of the goals of “strong AI” (successful human mimicry as sign of “true” artificial intelligence) is artificial intelligence with sentience (weak AI being more task-oriented), some designers interpret strong AI as successful human mimicry, such as the ability to pass the famous Turing Test first theorised by computer pioneer Alan Turing, where one cannot tell the difference between a human being and a computer (1950). This approach has been criticised on the grounds that a machine – or indeed animal – can be intelligent without operating as a human.

We return to the question regarding whether wanting to have sexual intercourse with a (successfully mimicking or not) object is an acknowledgement of the object’s humanity or an objectification (or both/neither). There are potentially multiple “maladaptive” yet pleasurable modes by which humans achieve sexual gratification, some of them relevant to this sub-chapter: sexual congress with sex dolls, or more generalised (non-sex-doll) “normal doll” sex fetishes, which vary from sexual contact with children’s dolls to transforming oneself into or having someone else become a “doll”. In the articles too there are non-conventional sexual allusions involving human and computer embodiment: “the sexy fembots in Austin Powers” [App. 171]; “the internet is [...] an unsupervised cloaca of all that is human” [App. 400]; a computer with “a little glass anus” [App. 181]. Tellingly, there is a recent plethora of films regarding female robots created for the pleasure – emotional and sexual – of men (Richardson 2015), such as 2007’s *Lars and the Real Girl* (dir. Gillespie). There are very few similar films involving sexual male robots, and even then it is acknowledged that, like male prostitutes, such male sex dolls/robots mainly pleasure other men (Savage 2012) (just as with RealDoll and other sex doll/sex robot sales, Richardson 2015): this is implied even by the non-specificity of Jude Law’s robot gigolo character in 2001 children’s film *A.I.* (dir. Steven Spielberg). It is revealing to watch (usually male) film directors’ interviews regarding the “creating” of the sexualised female robot characters where the directors have general control of the character’s special effects creation (here skirting closer to so-called “pygmalionism”, where one falls in love with one’s own creation). The directors’ relish in “creating” their sexy and/or lovable female robot characters persists even when, mitigatingly or not, in terms of the larger and more subversive plots the female robots (or brainwashed, programmable human automatons such as in [self-described feminist] Joss Whedon’s TV series *Dollhouse* or in the 1975 film *The Stepford Wives* [dir. Bryan Forbes]) struggle to break free of (male) human control, such as in the 2015 film *Ex Machina* (dir. Alex Garland) or 2013’s *Her* (dir. Spike Jonze). There also are multiple child robot or childlike filmic (read: cultural) examples intended for adult (or in-part-adult) viewing, such as *Eva* (dir. Kike Maíllo, 2011), the aforementioned *A.I.* and *Wall-E* (dir. Andrew Stanton 2008). Perhaps dolls (or sex robots) in particular are associated with adult females and with children – not just due to diminished agency, but also due to controllability and being of a specifically manageable size; dolls are shrunk down to child-size and can be manipulated by children (Singer 1994) – even in great-ape doll play, the “stick dolls” used by juvenile chimpanzees and orangutans are of very specific sizes (Kahlenberg & Wrangham 2010). Let us

recall that even the objectifying male still feels protective to the women in online video pornography (Fiske 2009; see also Loughnan & Haslam 2007).

Humans attribute more humanity and agency to dolls when told they belong to their own ingroup than dolls belonging to an outgroup (Hackel *et al.* 2014). Just as the doll investigators involved suggest that agency should not be confused with empathy, others such as Harris and Fiske made similar conclusions regarding the *Fantasia* brooms, as noted by Hackel *et al.*: “it is possible that people who perceive out-group threat may be more likely to perceive high out-group agency, but not out-group experience. Such a dissociation would allow partisans to respond adaptively to perceived out-group plans and strategies (e.g., perceiving a threatening out-group as agentic) without enhancing empathy (e.g., dehumanizing the threatening out-group in terms of experience)” (*Ibid.*:22).

6.1.7. Repulsion

As previously noted, there may be a flip-side to sexual and emotional attraction, and that is fear or repulsion. A condition called *pediophobia* (fear of dolls, be they porcelain or talking) – exists, as does *automatonophobia* (fear of any automated human-shaped figures such as puppets, mannequins, ventriloquist dummies or robots) – the reasons for why these phobias might exist in functional terms have been discussed, as the same theories of mortality salience, predictability, category confusion and social context would apply. There are multiple negative reactions to dolls that are meant to look like specific humans, such as “Me Dolls” that look like oneself or one’s child (presumably the commissioning individual likes the doll in question just fine) (RMD 2015; see also McRobbie 2015). *Pediophobia/automatonophobia* is a common fictional, film and television theme (Buckingham 1996).

Like dolls, machines, perhaps frighteningly, do not die. In one sampled article, there are intermediaries in that both humans and machines (and buildings) are treated in the same way but react differently; this is seen as negative: “human beings became known as ‘soft targets’ as opposed to hard targets like machines and buildings which didn’t shatter into so many pieces when you fired a shell at them.” [App. 102].

6.1.8. Replacement

If machines can replace us entirely – and yet they do not die, as we do – perhaps this is the most mortality salience triggering event of all. Creepy dolls, too-human androids and potential machine uncontrollability and immortality: we see this echoed in book titles such as Kevin Kelly’s 1994 cybernetic-themed work *Out of Control: the Rise of Neo-Biological Civilisation*. It is not so surprising that automatons flourished in the Age of the Enlightenment (ca.1620–1789, when humans were

considered machines in the Cartesian sense: clockwork plus “souls”, see Mastin 2008) – or even now, with cognitive psychology being the conception of the brain as a computer, or even certain behaviours seen as “tools” in the sense of a Swiss Army knife with many gadgets (read: modules) (Rolston 1999, referencing Pinker 1994), or with *computationalism*. Computationalism refers to computations performed by a computer or a brain, and is considered by some researchers to be the direct equivalent of human cognition. Human cognition is sometimes argued to be computationalism itself; this is known as the Computational Theory of Mind (Rescorla 2015). “Three-dimensional” computationalism (as opposed to cognitive computationalism) also echoes physical human brains: as in this *New Scientist* print article on the subject of computers “healing themselves”: “The idea is to create a supercomputer that works just like the human brain using the same ARM chips that power most smartphones. The team wants to do parallel simulation of large-scale neural networks” (Marks 2013:3).

We ascribe the phrase the Machine Age to a time period in which industry and machine replacement became rife (ca.1880–1945), including, but not limited to, the development of automobiles, railways, radio, television, aeroplanes, nuclear fission, computers and machine-based assembly-line factories. In the book *Pandaemonium, 1660-1886: The Coming of the Machine as Seen by Contemporary Observers*, which details the time period predating and including what is termed the Industrial Revolution (ca.1760-1840), we see already in the 17th century interesting mentions of humans not being animals, but instead possessing inanimate qualities (Jennings 1985). In contemporary times, machine replacement is an almost-constant negative theme throughout the newspaper articles I surveyed. Replacement was common enough that there were multiple examples specifically in terms of replacement that I termed the *Human Superiority Complex* (HSC) (also found in the Human–Animal chapter), where, once replacement was discussed, there followed a quickly voiced assertion that humans were nevertheless preferable and superior. There were only very rare examples of a complementary Machine Superiority Complex (MSC), cf. [App. 130]. Strong AI is explicitly about human replacement – or, more generously, equivalisation – about a machine being able to be considered human. We are fine about machines when they’re useful to us (slaves, help for the elderly, life support), but less so when they’re taking our jobs or replacing us in multiple aspects of our lives (such as in sex or jobs: arguably, “niches”), which also is seen in social attitudes towards migrant workers and foreigners (Blaine 2013). Once we’re replaceable, we’re also implied to be the equivalent – they are us and we are them. And we don’t like that.

Here is an example of a starkly negative attitude towards virtual replacement, including towards a “virtual news-reader” with both a “computer-generated” and a “human” face: “the internet’s first virtual newsreader spoke for the first time last week. Ananova is the computer-generated face and voice [...], who ‘reads’ the news in her own inimitable way. [...] As a concept and gimmick, Ananova could be a great idea. [...] But do we really need her? Are those who look to the internet for news so

desperate for a human face that they will choose a cumbersome download [...]? There are plenty of superb human news readers, easily accessible via television or radio, or via internet radio" [App. 123]. (There are some designers who argue that we are becoming very close to being able to replace the human face realistically in films and in advertising, Weschler 2002.)

There also are more generalised, less concrete fears of contagion (cf. Douglas 1966) and dystopias. The following article from January 1996, although not specifically about replacement, references fears surrounding the "millennium bug" (the feared year-2000 computer crash that never came to pass) in addition to a specific computer/blood fear of contamination. There is intermediacy in the sense of enmeshment regarding this curious juxtaposition of computers and human blood: "£400bn fear as computers head for the disaster of the century: A BIZARRE technological hitch is threatening to create global computer anarchy in 2000. Because the date ends in two noughts, computer systems may have to be reprogrammed from scratch at a potentially huge cost. [...] potentially catastrophic implications for the billions of pieces of numerical information processed by computers each day. Any computerised storage facility, for example, involving anything from food and drink to supplies of human blood, might reject items dated '00' on the basis that they long ago reached the end of their shelf life." [App. 101].

Interestingly, in 1997, the computer Deep Blue beat for the first time a human chess champion (Campbell *et al.* 2002), and that widely reported occurrence in the late 1990s might, along with social instability (signalled by pathogen fears via the "millennium bug" prominence), might have been enough to induce the infrahumanist attitudes found in my year-2000 results (we apparently were still bristling over the humiliation in this mixed coding from 2005: "They beat us at chess. They make better LBW [cricket] decisions than us. And they even milk cows faster than we can. Are there any Man v Machine challenges left that we'd back ourselves to win these days?" [App. 157]).

Just as philosopher Klaus Theweleit likens the machinised male bodies of the Third Reich directly with fascism (1989), scientists Nicholas Bostrom (author of *Superintelligence: Paths, Dangers, Strategies* and *The Future of Human Evolution*) and sociologist Nikolas Rose also theorise the potentially fascist qualities of machines, and even the dangerously machine-like qualities of human beings: "dystopian scenarios where freewheeling evolutionary developments, while continuing to produce complex and intelligent forms of organization, lead to the gradual elimination of all forms of being that we care about." (Bostrom 2004:339); "biogenetics, in combination with genetics, still judges human life and worth, in so far as it intervenes upon the chances of life *in order to eliminate differences coded as defects*" (Rose 2006:55, emphasis added).

6.1.9. Cognition and Safety

In 2014, a think-tank co-founded by Skype founder Jaan Tallinn was organised regarding “existential threats” to humans from artificial intelligence (AI), a group supported by theoretical physicist Stephen Hawking. Some ethicists such as Nicholas Agar also have weighed in reservations regarding human enhancement (2010). In early 2015, Tesla Motors founder Elon Musk donated \$10 million for research into safety precautions for potential superintelligence, and so such fears are palpable even in the scientific community (*The Week* 2016). It could be argued that, due to the use of computer modelling in both the hard and social sciences, machines are already predicting (and controlling) future human behaviour in terms of social policies based on machine-output (Pettinger 2015). Some researchers, such as Joshua Fox and Carl Shulm, argue more optimistically that evolutionarily supported patterns of reciprocal altruism might likely be the result in artificial “superintelligence” as well – though perhaps only if we purposefully design artificial intelligence to work in this manner (2010). (There also are references to “superstupid” machines, this one from an AI researcher at MIT: “What we’re doing every day is producing superstupid machines that make mistakes”, *The Week* 2016.)

We caution ourselves constantly – correctly – regarding the safety of our tools and, more specifically, the tools we call machines: “Daedalus uses his wings carefully and flew to safety. Icarus, however, takes too many risks, reminding us of the importance of using new technologies appropriately.” (Sargent & Topiwala 2012). We fret – correctly – over the harm and changes we have caused our planet via our machines in such a short time (Kolbert 2014). Certainly, there are many aspects concerning technophobia that can be compared to standard human hard-wired protective/prejudicial attitudes, as seen in the discussions above. There is a clear survival mechanism that can be seen in human distaste for machines “taking over”/encompassing the human in terms of both high cognition and other “human” abilities (coded in the articles as “machine enmeshment”: “Meantime, cities will be [...] be hi-tech, multi-cultural and probably much more dangerous places [...] a world of screen and image, in which everything – education, entertainment, shopping – will be easily accessed. Because of the technologies we’re letting into our homes now, the homes of the future will leak freely into the wider world.” [App. 114]). Or we have infiltration uneasiness concerning humans encompassing machines, as in “blood article” [App. 101] already noted. We have fears – maybe valid ones – about genetically modified organisms (Dona & Arvanitoyannis 2009), but also likely in part a result of a natural-unnatural dichotomical category formation.

6.1.10. Changing Goalposts

Just as Schoenherr and Burleigh argue that it is unfamiliarity that drives the uncanny valley, rather than cognitive bias (2015), neuroscientist Ayse Saygin *et al.* concluded one study on human

reactions to humanoid robots by suggesting that our perceptual systems eventually might be re-tuned by familiarity with artificial agents (2012). As the North African Roman comic playwright Terence put it: “ ‘*Homo sum: humani nil a me alienum puto*’: I am a man: I count nothing human foreign to me.” (Terence 163 BCE) – perhaps this inclusive attitude will expand even as the definition of “human” changes.

Certainly, rats exhibiting death-avoidance behaviour can be trained to find death-associated scents sexually attractive (and even preferable, Pfaus *et al.* 2010), so we might exhibit similar flexibility. Some designers of artificial intelligence suggest that humans are prejudiced against machines, invoking a concept called the “AI Effect” of discounting machine intelligence by arguing that it is not genuine (human) intelligence (Hofstadter 1979, Kahn 2002, McCorduck 2004). The AI Effect sounds very close to the anti-animal/ape/hominin infrahumanisation efforts discussed in the previous chapter: “It’s part of the history of the field of artificial intelligence that every time somebody figured out how to make a computer do something – play good checkers, solve simple but relatively informal problems – there was chorus of critics to say, ‘that’s not thinking’.” (McCorduck 2004:204).

6.2. Cyborgs and Human–Machine Intermediaries as Non-Kin: “Invisible Worms”

Fig. 20. Under the mask: © “Dark Horror Sci Fi Cyborg 3d Cg Digital Art Robot Mask Face Alien Futuristic – 1280”.

“The most serious thing mechanical exposure has done is to take not only the secrets but the mystery out of life, to trivialise it and reduce human intercourse to the status of an e-mail. How dull it would have been if Romeo had no balcony to call up to, but could have corresponded in comfort by computer. Mechanical communication also brings about a language which is dry and meaningless. [...] Measuring love by computer size is hardly like wishing your lover cut out in little stars ‘so all the world will be in love with night’. The poet William Blake wrote about the ‘invisible worm’ that can find out the ‘bed of joy’. The invisible worm is floating on every airwave. It can be bought in any High Street and is being hailed as the great advance in civilisation.” [App. 100]

In terms of discernment regarding what is human, and similar to the patterns seen here regarding cyborgs and what we shall shortly define as transhumans/posthumans, computational

psycholinguists Feldman and Griffiths have measured boundary patrolling using a Bayesian mathematical model in discerning human speech; they call it a “perceptual magnet effect”, but we can also recognise it as what we have previously described as infrahumanisation concerning great apes and hominins, as well as disenfranchised human social groups and the machine-based AI Effect: “The identification function is changing most rapidly near category boundaries, in areas of highest uncertainty, resulting in greater perceptual distances between neighboring stimuli near the edges of phonetic categories.” (Feldman & Griffiths 2007). Exactly such ambiguous territories are where we find our cyborgs, be they linguistic, mechanical, gender-based, sexual-orientational or animal, and where we find our own tension regarding such categories.

6.2.1. Crypticity

Fig. 21. “Uncanny baboons”, to which baboons reacted negatively; image taken from Steckenfinger & Ghazanfar 2009: “Monkeys, they found, are also unsettled by images that are realistic but synthetic” (MacPherson 2009:2).

Cyborgs are individuals part machine and part human: hybrid individuals (or objects, if you prefer). The in-between state between robots and humans (between humans and machines; between life and vegetative states; between unnatural and natural), they are therefore, potentially, a threat in terms of alliance. In multiple films and television shows, the idea of partially human (or undetectably non-human) infiltration of the human ingroup is rife: the film *Blade Runner* (dir. Ridley Scott, 1983), with cryptic cyborg replacements so human that it is not even clear to themselves whether they are robots or not potentially triggering a filmic replacement fear-rooted Capgras syndrome (Feinberg 2001); the 2004 re-booted TV series *Battlestar Galactica* (prods. Ronald D Moore & David Eick), with cybernetic spies, the majority of whom are not only successfully passing as spies, but also intent on destroying humanity; and the British TV series *Humans* (creators Sam Vincent & Jonathan Brackley, BBC, 2015-ongoing), with conscious and feeling “synth” replacements for humans causing marriage problems. These three are well known amongst many other examples, including the portrayal of *Star Wars* villain Darth Vader. There are in my sampled articles multiple references analysing and reflecting the ambiguous nature of the cyborg, such as this: “Cinema's first bionic woman [‘Maria’ in

1924's *Metropolis*] has since inspired numerous malevolent metallic villains, sometimes representing contemporary fears about dehumanising technology, sometimes male anxiety about female liberation." [App. 171].

These are theoretical-only cyborgs, undetected as mechanical by others and sometimes, as in *Blade Runner*, even unto themselves. As with cheater-detection systems evolved to ensure fair play and honest signals regarding who is "human" or belonging to one's ingroup and who is not, the dis-ease in trying to work out which cyborg is "fake" and which is not follows suit, not only fictionally or philosophically in films and books, but also socially in "real life". The uncanny valley comes into play once more; Mori was the first to label it so, but the concept of uncanniness and dis-ease in regards to potentially-fake others has been referred to before by Freud ("unheimlich": 1919) and by others even previous to that (Saygin *et al.* 2012). The uncanny valley – or infrahumanisation, or the AI Effect – is the point *before* we start regarding intermediaries as potential kin, where uneasiness and perhaps even repulsion regarding the "interloper" are at their most potent (Feldman *et al.* 2009). Human replicas are almost, but not quite human. In terms of real-life cyborgs, then, the valley would be the dip in comfort that results between a) our reactions to clear robots with whom we are fairly comfortable; and b) perfectly undetectable human replacements (comfortable once again, Mori 1970). The cyborgs are ambiguous and potentially indiscernible (as with fictional cyborgs: replicants, third-wave Cylons, "synths"). It is worth mentioning that no "real" cyborgs have so far have passed an hour-long in-person Turing test (though a computer achieved 33% convincability in a chat-only algorithm in 2014, *Guardian* 2014), unless you include humans with bionic parts such as pacemakers or prosthetics. We consider these humans as humans, just as we would likely do for a human with a minority of transgenic animal parts when we are the transgenic human in question. The machine-contextual uncanny valley very probably uses similar mechanisms to infrahumanisation responses that concern visual appearance, vocal cues, haptic response, predictability, agency attribution and olfactory signals – the closer you get but fall short, the more tightly drawbridges will be drawn up against you (Feldman *et al.* 2009).

It is unlikely that we have hard-wired (I note the irony of the term) fears of machines *per se*, or even hard-wired fears of the appearance of (microscopic) viruses and bacteria, those "hidden invaders in our bodies" (Ju 2015), but even though we generally do not have a scientific robotics, bacterial or virological understanding in our evolutionary mechanisms in terms of our reasoning minds, it doesn't mean that said minds aren't adapted to function that way in regards to object predictability (potentially in terms of niche protection) and pathogen avoidance (possibly in regards to mortality salience/danger). For example, it is easy to understand that there would be strong selective pressure for pathogen avoidance and predictability discernment in olfactory, visual, aural, haptic and taste sensing, even if our hominin ancestors did not (and we do not, mostly) understand the precise mechanisms of virology, epidemiology, "agency detection systems" and the theorised Person

Perception Network (facial recognition). Nor is this just a robot-theory abstract thought experiment. We can see these fears of machine-mixing in my own results (*Fig. 2(B)*; *Tab. 11*). As there is evidence that non-human great apes and other social animals such as corvids and elephants (Bekoff 2007) have an awareness of their own mortality and form biological categories (Vonk 2013, Tomonaga & Imura 2015), it is not then surprising to discover evidence of the uncanny valley in other primates such as baboons, suggesting an evolutionary root to the behaviour (Steckenfinger & Ghazanfar 2009, cf. *Fig. 21*).

Suggestions for design principles that allow designers or animators to avoid the uncanny valley “problem” have been proposed, including the matching of human (or robot) traits within the robot, such as the avoidance of photorealistic human skin texture with non-human facial proportions (MacDorman *et al.* 2009) or anthropomorphised cartoon characters (Polo 2010, Brown 2011) – or sometimes to embrace the purposeful use of such uncanny traits in appearance and sound to invoke strong fear reactions in horror films (Tinwell *et al.* 2010). The discomfort regarding “mixing” human and non-human morphology studied here clearly adheres to psychologist Susan Gelman’s theories of discomfort regarding category mixing between natural kinds (Gelman 2003).

6.2.2. (Un)Controllability

That which is binary and visible might be considered safe, and that which is unseen but-still-experienced-as-uncanny might be reacted to more like “viruses” and uncontrollable pathogens. We see uneasiness regarding crypticness in the imagined-future art exhibition *2050* which took place at the Royal Museums of Fine Arts of Belgium in Brussels (2015), which had both dystopian and utopian elements in terms of the blending of humans and technology that reflected our ambiguous attitudes towards infiltrative states. We see it in racial attitudes towards bi-racial American president Barack Obama, a living, salient reminder of mixed “races” that many (though not biologists) consider discrete biological categories (Morgan 1999, Azoulay 2006, Jayaratne *et al.* 2006, Sinyangwe 2012).

Not only does the (sometimes) embodied film/book/game cyborg or purely theorised cyborg threaten infiltration of the human ingroup (visible as well as invisible; external as well as internal), but there also exists an association between femininity and cyborg states/wildness/animality (Haraway 1991, Plant 1996, Roylance *et al.* 2016) and things which cannot be controlled (Theweleit 1987, 1989). The machinised body more often is correlated to masculinity (*Ibid.*), yet in the sampled articles and in wider research (cf. Toffoletti 2007, Richardson 2015), it is the feminine state or the sexy female robot that is referenced (“the first screen robot, a kind of female Frankenstein’s monster that takes on human form as ‘Maria’, a seductive siren to the rebellious slaves of *Metropolis*” [App. 171], and usually negatively (though still sexualised). So perhaps it is not the machine body *per se*, nor even what novelist Isaac Asimov called a fear of mechanical humans (“the Frankenstein Complex”,

Warrick *et al.* 1978), but rather the uncontrolled and cryptic nature of a wild cyborg (read: predictability). Females are generally more cryptic in bodily processes and sexual stratagems (Hrdy 1981, Eberhard 1996, Jones 2002); one posthumanist writer, Kim Toffoletti, argues that (female) Barbie dolls' embodied plasticity makes them conceptually cybernetic and fluid (2007). Such crypticity mimics nature, for there are multiple behaviours in nature that remain cryptic to the very actor, such as (usually) cryptic ovulation in human females (Hrdy 1981) and cryptic choice that takes place within a woman's Fallopian tubes. Females often are considered more animalistic than males as well and are dehumanised – potentially also due to association between females and reproductive functions such as breastfeeding shared with other animals (Roylance *et al.* 2016).

That which cannot be controlled – even an infiltrating, theoretical cyborg – is always suspect (Theweleit 1987, Haraway 1991, Bryson 1998). Haraway characterises negatively dichotomised reactions towards cyborgs (whom she triumphs) in her work *A Cyborg Manifesto* as being directly related to this intangibility, complementing Gelman's research regarding the invisible qualities of essentialised categories: "Our best machines are made of sunshine; they are all light and clean because they are nothing but signals, electromagnetic waves, a section of a spectrum, and these machines are eminently portable, mobile [...] People are nowhere near so fluid, being both material and opaque. Cyborgs are ether, quintessence. The ubiquity and invisibility of cyborgs is precisely why these sunshine-belt machines are so deadly. They are as hard to see politically as materially." (1991:1664). See this "hidden" quality too in the sampled articles: " 'When you first find a huge new threat it's very exciting, but we also track lots of smaller, stealth viruses which can steal your online banking details or harvest your email addresses.' Orla trawls through blogs and underground forums used by hackers and fraudsters and plants 'honeypot systems' – virtual versions of unprotected computers – in cyberspace to catch viruses." [App. 190].

6.2.3. Enhancement as Foreign

There are humans with contact lenses, tooth fillings, pacemakers, wheelchairs, cochlear implants, bionic eyes and hip replacements, all of whom can be considered to be cyborgs "out of necessity" in a wider sense (yet rarely labelled as cyborgs), and then there is another type of human cyborg who starts out human and becomes something else by choice: the theorised transhuman, the technologically modified human. There is a well-known philosophical movement built up around future modified humans becoming (transforming into) something qualitatively different, perhaps even superhuman (Kurzweil 1998), a movement spearheaded by philosopher Max More, gerontologist Aubrey de Grey, academic Cary Wolfe, cybernetics professor Kevin Warwick (famous for implanting a microchip in his forearm), computer scientist Ray Kurzweil and robotics scientist Hans Moravec. It is a philosophical movement that is heavily criticised by people such as Bostrom, computer scientist

Bill Joy and primitivist author John Zerzan, who argue that such blind optimism regarding human–machine blending is dangerous. Self-described futurist writer Jamais Cascio theorises a second uncanny valley, where technologically modified humans (“transhumans”), once having attained verisimilitude, begin to veer away from “normal” human variability, and are again considered non-human, with potentially negative reactions once again (2007). These individuals would no longer be humans (beginning point) or transhumans (in flux), but posthumans. *Posthumanism* too is a philosophical movement, used in this sense in the transhumanist context and most championed by the above-mentioned Max More and Cary Wolfe, as well as futurist author FM-2030 (birth name: Fereidoun M. Esfandiary). Posthumanism can be distinguished from transhumanism in the sense that it is the “next step” – an arguable alterity (or at least spectrum). Saygin *et al.* and Cascio have theorised that once mid-process transhumans (or in Saygin’s study, androids) pass the clearly “non-human” state and enter an “almost-human” category they are judged by the implicitly higher standards of humans, not robots (Cascio 2007, Saygin *et al.* 2012) and subsequently are found lacking, thus the uncanny valley.

6.3. The Mechanised Human as Foreign: “Leaving the Real World for the Damaged Virtual”

Fig. 22. Dissociation: image taken from “Trauma and the Freeze Response: Good, Bad, or Both?” © Psychologytoday.com (Seltzer 2015).

“Yet people do not seem to realise that those [social-networking] sites can only make initial connections; they cannot begin to develop the depth of real friendships, of real connectedness. It’s as if we’ve partly left the real world for the virtual. And it damages us.” [App. 169]

6.3.1. Dehumanisation and Objectification

Scottish philosopher Thomas Carlyle lamented already in 1829 that: “[H]abit regulates not our modes of action alone, but our modes of thought and feeling. Men are grown mechanical in head and in heart, as well as in hand. [...] – for Mechanism of one sort or other, do they hope and struggle. Their whole efforts, attachments, opinions, turn on mechanism, and are of a mechanical character.”

(Carlyle 1829). Humans treat other humans as objects, oppressed humans whom also can be considered to be tools (read: machines): this is seen in the lack of activation of the medial prefrontal cortex when engaging with groups stereotypically considered "low-competence" and "hostile" (Harris & Fiske 2006). Humans dehumanise most those other humans who they stereotypically associate with incompetence and hostility, such as the homeless and drug addicts (Harris & Fiske 2006). In this study, the medial prefrontal cortex was not activated when considering those groups, suggesting that the participants treated the homeless and drug addicts as objects but not persons, an extreme form of dehumanisation. Directly after viewing pornography, heterosexual males assess real women not as persons but rather objects – this effect is highest in men self-rated as sexist, who attribute less intentionality and agency to the females (this study was not done on straight women, gay men, lesbians or bisexuals of either gender) (Fiske 2009). Attitudes regarding less-human "savages" still exist today, of course (Saminaden *et al.* 2010). In a study by Capozza *et al.*, progressively morphed human-ape faces were judged human (or not) when told that they were members of a cultural outgroup, and that study not only found that humans protect the humanity of their ingroup more than that of an outgroup by avoiding what the article authors describe as "animal contamination", but that "individuals may have stronger associations between outgroups and animals, than between ingroups and animals" (*Ibid.*:778), and, indeed, "outgroup humanity is not protected: a portion of animality within its members is accepted" (*Ibid.*:782). In this study, unlike others, participants were slower in categorising ambiguous faces in the outgroup, which the authors suggest might be due to trying to control the "inclination to include these still-animal faces in the outgroup" (*Ibid.*:783). Controlling prejudice in itself in an interesting exercise, as the authors further point out.

To attribute or force automation in others – be it via voluntary or conscripted military automation or dehumanisation of groups/individuals – implies this very same deindividuating mechanism: we consider other humans to be tools available to work *en masse* (or individually as a sole object) for the aims and purposes of other agency-attributed human beings (ourselves, the most "human" humans, cf. Haslam *et al.* 2005, Loughnan *et al.* 2010) or cause (Theweleit 1989, Johnson 2010). Slavery is an obvious example (Spinney 2014). Although the oppression of humans as slaves is not inevitable, there are multiple automatic responses or modes in humans such as prejudice and dissociation that likely are hard-wired that allow us to reduce uncertainty and cognitive load; psychologist Donald Broadbent called this a *filter model of attention* (1958). In addition, we can become "social machines": we can train ourselves to have new automatic responses to new stimuli and, more depressingly, we can train other humans to act automatically for our benefit (Pavlov 1927) – essentially "acting like machines", known as *classic conditioning*.

6.3.2. Cognitive Dissociation and Rejection

We see some of this dissociation via references to automatised behaviour in the mixed codings: "A

band who have essentially made themselves into robots seem perfectly suited for a film about humans becoming trapped inside a videogame. The premise – that the boundaries between the real world and the virtual world are blurred to the point of non-existence – is so commonplace these days it almost seems facile.” [App. 182].

Our bodies are capable of rejecting physical prostheses and transplants at quite deep and varied levels of immune-system-based bodily rejection (Belperio *et al.* 2009), but we also can reject such mechanical extensions on psychological levels as well, such as when disabled children and disabled adults prefer their own, non-normative bodies over prostheses, or when a transplant hand is psychologically rejected by its new owner due to not feeling correct (Feinberg 2001); or when a prosthetic hand is similarly psychologically rejected, citing lack of need amongst other reasons (Østlie *et al.* 2012).

We also can dissociate from our behaviour– the act of dissociation implies cognitive automaticisation, and also the loss of a sense of a unified self, a trespassing of “natural” boundaries. We can reject embedded parts of ourselves when they don’t feel natural, as in this sampled article: “Electronic tags turn workers into robots says union [...] many are not prepared to co-operate and are resigning, some within hours of being told to wear tags.” [App. 148].

Here we see a classic example of infiltration fears, where the metaphorical technology (here, satirical) invades our personal, singular bodies and is enmeshed: “it was plain from the tone of the report that the technology of *Fantastic Voyage* has now become a reality within football. The practice of shrinking the Jonathan Barnetts or Eric Halls of this world down to germ-size and then pumping them into footballers is clearly so widespread as to pass without explanation or comment. We have all heard of super-agents, now it seems we are entering the infinitely more disturbing world of the micro-agents.” [App. 145].

In a very different context – but still related in terms of dissociation – sometimes we reject our original limbs even when they are not physically damaged (Feinberg 2001). We can have a distorted sense of where our own, self-conceptualised body belongs. Such dissociation, including prosthetic rejection, has social implications, making us feel like remote avatars from our own bodies (*Ibid.*).

As noted, automatic behaviour (and associated deindividuation and dissociation) tends to have a low cognitive load (Bargh 1994). For example, dissociation is high amongst first-person video gamers, particularly during violent games (Hartmann *et al.* 2014) – gamers experience higher levels of dissociation or justification of violence when conceiving of mental states in others. We also often dissociate (and dehumanise) in order to *inflict* pain as well as to endure it (Schulz 2007), and dissociation and automatic behaviour are found in trauma victims and victimisers alike. The gaming dissociation, however, is likely not only due to the mental negotiations of violence, but also the lack of agency – in some senses we are experiencing other people’s envisioned “reality” rather than

imagining when we play video games or watch films. In radio, fiction and storytelling and even in some hallucinogenic drug experiences such as MDMA (as opposed to methamphetamines, see Price 2014), our capacity to mentalise and empathise likely is still activated due to greater agentic possibility. It has been argued that the internet increases dissociative behaviour (Kraut *et al.* 1998, Moody 2001). In terms of virtual friends via online social networks, the *Daily Mail* reported, even as virtual closeness has increased, a recent algorithm that Facebook used to make personalised “friends” videos for users was not very successful: “Facebook users have even reported that they barely knew some of the people featured in their Friends Day collages [...] researchers [...] found that the social network can lead to depression” (Zolfagharifard *et al.* 2016).

There are counterarguments, however, suggesting that completely immersive first-person games show raised levels of happiness precisely *due* to the control allowed by first-person gaming (Allison 2001, Konnikova 2013) and that virtuality creates social connection (Morris *et al.* 2002).

As suggested above, psychological rejection of physical prostheses (bodily extensions, by default mechanic) may be a sign of *high* self-esteem and a self-acceptance of a different kind of body: “complex prostheses [...] were developed for the children born affected by the drug thalidomide [...] attempting to replicate the ‘normal’ body – at the expense of functionality. Many children rejected these devices, preferring instead to adapt it to their own particular bodies, demanding that wider society accept them as they were born.” (Sargent & Topiwala 2012). Why do we adhere, or aspire to adhere to, a “perfect” Plato-esque prototype of what a “natural” human body looks like in the first instance?

Yet we do conceptualise our own bodies/minds and those of others, even in virtual senses, which can lead to its own set of problems. Cyber-relationships (relationships conducted primarily electronically, via virtual extensions such as the internet and telephones: prosthetically extended), long-distance relationships negotiated via email, text and Skype (or even old-fashioned letters) share common features in that idealisation about the absent, partially imagined partner occurs at quite extreme levels (Stafford & Merolla 2007). Such relationships tend to break down once the couple is permanently reunited in “real time” (*Ibid.*). Theories as to why this occurs conclude that it is the not just the loss of touch and real-life contact (Dunbar 2010) and masking of “honest signals”, but also the overabundance of intimacy, potentially over-mentalised, which creates false, later disappointing conceptualisations, and a disconnect between the individuals as conceptualised whilst virtual and the reality when geographically proximate (Stafford & Merolla 2007, Jiang & Hancock 2013) – this may relate back also to the objectification mechanisms described above in terms of visual pornography (in addition to acting as an enhanced masturbation tool, visual pornography can effectively act as a proxy sexual relationship).

Imaginary friends have been observed long-time in humans (Klausen & Passman 2006). One modern, embodied example is the virtual girlfriend called Love Plus+ for the Nintendo console gaming system, sold exclusively in Japan. This involves the funnelling of the human body into sex with a haptic machine that stimulates and mimics sexual functions. There might be potentially maladaptive consequences, though not probably in the long run, even though this level of sex/emotional female proxy-use is seen as a social problem (Hay 2015): if such Japanese males aren't reproducing, then whatever tendencies have led them to potentially maladaptive behaviour, such tendencies, if inheritable, won't be passed down, as the ones reproducing with females will be those who desire to have "real" sex (it is interesting to note that a subset of online pornography, "interactive" real-time online pornography, is considered by many to be "real" cheating whereas non-interactivity is not as often judged to be so, cf. Ben-Zeév 2008). The same worries of "replacement" (we see the same machine-theme rise up again) have been expressed regarding females preferring vibrators to penises, or sperm banks to fathers – the latter behaviour is, however, highly adaptive (even more so if there is alloparenting present). If pornography drives males to have *more* reproductive sex (as vibrators and orgasms in general, for example, seem to do with females, Hebernack 2009), then the behaviour is decidedly not maladaptive. If not – nothing to worry about in the longterm view, as the population will generationally favour males who eschew solely virtual girlfriends. This does not stop Japanese (or Western) hand-wringing over the concept of one's (sometimes extended, virtualised) self engaging in emotional or sexual bonds with machines (Hay 2015). Perhaps with some validity, as in industrialised nations we recently have been engaging even non-sexually much less directly in social terms and much more by way of proxy, be it via smartphone or internet (Turkle 2011).

With the virtual extended self, once "conditioned" or not, via new technology or not, we experience a separateness from our behaviour (specifically, a dissociation from the consequences of our actions) when we kill remotely (Morral 2006). This was anticipated already in the work *A Cyborg Manifesto*: "modern war is a cyborg orgy" (Haraway 1991), but certainly expanded upon in recent years by targeted satellite bombing enabled by drones in warfare. Comparisons in modern warfare have been made in terms of "playing a video game" (Brown 2013, Shaban 2013, Democracy Now 2015) (though sometimes the arguments are rejected, Blackhurst 2012; cf. Allison 2001).

Similarly, it has been repeatedly shown that when humans "like" (support) political causes on Facebook, for example, this has little correlation with whether they donate to those causes – direct (and tangible) mail campaigns have far higher returns in terms of charitable donations) (Lewis *et al.* 2014). Perhaps, as with the similar detachment in remote drone killings in war (Morral 2006), where we don't take in our actions of killing or bombing thoroughly, we also are not committed when we engage in abstract-heavy, imaginary spaces (such as reacting to worldwide-scale disastrous events on social networks, Zandt 2012). We may feel that we have done something in a virtual space, yet

the effect is little. We may not feel as if we have done something in virtual space, yet the effect is great. We are automated: mechanically dissociated. We are bodies divided from our heads, the same embodied Cartesian dualism that allowed for historical concepts of mechanical human and non-human animal bodies.

6.4. The Mechanised Human as as Integrated Being:

“Hypnotic Interactivity, Startling Beauty and Revolutionary Science Fiction”

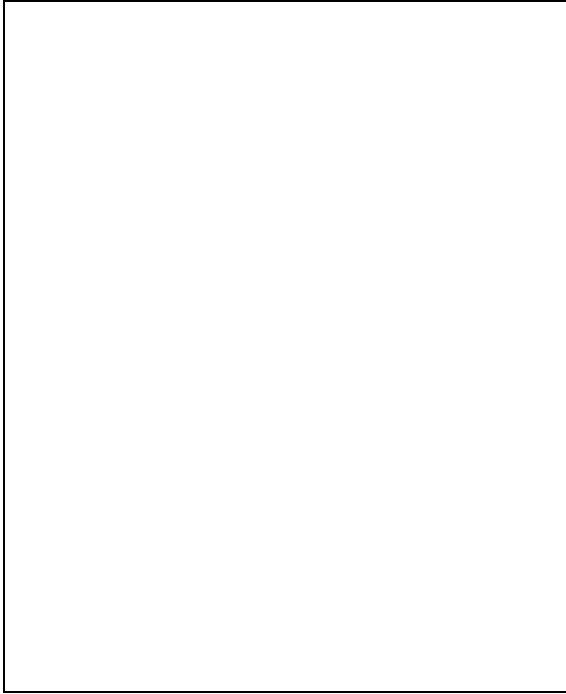


Fig. 23. Top, L-R: Nirenberg's improved retinal prosthetic; current retinal implant (Nirenberg & Pandarinath 2012); Bottom: Decorated prostheses © The Artificial Limb Project.

“[T]hese hypnotic, interactive games – which encompass romance and humour as well as violence – have changed perceptions of what narrative and drama can or should be. [...] And sooner or later, one hopes, the greatest human imaginations will seize on the potential of the microchip and create something startling, beautiful and original out of a medium that presently seems useful but prosaic.”
[App. 135]

6.4.1. Virtuality

In 1995, there is quantitative (Fig. 2(B) and Tab. 12) as well as qualitative evidence of positivity regarding digital, immersive virtual reality – it is new and exciting, and multiple articles reference it. Long before digital virtual reality, Western culture has told the story of Icarus and his mechanised wings (ca.50 BCE). And long before that, likely the last common ancestor of all the great apes, including humans, used tools (Carvalho *et al.* 2009), a form of mechanisation. Humans plausibly always have yearned for and been excited by such extensions of their physical body, be it via pacemakers or the possibility of out-of-body experiences, hallucinatory drug-trips or even via smart

drugs, which 10% of Cambridge students currently use for concentration during their studies and exams (Sargent & Topiwala 2012).

We have a history of virtuality via theatre and storytelling, experiences that before the written word also were ephemeral, and now in a digital context have differing materialities than text (itself a visual experience). The virtual world is not new, and is shared by other primates who have their own imaginary worlds (Goldman 2013, Gómez & Martín-Andrade 2005), and by the fact that most mammals appear to dream as well (Langley 2015), an exercise in nightly virtual reality that we all experience.

Our early cave art shows creatures who break the laws of physics in hybrid ways – a lion-woman from 40,000 BCE, a stag-headed man from 13,000 BCE; similarly, in 1995, we grew excited at the thought of embodied human–machine hybridity: embedded computers in our clothing and integrated eye software chips; and excited by intermingling via virtual reality in terms of interactive CD-ROMs, the internet and VR (virtual reality) experiences. We had previously experienced fictional, im/possible realities via novels, paintings, plays, photographs, sculptures, films, schizophrenia, hallucinogens, meditation, dreaming (children as young as five understand that dreams are not “real”, Meyer & Shore 2001) or, for the gifted, lucid dreaming, where one is conscious during the dreaming state. Micronesians historically (and likely prehistorically) use phantom islands to navigate whilst sailing (known as the islands of Etak), an abstraction of virtual reality with highly functional navigation purposes (Abramson & Holbraad 2014). Indeed: “Scientists have long speculated that the act of seeing things in our mind’s eye employs some of the same brain circuits that we use when seeing with our physical eyes” (Zimmer 2010:1). Some have argued that mental time travel is a human exceptionalist quality (Redshaw 2014), though this is unlikely due to ToM and mentalising capabilities in other species. We have cross-cultural concepts of disembodied selves and “souls” (Metzinger 2009). We attribute agency to fictional people and beings, including gods who can read our minds (Dein & Cook 2015). As noted, we usually only show outgroup favouritism to (conceived-of) gods, with some exceptions of outgroup favouritism by minority ethnic groups directed towards majority culture (Demoulin *et al.* 2008, Haslam *et al.* 2008). We experience extensions of ourselves that do not exist, such as phantom limbs (and occasionally even supernumerary phantom limbs in addition to our original four, ones that have never existed or received sensory input, Khateb *et al.* 2009). Our concept of our self is not bound by our corporeality (Feinberg 2001, Metzinger 2009).

Digital virtual extensions of ourselves experiencing different types of “reality” changed things: we were freed from dead tree pulp or the purely subjective; we could interact and make (facsimiles of) free will (particularly in closed-set worlds such as CD-ROM); we could in theory come very close to the computer designer’s intended reality. Indeed, this would fuel our intentionality intersection with the designers: in virtual reality we would literally see what another person saw. Indeed, I observed many positive references to the possibilities of virtual reality in the 1995 sampled codings.

There have been other manifestations of interactive virtuality: the rise of the world wide web and the internet, which allowed for a virtual extension of reality and a theorised “flow” between the boundaries of humans and machines (Argyle & Shields 1996, Bryson 1998); reactive media that can “link films and music to devices that capture small changes in our emotions” (Kirke 2014:1); virtual interactions via iPhone apps for long-distance couples that allow them to “kiss” by putting their thumbs on the same spot of their screens to make it buzz (Kessler 2012) (something attempted but not achieved by the filmic device of subjective realism, Bryson 1997); and the recent augmented reality of the 2016 videogame Pokémon Go, as viewed through one’s smartphone camera (Dayus 2016).

Some writers such as Maria Konnkova argue that first-person-perspective games – where the avatar is not seen, but we are experiencing through their “eyes” (perspective), such as flight simulators used to train airline pilots, allow us more agency and therefore are life enhancements (2013; see also Allison 2001). There also is the concept of the previously-referred-to “flow”, where the best gamers enter a trance-like, automatised state (Smith 1981), just as individual virtuoso piano players do (de Manzano *et al.* 2010). The idea of the virtual extended self is now so taken for granted that access to the internet is considered a human right alongside safety and freedom from torture (Wagner 2012).

6.4.2. Enhancement, Extension and Integration

As noted, like virtuality, human enhancement via tools is no new invention. We are dependent on tools and help from other humans or dogs to survive as adults in the “wild”. Chimpanzees and other non-human great apes also are dependent on tools – e.g., they build sleeping structures every night of their lives. Excitement regarding tools is exemplified in the sampled articles, including biotechnology, bionics and the concept of the self as an integrated machine. People have a pleasure response to new inventions, not just apprehension, yet we reacted with excitement and novelty-thrill in 1995, and fear/repulsion to equally exciting refinements such as the internet ca.2000. We remained excited by bionicity and prosthetics, however (and indeed always have been excited by helpful extensions in a personal self-enhanced context, as with the previously mentioned contact lenses and pacemakers, arguably cyborg forms of humans), especially those that replaced lost sight, hearing and limbs, or eliminated colour blindness (*New Scientist* 2013). By 2005, though, I observed positively framed recovery in the 2005 sampled articles towards even non-useful intermediaries (“the melding of man and metal”: App. 156).

New bionic eye projects such as Second Sight were being developed towards the very end of the 16-year time period surveyed; and improved cochlear implants appeared for the deaf (provoking in some cases reactions *against* prosthetics for fear of threatening deaf community cohesion, Bradshaw *et al.* 2010). Artificial sight projects appeared, such as Sheila Nirenberg’s bionic eye that

allows neurons to be controlled via gene therapy (Swaminatha 2011, cf. *Fig. 23*). Our concept of prosthetic limbs was expanded conceptually via imaginative new programmes such as the Artificial Limb project producing highly artistic and aesthetic prosthetic limbs (*Fig. 23*). Further extensions such as the PR2 robot enabled “a quadriplegic man [to] move objects around his house, control a mouse and even scratch his face” (Biever 2012:1). Debates took place over whether athletes should be allowed to use prosthetics, or use electrode-booster training with lasting positive after-effects (Zimmer 2011), with the implication that the augmented human was the “improved” human. I reiterate that when cybernicity is advantageous, we do not react negatively.

Still, we think of cyborgs as other than ourselves. As noted, as soon as we are personally cybernetic, we remain human; it is the others who are more-machine, e.g., mechanised clothing is enmeshment – clothing is personal and “part of” an individual: therefore a prosthetic (yet the self remains essentially “human”). Similarly, encompassment/enmeshment by a life-support machine is often described in very positive terms, which make perfect sense – these tools literally save human lives. Here is the inverse, a positive, personalised and life-saving example of “infiltration” of a human by a robot: “[a] robot that will use cubes a tenth of a millimetre in size and could be introduced into the human body for delicate operations. He said: ‘Robots could go into your brain cells or they could cut out cancers, cysts, or stop internal bleeding.’ ” [App. 106]. Though negative (here, sarcastic) reactions towards machine enmeshment still exist in either direction: “NO WONDER ILLITERATE YOUTH TURNS TO CRIME [...] Adidas unveiled an ‘intelligent’ running shoe, costing £175 a pair – apparently this must-have footwear contains a ‘brain’ which reads the terrain you run on.” [App. 146].

Thus, when machines offer us entertaining novel experiences or lifesaving functions (just as when non-human animals do via bioresearch), we like them, and sometimes we happily modify our own bodies to become more mechanic, e.g., tongue augmentations – termed “augmented reality” – that allow an individual to sense the Earth’s magnetic field (*New Scientist* 2013). The 2000s experienced the rise of the do-it-yourself “grinder” cyberpunk/biopunk lifestyle movement, where individuals modified their own bodies (and those of other species, cf. *Fig. 24*) with augmentations, known as *biohacking* (CBM 2012).

Fig. 24. A genetically modified bioluminescent rabbit as “art” raised biotech issues: “GPF Bunny” by © Eduardo Kac 2005.

Biohacking aka “grinding” can be understood in the context of the “Morphological Freedom Movement”, which posits generally that one has the right to modify (or not modify) one’s own body (Sandberg 2001), which can be related to species dysphorics and otherkin previously discussed, as well as those who seek to modify their biological sex, which will be discussed in the following chapter. This is what Nikolas Rose terms “somatic individuality”: “[e]xercise, diet, vitamins, tattoos, body piercing, drugs, cosmetic surgery, gender reassignment, organ transplantation” (2001:18); and what transhumanist Max More described as “the ability to alter bodily form at will through technologies such as surgery, genetic engineering, nanotechnology, uploading” (More 1993:16).

6.4.3. Transhumanism

This concept of biologically modifying and prosthetically extending one’s body is directly related to *transhumanism* (“the idea that we can become more than human by using technology” (Sandberg 2012:30) and *posthumanism* (the type of being that results *after* transhumanist changes).

Transhumanism tackles questions directly related to evolutionary theory: “Do we actually have to age? Do we actually just have to have this level of strength and dexterity? Wouldn’t it be a good idea to have extra arms? Wouldn’t it be a good idea to have perfect memory?” (*Ibid.*:31). UK philosopher Bennett Foddy believes people will shortly be living 120–150 years, on average (Sargent & Topiwala 2012). He points out that modern medicine not only has extended human life, but human youth – in a species potentially already retaining multiple paedomorphic (juvenile) morphological traits such as larger eyes, hairless faces and lack of a baubellum/baculum (clitoral/penis bone) compared to other great apes (Gould 1996). In addition to morphological freedom for the adult individual, there is the

concept of the “genetic supermarket”: the idea that parents might pick and choose – and modify via genetic engineering – particular qualities for their infants, echoing discussions surrounding eugenics (cf. Nozick 1974). Excitement reigns similarly for virtual as well as bodily extensions: “2020: you’ll be able to point your phone at almost anything and become an expert on it in seconds. Imagine hearing a political speech, for example, and being able to verify the truthfulness of the claims in real time. [...] Gamers across the world will link up online, playing against each other using their brain cells rather than the fast reflexes of their thumbs.” [App. 179].

Counterarguments towards this positivity have been spearheaded, as noted, by philosopher Nicholas Bostrom and some disabled communities (Bradshaw *et al.* 2010). The latter argue that the very concept of “improvement” is a form of body fascism, i.e., presuming there is only one approved way (prototype) to look or be.

In terms of natural selection, some proposed transhumanist modifications – perfect memory being one – might not be to our advantage, for remembering trauma and even self-delusion can be useful to an individual in functional evolutionary terms. Neuroethicist Julian Savulescu takes the transhumanist aims even further, suggesting that evolved mechanisms towards selfishness could be removed via genetic engineering (Persson & Savulescu 2012, Savulescu 2012). Even if possible (likely not: we know little regarding gene manipulation and behavioural causality, and much behaviour seems to be related to multiple alleles), this would result in reciprocal altruism and human cooperation disappearing as well, for there would be no advantages in being cooperative in such systems where “social cheaters” thrive (and such cheaters would appear; that is the nature of selfish organisms, Stephens 1996). Yet Savulescu is explicit in his philosophy: “It’s important to realise that evolution distributes characteristics among humans. [...] Unless you believe that evolution provided just the perfect number of sociopaths in our community and just the right level of selfishness within different individuals, you should believe that we should change that natural distribution for the better and use science to do that. For those who are skeptical about making humans morally better, at the very least we should try to reduce the distorting influences and also the natural inequality in moral capacities that already exist.” (2012:41).

Although it can be strongly argued that the level of sociopaths and altruists is eventually adjusted for in cooperative societies (Trivers 1971, Stephens 1996), there is some evidence that we can create large-scale cooperative systems in already social animals (Sapolsky & Share 2004), as long as such systems come with excellent cheater-detection and deterrent mechanisms. I agree with Savulescu’s last sentence in the cited paragraph above and will address this directly in the overarching chapter that ends this thesis.

Clearly, Savulescu’s positivity regarding the transformative qualities of moral modification highlights some similarly (often post-millennial) optimistic tones observed in the wider media and in the

sampled articles regarding personal transhumanism, personal prosthetic augmentation and personal responsibility.

6.4.4. Bionic Superheroes

As with the Human–Animal dichotomy, the terms used are significant. “Bionic man” or “bionic woman” – no doubt related to the popularity of 1970s TV shows *The Six-Million-Dollar Man* and *The Bionic Woman* – nearly always are positive assessments, even in this “Mixed” article: “Children won’t carry bulging satchels, because all their school textbooks will be available at the touch of a screen. There will be problems in this electronic, bionic nirvana. Implants will help foreign correspondents get the story swiftly and discreetly – but there won’t be many who will go for an optic nerve camera fitment.” [App. 133]. Bionic humans are superhuman superheroes (Haslam *et al.* 2008): for example, Iron Man, a Marvel superhero, needs his artificial heart (and enhanced suit) to survive and flourish (Sargent & Topiwala 2012) and this is an integral *part* of his superhuman persona, not a caveat.

The ever-growing popularity of the Paralympics and the 2012 Superhuman exhibition dealing with prosthetics (and other extensions of the human body) at London’s Wellcome Museum are examples of this. General UK attitudes towards prosthetic limbs and bionicity before and after the 2012 London Paralympics were vastly different (DWPODI 2014). This makes sense, as mainstream culture would not have been threatened due to the fine UK Olympics – as well as Paralympics – performances, and therefore the non-disabled public would be – and was – magnanimous: “More than two-thirds of people believe attitudes towards disabled people have improved since the Paralympic Games in 2012, a survey has suggested. But while 68% held this view, only 56.1% of the disabled people questioned agreed compared with 70.7% of non-disabled people.” (“Paralympics ‘transformed attitudes’ towards disabled people”, BBC 2014). Attitudes towards Paralympic and Olympic South African champion sprinter Oscar Pistorius, found guilty of his girlfriend’s murder also are revealing, i.e., Pistorius is treated as representative of *all* disabled people and deindividuated due to stereotyping, rather than a murdering individual like other murderers (Davis 2014) (admittedly, I here may be essentialising the concept of a “murderer”). Attitudes also have been implicitly different towards him in association with his stumps – suggesting bodily divergence from a prototype – as opposed to his (superhuman) prosthetics (Corrigan *et al.* 2010). The loss of Oscar Pistorius as a role model aside, there is a mainstreaming of positive sentiment towards other prosthetically/bionically enhanced humans since 2012 (BBC 2014).

Positive-shifting attitudes towards machination and bionicity is but one way in which we have favourable concepts of ourselves acting mechanically: another example is our attitudes towards the way we synchronise when cooperating (or not cooperating) within a group, such as in the collective

behaviour of multi-player online gaming. Media theorist Marshall McLuhan spoke already of the concept of interconnectedness, interactivity and global villages in his 1962 work *The Gutenberg Galaxy*, envisioning a future where humans are connected by electronic technology (he saw this change as neutral and sometimes positive): “The next medium, whatever it is – it may be the extension of consciousness – will include television as its content, not as its environment, and will transform television into an art form. A computer as a research and communication instrument could enhance retrieval, obsolesce mass library organization, retrieve the individual's encyclopedic function and flip into a private line to speedily tailored data of a saleable kind.” (Getto 2015:1).

6.5. Cyborgs and Human–Machine Intermediaries as Kin (Sometimes):

“Electronic Helpmates”

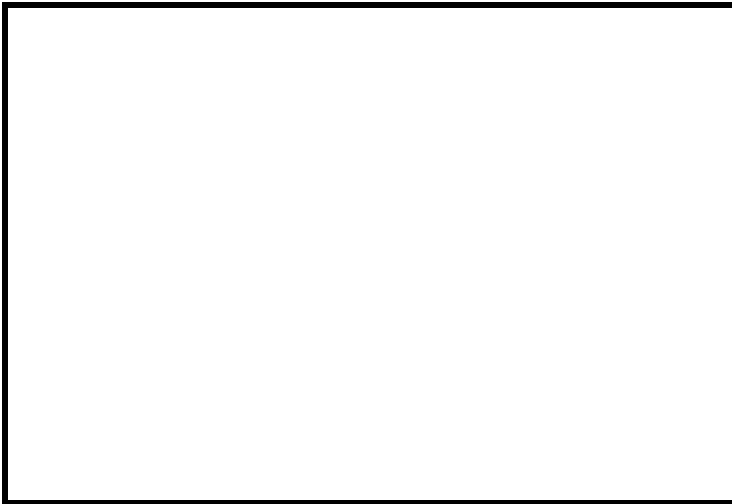


Fig. 25. Superhero, supercyborg: © www.comicvine.com.

“Kevin Warwick, Professor of Cybernetics at Reading University implanted a chip into his left arm. The device linked his nervous system to a computer and allowed him to manipulate household items. [...] It is hoped the chip could help elderly people with a range of day to day tasks” [App. 156]

6.5.1. Helpful Part-Humans

Cyborg is a hybrid category and that means positive associations too, despite attitudes regarding infiltration previously detailed. Christians conceive of Christ as hybrid: half man and half god – certainly, in any case, as the ultimate *deus ex machina*, which means the unexpected intervention of a higher power, usually in fictional or filmic terms, and translates literally as “god from the machine”, a concept first conceived by Ancient Greeks (Chondros *et al.* 2013). Indeed, we believe in supernatural beings in the same way as we ascribe agency to machines (Epley *et al.* 2008). We can see them as superintelligent while not necessarily being entirely human. Humans, furthermore, have

often conceived of themselves as a hybrid state – British prime minister Benjamin Disraeli speaking in 1864 said, “Is man an ape or an angel? My Lord, I am on the side of the angels” (Dennett 1996) – so this metaphor is not new for us.

As with positivity towards useful animals (cf. Walsh *et al.* 2009) and useful human–animal hybridity via xenotransplantation, we sometimes have favourable associations in the general media towards useful cyborgism – potential infiltrative “cuckoos in the nests” that instead end up helping humanity, such as with reproductive technology: “Egg on a microchip [...] a chip that allows hormones and nutrients to flow over eggs the same way rivers flow over rocks [...] a 70 percent success rate in the pigs eggs he tested – a huge jump from the fertility rate achieved with the standard method. [...] a Japanese team has managed to grow uterine cells on their microchip wombs to make the eggs feel even more at home.” (Vance 2008).

We see this reflected in the sampled articles, even when the human is entered by machines, either literally or figuratively: “An end to open heart surgery: The technique involves pushing a hollow tube called a catheter through the femoral vein in the groin and up towards the heart.” [App. 154]; “ ‘Antibodies are formidable molecular war machines. It now appears that they can continue to attack viruses within cells. This research is not only a leap in our understanding of how and where antibodies work, but more generally in our understanding of immunity and infection.’ ” [App. 175].

There is the highly beneficial aspect of enhanced long-distance communication. When we engage in long-distance relationships with our loved ones or acquaintances on Skype or on the telephone, we act as if the person is real, though interacting with a computer-negotiated representation of them. It is interactive, but also partially imagined (the counterargument to the “risks” of idealisation might be that even in “real life”, all relationships are imagined as per ToM).

Being able to see things from more than one perspective has been argued to be of political and social usefulness (Davis 1983, Crenshaw 1989, Haraway 1991), and the ambiguity tolerance shown in my results, particularly the changes in human–machine ambiguity tolerance from 2000 through to 2010 (cf. *Fig. 2 (B)*, *Tab. 12*, *Fig. 4(B) & (F)*, *Tab. 16*, *Fig. 6(B) & (F)* and *Tab. 23*), has positive social effects, as seen with ambiguity-tolerant medical students who humanise patients to a greater degree than the non-ambiguity-tolerant (Wayne *et al.* 2011). As discussed, machination combined with the human body is an almost-universally-desired trait when “bionicity” is invoked or observed. In *A Cyborg Manifesto*, Haraway, who not only theorises (non-human) apes as a hybrid state between humans and animals (1989), also argues that (modified, either physically or socially) *humans* might be considered to be the cyborg entity between animals and machines): “a cyborg world might be about lived social and bodily realities in which people are not afraid of their joint kinship with animals and machines, not afraid of permanently partial identities and contradictory standpoints.” (1991:154). (It also could be said that Haraway human-exceptionalises via this positioning.)

The humanity afforded to the cyborg (or replicant) state is shown in these two following sampled articles. Even though both were coded as “negative”, this is mitigated by sympathetic attitudes towards human elements (though not towards machine parts, and not necessarily towards the holistic cyborg entity), perhaps an admittance of (partial) kin-connection: “the best science fiction movie ever made, *Blade Runner*, featured flesh-and-blood artificial humans implanted with real memories – and emotions” [App. 402]; “The Dalek’s lament, ‘I. Am. Dying. I welcome death’ could have been as poignant as, say, Rutger Hauer’s demise in *Blade Runner* and HAL running down in *2001*” [App. 150]. Here, an android is approved of precisely because it fights the (more machinic) “evil” robots: “Passable animation about an android called upon to defeat an evil robot. Great for kids.” [App. 180].

6.5.2. Intersectionality and Integration: Open Borders?

Are there partial identities and increased physical hybridisation between humans and machines these days? Transhumanist writer Zoltan Istvan argues yes, citing the invention of 3D printers that allow for better-scanned robotic hearts and other human organs (2015); cognitive scientist Margaret Boden argues no – she does not believe in an extended mind or that robotics is substantially different than cultural difference, and anticipates no singularity (2015) – a *singularity* understood here as the sudden acquisition by machines of superintelligence causing runaway technological changes (Eden *et al.* 2013).

In terms of practised (as opposed to theorised) cybernicity, there is certainly more general virtualised behaviour in optic terms, as with video-based live online chat functions, but then again, we have had telephones for 140 years, and we mentalise our telephone conversations: perhaps one of the reasons it is dangerous to drive vehicles even while talking hands-free is that there is cognitive load in imagining the facial reactions of our virtual telephonic partner, mentalisations that we don’t engage in if the friend is sitting next to us in the car (Strayer 2006). Here we observe again a possible conflict between a “natural” state and masked signals. Newer video technologies such as Skype (a program which introduced video telephones to the wider public) and FaceTime that enhance long-distance communication also are argued to allow “too” much connectivity to long-distance relationships (read: lack of idealisation) (Dockterman 2014).

Via virtuality, our invisible boundaries and extensions in hybrid forms are explored, as they are in political and philosophical arenas as well (Haraway 1991). In “real-life” cyborgism (often “helpful”), we see that two of the most well-known positive examples of visible extensions are physicist Stephen Hawking (who is in a wheelchair and speaks with a mechanical voice due to his disease, ALS), and robotics scientist Kevin Warwick, who has implanted several interactive devices into his flesh to re-create himself as a cyborg (“Humans have limited capabilities. Humans sense the world in a

restricted way [...] [C]an this be improved on? Can we use technology to upgrade humans?”, Warwick 2002:2). The “cybernicity” of both men has transpired via different routes – one through necessity and one through choice, but both have ended up with potentially superhuman, non-“normal” human bodies. Yet even superhumanism has its downsides, as even such superhuman beings are pushed away by distancing mechanisms, and not always seen as fully human (Haslam *et al.* 2008).

Cyborgology, according to theorists Gray *et al.* (1996), involves invisible (virtual) and visible extensions (prostheses) alike, although a research team led by communication studies academic Thomas Corrigan argue that effectively many disabled people feel unified and integrated with wheelchairs and artificial limbs, and so these elements might be less prosthetics and rather more extensions of the self (Corrigan *et al.* 2010; cf. Metzinger 2009, Feinberg 2001). We certainly consider individuals such as Hawking and Warwick human, perhaps even superhuman, as noted above (Corrigan *et al.* 2010). We emphasise difference in generally admiring or curious ways (though for Hawking, as with the media reactions to Paralympic athletes, the framing is usually in the sense of having “overcome” an ordeal, cf. *Ibid.*). Though we humanise such celebrity “cyborgs”, cybernicity itself often is deemed negative – in the Corrigan paper, the simple fact that an athlete such as (pre-murder-trial) Pistorius was associated with cybernicity meant, in the eyes of the authors, that “prominent cyborg imagery further marked Pistorius as deviant and even dangerous” (*Ibid.*:290) – this was the starting point of the journal authors’ argument, rather than the conclusion.

Following on from Haraway’s “female cyborg” positing, the rise of intersectional theory also could be argued to be related to cyborg – or at least hybrid – concepts. This is the study of overlapping identities such as race, ability/disability, sexual orientation, religious views, etc., which then are viewed through an analytical lens that takes into account theories of oppression: the parts cannot be separated from the whole when looking at an individual’s social identity (Davis 1983, Crenshaw 1989). Similar to attitudes espoused towards bisexuals and multi/bi-racial individuals (Simal & Marino 2004, Chong 2013, Hayfield *et al.* 2014), those with multiple political identities have been criticised for lack of allegiance to a specific category (Haslam 2002).

This disavowal of cybernicity also is seen via the AI effect, where, as mentioned, as soon as a machine nears human behaviour, we move the goalposts. Similarly, when we intermingle with machines (e.g., artificial heart valves), we continue to define ourselves as fully integrated human beings, and the embodied machine gets cognitively left behind. All cyborgs (not just superhumans, but *all* enmeshed or extended bodies) are indeed *part*-human, and usually *mostly*-human, and, as with non-human animal kin, if we extend our ultrahumanisation to cyborgs, we can potentially treat them – the *whole* of them, their machine-and-human selves – as kin as well. Evolutionarily speaking, to any given human individual – the self notwithstanding – kin and friends are the most useful humans of all.

6.6. Machines and Non-Organic Matter as Kin (Sometimes):

“Fabricated and No Less Gorgeous for That”

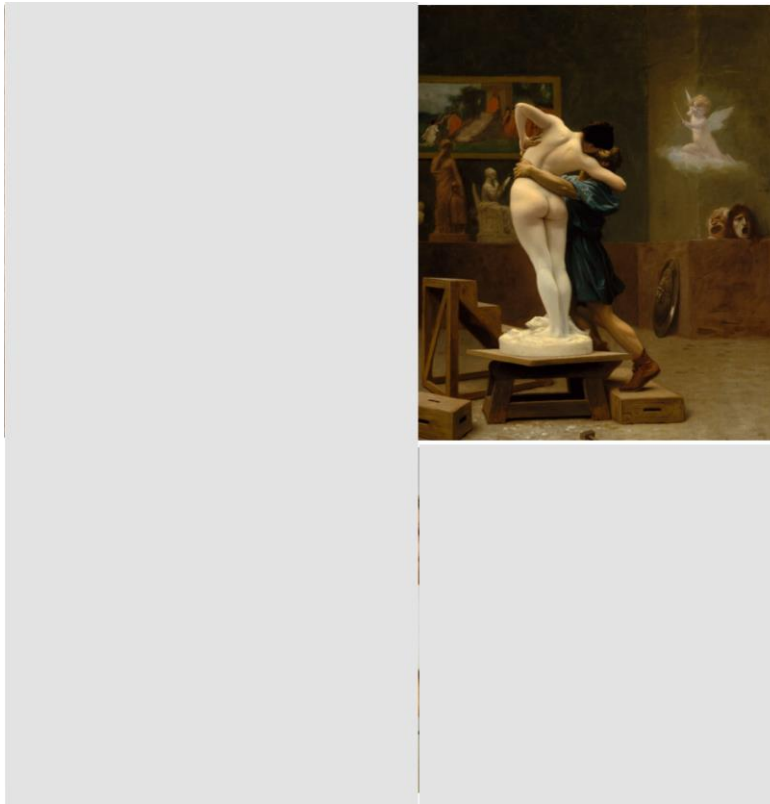


Fig. 26. Top, L–R: An outlier illustration of an eroticised male robot intended for human female pleasure, © Blutgruppe Corbis; “Pygmalion and Galatea”, portraying the myth of the sculptor who fell in love with his female sculpture, which then came to life, by Jean-Léon Gérôme, ca.1890. Bottom, L–R: Robot mother and human baby, © Shutterstock; Pastiche of family life incorporating a robot child, © “Plastic Pals”; Real-life commercial family robot Jibo, designed to avoid the uncanny valley (Brown 2014).

“Cancun is an entirely preplanned and man-made destination. The water is without embellishment, as is (or was) the sand. The rest? Legend has it that Cancun was selected for development by computer, then planned and executed equally as systematically. [...] Like any good boy band, Cancun was fabricated but is no less gorgeous for that.” [App. 188]

6.6.1. Helpful Machines

Similar to attitudes towards cyborgs – with whom we at least share a part-human kinship, attitudes not necessarily to the cyborg’s benefit, as noted – we react most favourably to our gorgeously fabricated machines when they – in addition to appearing different to humans – exhibit helpfulness and usefulness: “Another advantage is that the computer picks a truly random set of [lottery] numbers – something experts say humans are incapable of doing.” [App. 108]; “ASSID is a marvel. It lists the lesson plan, records instantly who is absent, and enables the teacher to score attitude, behaviour and homework.” [App. 153]. Such helpful machines are those that use depth-sensing and motion-capture, along with facial analysis and voice recording, to analyse cues towards human

emotional states: indeed, these computers are able to identify the correct emotions in schematic stick figures 61.3% of the time – humans clock in at 61.9%, only fractionally better (Hodson 2014), with the aim to develop software that helps autistic children read the emotions of other children correctly. Computers work as “friends” here: computers essentialise, then translate emotions back to autistic humans (with potentially sinister surveillance aspects hinted at too, via the accurate remote machine-reading of human emotions and intentions). There still is resistance, however, to concepts of self-flying aeroplanes (this aversion is practically moot: autoflight computer systems are now installed in all jets and used at least some portion of the time, cf. Smith 2011) and self-driving cars (*The Week* 2016), perhaps due to human control issues in terms of agency connected with movement. (June 2016 recorded the first machine-error death in a self-driving car, Vlasic & Boudette 2016.)

In a medical context, realistic-looking infant dolls recently have been used with dementia patients with positive effects in behaviours such as improved eye-gazing and care-giving (Pezzati *et al.* 2014), and robotics anthropologist Kathleen Richardson works with robots for assisting people with autism spectrum disorders (Byrne 2011). There is usefulness promoted in terms of childcare and petcare, invoking a fictional kin (alloparent) role: “an app that turns the Nao into a storyteller for children and one that can enable the Nao to recognise when a pet’s dish is empty and refill it with food.” (Biever 2012:1).

Still in advantageous mode, virtual autopsies (“virtopsies”) with whole-body surface scans and MRI scanning of the cadavers have been developed – perhaps, one might think, we can use such methods and machines to help us with our own mortality salience issues. The opinions in the *Guardian*’s comments section following a 2013 virtopsies article are rather telling in terms of replacement (technophobia) and pro-technology public attitudes (technophilia): “I think it will be a long time before this machine replaces the forensic pathologist, and the traditional autopsy. Being able to see an injury ‘in the flesh’ gives the pathologist a better idea how it was caused. Seeing it on the screen just wont [sic] be the same.” (“David Higham”); “For god sake David Higham read the damn article, which utterly SLAUGHTERS every word you wrote. They are pretty clear: this technique [sic] is dramatically better (as in ‘B-E-T-T-E-R’, see?) than the naked eye, NOT worse! I’m thinking you might be late to your own recent appointment with a mortician! (“scientific”); “How does the machine know the body’s dead?” (“VSLVSL”) (Connolly 2013). It appears we still have a way to go in terms of dealing with our own mortality salience, even when machines are doing the “dirty” work.

6.6.2. Humanising Machines: Helpfulness and Agency

When we think of “helpful tools” in a very wide sense, in terms of childbirth and the future of humanity, human mothers are generally dependent on human tools, aka midwives – or at least friends or kin – when giving birth (Hrdy 1999). When raising the offspring, often fathers and closely

related kin and friends help: alloparenting. When the alloparents are not directly related, are we objectifying or dehumanising other (usually female) humans as “tools” here (as meerkats do, who may force help [Kutsukake & Clutton-Brock 2006: but see Santema & Clutton-Brock 2012]), or are we, with a more positive interpretation, engaging in symbiotic, synergistic and socially cooperative reciprocal relationships? Could not the same be said for “artificial” reproductive methods and such machine assistance? What, indeed, would be considered to be an adaptive attitude towards tools? We *personify* tools: human anthropomorphism of tools has a long history, judging by cross-cultural material culture, which suggests that it is the norm for human beings (Waytz *et al.* 2010b). When technological objects such as alarm clocks and cars are designed with human forms or human faces, we endow them with more human qualities (Waytz *et al.* 2009). We anthropomorphise cars, for example, possibly due to the “eyelike” feature of an automobile’s headlights (Kühn *et al.* 2014). Yet the authors point out that “brain regions that have been associated with thinking about beliefs and mental states of others [...] do not seem to be related to anthropomorphism of car fronts” (*Ibid.*:1), which echoes the previous studies discussed such as the brooms in *Fantasia* (Harris & Fiske 2008) and reduced agency attributions towards females viewed in pornography (Cikara *et al.* 2011).

Applying gender to artefacts (cf. Berg & Lie 1995), arguably, is a way of humanising artefacts (but also stereotyping artefacts’ “behaviour”), so salient here are gender and the acts of personifying and humanising (or potentially *dehumanising* according to gender, as previously discussed). Similarly: “Attributing intent is not reserved simply for targets that people generally believe have internal mental states, namely human beings. Indeed, other species do have personalities and are attributed dispositions” (Harris & Fiske 2008:210; cf. Gosling 2001, Gosling *et al.* 2003). People generally believe dogs and cats (and probably other primates) have internal mental states as well, while not attributing to them full agency (cf. Bekoff 2007; see also Griffin 1976, Dawkins 2012).

Humanisation of machines and part-machines is possible, but – currently in the West, in any case – subhumanisation is more likely.

Machines often are seen as potentially “smart” (and perhaps animals as “stupid”), but we dehumanise both categories. We subhumanise machines when they operate in more sexualised modes, as some males do to (presumably similarly intelligent) women. Empathy is not necessarily always emotional concordance, let us recall: we can understand the intentions of others whilst still not being sympathetic to their differentiated agency, such as with the Machiavellian intelligence exhibited by sociopaths (McIlwain 2003, Hackel *et al.* 2014; see also Oakley 2007). This is interesting when we reflect on the connection in amygdala responses and both fear and empathy responses in entire-object categories (such as an army of brooms) observed by Harris and Fiske (2008).

We also are somewhat biased in terms of *what* we anthropomorphise. The *endowment effect*

(Coombs *et al.* 1967), which occurs when we ascribe higher value to objects that we own, means that familiarity – metaphorical kinship, or perhaps usefulness – plays a role in anthropomorphising attitudes: “[o]ur own computers, cars, and even pens receive the endowment effect [...], and as such may not be especially emotionally arousing when anthropomorphized.” (Harris & Fiske 2008:221).

Anthropomorphism of the non-living is a very widespread phenomenon – merely thinking of inanimate “objects as alive makes people less willing to replace them” (Chandler & Schwartz 2010:138), especially amongst children, and children with imaginary friends are said to create richer narratives (Trionfi & Reese 2009). Adults are not immune to imaginal stretches. Keeping in mind the endowment effect, the anthropomorphism of tools in particular might be a survival benefit. As argued, we often positively conceptualise our own minds as tools as per cognitive psychology. For example, in the wider but unsampled press from the same mid-1990s time-slice when my own sampled articles began: “we jolly well know that we’re members of *Homo sapiens* [...] It’s this expandable capacity to represent reasons that we have that gives us a soul. But what’s it made of? It’s made of neurons. It’s made of lots of tiny robots. And we can actually explain the structure and operation of that kind of soul [...]” (Dennett 1996).

Here is another example from the wider unsampled press at the end of the time-slice my analysis surveyed, with an extreme and perhaps misguided optimism regarding real-life cyborgisation of insects, whom we have recently also started using as tools, including a disturbing allusion that one day humans also may be physically mechanised against their will. This potential unsavouriness is brushed aside over the excitement regarding “tiny flying robots” (note the reference here to “tiny”, just as in the above quote, and recall doll-arguments in terms of controllability): “Cyborg Beetles: Merging of Machine and Insect to Create Flying Robots. Tiny flying robots that are part machine and part insect may one day save lives in wars and disasters [...] Working out the details in insects first will help us avoid mistakes and false starts in higher organisms, such as rats, mice and ultimately people. And it allows us to postpone many of the deeper ethical questions about free will, among other things, that would become more pressing if this work took place on vertebrates. Developing cyborg beetles will not replace the fundamental pursuit of building synthetic robots (given that humans often build better machines than nature does), but the discipline of seamlessly merging the organic with the synthetic is only beginning.” (Maharbiz & Sato 2010:99).

6.6.3. Bridging the Uncanny Valley

There are therefore positive attitudes towards machines incorporating human (or another non-human animal, cf. Kac 2005, *Fig. 24*) elements in cybernetic states, though we do not often privilege the machine parts of our cyborg-selves as the transhumanists do. Positive reactions to the purely mechanic do not involve boundary patrolling, as more ambiguous hybrid states do (as per the

uncanny valley), and are much more common (Knight 2014). As with the morphed human-ape faces, we attribute humanity to non-human ambiguous faces more readily when our own ingroup is not “threatened” (Capozza *et al.* 2009).

Family robot Jibo (*Fig. 26*) was designed specifically to avoid distaste (Knight 2014). Some other popular robots do not resemble humans at all – these robots are not provoking uncanny responses and are reaping the benefits, as we react towards them in much the same manner as we might think protectively and affectionately towards cuddly pets: “Before iRobot introduced the Roomba vacuuming robot in 2002, focus groups imagined it would look like the Terminator pushing a vacuum cleaner – and told us they would not accept such machines in our homes. But when we showed them that Roomba was small, light and friendly, they loved it.” (Greiner 2012); “Larson strokes a finger across the phone’s touchscreen and an animated face appears. One end of the phone then rears up as the cradle splits into a pair of legs, allowing the phone-robot to wander around, cooing when people ‘tickles’ it and taking photos of faces using its inbuilt camera. ‘It’s a transformer!’ laughs one delighted hobbyist. ‘It’s Skynet,’ [conscious artificial intelligence system from the *Terminator* film series] breathes another.” (Biever 2012:1). Once again, as with animals (like sexist men who only show sexist attitudes when their status is threatened, Aasvold *et al.* 2006), we can be ultrahumanists and enjoy machines – perhaps even enjoying their artificial intelligence (computationalism) – when the category of human is not threatened. Harris and Fiske further suggest that the way in which we attribute stable traits to outgroup members “provides a link to the level at which people sometimes anthropomorphize objects.” (2008:211). This is interesting, as it suggests that stereotyping helps us simultaneously to dehumanise and also in a sense to humanise our ingroup and attribute objects with human traits (cf. De Dreu *et al.* 2015) – although, as noted, and as Harris and Fiske point out, this does not mean we consider such objects fully human.

Designers and engineers are aware of the importance of improving relations between robots and humans. An entire branch of computer science, *affective computing*, is dedicated to developing systems to both mimic and interpret human behaviour. Some designers and programmers argue that they *have* created aesthetically comfortable lifelike robots (Hanson *et al.* 2006). Many continue with the aim of replicating human movement (which stems from improving prosthetics for the disabled, as well as replacement in dangerous areas such as contaminated war zones) and human behaviour: for example, programmers are developing dancing robots (Biever 2012). Robotics scientist David Hanson (the same who eschewed uncanny valley theories) uses evolutionary psychology tropes to argue that we should use “hardwired” human aesthetic preferences in design: “It is well demonstrated that human aesthetic preferences transfer to nonhuman objects and beings [...] People are more kind and protective of other species that are baby-like in appearance [...] They purchase more clothes if worn by beautiful mannequins [...]. They more readily warm up to cartoons that are cute or beautiful [...] We expect that these universal neural-templates of beauty may make

robots more appealing too, regardless of level of realism.” (Hanson 2005:5). Here, Hanson theorises that human evolutionary preferences (contested, cf. Chapter 7) should be exploited in robotics technology (Hanson 2005, citing Eibl-Eibesfeldt 1970, Norman 1992, Etcoff 2000, Cunningham 2002).

The mortality salience issue is explicitly addressed by Hanson: “If robots get to the point where they seem alive [...] and are well designed to be friendly and cute, then people won’t feel like the robots are half-dead. [...] Removing these flaws and making them alive, friendly, and attractive, and I suspect the level of realism will not matter. [...] Ultimately, good design can help to make robots lovable and enter the human family.” (Hanson 2005:16).

Other designers attempt to emphasise the importance of re-creating the “internal” qualities of humans as well as the external ones: psychologists involved with cybernetics stress the six goals of artificial intelligence should encompass: “autonomy, imitation, intrinsic moral value, moral accountability, privacy, and reciprocity” (Kahn *et al.* 2006:364).

There are training sessions – “[b]rain training to build the robo-human bond” – which teach robots to individualise human behaviour, facilitating working together (Biever 2012:1). (I note that the training does not go in the opposite direction; there is no system for training humans to individualise robots, so the transhumanist vision of true reciprocity is not enacted here.) We see positivity towards this approach in the sampled articles: “[interface expert Jef Raskin] argued that existing ways of using computers are no longer acceptable and that it is time to develop new interfaces. He assembled a team to create ‘The Humane Environment’, a practical implementation of his principles, and established the Raskin Centre for Humane Interface.” [App. 401].

Mimicking human mental states is effective in terms of design: “[in cartoon animation theory] staring hungrily at a piece of cheese before grabbing it, say, creates the illusion of a thought process that makes a character believable. [...] onlookers were more certain of their interpretation of the robot’s behaviour if its action portrayed forethought. They also described the robot as more approachable.” (Biever 2012:1).

There are other designers who still are “robot-positive” but don’t feel our aim should be dancing robots: “Drop the gimmicks, focus on practical problem-solving, and robotics can change the world [...] As a result [of the Fukushima nuclear incident], many in Japan have questioned the nation’s research focus on singing, running and dancing humanoid robots [...] This is to be welcomed because at this point, attempting to duplicate human intelligence or the human form robotically is a wrong-headed approach. We already have about 7 billion humans on the planet and we are really good at what we do.” (Greiner 2012:1-2).

6.6.4. Effective Virtuality

Invisible boundary transgressions too are “improving” in design (read: getting better at mimicking humans). I observed descriptions of virtual newsreaders as more in line with animated characters with more-developed personalities (similar to the entirely-fictional mid-1980s “virtualised” British TV character Max Headroom); we also have the 1996 fictional barista character Dev Null, who interacted with a television computer news programme via a virtual-reality suit: the latter certainly is a cybernetic extension rather than an entirely-machine replacement. What is more, there are “pure” (as opposed to cybernetic) machines that have been programmed to interact in real time: the already-noted *chatbots* are interactive computer programs intended to simulate human conversation, and the most famous is ELIZA – who conversed as a psychotherapist – developed in the mid-1960s by Joseph Weizenbaum. As noted, a chatbot called “Eugene Goostman” recently managed to convince a third of participating judges of its humanity, effectively passing the Turing test for a sizable minority (*Guardian* 2014) – note the human first names for both chatbots. Some chatbot programs have been continuously updated over the years, e.g., the 1980s-created Virtual Woman software program – currently invoking replacement fears online by claiming that “Your girlfriend just got some competition” (CPS 2016). Such software manifestations are not cybernetic – though the human-interacting process might be – but rather entirely machines in their embodied or virtual state (at least post-programming). The popular (and sometimes unpopular, Parrack 2015) application Siri on Apple iPhones also functions as a chatbot as well as an information-purveyor and navigation device. Chatbots are “invisible” in much the same way that cyborgs are theorised to be – there is a hidden, closed-set program responding digitally to our prompts.

In a digital society – virtual money in terms of use of credit and debit cards, virtual books (*à la* Kindle), virtual music (*à la* iTunes and Spotify), are we as of late necessitated to believe more in the concepts of things – the essences of them – than the things themselves? Do the digital versions *become* the accepted essences? For example, is the experience of hearing music the “real music” or is it the sheet-music notation or even a tangible CD – or is this just a materialist attempt to essentialise an ephemeral experience? We can tangibly rid our living spaces of books, DVDs and CDs (Smith 2013). What if the essences are not “real” themselves? It could be argued that this mental negotiation towards digitality is also taking place in conceptualisations surrounding artificial intelligence: neurological studies suggest that we think of our favourite TV characters as “real” (Gardner & Knowles 2008). Do we credit AI as “real” intelligence or not? If we consider it rather to be programmed with rote responses, but discover that it seems malleable and flexible, does that make artificial intelligence more real? How big does the set of rote responses have to be to be considered “real”? Are we not ourselves as humans limited by rote responses in language and behaviour?

6.6.5. Fictional Kin

There are generational differences in how human–machine technology is conceptualised, particularly by the highly technological Millennial generation in the West, born roughly between 1982 and 2000 (Dalton 2012-2013, Serazio 2013; cf. Prensky 2001). Kurzweil in *The Singularity is Near* argues that technological progress has sped up in the last years at a remarkable pace (2006). Western Millennials are highly tolerant in terms of flexible human-, animal-, sexual- and gender- identities (Main 2013), and some may find it hard to conceive of any type of essentialism as anything other than prejudice. It is possible that this generational flexibility could extend to transhumanist or posthumanist part-machine individuals as well, eschewing the transhumanist conclusion described by philosopher Peter Baofu describes as “that the coming ethical issue is not the creation of so-called monsters, but what they characterize as the ‘yuck factor’ and ‘human-racism’, that would judge and treat these creations as monstrous” (Baofu 2011:156), with transhumanists arguing instead that “human clones, human-animal chimeras and uplifted animals [genetically modified, intellectually] would all be unique persons deserving of respect, dignity, rights, responsibilities, and citizenship” (*Ibid.*).

Studies support my results suggesting malleable categories and conceptualisations: as Pollick points out, we see cultural differences in attitudes towards robots as well as differing attitudes over one’s own lifespan (Pollick 2009, citing Kaplan 2004 and Turkle *et al.* 2006; see also Turkle 1984). We’re already “mating” (engaging sexually) with machines. As with animals – is this an acknowledgement of machine subhumanisation, objectification (“used” as sex partners) or machine agency? Perhaps we can extend our ultrahumanisation to machines, in the sense of the cognitive act of considering others to have “personhood” (human) traits (indeed, in January 2017 a draft detailing robot personhood rights was passed in the EU parliament, Hern 2017). Like animals, machines may be inadvertently triggering a “species” schema. Schema theory comes from the cognitive school of psychology and refers to the mechanisms via which we acquire and organise information (Bartlett 1932, Anderson *et al.* 1977; see also Piaget 1926): if we operate under such schemata – and similar to the other three dichotomies discussed in this thesis – the Human–Machine alterity seems flexible in terms of the actual schema *qualifiers*.

As noted, we sometimes think of pure machines as nearing human, perhaps much earlier than we can partially-human cyborgs, but we retain a certain scepticness, as seen here: “[D]espite the tremendous advances in computing technology in the past few decades, every all-purpose humanoid robot to date has been an abject failure compared with the fantasies of science fiction. The mechanical servant who will clean your home and do the ironing seems as far away as ever. As for a machine that can feel emotions and interact with people as an equal – experiencing hate, fear, love and even lust – no chance. So far, the most convincing robots have been children’s toys, such as the Christmas hit Robosapien [...] But these can no more fall in love or take over the world than your

video recorder. Nevertheless, there is an infinitely wide market for anyone who can crack the problem.” [App. 402]. Perhaps it is subhumanisation, after all, for we do not seem to care whether our mating “machines” (disembodied vibrators, pornography-dehumanised “characters”) experience on their parts “hate, fear, love and even lust” at all.

A recent study showed that humans *can* empathise with robots, particularly when they worry that robots can feel pain. The experiment compares empathetic reactions to pain applied to human hands and android hands (Suzuki 2015) – bear in mind the already-noted distinction between a more-complicated (but less inhumanising) uncanny valley reaction regarding mechanical hands as opposed to mechanical faces. That said, it is the first indication of strong empathetic responses from humans towards robots that matched responses towards conspecifics.

The *Daily Mail* gives a hyperbolic interpretation, asking its readers “Could YOU fall in love with a robot?” (Zolfagharifard & Prigg 2015). Maybe humans *can* fall in love with robots – again, at the same time perhaps not caring that the robot cannot fall in love with us, so in a sense we are not valuing the robot’s (lack of) feelings, as long as it suits our emotional needs.

Very young children do not show our full suite of machine prejudices (Saylor *et al.* 2010, Kahn *et al.* 2012), but it can be counterargued that young children have limited mortality salience as compared to adults (O’Halloran & Altmaier 1996). Additionally, young children also can seem apprehensive regarding robotic pets, treating them with a certain amount of agency as compared to stuffed toys. Although we may be treating non-humans such as animals and machines as outgroup members via a culturally taught “ethnic” (outgroup) schema (cf. Gil-White 2001) (likely due to associated movement), robotics theorists such as David Hanson and Cynthia Breazeal suggest that robots can become viewed as family (Hanson 2005) or that “friendly” robots can fulfil some family roles (Breazeal 2002). Perhaps due to hard-wired human kin-selection mechanisms, combined with the endowment effect, we potentially could come to see such robots as close kin, rather than merely sex/romantic partners/housekeepers to be exploited. Perhaps this could be accomplished via early exposure to kin-identified “mechanic humans” – e.g., quasi-family member Rosie the Robot in cartoon *The Jetsons* – using a similar reasoning that children who are exposed to varying ethnic groups as children are less racist as adults (Rhodes & Gelman 2009, Deeb *et al.* 2011).

6.6.6. (Un)Natural Selection?

With the possibility that we metaphorise concepts such as the singularity due to cognitive limitations, perhaps we do the same when thinking of the “evolution” of artificial intelligence, e.g., trial-and error algorithms based on natural selection. Writer Samuel Butler first wrote speculatively of machines potentially evolving along the lines of natural selection in 1863 in his article “Darwin among the

Machines” (Butler 1863), theorising that machines someday might outcompete *Homo sapiens* in terms of natural selection. That said, one reassuring theory (for us) suggests that rather than the horror-stories of machines taking over, that the likelihood is that converged artificial intelligence too will function along the lines of reciprocal altruism, whereby cooperative individual systems (and subsequently cooperation-rich groups/systems) benefit more in linked, co-dependent systems. If this is the case, and not just a supposition based on our anthropomorphisation of computer systems, perhaps Cartesian philosophy was on the right track, but got it wrong: rather than animals being machines, machines will need to become human-animalistic – using cooperative systems to have artificial intelligence thrive (more radically, perhaps such cooperation is not even limited to organisms). A paper by Zhao *et al.* experimented with artificial intelligence agents where, similar to mechanisms that promote reciprocal altruism in animals (including humans), relationships are not immediately severed due to lack of mutualism and where “the agent has a controllable rate of tolerance and is willing to grant favours for long-term return” – when these parameters were put into place, reciprocal altruism was “selected for” in artificially intelligent agents (Zhao *et al.* 2012:689).

However artificial intelligence develops, even if “cognitively” similar to cooperative organisms, it seems that there will be not-yet-conceived physical differences to which we as humans either will adjust, as the transhumanists hope for, or not. If we cannot adjust and overcome our machine-bigotries, we may build machines that mimic us as perfectly as we can construct them in physiognomic terms in order to not invoke uncanny valley responses, whilst perhaps still retaining unseen (and potentially deemed therefore suspect) differences. Or we may opt for the far-end of the Human–Machine alterity in terms of robots aesthetics: “perhaps, we will decide it is not a good idea to make them so closely in our image after all” (Saygin *et al.* 2012:422).

In any case – and for better or for worse – such future creations will not be anything like us. In the inverse of the bucolic nature envisioned in William Blake’s “Jerusalem” that castigated the “dark satanic mills” of the Industrial Revolution (“*And did those feet in ancient time, / Walk upon England's mountains green: / And was the holy Lamb of God, / On England's pleasant pastures seen! / And did the Countenance Divine, / Shine forth upon our clouded hills? / And was Jerusalem builded here, / Among these dark Satanic Mills?*”) (Blake 1804), the British indie band the Indelicates put the aims of transhumanism perhaps best in their song “Savages”:

"The Brave new futures we have seen / Filled with beautiful machines / Greener pastures, clearer skies / And not one such as you or I." (Indelicates 2010).

6.7. Summary

6.7.1. Infrahumanisation

- Perhaps general infrahumanisation is rooted in hard-wired niche protection, where we protect our environmental niche most from those “almost” like us – survival of the fittest forged against similar but not directly related rivals potentially may be manifested as border-control against intermediary states (animal or mechanical “sub”-humans).
- “AI Effect” that discounts machine intelligence (“computationalism”) by arguing that it’s not genuine (human) intelligence every time AI passes another “test” very close to infrahumanisation behaviour regarding non-human animal intelligence/abilities such as making tools, ToM etc.
- Similarly infrahumanist “Strong AI” (successful human mimicry as sign of “true” artificial intelligence) criticised on grounds that machines can be intelligent without operating as humans.
- Uncanny valley likely uses similar mechanisms to Human–Animal infrahumanist responses that concern visual appearance, vocal cues, haptic response, predictability, agency attribution and olfactory signals: cyborgs and apes, as liminal categories, trigger human hard-wired cheater-detection systems regarding who is “human”.
- Many aspects of technophobia correlate with standard human hard-wired survival mechanisms.
- Cyborgs invoke potential conflicts between “natural” states and masked signals.
- Applying gender to artefacts potentially humanises artefacts but also stereotypes artefacts’ “behaviour” – just because we have empathy towards objects, see them as intelligent or as having agency does not mean we see them as fully human.
- Fear/repulsion may be cognitive flip-side to sexual/emotional attraction.
- Breakdown of virtual relationships potentially not just due to idealisation, but also conceptualisation as long-distance partners as virtual beings, matching objectification mechanism patterns seen in use of digital pornography.
- We are “social machines”: we train ourselves to have new automatic responses to new stimuli and we train other humans to act automatically for our own benefit, though our capacities remain flexible.
- We dissociate from our behaviour, which implies cognitive automaticisation, and loss of a sense of a unified self.
- When we engage in abstract-heavy, imaginary spaces, we don’t accurately judge consequences of our actions.
- Humans treat some humans as specifically mechanistic objects.
- Discomfort regarding “mixing” human and machine morphology adheres to Gelman’s theories of discomfort regarding natural-kind category mixing.
- Multiple fear-of-replacement articles present in *Appendix A*, where the human ingroup is subsequently defended.
- Cyborgs = those other than ourselves: as soon as we’re personally intermingled, e.g., pacemakers, we remain human but others are part-machines.

- Fear of “cryptic” cyborgs associated with sexualised female bodies potentially due to association with female cryptic bodily processes and sexual stratagems; potentially also due to (cultural) association between females and (dehumanised) animality.
- Positive reactions towards the purely mechanic do not involve boundary-patrolling, and are more common than towards cyborgs.
- Distinction/social dichotomisation between cyborgs-by-necessity (“natural” cyborgs) and cyborgs-by-choice (“artificial” cyborgs) invokes natural/unnatural reactions.
- Non-human primates likely have symbolic “virtual” thought and mortality salience; they appear also to have a sense of uncanny valley/infra-“zoo”-isation and essentialism in regards to part-digital primates, suggesting evolutionary root to behaviour, e.g., perhaps useful in kin, age, gender recognition.
- Transhumanist dream of genetically modifying humans to lose their selfishness won’t work in long run, as we’re social animals who engage in mutualism and reciprocal altruism, not true altruism.
- If we cannot overcome our machine-bigotries, we likely will build machines that mimic us as perfectly as we can construct them in terms of physiognomy in order to not invoke uncanny valley responses, whilst retaining unseen (and potentially therefore deemed suspect) differences.

6.7.2. Ultrahumanisation

- Agalmatophilia (statue syndrome) not a rare paraphilia if we extend statue definition paraphilia to video, TV, film and comic book human representations.
- We’re already “mating” (engaging sexually) and potentially emotionally interacting with machines.
- We react most favourably to machines when they – in addition to appearing different to humans – exhibit helpfulness and usefulness via lifesaving functions or novel experiences (just as we like helpful non-human animals via bioresearch or entertainment).
- CD-ROM virtual reality and chatbots allow us interactivity and empathy with the designer’s POV but only facsimiles of free will in closed-set worlds – yet same could be said for humans in the “natural” world.
- If rats exhibiting death-avoidance behaviour can be trained to find death-associated scents sexually attractive, humans potentially could exhibit similar flexibility with mortality-salience reactions against machines.
- Very young children do not show full adult suite of anti-machine prejudices, but some researchers have counterargued that young children have limited mortality salience compared to adults.
- Cybernicity can take different routes, through necessity or choice – and can be considered “superhuman” (though not always fully human).
- Seeing things from more than one perspective – cyborg philosophy, such as intersectionality – politically and socially useful.
- If we get rid of tangible versions of books, DVDs and CDs and rely only on digital versions – we likely still will conceptualise such things even when the essences are not “real” themselves.
- Perhaps rather than animals being machines, machines will need to become human-animalistic

- using cooperative systems to have artificial intelligence thrive.
- Robots potentially can become parts of our family, perhaps due to hard-wired human kin-selection mechanisms combined with endowment effect.
- Cyborg is a hybrid category – if we extend ultrahumanisation to cyborgs, we can treat their *whole* selves as kin and thereby kin-link ourselves to machines via cyborg part-animality (“machine-adjacent”).

7. MALE-FEMALE: “PEACE BETWEEN THE SEXES”

7.1. Concepts of Gendered Objects: “Dressing Up in Women’s Clothes”

Fig. 27. L: Ms Male trope © Sarkeesian 2013; TR: Standard Ms Pac-Man and Pac-Man, image taken from Neave Classic Pacman – Flash Pacman © www.neave.com/webgames 2016; BR: Proposed gendered male Pac-Woman © the societypages.org.

“ ‘Drag ritual has evolved as an institutional performance genre in response to a core set of ambivalent conflicts in the culturally modelled subjectivities of gay men due to the psychocultural hegemony of hetero-normatives models of gender and sexuality.’ And we thought that these guys just liked dressing up in women’s clothes.” [App. 236]

In this chapter, we follow a strictly gendered route from binary-gendered objects to precisely gendered selves, then switch the focus and lift the magnifying glass away from ourselves in an expanded, postgendered framing.

7.1.1. Gender is Stable

The Male–Female dichotomy (*Fig. 2 (C); Tab. 12*) has little fluctuation except for a moderate increase in mixed results in 2005. Ambiguity tolerance has a non-significant dip in 2000 and non-significant subsequent recovery in 2005 and 2010. However, for the other dichotomies, (A), (B) and (D), we observe a highly significant millennial dip with corresponding recovery in 2005 and in 2010.

This strongly suggests the Male–Female dichotomy, and concepts surrounding it, is more stable than the other three (though still exhibiting the same, but much smaller, millennial effect). One potential

explanation is we are hard-wired to essentialise male–female distinctions. Gender differences might not be “real”. We *believe* they are. “Genderedness” is likely deep-rooted: a functional advantage in terms of reproduction/survival to distinguish such even in relatively non-sexually dimorphic species such as humans (Larsen 2003, Wade 2013a, Andrews 2016) – it may be even *more* important in non-sexually dimorphic species. Gender essentialism likely is shared by our closest non-human primate relations: chimpanzees, who also have low degrees of sexual dimorphism (cf. de Waal & Pokorny 2008).

Stable concepts are important from early childhood: that individuals retain essential qualities when transformations occur over time, such as caterpillars becoming butterflies (Gelman 2003). Gender constancy is more prevalent in older children (8-year-olds) than previously theorised by Piaget (Ginsburg & Oppen 1979) – very young children are more essentialist but use placeholder concepts (*Ibid.*, Gelman 2003, Taylor *et al.* 2009) – but essentialism is present throughout the childhood development process (MSRCD 2004a, MSRCD 2004b, Johnson *et al.* 2010, Kahlenberg & Wrangham 2010).

Gendered essentialism exists outside heteronormative contexts (Lick 2015, Kurdek 1994), indicating salience detached from biological sex, e.g., gendered lesbian concepts of butch-femme (Nestle 1992, Due & Burana 1994, Eves 2004). In prison, males cope more easily in sociosexual terms by taking a clear female or male identity (Fiske & Taylor 1984, Medin 1989) – expressly *not* ambiguous (Cabb 2008): “an openly gay prisoner, tells Louis how [...] [b]y plucking his eyebrows, wearing a bit of make up, and acting effeminately he (and others like him) are seen as ‘girls’ by the general population of his wing and are more likely to avoid the threats facing straight inmates” (Phil BC 2008:1).

Transgenderism in a Western concept includes *transsexuals* (surgery and/or hormones to physically change one’s biological gender) and those *transvestites* (exhibiting masculinity/femininity displays that do not “match” one’s biological sex, sometimes including drag queens and drag kings) who consider themselves transgender – not all do. It also can include those who call themselves *transgender* (considering oneself the opposite gender – or a continuum – of one’s biological sex); *gender non-conforming* (GNC, self-explanatory); *non-binary* and *gender-neutral* (rejecting physical and/or behavioural binarism altogether); sometimes *androgynous* (mixing so-called male and female physical and/or behavioural traits); *genderqueer* (subverting the same); and other terms such as *transfeminine*, *transmasculine*, *butch(femme)* (occasionally), *third gender*, *two-spirit* and more. *Trans**, an umbrella term, can include all these concepts, the asterisk often added to indicate such inclusivity.

Those on both sides of the more hardline “radical feminist” (crudely: “gender does not exist; biological sex does”) or hardline trans* theory (crudely: “biological sex does not exist; gender does”)

“divide”, in addition to the multiplicity of those not in a particular camp regarding transgender issues, agree that gender classification is salient and pervades culture (Raymond 1979, Butler 1990, Stangor *et al.* 1992, Stone 1996a, Bornstein 1998, Haslam *et al.* 2000, Fine 2010b, Bornstein 2013, Jeffreys 2014, Dreger 2015): “Sex is the most pervasive method of categorizing people. We are more likely to categorize people based on gender than race. People use gender to sort individuals into categorical ‘natural kinds’ more than they use 20 other kinds of social categories. From these and other findings, it has been argued that sex may be the strongest example of Essentialism in lay social cognition: the belief that categories possess distinctive ‘deep, hidden, and unchanging properties that make their members what they are.’ ” (Prentice & Miller 2007:202; see also Prentice & Miller 2006, Carothers *et al.* 2013,). This elides with the findings of the Gelman school that children essentialise gender and age most (Gelman 2003). Our tendency towards gender essentialism may not merely “disappear” as we learn more/grow older, but rather be “suppressed by more explicit reasoning processes”, as studies on young adults have suggested (Eidson & Coley 2014:382).

Females and males are not considered equal in this planet’s nearly-global patriarchal systems (Henslin 2001, Lewontin *et al.* 1984, Ciccodicola & Palmeri 2012) and in many historical post-agricultural world cultures, too (Hughes & Hughes 2001, Strozier 2002). Anthropologists such as Peggy Reeves Sanday (2002) and feminist theorists such as Heide Goettner-Abendroth (2004) have additionally drawn attention to the fact that the inverse of patriarchy is not necessarily a matriarchy *per se*, but rather egalitarianism (the rare examples of egalitarian cultures also are usually non-industrial). In patriarchal systems, males as a class are privileged, earning more and being allowed, more often, to own and inherit property, vote and have less constrained sexual behaviour (Walby 1997). I note that the privileging of one half of an essentialised binary pair – such as between the sexes – is often the case (Goody 1977, Derrida 1978, Bryson 1998, Brown 2010), and patriarchy is a good example of such “logocentrism”.

For human females, masking your gender when applying for scientific and academic jobs means you have a greater chance of getting hired (Steinpreis *et al.* 1999, Budden *et al.* 2008, Moss-Racusin *et al.* 2012, Knobloch-Westernwick *et al.* 2013); Knobloch-Westernwick *et al.* argue that this bias additionally applies to hiring musicians, evaluating work teams and leadership positions (2013). Science in general is heavily biased in favour of males, including evaluation of scientific papers (Morton *et al.* 2009; see also Kay & Jost 2003, Keller 2005). Even in my own results there is an ingroup (males). Known male journalists outnumber females at a ratio of 1,909 to 964 – nearly twice as many – and such male journalists are less ambiguity-tolerant (more mixed, more negative and less positive than neutral) than female journalists for all years and all dichotomies (albeit at a low level) (cf. *Tab. 17-20*), though it is noted that said males are not specifically protecting a “male-journalist” set, *except* for in the gender-resonating Male-Female dichotomy (*Tab. 9, Tab. 19*). Relatedly, there are indications that patriarchy is a side-effect of agricultural and industrial societies,

as hunting-and-gathering groups are more egalitarian (Erdal & Whiten 1996, Lugones 2008). Some females (like any “outgroup”) participate in this perhaps-modern (or at least post-agricultural) patriarchal dynamic (Morton *et al.* 2009): the female “group” does not benefit; the female individual might. This may be related to system justification theory: “members of disadvantaged groups sometimes support and justify the social order to an even greater degree” (*Ibid.*, citing Kay & Jost 2003). Female leaders are viewed and judged far less favourably than male leaders by both sexes; this is known as *Gender Role Congruity Theory* (Eagly & Karau 2002) – though some journalists invoke sexual differentiation *in order* to argue for females in power (Amen 2013).

Even in “egalitarian” societies, there often are binarised gender distinctions and sex roles such as hunting that some have argued favour male status (Beckerman 2000, Cameron 2008). That said, Beckerman works with hunter-horticulturalist societies and not immediate-return hunter-gather groups and others such as anthropologist Jerome Lewis argue (and have observed) differentiated sex roles but egalitarian structures in groups such as the Mbendjele in northern Congo that engage in direct hunting/gathering (Lewis 2008). Furthermore, differentiated sex roles do not implicitly mean lower status for either sex. Moreover, it is in unequal, non-egalitarian societies that the level of dehumanisation applied to women is more explicit: “It’s not a coincidence that in Christianity, Judaism and Islam, women are considered unclean, dirty... more *animal*” (Bryson 2002). Indeed, the globally dominant Abrahamic religions are human-exceptionalist and animal-avoidant as well as patriarchal (*Encyclopædia Britannica* 2009, Meng 2009), and we have already observed a conflation between sexism, racism, xenophobia and homophobia: that is to say, essentialists tend to be “all-around” essentialists (Aosved & Long 2006, Aosved *et al.* 2009; see also Bastian & Haslam 2006).

We see extreme gender dichotomisation in historical proto-psychological writings (Krafft-Ebing 1886, Weininger 1903). We also find intense binarism in modern society, where those who transgress stable gender conceptualisations are societally punished (Eagly & Karau 2002, Sirin *et al.* 2004). In my 1995 results, there were negative gender-ambiguity associations (“hermaphrodite; ruthless, vindictive and often seriously unstable” [App. 193]); “razor blade-wielding psychopathic transvestite” [App. 194], just as there were in 2000 (“socially transvestite Britain, where the elites masquerade as the masses [...] [a] culture of pretence.” [App. 221]); 2005 (“opinions of Wallis among friends and colleagues [...] ‘cold’, ‘ambitious’, ‘manipulative’, ‘hermaphrodite’, ‘Nazi spy’, and even ‘prostitute’ ” [App. 244]); and 2010 (“Jen rocked up in this gold patent number which was half mini-skirted disco babe, half Greek goddess. Unfortunately, the bizarre combination proved more hermaphrodite than Aphrodite” [App. 270]).

Such are the fates of those who challenge or are conceptualised by different gender structures (so deep is gender salience that homosexual behaviour has been theorised [McKnight 1997] – and conceived, in many cultures – to be a third gender between prescribed male and female sexual behaviour) (Martin & Voorhies 1975). Dichotomy stability includes positive ambiguous associations

too: 1995's sentiments ("Here, beguilingly, is a sensational new world where men and women become androgynous creatures who have feet in both camps, and look like examples of what one can only call a third sex." [App. 203]) did not alter substantially from 2010's ("Myriad refinements brought depth and brilliance, virility and sensitivity, in equal measure. Sir Thomas Beecham's description of the viola as the hermaphrodite of the string section seemed especially fitting." [App. 272]).

My negative codings for Male–Female ambiguity tolerance start at a lower level in 1995 than Human–Machine and Heterosexual–Homosexual (though not Human–Animal), but both our acceptance and discomfort regarding plastic gender are rigid (cf. *Tab. 12*).

We acknowledge our rigidity when we (over)genderise non-human objects/animals, e.g., when we are so uncomfortable with intersex dogs that we give them strict gender assignment surgery ("A HERMAPHRODITE dog in England called Georgie has had surgery to make her all female in a bid to find her a new home." [App. 282]. This mixed response is tolerant of fluid gender with reference to the sex-change intermediary, yet intolerant of the "hermaphrodite" intermediary: as differentiation eases, it simultaneously tightens.

7.1.2. Gendered Characters and Gendered Colours

Stable gender matters so deeply that we project our essentialism not only onto the living but the non-living. Binary gender, with few exceptions, permeates culture to such a degree that we find stereotyping in fictional characters such as 1981's Ms Pac-Man in *Fig. 27*. The eponymous video-game character is a yellow, 2-dimensional circle shown with a hairbow and, in advertising schemes, with rather sexualised big lips and naked legs, a spin-off from the highly popular (male) Pac-Man (1980). This derivative exemplifies a modern gaming trope called the "Ms Male" complex. Cultural theorist Anita Sarkeesian argues that, in an overwhelming majority of female-centred video games, female characters are "Ms Males": males with added, highly "feminine" visual signifiers such as eyelashes, red lips or hair bows (2013): the "dressing up in women's clothes" alluded to in the opening quote. This trope has been observed in other cultural artefacts such as films (Pollitt 1991) and literature (Anderson & Hamilton 2007). The female is subsumed into a male prototype, known as *androcentrism* (see the satirical lower-right *Fig. 27* of how "Mr. Pac-Woman" might appear were the situation reversed). If the male is the prototype for human, even in cartoons or human evolutionary models (Slocum 1975), this suggests that anything outside the prototype is "wrong", e.g., male rats are used for human-proxy experiments, due to unfounded fears of female hormones distorting results (Clayton & Collins 2014; see also Irigaray 1977/1980).

Androcentrism also forces onto the “Ms Male” male qualities, as there is no prototype for such female objects. It has real-life ramifications: see American Hillary Clinton’s political career, where her identity and record also are considered to be those of her politician husband’s (Purdum 1996, Maroon 2016). Male politicians do not undergo similar subsumation processes (Maroon 2016). This pattern, reflective of the biblical story of Eve being created from Adam’s rib, satirically inspired long-lived UK feminist magazine *Spare Rib* (Davies 2015).

Theorists use examples from hunting-and-gathering cultures and the archaeological record to argue that particular roles are more “natural” for a given sex, but many roles are as random as those of cartoons. Via post-DNA archaeology, multiple graves incorrectly marked as male or female based solely on the grave goods (knife = male, etc.) are being re-assessed (Arnold & Wicker 2001). In some cultures, men are the fishers; in others, women (Gewertz & Errington 1985). Blue was a girl’s colour circa World War I; now it is pink (Maglaty 2011, Orenstein 2011). The red-and-pink associations with females – Ms. Pac-Man’s sexy red lipstick and pink hair-bow – often are argued to be oestrous cues (Low 1979, Ackerman 1992, Kayser *et al.* 2010), but may be merely cultural signifiers for genderedness (Maglaty 2011). Recent research suggests that red is *not* “a proxy signal for female genitalia in humans”; if anything, for both red *and* pink, there was “no significant interaction between genital colour and vulva morphology” (Johns *et al.* 2012:1-3). Yet biological and social science papers genderise by arguing that a colour be connected to females alone (Elliot & Niesta 2008, Park 2014). I do not doubt that the colour red, however, easily associated with menstrual blood, may be linked to females in many prehistoric societies (Knight 1995, Knight *et al.* 1995) (potentially to *confuse* male awareness of menstrual cycles: *Ibid.*, Power *et al.* 2013), and that such cultures would emphasise such “difference”, though I suspect gender-signifying colours still can vary from culture to culture. I note additionally that the Knight/Power/Watts model does not argue that femaleness itself is a direct corollary to the colour red; they argue rather that ritual power, enabled by female sexual strategies, is marked red (wherein the ritual power itself is ambiguously gendered). I find this this argument generally convincing; however, in the context of my thesis discussion, the (possibly functional) *need* for such difference (be it gender differentiation or cryptic ovulation, or both) is the more interesting aspect of gendered colours, not the shades themselves.

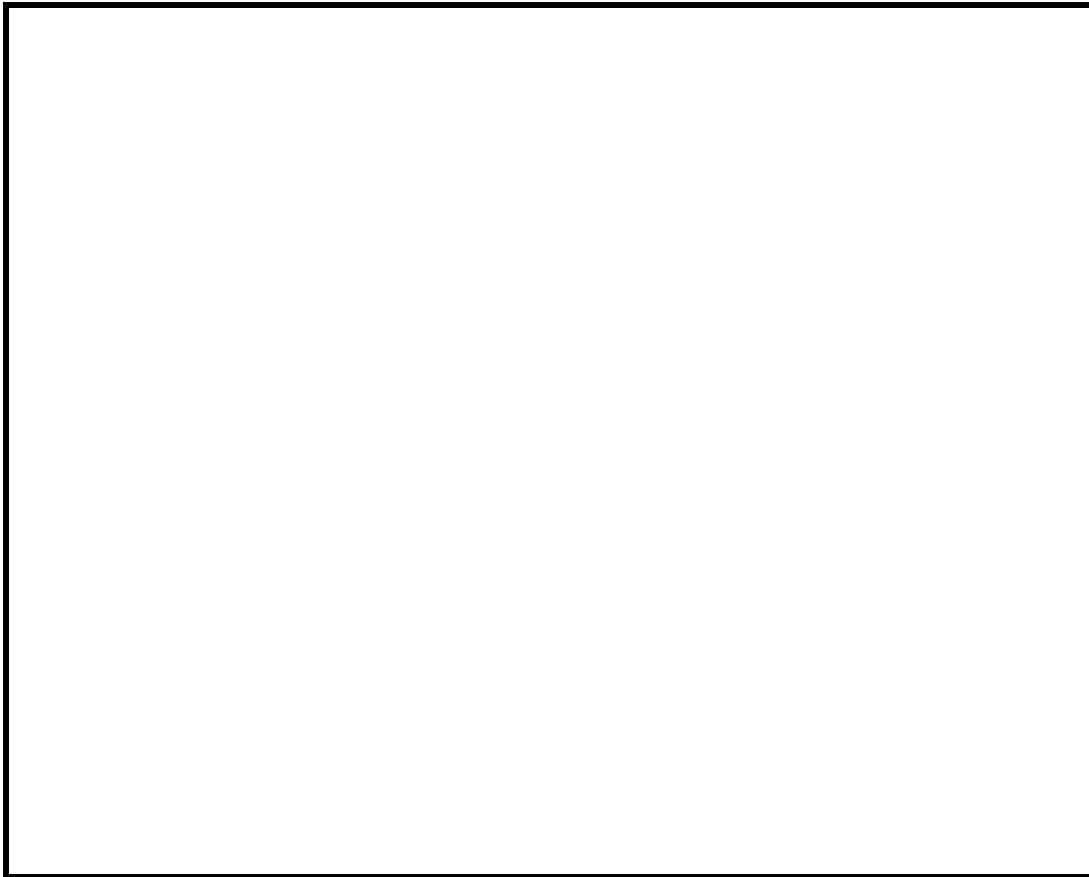


Fig. 28. "10 Unnecessarily Gendered Products That Will Make You Laugh (Or Cry)"; all images and text © Ashley Reese 2014, Gurl.com.

7.1.3. Gendered Language

The linguistic genderedness of our English database bears very modest scrutiny, though I cannot begin to do justice to an entire field of study. That said, whether or why we assign gender to language is not as abstract as it might appear (DeLoache *et al.* 1987, Hamilton 1988, Bojarska 2012).

One modern assumption posits that same-culture males and females speak "different languages", a popular trope for newspapers, magazines, websites and best-selling books (Tannen 1990). As in: "Allow us to translate. He says: We share the housework. He means: I wash my plate after dinner. He says: Of course I heard what you were saying. I agree completely. He means: That blonde by the bar just bent over, and I noticed she was wearing a thong" [App. 430]. There are accordingly many Man-Woman dictionaries in print and online to "help" the sexes "communicate" better, though linguist Deborah Cameron and others show that males and females communicate just fine even if they strategically "misunderstand" each other (Cameron 2008).

Genuine gender differentiation in multiple languages ranging from Japanese to French exists in form and vocabulary, but both sexes have the capacity to use all modes: speakers sometimes conform to their native language's gender prescriptions, and sometimes pointedly not (Cameron 2008). The bigger question is *why* languages are gendered. Most languages, for example, have gendered first names, and most people in patriarchal societies take patronymic surnames (Friess 2007) (matrilineality – enabling alloparenting – is likely to be the human lineage's "natural" state [cf. Wu *et al.* 2013], but these days in Western culture is rare).

In English, animals can be male, female or neuter (triple-gender nouns). Animals that are not useful to humans are less likely to be "he" or "she", and referred to as "it" – although, if sex is indiscernible or unknown, an animal more often takes "he" pronouns over "she" (Siemund 2008, Gardelle 2015). At first, this seems to work contrary to the animals=dehumanisation pattern previously discussed. But not when examined more closely. We sometimes are more generous applying humanity, and sometimes agency, to outgroups when we are not ourselves threatened. Compare this with the boundary-challenging "ape" category and the criticism primatologist Jane Goodall experienced when she used personal pronouns for chimpanzees rather than "it" or numbers (use of "it" is considered contemptuous [Hall 1951], something to bear in mind when "it" is applied to intersex or transgender people). Recall too the initial reluctance to give a name to the chimpanzee astronaut known as No. 65 until "Ham" made a successful return trip from space, thus proving *himself* very useful indeed – this also could be dehumanisation when mortality risk is still high, such as not naming children before a certain age.

Objectification is a dehumanisation process (Mulac *et al.* 2002, Yao *et al.* 2010). In English, most objects – not just ships and storms – are much more frequently given female pronouns (Wagner 2003). Linguist Peter Siemund proposes a "continuum of individuality along the following categories: proper names > humans > animals > inanimate tangible objects > abstracts > mass nouns" (Siemund 2003; see also Gardelle 2015). Unknown/ungendered objects, particularly inanimate nouns (Joly 1976, Wagner 2003) are more likely to be seen as female (Svartengren 1954, Wagner 2003, Gardelle 2015). Via the fact that unknown/ungendered animals take male pronouns and unknown/ungendered objects female pronouns, maleness in English is individuated more than femaleness.

Male forms of English nouns often stand for both sexes ("Light will be thrown on the origin of man and his history", Darwin 1859), even via liberal feminism that "subsume[s] the female gender into the [male] generic, or universal, category" (Dolan 1986:6), i.e., replacing *actress* with *actor*; or via the Western concept of patronymic maiden names for women who then take their husbands' surnames (Friess 2007). The metaphorical practice of Pac-Man standing in as the prototype for all pac-men and pac-women thus occurs frequently in English. English has in effect become a global "lingua franca" (Hellinger 2001), and it has been shown that English's gender biases (which are, in essence,

categorical groupings) affect global gender biases outside mere language as well, i.e. influence which gender we believe appropriate for a particular job (Hamilton 1991).

7.1.4. Gendered Objects and Toys

We distinguish gender in functional objects such as bicycles long past times when most Western women wore long skirts; certainly always when men are capable of riding “female” bicycles without a bar across the middle. Not only does the bicycle – a useful tool – mark the *user* as male or female, the object *itself* becomes gendered (women are more “transgender” in their bike-riding habits, see Negami 2014). There is an associated advertising phenomenon of “gender contamination” – that when a product is associated with females, males begin avoiding it (Copeland 2013).

Gendered objects include watermelon Halloween costumes and earplugs (*Fig. 28*) and even vehicles via plastic testicles (US: “truck-nuts”/UK: “bumper-bollocks”) adhered to the underside of cars and trucks (Munday 2011). That clothes, cosmetics, perfumes, antiperspirants and makeup are gendered is socially accepted. When it comes to “dressing up in women’s clothes”, *women* and not just men dress up in women’s clothes themselves to signify femininity and therefore difference (Butler 1990).

Just as with functional objects, children’s toys can be, and usually are, gendered (Orenstein 2011, Fine 2010). We return to our Ms Male trope, where Western girls’ toys are not just “useful” as per crafts and cooking and social skills (Quaiser-Pohl & Endepohls-Ulpe 2012) but also be-pinked, be-bowed, be-lipsticked, be-eyelashed and boys’ toys blue, minimalist, technological, science-based, aggressive, action-and-activity-oriented: defining (and signifying) “femininity” and “masculinity” for the users. Female signifiers could just as easily (and have been) undecorated (with males being modified/decorated, Angulo *et al.* 2011). It is even possible to envisage a matriarchal version of Pac-Man (*Fig. 27*). This is because, for functional objects (tools), as well as those meant for decoration and playful use, it may not be the signifiers or sex roles that matter (though there are doubtless trends, Carothers & Reis 2013); what may matter is that it is highly important for humans to binarise and rigidify gender.

7.2. War of the Sexes and Gendered Others: “Acceptable Fault-Lines”



Fig. 29. A battle for control? L: 16th c. German satirical woodcut: female chastity belt. R: BDSM male chastity belt via WikiCommons. Both public domain.

“A festive fault line [...] exists between men and women over what is considered acceptable at the annual office bash. [...] Men are twice as likely to ask for a pay rise, three times as likely to strip and five times more likely to be sick on a colleague than women.” [App. 245]

7.2.1. Gendered Stories

One prominent Western narrative involves the naturalness of two discrete sexes, Adam and Eve. Males and females are treated as separate species to each other, or at least distinct natural kinds (Morsella & Ben-Zeev 2012). Yet why two sexes, when many species produce asexually? The advantage is long-touted to be genetic variability to enable parasite reduction. Investigators researching snail species that reproduce both asexually and sexually found that sexual reproducers lived in infection-rich areas (Zuk 2008, Morran *et al.* 2011). Parasite resistance invokes an evolutionary loop known as the Red Queen Theory (Van Valen 1973); we evolve parasite-resistance; parasites similarly evolve resistance to our resistance: sexual reproduction is therefore “running in place” like Lewis Carroll’s Red Queen (*Ibid.*, Morran *et al.* 2011, Ridley 1993). Biologist Thierry Lodé argues, though, that sexual reproduction is a “primitive interaction” based on efficient exchanges of genetic material in eukaryotes rather than a “solution for reproduction” (Lodé 2011). Thus, optimal reproductive strategies differ by organisms: for some asexual, for some sexual, for some both strategies (Morran *et al.* 2011). Since currently humans only reproduce sexually (even via IVF), that is the most “natural” narrative for us.

The theory of bisexuality – in scientific terms – refers not to sexual orientation but double-gendered (hermaphroditic) biological sex in some reptiles, mammals and insects. Double-genderedness and

sex chromosome variations occur also in humans, but the words used are *intersex* or *Disorders of Sex Development* (DSD). I use the term *bisexual* to mean temporal, longitudinal or contemporaneous sexual attraction to both sexes (sexual orientation), but the older meaning is specified when apt to avoid semantic confusion. Implicit in (biologically) bisexual animals is that they not only can produce the gametes of both (or multiple) genders, but also are functioning “bisexually” in a sexual-orientation sense as well.

As I discuss the narratives surrounding gender, in order to discuss stereotyping I will be “binarising” throughout in terms of my headings and discussions.

7.2.2. Gendered Physicality, Female

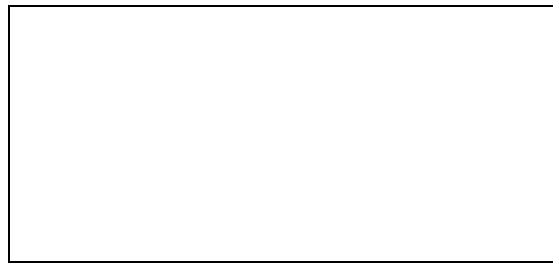


Fig. 30. Clitoral glans and homologous male head of the penis, source: Google Images; WikiCommons: HenkyP (public domain).

Our tendency towards *human* sexual differentiation in the West plays out *particularly* when sexual body parts are homologous, invoking a type of bodily infrahumanisation, as with the underarm, pubic and leg hair that both sexes share but primarily women shave (Braun *et al.* 2013), and, more basically, the penis and clitoris. The clitoris is peripheral: ignored in the scientific literature in favour of the penis at the ratio of 539 to 7 (Bagemihl 1999, Balcombe 2006), and, while the female genitalia term *vagina* is found, in one survey, 409 times to the penis's 1,482 (already highly disproportionate), the homologous-to-penis clitoris was mentioned only 83 times (Ogletree & Ginsberg 2000). Heterosexual intercourse – from the human female perspective – generally lacks orgasm: 70-94% of women never orgasm from intercourse alone due to the positioning of the clitoris (or, one could argue, the penis and/or vagina) (Masters & Johnson 1966, Lloyd 2005, Wade *et al.* 2005, Hite 2008, Dingfelder 2011, Wade 2013b, Puppo & Puppo 2014; see also Rodriguez 2014), just as most men achieve orgasm only by direct penile stimulation. This does not apply to oral sex, manual sex or masturbation, where the clitoris is stimulated and females orgasm as often and as quickly as males do, within four minutes (Hrdy 1981, Wade 2013b; Gleeson 2015). As natural selection seems to have resulted in fewer vaginal nerve endings, probably due to reducing pain in childbirth (Balon & Segraves 2009), the “inconvenient” placing of the clitoris is likely functional (Alcock 1980). Clitoris-inclusive sexual practices between male and females, and between females and females, could have

pair-bonding aspects that have not been sufficiently explored (cf. synchronising of ovulation that promotes female–female cooperation and emotional bonding: Hrdy 1981, Power 1990, Knight 1991). Studies suggest that female copulatory calls increase during penetrative-only sex (Brewer & Hendrie 2011), perhaps provoking sperm competition: *louder* sex, but not usually orgasmic. This could be something strategic for males as well as females: cunnilingus – and indeed attention to the clitoris altogether – is more common in long-term heterosexual pair bonds than in one-night stands (Armstrong *et al.* 2012, Wade 2015). One study found that women eschewed casual sex primarily because they calculated that the male in question would not be “good in bed” (Conley 2011). Lesbian sex, where the clitoris is given more attention (Wade 2013b), is likely adaptive in humans.

Science is not immune to downplaying sexual homology (Balcombe 2006, Ogletree & Ginsberg 2000). A recent *Scientific American* article linked “female sexual dysfunction” (FDS) to relationship dissatisfaction. The same article circumnavigated the “problem” by not pointing out that this is likely because female’s clitorises are not being rubbed during heterosexual intercourse (Rodriguez 2012). It would be difficult to conceive of an analysis of male sexuality and potential to orgasm without once having referred to his penis (cf. Bright 2000).

First noted in early written history by Aristotle, the clitoris has been periodically excised from anatomical records and observations (Di Marino & Lepidi 2015). In 1561, anatomist Gabriele Falloppio, who discovered the Fallopian tubes, wrote that “modern anatomists have entirely neglected it ... and do not say a word about it.” (Hillman & Mazzio 1997:177). Hrdy and others theorise that the clitoris is not vestigial but a precise adaptation for human females (Alcock 1980, Hrdy 1981: but see Lloyd 2005); urologist Helen O’Connell *et al.* argue that the interior clitoris is much larger and more extended (2005). Anatomists Vincenzo Puppo and Giulia Puppo counterargue though, that the neo-feminist revisionism of thinking of the clitoris as interior and extended is incorrect (2015) and imply it is yet another mode of the social pressure for women to have “vaginal” orgasms.

That said, those same researchers in their zeal to defend the clitoris as the female orgasmic centre also dismiss the “phenomenon” of female ejaculation, denying females their subjective experiences (Pastor 2013). Such ejaculatory fluid has been shown to be sourced from the Skene’s gland (Kilchevsky *et al.* 2012), again directly homologous to the male prostate gland, and so perhaps Puppo and Puppo too are practicing an unnecessary form of sexual differentiation.

These and other researchers, however, conclude the existence of a “social construction of sexuality, endorsed by both men and women, that privileges men’s sexual pleasure over women’s, such that orgasm for women is pleasing, but ultimately incidental.” (Wade *et al.* 2005:117). Accordingly, the literal excisement of the clitoris – “removal of the clitoris and labia – viewed by some as *the male parts of a woman’s body* – is thought to enhance the girl’s femininity, often synonymous with docility

and obedience” (Koroma 1997:4, emphasis added) – via female genital mutilation (FGM) takes place in multiple contemporary global cultures (Di Marino & Lepidi 2015).

Thus, the most sexual physical body part – from a human female’s point of view – has been ignored periodically for centuries in scientific and anatomical literature (*Ibid.*) in favour of the vagina. Again, imagine a world in which the central male organ of physical pleasure was ignored as often as the female “tiny penis” (Di Marino & Lepidi 2014) (the penis is arguably rather an overgrown clitoris, the female state being the biological default, Kilchevsky *et al.* 2012). Although there are potentially some non-crossover arenas in biological terms (cf. *Tab.* 27), the lack of sexual differentiation between penis and clitoris links males and female more than they feel comfortable with (Fausto-Sterling 2000; cf. *Fig.* 32). Cultural and literal clitoral excisement makes it easier to think of males and females as essentially, genitally separate.

Tab. 27. Some observed physical differentiators said to be inherently female.

Female Physical Traits
● females usually – but not always – have two X chromosomes (USNLM 2016);
● females have eggs that are more costly to produce, bigger and rarer than male spermatozoa (Mealey 2000);
● females have breasts, uteri, vaginas, clitorises, cloacae and ovipositors (<i>Ibid.</i> , Volodin <i>et al.</i> 2015);
● females often sexually advertise availability by sexual swellings and other physical mechanisms (Deschner <i>et al.</i> 2004);
● male and female brains are inherently different (Beresh <i>et al.</i> 2002, Baron-Cohen 2004, Mogil & Bailey 2010, Cahill & Aswad 2015).

7.2.3. Gendered Physicality, Male

As noted directly above, some theorise all male mammals can be described as females (Jost 1953) as, barring *in utero* hormones, individuals develop physically as females (Jones 2003, Kilchevsky *et al.* 2012). Human infants of both sexes can lactate at birth (“witch’s milk”) (Madlon-Kay 1986), but males do not usually develop prominent breasts – though in perhaps another “uncomfortable” homology reminder, mammal males occasionally can produce enough vestigial milk to lactate (Kunz & Hosken 2009) and, very occasionally, human males have nursed infants (Swaminathan 2007) (Darwin theorised that mammalian ancestors of both sexes may have nursed infants, Darwin 1871). Though males too are said to have physical differentiators (cf. *Tab.* 28).

Tab. 28. Some observed physical differentiators said to be inherently male.

Male Physical Traits

- biological males usually have at least one Y-chromosome (USNLM 2016);
- most mammalian males have penises, scrota and prostate glands (Fauci *et al.* 2008);
- male gametes are considered less costly and more active (Clark 1978);
- spermatozoa compete at a cryptic level post-copulation between the sperm of other males and between themselves in order to fertilise the egg(s) (Ramm & Stockley 2007);
- males are more visually colourful and ornamented (Darwin 1871);
- males often have greater muscle mass than females and often are stronger (Miller *et al.* 1993);
- (heterosexual) human male brains are distinguishable in size from (heterosexual) female brains, with some scientists claiming that gay males have “female brains” and lesbians “male brains” (Savic & Lindström 2008, LeVay 1991);
- most human males have more post-pubertal body hair than females, particularly on the face and chest, though most females have some hair there too (Inui & Itami 2012).

Less sexually dimorphic species often have more sperm competition due to reduced male–male bodily competition and testes tend to be larger, e.g., chimpanzees and bonobos compared to the more sexual dimorphic gorillas and orangutans (human testes too are slightly on the larger side [Dunsworth 2007], suggesting a shared current or ancestral state of sperm competition, further suggesting females mating with multiple males in our most recent common ancestor, Hrdy 1981, Ryan & Jethá 2010).

As with penises and clitorises, and Skene’s glands and prostate glands, there is some degree of physical overlap: even evidence that human males too experience both monthly hormonal cycles analogous to menses (Scott 2004) and even menopause (“andropause”, Asadollahi *et al.* 2013). Similarly, while human males develop deep voices at puberty due to androgen, it is not widely known that males also retain their “female” high registers as well; as in females, the so-called falsetto is present in all adult males (Greene & Mathieson 2001), yet few use it to speak or sing, perhaps due to our social compulsion to sexually differentiate.

7.2.4. Gendered Behaviour, Beyond the Binary

In terms of sexual characteristics, sex reassignment surgery (SRS) often physically manifests as the inversion of the penis to form a vagina, with part of the glans formed into a clitoris, and the removal of testicles for a male-to-female (MTF); and “top surgery” (bilateral mastectomies), testosterone injections and, more rarely, “bottom surgery” (hysterectomy, occasional penis augmentation from tissue grafts or clitoral hormone treatment, with the labia being formed into a scrotum) for a female-

to-male (FTM). For many years, transgender people have been dichotomised into “pre-op”(-eration) and “post-op”; this, however, is shifting (Moser 2007).

In countries such as Iran, gays and lesbians are forced into SRS, due to prejudices against homosexual behaviour (Terman 2014, Senzee 2015, Robinson 2015). Similarly, a certain percentage of SRS has been theorised, rather controversially by some, to be due to personal non-acceptance of one’s own homosexuality or bisexuality (Bailey 2003, Dreger 2015). The Iranian mode of “homo-preventative” transitions make sense in that in most conservative cultures that embrace extreme heteronormative attitudes, romancing someone of the same sex equals grievous gender nonconformity (Terman 2014).

There are genuine concerns (Boghani 2015) over the use of “puberty-blockers” in the treatment of children who are gender-non-conforming (“GNC” – a problematically essentialist term from the get-go, as it presumes “normal” male/female children’s behaviour), which may involve future cancer risks (Mueller & Gooren 2008), and, if followed by cross-sex hormones (ca. age 16), involves a high risk of sterilisation (Brill & Pepper 2008).

Some theorists have suggested that lack of congruence with one’s biological gender is a form of BIID (“Body Integrity Identity Disorder”) (Garcia-Falgueras 2014) – though I would counterargue that the lack of congruence rather is with an essentialised gendered *prototype* that we (often) do not question. Just as Cascio has theorised that once transhumans pass the “almost-human” state, they are judged by the (more rigorous) standards of humans (Cascio 2007, Saygin *et al.* 2012) – it is highly possible that transsexual people, nearing an “almost-passing” category of male or female, are more discriminated against than those who are either clearly *not* passing or successfully passing as biological men and women. In this mode, trans people are scrutinised not as trans but as biological men or women – and then potentially found lacking. This would involve similar evolved uncanny valley mechanisms that I discussed in terms of Human–Animal and Human–Machine infrahumanisation, responses that concern visual appearance, vocal cues, haptic response, predictability, agency attribution and olfactory signals. Just as liminal categories – cyborgs and apes (Haraway 1991) – may trigger detection systems regarding who is “human”; this also might apply to transsexuals in terms of who is “male” or “female”; and also to people who use plastic surgery in general (Sung 2007, Choo & O’Daniel 2016). This boundary control similarly has been invoked when including or excluding those of mixed-race background in terms of race (Sanchez *et al.* 2009), and of bisexual sexual orientation in terms of sexual orientation (Turner 2015).

7.2.5. Gendered Behaviour, Female

Socioecology (interactions between organism and environment in an evolutionary context) allows for selection of phenotypical and behavioural plasticity within general trends: as females map themselves onto resources to grow their investment-expensive gametes, so do males map themselves onto females (Wrangham 1980, van Schaik 1996). Multiple strategies help both genders attain the highest chance of survival and/or reproduction. When resources are abundant, there is less female competition, as with gorillas or bonobo females. Selection does not favour females who develop a reliable sexual signal of ovulation, as confusing paternity assists with infant care; sexual swellings are not necessarily associated with maximum fertility (Engelhardt *et al.* 2004, Deschner *et al.* 2004; see also Hrdy 1981, Power 1990, Knight 1991). Whilst socioecological theory is niche-dependent and suggests a suite of plastic behavioural traits from which optimal behaviour occurs, evolutionary psychology posits more hard-wired mechanisms, theorised to run specific modalities (“programs”) in the brain: in a sense, rigid “prototypes” of behaviour. *Tab. 29* details some observed behavioural differentiators argued to be inherently female.

Tab. 29. Some behavioural differentiators claimed to be inherently female.

Female Behavioural Traits

- females are more nurturing and submissive (Hawley & Hensely 2009);
- females desire dominant males (Sadalla *et al.* 1987);
- females are choosy (Trivers 1972);
- females prefer committed relationships to one-night-stands, and are more monogamous than promiscuous (Symons 1979);
- females are emotionally jealous, not physically (Buss 2006);
- females are hypergamous: they want older, rich – or potentially rich – high-status men (Pawlowski & Dunbar 1999a);
- females are more verbal (Brizendine 2007);
- females are empathetic (Baron-Cohen 2004);
- females listen more and talk less (Miller 1999).

7.2.6. Gendered Behaviour, Male

Accordingly, there are similar behavioural patterns argued to be primarily “male” and hard-wired (Tab. 30).

Tab. 30. Some behavioural differentiators claimed to be inherently male.

Male Behavioural Traits

- due to low-value sperm compared to eggs, males are more promiscuous and want to spread their genes further than females (Buss 2002);
- human males are more visual and enjoy pornography (whereas females enjoy romance) (Ogas & Gaddam 2011);
- human males of all sexual orientations enjoy – sometimes erotically – looking at male genitalia (Morris-Roberts 2013) – indeed more than females do; this is possibly connected to sperm competition (Ogas & Gaddam 2011);
- males behave dominantly, as males will be selected by females based primarily on dominance over other males (Altmann 1962, Smuts & Smuts 1993, Hawley & Hensely 2009), resulting in similarly dominant, evolutionarily successful sons – this theory is known colloquially as the *Sexy Son Hypothesis* (Fisher 1930) and is related to a similar “good genes” hypothesis (Byers & Waits 2006);
- both socioecology and EP suggest that males’ reproductive careers (and survival) is more varied than that of females (Trivers 1971, Kokko & Jennions 2008);
- males desire most younger, fertile, submissive females for whom they compete (Pawlowski & Dunbar 1999b);
- human males are more systematic with their “male brains” and rank higher on the Autism spectrum than females (Baron-Cohen 2004);
- human males are said to be more stoic than females (Fischer *et al.* 2004);
- human males prefer (sexual) novelty (Little *et al.* 2014);
- human males take more risks than females (Byrnes *et al.* 1999);
- some primate societies are multi-male due to conflict over ingroup/outgroup status (Port *et al.* 2010, 2011);
- human males – at least initially via natural (specifically sexual) selection – are said to be more talented musically, artistically and compete by showing off in order to “attract” females (Miller 2000, de Waal 2014).

We see therefore that behavioural prototypes are fairly strict. In terms of such prototypes, the more hyper-masculine a Western man is bodily, the more likely he is to be cognitively and behaviourally sexist, and also to prefer larger-breasted women with thinner bodies (Swami & Voracek 2013, Lavine *et al.* 1999, Wiggins *et al.* 1968). This is salient as it suggests such males essentialise socially-influenced prototypes in both genders (cf. Agliata & Tantleff-Dunn 2004). As pornographic searches suggest the default for male attraction skews towards heavier female bodies and not thin (“for every [pornographic] search for a ‘skinny’ girl, there are almost three searches for a ‘fat’ girl”, Ogas & Gaddam 2011:33) – at least under stress/cognitive load (Swami & Tovée 2012), when in theory we default to more hard-wired preferences (Yu 2016) – this “Western-specific-but-globally influential” (see Gordon 2003) prototype suggests it is *social* gender differentiation that matters, rather than biologically determined differentiation.

To sum up, human males, in a behavioural ideal, embody “courage, endurance and toughness, lack of squeamishness when confronted with shocking or distasteful stimuli, avoidance of display of weakness in general, reticence about emotional or idealistic matters, and sexual competency.” (Cornwall & Lindisfarne 1994:126). Quite a lot to live up to.

7.2.7. Gendered Behaviour, Beyond the Binary

Transgenderism sometimes can be regarded as exhibiting a better gender prototype than the biological “original”; we see this in *Appendix A* with the suggestion that passable, but not “un-passable”, transvestism is acceptable (perhaps because the “results” embody prescribed gender categories): “Larry Mullen managed to make the cut as a foxy lady [but] Bob [...] wasn’t too impressed at Bono’s lipstick-laden antics. Bono said: ‘He reckoned that I looked like – and I quote – “A dirty-looking eejit” ’.” [App. 258]. Similarly “unsuccessful” gender transgressions are noted: “He appeared on screen in a curly blonde wig, gold mini-skirt and matching gold bra. He made no attempt to hide his 5 o’clock shadow or hairy arms. The only thing he has to be thankful for is that it didn’t last long” [App. 198]; “he comically reveals the dilemma of a young woman trying to act male and slightly missing it.” [App. 203]. We see also clear assertions that gender identity itself can be fluid: “learning to be a real man” [App. 231]; “clearly not ready to cope with any emotional ambiguity which challenges the stereotypical gender roles.” [App. 199].

We have too an interesting negative quote where the writer prefers “butch” (“honest”) lesbians to “insidious” lipstick lesbians [App. 196]. Here it is the lipstick lesbians who are the ambiguous, infiltrating “cyborg” category within lesbianism itself, not the butches: non-heteronormative gender essentialism.

The “better than biological” trope found in the sampled articles usually refers to MTFs. We see that while the male-dominant cache of writers in my samples protect the male ingroup from so-called infiltration, they do not do the same for the female outgroup, judging by the dearth of analogous articles. Perhaps it is easier – in gender (in sexual orientation, in racial identity) – to anchor oneself to one side of a binary than to be caught in the middle: here, a form of categorical “transgender essentialism”. This applies to biological men and women, too.

Some theorists argue gender socialisation is so strong that it is impossible for a male, even if he feels like he is a female, to have ever known what it is like to have been socialised as a female (or vice versa) (Jeffreys 2014), which is a similar argument to “what is it like to be a bat” (Nagel 1974). The argument here is biological males only can have a “theory” regarding femaleness, and it is impossible to confirm or deny that experience for, as discussed previously, we are not privy to the interior subjectivity of others. The counterargument is that this also applies to the same sex as well; biological women cannot know for certain that they experience what other women experience.

In 1996, theorist Rosanne Allucquere Stone pointed out that “men are choosing [online] female identities more often than women choosing male identities, at a ratio of about four to one” (1996b:119). Yet the idea of online-only, as opposed to “real life”, transgenderism has dissipated; the two have merged to a wider but stricter (essentialised) off-line transgender identity. In the 1990s, there was a similar categorical distinction between transsexuals and transvestites (Cornwall & Lindisfarne 1994). This too has recently shifted and transvestites have been moved into the more concrete essentialised category of trans* complete with asterisk. The catch-all term of “trans*” has subsumed gender-nonconforming (GNC) individuals into a spectrum that calcifies one from “cis” to “trans”, not cognitively dissimilar to the Kinsey Spectrum of sexuality ranging from straight to gay – effectively suggesting so-called GNC identities such as “butch”, “transvestite” or “effeminate” as pitstops between two points. Equally notable is the fact that the lesbian concept of “femme” is not seen on such a continuum (though its polarisation “butch” is), as “femme” elides with standard feminine gender prescriptions for women in general. Childhood tomboy antics are often praised but not “sissy” behaviour – this may be because males (and masculinity) are more esteemed in our societies. Butch women have high status in lesbian circles too, and can be considered of higher “value” than femmes (Urquhart 2015).

Others have argued that including butches and transmasculine individuals as women is in itself essentialist, with the physical category of “women” acting as a polarised point to “men” (though I note the category “butch” here also has been essentialised as something separate from “woman”, and, I would argue, similarly historically unknowable in terms of self-identification): “For them, the anatomically-female body is the natural link that unifies lesbians, butches, and transgendered men, and all identities are subsumed under the category of ‘women’.” (Hwahng 2011:170).

There is too, then, the concept that transgenderism is a journey to an inevitable other-side of a binary: “fully transgendered” (Fuller 1995:5). It is technically due to a gender binary that one feels one is born in the “wrong” body in the first place; does this then imply that those who are “cisgendered” believe less in gender constructs? (Probably not – most, but not all, heterosexual cisgendered relationships are at least moderately gender-differentiated, Seidman 2015)

Interestingly, drag contexts too enforce non-heteronormative gender essentialism: drag artist and TV celebrity RuPaul was criticised for diluting the purity of drag by allowing transsexual participants in his Drag Queen reality show (Blankenship 2013). Similarly, the decades-old Miss Gay America drag beauty contest is open to males who are not “using hormones or hormonal therapy, [or have] breast implants, silicone injections, or other similar type products or chemicals *below the neck*.” (MGA 2016:1, MGA emphasis).

Non-binary transpeople often argue gender does not exist; binary transpeople may insist one’s new gender identity is the “real” one. Appropriate language can shift quickly and knowing the correct nomenclature is a signifier of belonging to a marginalised outgroup. “Tranny”, which once primarily (pejoratively) described transvestites as “opposed” to transgender people, is considered a transgender-specific slur as of late (though contested: cf. Bornstein 2014, Lowder 2014); the word *transgender* has morphed to *trans** semantically and even previously acceptable terms such as “transwoman” as opposed to “trans woman” may identify one as an outsider (see later comments on nouns and adjectives in Section 8.11.2.). The relatively recent word *transgenderism* has become unfashionable (Ennis 2016). Similarly, the language for operations for transsexuals over the last three decades has changed from “sex change” to “sex-assignment surgery” (SRS) to “gender confirmation surgery” – the latter with the implication that the true, essentialised sex has now been achieved, as noted above.

Just as lesbians experience pressure to identify as butch or femme (Cooter 2014), trans people have been policed for not taking on binary positions (Jones 2015), as *transgender* itself has arguably become a linguistically protected, essentialised category, binarised against *cisgender*. The suffix “cis” and label “cisgender” often are rejected by biological men and women – biological people consider their state the true state, and are reluctant to add a modifier; or feel they get to choose their identity labels, just as trans people do (Aviance 2015). There is physical-space policing by biological men and women too, the majority of it in women-only spaces such as dressing rooms, bathrooms, lavatories, political groups and events (Redded 2016) – enabled, potentially, via some biological females’ willingness to “aggress [an] [...] outgroup” (cf. De Dreu *et al.* 2015:), though some biological women claim the same dynamic, with “biological males” (now transwomen) aggressing “female-only” space(s) (Kogan 2016).

The idea that one's "true" self begins at transition sees new names that are not considered "generation-appropriate" being taken by the transitioning individual, e.g., the Millennial-generation-popular moniker Caitlyn for former Olympic athlete Bruce Jenner. This "true self" being signified as sometimes decades younger and starting at the time of transitioning echoes the "second adolescence" trope hypothesised to occur when previously-repressed people come out as gay or lesbian (Josh VS 2013). The idea of "age-appropriate" names indicates proscriptions in our society not only by *gender*, but also *age*: social natural kinds.

7.3. The Gendered Self: "Biological Forces and Social Factors"

Fig. 31. Gendered lesbian pulp fiction, aimed to be both cautionary and titillating © Guy des Cars 1956.

"Marc Breedlove, a neurobiologist from the University of California, said the lay public should not 'assume that a structural difference in the brain is the immutable signature of purely biological forces'. Only if a difference between the genders were found in newborn or foetal brains could it safely be ascribed to non-social factors, he said." [App. 212]

7.3.1. The Gendered Prototyped Self

We form senses of ourselves based on subjective experiences of the physical world, and our consciousness too forms a sense that holds the whole self together, stalwart or frail or malleable (Feinberg 2001, Doidge 2007, Metzinger 2009). Many studies have suggested humans are attracted to symmetry (Poppy 2014), but it is more likely to be acculturated prototypes informing our sense of the physical world: "a strong relationship between averageness and attractiveness also for nonface objects like drawings of dogs, birds and watches. It may be humans have a general attraction to

prototypical exemplars (Halberstadt 2006), and their attraction to average faces is a reflection of this more general propensity” (Fink & Penton-Voak 2002:155).

We think in essentialised terms: prototyped genders, bodies and even species. When our bodies physically do not fit such “prototypical” exemplars, this affects interior self-concepts, as well as how we view others (Agliata & Tantleff-Dunn 2004). These reactions likely are related on a deeper level to our resistance or adherence to category formation.

7.3.2. Gendered Female and Male Selves: Inevitable

The concept of gender one has for oneself is significant, whether one is male, female, something encompassing both “essences” or neither; whether one behaves in a stereotypically masculine, feminine, androgynous and/or attempted gender-neutral manner. It is salient to have a distinct gender, usually one of two, with some cultures acknowledging “third-gender” roles (one culture is argued to have five distinct gender variations, Graham 2001). Such third-gender roles are not binary-free: they are often androgynous in the sense of encompassing traits between two points or, some argue, a mask for homosexual behaviour in highly gendered societies that prescribe males only behaving sexually with females, and vice versa (Vasey & Bartlett 2007). It is not just biological men and women that grip tightly to one role or another. So too can transgender and transsexual individuals. The narrative of being the opposite-sex brain in the “wrong” body, for example, presupposes ways of being that are “essentially” female or male when it has been shown, fairly conclusively, that there are no male or female brains (Joel 2011, Joel *et al.* 2015: but see Cahill 2014).

As discussed, knowledge of others’ experience is impossible for biological women/men even in relating to same-set members; interpreting another individual’s self-perception of gender is a guessed-at conceit. Yet we are born into a gendered world and we quickly learn to essentialise gender. Alongside transpeople, many biological men and women feel this differentiation to be correct in terms of their “inevitable” male and female physicality. Accordingly (though incorrectly, cf. Cantor 2016), the cisgendered should not experience “gender dysphoria”.

Having a strong sense of one’s gender is argued to be psychologically important (Halim & Lindner 2013). It certainly is easier for *others* in wider society, though not necessarily for the individual. Not knowing this or blurring the two has come to be seen as a disorder (Korte *et al.* 2008). There is, for example, a large increase in children’s gender dysphoria clinics in the UK (Taylor 2015). Whether this is progress in accepting wider gender expression or pathologising the ambiguously gendered behaviour of children (even while children strive to essentialise gender, they are nonetheless flexible in their own behaviour, cf. Fine 2010) via a reductivist, highly gendered system imposed by adults and already culturally omnipresent – remains to be seen.

7.3.3. Intersex Selves: Aberration

The manner in which medical science refers to intersexuality – “disorder of sex development” (Holterhus *et al.* 2009) – lets us know that society thinks there is something “wrong” with a human body that does not fit the genital/chromosomal prototype (Feder & Karkazis 2008). Intersex is a catch-all term for multiple conditions/existences ranging from Klinefelter syndrome to Congenital Adrenal Hyperplasia (CAH). I will not detail them, yet will note the asymmetry of one umbrella term for so many different and such widely ranging medical conditions: clearly the “problem” here via this umbrella label is because we are no more comfortable with the blurring of biological traits than we are with blurred behavioural traits. The implied grouping is binarised: Normal (sexed) versus Abnormal (intersexed).

Foucault details the way intersex bodies are treated as medical emergencies from birth, a criticism which, while philosophical in nature (1980), is reiterated in medical literature until quite recently (Fausto-Sterling 2000). The recent controversial re-labelling of “intersex” as “disorder of sex development” is telling in itself, and intersex advocacy groups have proposed “Variations of Reproductive Development”, which is less pathologised (Simmonds 2007). (The medical nature remains salient; many intersex individuals, even those who choose not to alter their bodies, require regular medical checkups due to heightened health risks, Diamond *et al.* 2003.) The nomenclature shift also was in part due to the scientific inaccuracy of terms such as “true hermaphrodites” and “pseudo hermaphrodites” – though I note, as ever, the essentialised binary of true/pseudo. I additionally note the word “disorder” echoes the “female sexual dysfunction” discussed earlier: both variations from the norm.

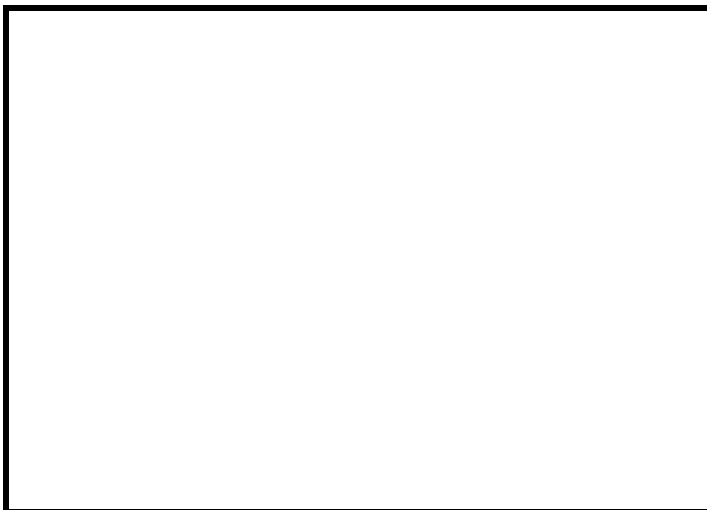


Fig. 32. Medically acceptable lengths of clitorises and penises at birth: image taken from Fausto-Sterling 2000.

Via very specific ranges of clitorises and penile length (cf. *Fig. 32*), bodies at birth are marked as normal or not (Dreger 1999, Fausto-Sterling 2000): extreme binarism *and* essentialism in terms of prototypes at a most basic level. The historical and contemporary exploitation of intersexual naked selves (Creighton *et al.* 2002, Guteman 2012) – no doubt out of dehumanisation and objectification mechanisms coupled with “natural” curiosity – is congruent with mechanisms involving the sexualisation of “female” robots, as well as the racist human zoos discussed previously, or, some animal rights activists might argue, plain old animal zoos.

Intersex, as noted, is seen as an “urgent” problem that involves a team of specialists ranging from psychologists to urologists to weigh in on the “emergency” decision of how to label a human born with ambiguous genitalia (Dreger 1999, Fausto-Sterling 2000, Kim & Kim 2012); when resolved at birth this is known as *optimal gender policy* (Money 1972, Zucker 2002). This policy has been discredited, as many individuals as adults are unhappy with such nonconsensual choices (Diamond *et al.* 2003, Köhler *et al.* 2012). The current treatment (assignments as boys or girls, without early surgery) espoused by intersex organisations such as the now-defunct Intersex Society of North America (now Accord Alliance) is known as *full consent policy* where, except for medical emergencies, the child in question must give full consent for feminising/masculinising surgery (Turner 1999, Karkazis 2009).

Many intersex people have questioned why their bodies should not be considered sufficient as they are (ISNA 1993-2008). There is a connection here to Chapter 6’s example of disabled children preferring their own, non-prostheticised bodies – a non-adherence to the encouraged physical (and social) prototype (arguably a form of “natural state” essentialism; Turner 1999). Accepting one’s own body could be argued as the opposite of gender dysphoria, a form of bodily ultrahumanisation: acceptance and integration of all disparate “parts” of one’s self (also observed in the “fat acceptance” movement, where individuals accept and celebrate their non-prototype bodies, Cooper 2010, and potentially also in terms of both non-surgical and post-surgical intersex, trans and cis bodies).

As some intersex people wish to retain their different bodies without being forced into an either/or, and some trans activists say that children who are GNC are proto-trans and need to change their bodies immediately (echoing the “urgency” of the optimal gender policy) (Brown 2011), there exists a distinction between “transgender”-by-choice and non-binary-by-birth that similarly echoes tensions between disabled prosthetic users and self-modified transhumanists.

Early intersex-researcher John Money is criticised these days for his utopian view of gender and sexual orientation that theorised gendered birth-assignments via surgery of intersex infants would not

be salient later (1972), as there resulted tragic counterexamples (*New York Times* 2004) – Money may well be right regarding theoretical gender-free, bisexual defaults, but if this is the case we are likely hardwired to promote gender difference regardless, and so such surgeries are not consequence-free in terms of *society*. We live in a gendered society; we do not exist in an “optimal gender” world to begin with.

7.3.4. Transgender Selves: Impossible Variation

Recent studies suggest that there is no such thing as a male brain or a female brain, at least not in the sense of behaviour (Joel 2011, Joel *et al.* 2015). The trans narrative of “female and male brains” in the “wrong bodies” is therefore likely inaccurate. Yet at the same time adults should have morphological – and arguably categorical – freedom in terms of their own bodies and identities. The hypergendered approach of adults taking their children under 12 for gender reassignments could be seen not as a freeing aspect, but as a constricting one (Cassidy 2016). Most GNC children, left free of transitioning paradigms, grow up to be gay, lesbian and bisexual adults; a large minority grow up to be heterosexual (Wallien & Cohen-Kettenis 2008, Singh 2012, Steensma *et al.* 2013); roughly 60-90% no longer are trans by adulthood (Cantor 2016). If such children and adolescents are allowed to choose puberty blockers, cross-sex hormones or have SRS, a generation of otherwise gay, lesbian and bisexual children – and proto-trans children, too – potentially may be permanently sterilised via cross-sex hormones (Brill & Pepper 2008) or rendered 8-37% less orgasmic (Bowman & Goldberg 2006). This particular politicised branch of the trans movement pushing for early hormonal/surgical treatment (again, not monolithic) thus potentially is enabling a form of societally forced SRS.

Sometimes, only binary, post-op transsexuals are considered to be “truly” transgender (Gaughan 2006) (some transsexuals also do not consider themselves transgender, Winters & Karasic 2008). In addition to being a masculine biological woman and feminine biological man, societies ideally – in my opinion – should strive so that it is similarly accepted to be a masculine transwoman and feminine transman (including social males who have clitorises and social females who have penises). It is problematic – considering the correlations with likely future lesbian and gay homosexual identity – that GNC is considered a social problem to be corrected and quickly surgically/hormonally enforced; *rather* than accepting those non-altered proto-trans individuals as “fully” transgendered.

7.4. The Postgendered Self: “Perfect Double-Sexed Flowers”



Fig. 33. Statue of the Greek god Hermaphroditus, ca.300 BCE, Archaeological Museum, Istanbul, Turkey, © Kathleen Bryson 2013.

“Plants can be monoecious, which means that flowers of either sex reside on the same plant. [...] Other plants are dioecious, which means that plants are either entirely male or entirely female. However, the most typical flowering system is called ‘perfect’ – this is where the male and female parts are on the same flower, such as apple blossom.” [App. 403]

The idea of one’s self expanded from binary gender is difficult. If we include the platonic spheres of Plato where the self, male or female, is half until joined with its complementary gender to create a singularity (Plato 360 BCE), the concept is not new. Perhaps even the Christian concept of heterosexual marriage (“the Creator from the beginning made them male and female and that he said: This is why a man leaves his father and mother and becomes attached to his wife, and the two become one flesh”, NJB 1985, *Matt. 9:16*) echoes this. More expansive in sentiment than these philosophical frames – less gender-differentiated than our lactating males – is the idea of gender neutrality. Sometimes known as *agender* or *non-binary*, the category gender-neutral purports to operate *without* a gender structure, though already a gender-neutral/gendered dichotomy is assumed. That said, there is therein avoidance of gendered language and cultural assumptions, and an understanding that concepts correlate with “real-world” prejudices, e.g., using androcentric terminology results in only males being envisioned as career prototypes (Hamilton & Henley 1982, Hamilton 1988, Bojarska 2012). Gender neutrality is idealistic and ambitious, perhaps impossible. It would be hard work due to our tendency towards categorisation (Fiske & Taylor 1984, Medin 1989). As I and many others have argued, the most “natural” essentialising seems to be that of gender.

What follows is a discussion of how we combine, subvert or, in the case of theorised gender

neutrality, entirely dispense with, gendered differentiation. Theorists George Dvorsky and James Hughes coined “postgender” with a specifically transhumanist application: “Postgenderism is an extrapolation of ways that technology is eroding the biological, psychological and social role of gender, and an argument for why the erosion of binary gender will be liberatory. [...] gender is an arbitrary and unnecessary limitation on human potential [...] [we] foresee the elimination of involuntary biological and psychological gendering in the human species through the application of neurotechnology, biotechnology and reproductive technologies.” (Dvorsky & Hughes 2008:1).

I agree that the “erosion of binary gender will be liberatory” and that gender is limiting; I reject the transhumanist requirement for biotechnology and dismissal of biology; indeed, *I reclaim evolution itself as postgender*.

How do we participate in postgenderism? We start by looking for similarities between the sexes, rather than differences, and also by acknowledging non-paradigmatic physicalities and behaviours.

7.4.1. Postgendered Female and Male Selves: Flexible

Gender chimerism can occur between a mother and foetus, and also between siblings *in utero*, or from siblings via one’s mother’s earlier pregnancies. A mother can in this manner pass on her siblings’ avuncular and materteral genes along with her own. Foetal-maternal chimerism due to modern IVF techniques – not just “normal” chimerism via biological-mother-to-biological-child (“Some 80 to 90 per cent of women carry their children’s cells or DNA in their blood during pregnancy and up to 50 per cent keep them for decades after giving birth”, Highfield 2009:1-2), or via twinning (Yu *et al.* 2002, Wolinsky 2007) – is now more common due to the use of donor eggs: in one study, 6 of 27 of an infant’s maternal miRNAs were theorised to be potentially influenced by the carrying mother, not the biological mother (Vilella *et al.* 2015). All of these chimeric examples can potentially involve both male and female DNA co-existing in the same human body, just as both-gendered chimerism exists for recipients of organ transplants, bone marrow (Waldemar 2005, Imanishi 2007) and blood-donation recipients (Gong 2009). The idea of one’s self as a gender chimera is but one way even “concrete” male and female selves can be flexible.

Before the “evolutionary arms race” between the sexes got armoured up for battle (with manipulated post-copulatory sex ratio attempts by both sexes – though, as with most nature/environment observations, to wrangle which “strategy” came first and which belongs to which sex is similar to the co-evolution of male and female genitalia: each a reaction to each other, Trivers & Willard 1973, Cagnacci *et al.* 2003, Arnqvist & Rowe 2005, Lodé 2006 – organisms were bisexual in origin, in both senses: “Bisexuality is in fact an integral part of all organisms [...] basic, conserved mechanisms underlie sex determination and sexual differentiation including processes in the brain, which contains

a conserved neural network of nuclei that regulate sexual behaviours. [...] As Per Södersten put it, 'the search for morphological sex differences in adult rat brains that are caused by the 'organizing effect of perinatal androgen' and that can be related to sex differences in behaviour has not been fruitful and may continue unrewarded'. The question, then, is whether there are dual circuits or a single network with two distinct foci that create alternative outputs" (Crews 2012:779-782).

Biologist David Crews goes on to argue for the latter hypothesis: "Simultaneous hermaphrodites [...] are another useful model for looking for a common network characteristic [...] this evidence suggests that modern vertebrates are fundamentally bisexual in nature; that the neural mechanisms mediating both male and female copulatory behaviour are normally inhibited; and that activation provides relief from some of the inhibitory inputs. In other words, rather than enabling males and females to do something that the other sex cannot, sex differences enable males and females to be better at the things they do" (*Ibid.*:783-784). This backs up further neuroscience results on the overriding lack of brain sex differences (Joel 2011, Joel *et al.* 2015). Crews' proposal is a far different biological paradigm than considering the sexes to be essentially gendered.

7.4.2. Intersex Selves: Freed

The now-inappropriate-for-humans Ancient Greek-rooted word *hermaphrodite* is a portmanteau of beautiful male and female love deities (Hermes and Aphrodite, respectively, parents of the god Hermaphroditus). Note, however, that "hermaphrodite" is a blending necessitated by two distinct (opposed) essences, with one an idealised male deity, and the other an idealised female.

Currently, it is accepted that intersexuality, in the widest sense, has a rate of occurrence of 1.7% of the population for intersex individuals (Fausto-Sterling 2000). This indicates mutations unlikely to have been selected for. That said, plastic ToM/empathetic responses that result from the state of not being monogendered in a highly gendered society could be socially advantageous, just as highly androgynous behaviour is theorised to be (*American Psychologist* 1997; see also Bem 1974) (or, conversely, cause extreme dissonance if such "natural" non-binary category-blurring is not accepted by others, just as ambiguous category membership seems to do for some bisexual and mixed-race individuals, Boon 2008, Sanchez *et al.* 2009, Ross *et al.* 2010, Lincoln *et al.* 2015). Perhaps part of acknowledging others' variable phenotypes and genotypes also is acknowledging an individual's right to make a full-consent decision about their own body, whether that is choosing *to* present/modify one's body towards maleness or femaleness, or *not* to modify one's "non-prototypical" body at all. As stated, full-consent is the policy advocated by most contemporary intersex advocacy groups (Karkazis 2009).

7.4.3. Transgender Selves: Fluid

Many intersex people campaign *not* to have their own bodies (and the bodies of other intersex children) permanently gendered via surgery and chemicals at early ages; many transgender people campaign *to* have their bodies and those of others permanently gendered (precisely to avoid, in many cases, the irreversible masculinisation [aka virilisation] via testosterone at puberty in those transitioning to be females, as well as female secondary sexual characteristics in FTMs). Therefore, as noted previously, there has been ideological tension between the communities (Costello 2014). That is not the whole picture: many intersex individuals choose binary gender identities, including surgery; many trans people identify as non-binary; and some trans people, both binary and non-binary, resist surgery and the presumed implication that if one transitions to female, one will desire men, and vice versa. Transsexual theorist and writer Kate Bornstein rebelled against such “transsexual training”: “She herself was planning to be a lesbian, and felt this ambition was not compatible with adopting the ultra-feminine linguistic persona symbolised by soaring pitch and smiliness.” (Cameron 2008:159); similar experiences have been detailed by FTMs who consider themselves gay men. Leslie Feinberg’s novel *Stone Butch Blues* details a protagonist who was born female, self-categorised as male, then ultimately decided against a male identity whilst not “returning” to a female one, yet retaining a butch lesbian identity (Bettcher 2014). Both Bornstein and Feinberg – with their fluid interpretations – are considered leaders in the vanguard of the modern transgender movement. It is not only the proposed butch-trans continuum (Feinberg 1996) where cultural identities have blended. (It should be noted that many butch and masculine women fiercely resist being considered trans, Due & Burana 1994, Halberstam 1998.) Another trans/cis (as we see, another dichotomy in the process of being culturally reified) crossover space is the concept of gender neutrality/gender fluidity. Furthermore, many individuals of all genders consider themselves along a spectrum, i.e., some straight and lesbian biological women consider themselves *transmasculine* (there is no biological female *transfeminine* category, as that does not challenge binarised biological female behaviour; the inverse of a transmasculine category amongst biological males also is generally absent, though female drag queens – women performing as men performing as women – do exist). Whilst transmasculine (transfeminine) is a gendered state, it is not entirely binary, as it does not necessarily presume an end to the gender journey with an essential state. (Both gradient terms also can apply to trans individuals, respectively.)

The right *not* to choose, as the right *to* choose, can be considered part of the morphological freedom movement. Transsexuality is different from intersexuality in the sense that one makes a choice to morphologically alter one’s body, whereas intersex individuals present with intersexuality, either phenotypically or chromosomally (which can be undetected) at birth, though intersex people can of course be transgendered- and transsexual-identified as well. Stone was one of the first to argue that there could be a solely transgender (transsexual) point of view that needed to be analysed outside of

biological male/female (and even intersex) dynamics (1996). This idea of a trans-specific category is echoed in many liberation movements that use strategic essentialism (Guha & Spivak 1988, Azoulay 1999).

Via natural selection, our own bodies have formed in particular ways and our brains use this information to detect differentiated biological sex. Body size, larynxes, hands and especially facial morphology (Gerhardstein & Anderson 2010) are among the identifiers by which humans determine sex categories. If a person has post-pubertal SRS/cross-sex hormonal treatment (potentially dangerous, Mueller & Gooren 2008; certainly often sterilising, Brill & Pepper 2008), there also is a surgical risk, primarily in MTFs, of diminished orgasmic capacity (Bowman & Goldberg 2006). Without cross-sex hormones, young MTFs' faces develop "masculine" features due to pubertal testosterone (virilisation), which also may account for the higher levels of MTF dissatisfaction with SRS as adults (30%) compared to FTMs (10%) (Pfafflin & Junge 1992). MTF transsexuals who undergo facial feminisation surgery report greater happiness levels than those MTF women who do not (Ainsworth & Spiegel 2010), as do post-transition MTFs with more "feminine" facial morphology (Gerhardstein & Anderson (2010), which fits theories of prototype infrahumanisation (or the categorical refinement of prototyping via what would here be called infrafeminisation, the ingroup within the larger human category). Without SRS or cross-sex hormonal treatment, gender dysphoria may be so strong that some children (only extremely rarely) and teenagers (more frequently) develop suicidal ideation. Unfortunately, although some studies suggest no correlation with suicide (De Cuypere *et al.* 2005), longterm follow-up studies suggest that suicidal ideation can remain even after SRS (Murad *et al.* 2010, Dhejne *et al.* 2011). In summary, via our essentialism towards prototypes (humans are "cognitive misers": Fiske & Taylor 1984), there are social and survival risks (suicide, self-harm, ostracisation due to different phenotype) if a trans teenager *does not* take cross-sex hormones and will not fit a phenotype prototype; there are social and survival risks (sterility, diminished orgasmic capacity, cancer, non-consensual transitioning of the vast majority of GNC children who would be neither trans nor gender-dysphoric as adults, Cantor 2016) if one *does* take cross-sex hormones. We need a more nuanced solution of potential risk laid against risk, with potential benefits weighed against benefits. That said, the "emergency" of "fixing" GNC children while still in adolescence, however, does echo the "emergency" of "fixing" intersex infants and bodies.

Social acceptance of differentiated prototypes should have positive effects on one's integrated sense of self, both transgender and cisgender. If this is not the case, then "uncanny valley" type reactions with transgender people who do not visually fit prototypes but are close enough to cause category confusion will continue to occur (likely in both subjective and objective senses) – perhaps similar to how bio-women do not fit the socially prescribed category of "human" in an androcentric world, and as a gender are considered "sneaky", "cyborg", "cryptic", "manipulative", etc. (similarities, too, to Nazi conceptualisations of Jews, cf. Taylor 1998). In nearly all ambiguous-set contexts, before one

metaphorically crosses the uncanny valley (cf. *Fig. 19*), one also is accepted: one is just in a different “kind” of *category within a category*. Once one enters “close but no cigar” territory in terms of acculturated prototypes, ultrahumanisation is possible, but not certain (Pfaus *et al.* 2001, Saygin *et al.* 2012).

The onus then should fall on the larger society to “re-program” their minds as to what a female or male looks like. Gender takes the form of a rigid mental dichotomy, possibly hard-wired. But because something is “natural” does not make it more “correct”; this is known as the “naturalistic fallacy” (Segerstråle 2001). Just as we can grow used to human–machine intermediaries and see them positively (Turkle 1984, Pollick 2009), if we wish to preserve many individuals’ fertility, sexual response and avoid cancer risk – but also be mindful of mental health risks regarding the dysphoria experienced by being in what is seen as the “wrong” body – we may need to get used to seeing men who look like different kinds of men or women who look like different kinds of women: alternative prototypes of facial and body morphology. Most biological men and women exhibit huge crossover in phenotype, and do not fit idealised prescribed prototypes, e.g., many women have pronounced brow ridges; many men have visible breasts. As psychologist Terri Conley points out, “Thinking about ‘ideal’ elicits more stereotypical thoughts about women and men — and what women and men ‘should’ do” (Pappas 2011:1) – and how they should *look*. As trans journalist Dawn Ennis puts it, and I concur, “These individuals – and others who openly embrace a nonbinary identity like many genderqueer, intersex, or gender-fluid people – don’t need help ‘passing’; they need society to broaden its concept of gender and expression and allow non-conformity to be an acceptable alternative to the male or female binary.” (Ennis 2016:11).

A gender-free (gender-neutral) world has ramifications also for disabled rights. There are similarities here to arguments regarding South Korean (cisgendered) feminising/Westernising facial cosmetic surgery (Kurek 2015) or to parents who opt for cosmetic surgery on the eyes of their Down Syndrome children. This might be due to parents’ own preferences, or to ensure more societal acceptance of their child’s physiognomy (Goeke 2003). Societies *can* adjust to different prototypes: schools that integrate mentally disabled students help both the mentally disabled kids, who often thrive (Buckley *et al.* 2006), and the non-disabled children, who become more empathetic by exposure to non-prototypical bodies, faces and abilities (Staub & Peck 1994/1995). To expand using a different simile, we in the West live in a Caucasian-prototype world in terms of media and culture: this does not mean we should encourage skin-bleaching and blue contact lenses; what we should do instead is expand the prototype. I also note the risk that even if we erase current gender signifiers we will attempt to find gender present, regardless.

Finally, in terms of flexibly gendered behaviour, there can be *fun* elements (exactly as with concretely gendered behaviour, cf. 1930s Hollywood “screwball” films) – “playing” with the performance of the opposite gender – such as in carnivalesque situations (Pielichaty 2015) or with drag queens and

drag kings in an environment/community that is both subversive and separate from a heteronormative world (Butler 1990, Feinberg 1996). Furthermore, acting – even on a part-time basis – as the opposite gender need not necessarily be caricatured in terms of either heteronormativity or of trans people, but also can be a result of empathetic reactions, as here in a letter from a self-identified heterosexual male addressed to the publishers of the Sapphire imprint of erotic books marketed by Virgin Publishing towards lesbian readers: “I am quite in favour of submissive and inexperienced erotic points of view, that is featuring introverted, femme, young, naïve, romantic, ordinary, intellectual characters (probably like me)” (Personal correspondence 1998, cf. *Appendix E*).

Along that line of thought, perhaps dominant males might see *themselves* as submissive in an act of extreme empathy exchange, a shared identification. We already know that males are more *giving* sexually than females (Ogas 2012, Bergner 2013) and care deeply about female reactions, particularly in sexual contexts: empathy is key.

7.5. Pax (Post)Humana and Postgendered Others: “Strong Females and Soft, Disclosing Males”



Fig. 34. [Heterosexual] “Lovers in Blue” by Marc Chagall (1914).

“[Men] are supposed to be strong and ‘manly’. And prison is a particularly hard environment in which to do anything that might be interpreted as weakness. It is so important that a safe space is created where men can disclose.” [App. 247]

The socioecological model enables us to examine “outlier” evolutionary sexual strategies in humans and other organisms. These observations beg the question of difference. Hrdy has commented on the scientific tendency to distinguish rather than blend: “ ‘ human evolutionary psychologists’ focused on the evolution of sex differences [...] they tend to be less impressed by behavioral flexibility and by

variation between individuals. From the outset their goal was the discovery of pan-human traits” (1981:xx).

Linguist Deborah Cameron makes a similar point that gendered reasoning feels “right” because it relies on stereotypes, therefore manageable shortcuts – indeed, in general, studies with no significant differences are less likely to be published (2008). We pay, she argues (as do many others), most attention to anomalies and differences, but stereotypes do not need explanation (*Ibid.*, Dovidio & Hewstone 2010). In *Tab. 31*, we find some potentially shared physical similarities.

Tab. 31. Some “postgendered” physical traits.

Crossover Physical Traits
● pronounced supraorbital ridges, thought to be a “male” trait, are variable parts of gorilla female morphology, potentially indicating intrasexual selection (Balolia <i>et al.</i> 2013) that could be argued to both signify and dismiss biological sexual differentiation; ● just as human females can grow full beards, female lions sometimes grow full manes (Dell’Amore 2012); ● as discussed, human females ejaculate (Kilchevsky <i>et al.</i> 2012); ● being more physically masculine boosts female fertility in African pygmy mice (Veyrunes <i>et al.</i> 2004); physical “masculinity” in human females also is linked to higher promiscuity (Van Anders <i>et al.</i> 2007, Burri <i>et al.</i> 2015), so potentially also male sperm competition and greater direct fitness for females; ● in primates, sexual swellings do not necessarily indicate maximum <i>fertility</i> (Engelhardt <i>et al.</i> 2004, Deschner <i>et al.</i> 2004), and also may not indicate reproductive <i>success</i> (Nunn <i>et al.</i> 2001); ● facial symmetry – “prettiness”, found more often in females than males and argued by some evolutionary scientists to be connected to attractiveness (Perrett <i>et al.</i> 1999) – is something that baboon males are neutral towards, but to which female baboons are attracted (Boulton & Ross 2013). ● lack of penis spines in human males (pearly penile papules aside, Johnson 2011) suggests less promiscuous males and less antagonistic mating (and potentially less multi-male mating, Harcourt & Gardiner 1994) – the presence of penis spines is more common in less “monogamous” populations (Cayetano <i>et al.</i> 2011); ● On the other hand, the flared glans of human penis shape may suggest ancestral multi-male mating (polygynandry or even polyandry, Hrdy 1981, Lloyd 2005, cf. Nummi & Pellikka 2012); ● as noted, mammal males occasionally lactate (Kunz & Hosken 2009) and, very occasionally, human males have nursed infants (Swaminathan 2007); ● the flexibility of male physicality can involve subterfuge. 40% of Western marsh harriers use female plumage (Sternalski <i>et al.</i> 2011, Gorman 2011). Male garter snakes also rely on female mimicry for survival purposes: “She-males attract enough males to give them a snake-hug, and once they’ve warmed up, turn off the pheromones.” (Gorman 2011, Shine <i>et al.</i> 2001); ● this is perhaps akin the reasoning behind Baron-Cohen’s over-50% of females having so-called male brains (Baron-Cohen 2004): a very large “outlier” described as a gendered trait.

7.5.1. Postgendered Physicality, Female

Binarised female physical traits too can be gradualist. Such “crossover” physicalised strategies – via natural selection – exist amongst all life-forms and genders and here are some (humans specified when apt). Brief illustrations in *Tab. 31* are but a small acknowledgment of co-gendered (shared) or non-paradigmatic physical aspects, e.g., cryptic sexual swellings are included in this table, as such non-paradigmatically suggest an active as opposed to a passive female sexuality.

7.5.2. Postgendered Physicality, Male

The variety of masculine physical traits spurred on by sexual selection, including spiny genitals (Harcourt & Gardiner 1994) is vast. Once-accepted theories such as the Priority of Access model (PoA), where females mate with the most physically dominant and masculine high-ranking male (then, for human females, choose “sensitive” males when it’s time to marry-not-mate, cf. “cuckoldry hypothesis”, Thornhill & Gangestad 2008), have been contested: evidence for non-compliance has been found in *hormotypes*, e.g., bonobo males have a hormonal mechanism wherein they react to potentially stressful situations with cortisol, not testosterone as in human males and chimpanzee males (Wobber *et al.* 2010). PoA as near-universal also lacks support when we observe lower sexual dimorphism combined with large testes (such as in human males, to a certain degree): this may indicate sperm competition (Ryan & Jethá 2010, see also Nummi & Pellikka 2012: but see Harcourt & Gardiner 1994, Cayetano *et al.* 2011), though this view has been contested (Frayer & Wolpoff 1985, Owens & Hartley 1998); in such primates, physically dominant and masculine males might be less attractive to females.

Most significantly, our human preference towards an average is indicated by a study where American and Japanese subjects (male and female) preferred “feminized to average shapes of a female face” (with strong suggestions that such prototyping also was learned behaviour), but also limited the effects of sexual dimorphism in males (Perrett *et al.* 1998:884) – we may well be applying “average-preferences” in a cross-gendered context: literally averaging male and female faces together (*Ibid.*). The feedback loop of strategies and counterstrategies swings round again: again, the portfolio in *Tab. 31* illustrates but a tiny fraction of co-gendered (shared) or non-paradigmatic aspects of male physicality.

7.5.3. Postgendered Physicality, Beyond the Binary

In 1988, a chimeric infant “resulted from the fusion of a male embryo and a female embryo. The child was outwardly male, but the lefthand side of his internal reproductive system had an ovary and

fallopian tube” (Highfield 2003:1). Many human fraternal twin sets are likely to be chimeric, though this is an understudied subject (Boklage 2006); chimerism sometimes is associated with intersex development (Buzduga *et al.* 2015). The fact that many intersex people retain physicalities with a mixture of primary and secondary sexual characteristics is a clear example of a non-binary embodiment. Such people in adulthood might have both uteruses and scrota, or ovaries and penile characteristics and breasts. Trans people can embody this non-binary physicalisation as well.

All of this in context points to a much less gendered world than the “official” (prototyped) one. Simply thinking in dyadic terms in terms of gender, for example, is problematic: “[d]yadism is the belief that there are only two ‘natural’ and ‘biological’ sexes, male and female” (Jourian 2015:17). We see this in sampled articles: “characteristics that differ between the sexes are at least partially determined in the womb, by hormones” [App. 291].

An anonymous Wikipedia editor takes it further than a neutral description: “In action, dyadism is discrimination against intersex people.” (Wiki: Intersex/Dyadism 2016:2).

7.5.4. Postgendered Behaviour, Female

When resources are plentiful or groups moderately related, females can be highly cooperative, “clumping” together for reasons of survival via resource and predator defence. This includes cooperative parenting, though in some species such as wolves and meerkats, the alpha (dominant) female manipulates other females into non-fertile states and receives the benefit of them nursing her pups (Hrdy 2009). Hrdy theorises that early hominin females likely nursed babies other than their own, setting them apart from other great apes, eliding with theories regarding the highly cooperative nature of the human species (*Ibid.*; see also McKenna 1979) (though chimpanzees and bonobos also can be pro-social and cooperative: Tan & Hare 2013, MacLean & Hare 2015).

In *Tab. 32*, we observed some notable female “alternative strategies”:

Tab. 32. Female alternative strategies.

Female Alternative Strategies

- In captivity, we observe flexibility in the famously solitary female orangutans, who collaborate in twosomes and prefer the company of females (Camer *et al.* 2012);
- wild bonobo female-female competition is low, perhaps initially “kickstarted” by abundant food resources (Sommer 2010), and now also negotiated by sexual and other behavioural adaptations, including proximate mechanisms such as low-antagonism in bonobo males;
- indeed, “nicer” males (with less testosterone) often are preferred by females in humans and other animals (Schradin *et al.* 2009, Pincott 2010, Van Anders 2009, Surbeck *et al.* 2012, Strier *et al.* 1999);
- one study suggested that women desiring less dominant men might be the case in high-stress environments as well, such as economic recessions (Lewis & Julal 2012), perhaps again indicating that the default “attraction” state for females is not necessarily the more masculine and dominant male (DeBruine *et al.* 2010);
- human females from countries with healthier populations prefer more feminine-looking men (Facereasearch.org 2010); in low-stress, low-pathogen environments, females prefer feminine male faces (Little *et al.* 2010, Penton-Voak *et al.* 2004);
- some human female studies show no “masculine” preference (Fink & Penton-Voak 2002, Rhodes *et al.* 2003; but see Rhodes 2006);
- female choice plays a great part in terms of choosing mid-ranking – *not* “alpha” males (Young *et al.* 2013);
- when female dominance occurs in matriarchal primate systems, it can be violent and in bonobos belies the “peaceable” myth (Sommer 2010), though, as with some lemurs (Schoelmann & Lewis 2012), not as lethal as the dominance shown in patriarchal chimpanzees;
- human females crave sexual novelty to the same degree that males do (Dawson *et al.* 2013);
- female primates are certainly equally as unlikely (or likely) as males to be truly “monogamous” (a problematically vague term in biology, Fuentes 1999, Sommer & Reichard 2000, Schultz 2014);
- lack of a post-orgasmic refractory period in females suggests multi-male mating (polygynandry or even polyandry, Hrdy 1981, Nummi & Pellikka 2012), in addition to females’ multi-orgasmic capability (noted by double-sexed Ancient Greek prophet Tiresias: “*If the sum of love’s pleasure adds up to ten/nine parts go to women, one only to men*”, Kerner 2009:22);
- human females are not themselves fidelity-hard-wired – they are, like human males, flexible in their mating strategies (Schacht & Mulder 2015) and can be just as interested in one-night stand as males (Conley 2011).
- human females are not themselves fidelity-hard-wired – they are, like human males, flexible in their mating strategies (Schacht & Mulder 2015) and can be just as interested in one-night stands as males (Conley 2011).

Evolutionary anthropologist Andreas Paul states that half of well-studied primate species fit the socioecological model of “relaxed, egalitarian” species, allowing “extensive interactions between their infants and other individuals in the first weeks of life”, further indicating a great deal of primate behavioural flexibility (1999:33).

In the spirit of such flexibility, I note that it is to the general female animal’s advantage to be promiscuous and then to practice cryptic female choice: “females may only be able to minimize the risk and/or cost by genetically incompatible sperm by mating with more than one male [...] One of

the most consistent findings is that females mate with multiple, and often, with as many males as possible, rather than seeking out copulations with one, or a few best males.” (Paul 2002:887,890, citing Zeh & Zeh 1996, 1997). Sarah Hrdy concurs: “the selective importance of an active promiscuous sexuality becomes readily apparent” (1981:174; see also Ryan & Jethá 2010, Nummi & Pellikka 2012). Even the “monogamous” gibbons can show signs towards multi-male mating, what Sommer and Reichard call “grouping polyandry” (2000). Nor are human tendencies towards pair-bonding (if not inviolable lifelong “monogamy”) necessarily an evolutionary result of males quashing down such female polyamorous instincts: there is a recent theory that for “monogamy” in many primate species, including humans, the selective force has been infanticide-avoidance, with fathers protecting offspring against rival males, as opposed to mate-guarding or paternal care (Opie *et al.* 2013; see also Borries *et al.* 2011).

One oft-accepted evolutionary theory is that human males prefer pornography and females romance: “fantasies that are reflective off the different ancestral problems faces by males and females” (Salmon 2012:158). Salmon doesn’t seem aware of the popularity of heterosexual written pornography for women such as Virgin Publishing’s highly popular series of Black Lace novels that sold 10,000 copies per novel, two new print novels per month from 1995 to 2009 (Berens 2000). The imprint consisted of explicit descriptions, not coy romances. Female “hardcore written erotica” does exist and is popular, and often involves impersonal sex with strangers (Friday 1993, Berens 2001). “Google porn” scientists Ogas and Gaddam also engage in this dichotomisation of desire (2011). Expanding to visually explicit material, a third of porn-watchers are female (this in Western cultures where females watching pornography and/or masturbating is highly taboo, Kaestle & Allen 2011); UK women’s magazine *Marie Claire* published a survey indicating that 33% of UK women watch pornography (Sanhdu 2015). Female sexual fantasies preferences may allude directly to polyandry and sperm competition in mating: Nummi and Pellikka found that females “find multipartner settings as arousing as males do”, and that there were “notable preferences among females for multi-male-partner fantasies over multi-female-partner fantasies or fantasies that include multiple male and female partners” (2012:93). As with potentially vestigial penis spines in the form of “pearly penile papules” (Johnson 2011), adding ballast to the polyandrous (or at least multi-male) ancestral “nature” of human females, female sex fantasies involving multiple males are higher near ovulation (Nummi & Pellikka 2012).

Salmon links an essential genderedness with the male consumption of erotic material via “the deeply visual nature of male sexuality”. However, studies show that females may be *just* as visual as males (Chivers & Bailey 2005, Bergner 2013). It seems we feel near-Biblical pressure to divide goats from sheep, especially when it concerns male/female versions of the same desirous animal.

Despite our likely Miocene ancestral polyandry/polygynandry, humans may now also be adapted towards being somewhat monogamous (“monogamish”: cf. Oppenheimer 2011, citing Dan Savage),

indicated by relatively large penises, lack of penile spines and predominant pair-bonding (Saxon 2012). Therefore it should come as no surprise that for female sex fantasies, one-female/one-male was the most popular grouping of all (Nummi & Pellikka 2012). This elides with some findings that indicate that human males, too, prefer one partner over all other combinations, with outlying randy types skewing the results (Conley *et al.* 2011: but see Schmitt *et al.* 2012).

Bonobos have “matriarchal” societies (Sommer 2010); with examples of females preferring lesbian sex to heterosexual sex (roughly 60% of sexual interactions are lesbian) (de Waal 1995, Bagemihl 1999). Preferring a female to a male as a female actor is certainly considered an “outlier” strategy in terms of scientific paradigms. Some human females do not engage in direct coitus for reproductive purposes, using alternative strategies such as IVF or self-insemination – all these “alternative strategies” are adaptive: lesbian-prioritising bonobos may reap survival and reproductive benefits via reciprocal altruism; assisted reproductive technology in humans promotes direct fitness (particularly in conjunction with alloparenting, as noted).

The wide variety and frequency of these “outlier” behaviours may cause category confusion for females even when they participate. Girls and biological women struggle in terms of outlier gender roles. This is related to *Social Role Theory*: the idea that society enforces sex roles between males and females: “individuals who violate gender stereotypes are often perceived unfavorably [...] women who show agentic traits are often regarded as less appealing [...] Likewise, competence in women – an agentic trait – increases the likelihood they are perceived as cold. [...] Both men and women demonstrate these biases against females who violate social stereotypes.” (Moss 2016:2, citing Eagly 1987). (Women who embody behavioural stereotypes may receive advantages in female-typical careers [Fine 2010], operating under *stereotype lift* [“a boost in performance caused by an awareness of a positive ingroup stereotype”, Cotner & Burkley 2013:1336].)

Other outliers include *hypogamous* human females who prefer younger men at the expense of older, wealthy men, finding such relationships more satisfying (Agnew & Lehmler 2008). Wanting a beta-male as opposed to a masculine dominant male may well be implicitly a “non-feminine” trait held by implicitly unattractive women who have to “shift” their mating strategies (Buss & Shackelford 1997), but women who are more gender nonconformist – associated with higher sociosexual behaviour (Ostovich 2005: but see Varella *et al.* 2014) – apparently also have higher self-esteem than “feminine” women (Johnson & McCoy 2000), a trait associated with being of high mate value (Buss & Shackelford 2008). This contradiction suggests cultural impositions allowed by a plastic behavioural repertoire rather than hard-wired behaviours, including an artificially imposed premium on low sociosexuality, submissiveness and general stereotyped feminine behaviour for females in Western society.

There does appear to be, however, an adult crystallisation of gender (Cantor 2016). It would make

sense that boundaries prescribing gendered behaviour and sexual orientation might be the ones most struggled with, since heterosexuality is the primary prescribed gender requirement for both males and females.

Another prescription is gender presentation. With a thriving beauty industry, subjectivism is ignored by capitalist interests (Black 2004) (and arguably overemphasised by evolutionary psychology theories, Hrdy 1981); both males and females attempt to adhere to culturally idealised prototypes (Agliata & Tantleff-Dunn 2004). We see this for race (Hunter 2011) – race prototypes additionally are unduly influenced by gendered prototypes, Johnson *et al.* 2012 – and body shape as well as faces (De Casanova 2004), and, with growing cultural prescriptions regarding *male* appearance (Agliata & Tantleff-Dunn 2004), we see this of late in Western men (Sturrock & Pioch 1998, Strother *et al.* 2012). Females risk their health with breast implants to fit bodily prototype categories: “ ‘They’re made to bleed so that the body will react and form scar tissue to hold the implant in place. What nobody realised was that the oil would start to kill off the tissue.’ ” [App. 430]. Prototype adherence also applies, of course, to those who have mastectomies due to breast cancer and want to look “whole” in a so-called normal body, and to transgender women who have breast implants.

In terms of such adherence, humans *do* consider average faces attractive (Langlois & Roggman 1990, Alley & Cunningham 1991), but they consider even more attractive those faces with outlier, unusual traits (Alley & Cunningham 1991, Fink & Penton-Doak 2002).

In terms of “alternative” female behaviour, artistic capacity in females is underemphasised (Coe 2003, Nettle & Clegg 2006); art usually is theorised in evolutionary terms to be a sexually-selected (by females) male trait (Miller 2000). Perhaps via empathy, artistic ability in males lead to an art-aesthetic/appreciation in females; females became artists themselves in this way: a feedback loop where aesthetic ability in females also leads to male aesthetic awareness (see also “niche construction theory”: Bandura 1986, Odling-Smee 1988, Scott-Phillips *et al.* 2011, Laland 2015). Artistic appreciation (and creation) in this manner also could take place in species that already had adaptations towards cooperation mechanisms (more generalised male/female differentiated behaviour additionally could function in this manner). Theorists have qualitatively argued that the subjective experience of art results from high intentionality, as writer Vernon Lee has explored (Lanzoni 2009) (or at least *presumed* high intentionality, Veras 2008). Moreover, this could go in the other direction, too, if females were the first to develop heavily symbolic representations – or, perhaps, art is not sex-linked, in the end; perhaps the very idea of *both* sexes being artists makes us appear, again, too similar.

Another behavioural example of “alternative” female strategies is that of the desired sexual role. One recent study showed that a very sizeable minority of 37.25% of females have being-dominant sexual fantasies, not too different from 40.32% for males; and similarly with 62.75% females versus 59.68%

males having being-submissive fantasies (Hawley & Hensely 2009), echoing previously observed patterns of males being drawn to both submissive and dominant fantasies (though a prior study showed females not as interested in being dominant, Zurbriggen & Yost 2004). The narrative seems to be that both males and females like both roles.

These above are just a few illustrative examples of overlapping gendered behaviour, though even they invoke a sense of a potential “pax humana” (or even “pax posthumana”), rather than a stoked-up “battle of the sexes” based on overemphasised difference. Although evolutionary psychologists are careful to state that more “mainstream” (prototyped) hypotheses are trends rather than absolutes (Begley 2015), for gendered behaviour there is much emphasis placed on differences, rather than similarities (Hrdy 1981). Certainly conceptualisations of (implicitly gender-linked) homosexual behaviour are highly malleable, according to my own results (cf. *Fig. 2 (D)*), and similarly the seeming fossilisation of gender concepts even in the evidence of plastic capacity and behaviour (Spence 1993, Hyde 2005, Fiske 2010, Carothers & Reis 2013) also must be relevant (cf. *Fig. 2 (C)*).

7.5.5. Postgendered Behaviour, Male

Dominance in mating via ranking (alpha male *droit de seigneur*: “PoA”) exists, and often such males are preferred by females (Altmann 1962). But not always. Multiple primate examples show that male coalitions, queuing as opposed to contest and female choice affect male skew (Dubuc *et al.* 2011, Young *et al.* 2013). Via similarly alternative mating strategies, a sizeable minority of human males – and for men in their 20s, possibly a majority – prefer older females (Borrelli 2015; see also Agnew & Lehmler 2008), just as a *majority* of chimpanzee males prefer older females (Muller *et al.* 2006, Fox 2007). Most human males prefer younger *and* older females (Ogas & Gaddam 2011; cf. *Fig. 45*): “it’s worth observing that more men search [pornographically] for fifty-year-olds than nineteen-year-olds” (Ogas & Gaddam 2011:26).

The world’s most popular pornographic website, PornHub, similarly found that male interests were primarily in congregated older women (“MILF” (“[a] mom I’d like [to] fuck”), “Mom” and “Stepmom”) – likely operating under additional eroticised incest taboos – but still nearly twice as much as congregated younger women categories (“Teen” and “Step Sister”). Categorically (and more dissociated from incest), there were over twice as many searches for the “MILF and “Mature” congregated older-woman categories compared to the “Teen” and “Babysitter” categories (PornHub 2016). Finally, younger (in addition to older) women are mainly preferred by younger, not older, men: “[i]n the 18-24 and 25-34 groups, searches for ‘Teen’ rank higher than other terms like ‘Milf’ which begin to rank higher in the 35-44 groups and up. In the 35-44 and 45-54 groups, ‘Teen’ ranks much lower, then disappears off of the list in the 55-64 group’s top 10. ‘Granny’ is the second most searched term among the 65+ crowd. [...] we are most likely attracted to [...] those similar to ourselves” (*Ibid.*:30).

A recent real-life experiment suggested that gendered age preferences are not particularly salient in real life, as age preferences disappear on blind dates (Kelley & Malouf 2013). Along similar lines, rather than the thinner female Western prototype, Google pornographic searches lend credence that most straight males prefer heavier women (Ogas & Gaddam 2011, Swami & Tovée 2012). We have an interesting tension therefore between potentially evolved (clearly very flexible) “preferences” and modern societal prototypes. Males, as it happens, use as many “alternative strategies” as females (cf. *Tab. 33*).

Tab. 33. Male alternative strategies.

Male Alternative Strategies
● The concept of female breasts as male sex-objects, seen in Western cultures, is not universal, with men from only 13 of 190 cultures surveyed regarding them as sexually attractive (Dettwyler 1995); ● female-dominance ranks (high-ranking mothers) helps enable bonobo males' own ranking (Furuichi 1997, Surbeck <i>et al.</i> 2011); ● the much-vaunted 0.7 waist-to-hip ratio (WHR) (Singh 1993) is not only <i>not</i> universal (China 0.6, Tanzania 0.9), but not based on hunting-gathering populations; amongst the Hadza, low WHR is not a male preference (Wetsman & Marlowe 1999); ● in a study by Conley <i>et al.</i> 2011, “men pondered sex 18 times a day to a woman’s 10 times a day, but men also thought about food and sleep proportionately more than women. That suggests sex doesn’t hold as vaunted a position for men as you might expect” (Pappas 2011): ● although males enjoy both sexual roles (perhaps it is <i>males</i> who are the more open-minded gender), males enjoy submissive sexual fantasies <i>more</i> than they enjoy dominant sexual fantasies (Hawley & Hensely 2009). The overarching male-dominant paradigm is not particularly accurate. ● In some monkey groups, alpha-males only account for 6-25% of the paternity (Paul <i>et al.</i> 1993). “Alternative” male strategies can be effective as long as the male actors survive to father offspring who also survive to reproduce. ● When male langurs are in a good reproduction “position”, i.e. troop leaders, they can be as choosy as females, with 4 of 5 solicitations by females ignored (Hrdy 1981); ● human males like intelligent long-term mates, just like females: “nearly as selective as females when considering requirements for a long-term partner” (Kenrick <i>et al.</i> 1990); ● men prefer commitment when women are scarce (Begley 2015); and men will commit for “non-ideal” women just because they want to settle down (Match.com 2012).

Females and males are indeed largely in agreement about the top qualities desired in a mate (Buss 1994/2003). Females: trustworthy/honest, kindness/understanding, dependable, sense of humor; males: trustworthy/honest, kindness/understanding, dependable, exciting personality (Stewart *et al.* 2000) – not wealth, physical beauty or age, and in some female cases not even gender (Baumeister 2000, Rupp & Wallen 2008, Diamond 2008, Peart 2015).

Nor does it always involve brawn. Although intelligence has been theorised (and shown, Prokosch *et al.* 2009) to signal health and “better quality sperm”, a separate recent study has linked high intelligence with increased monogamous behaviour (Kanazawa 2010). Possibly female preference for high-IQ males isn’t due to honest signals of health, but rather potential parental investment and fidelity. Additionally: parental investment by males is not merely a case of being “manipulated” by females but highly strategic on the part of males: being attentive means *less* likelihood of cuckoldry and *more* likelihood of surviving offspring (Patrick *et al.* 2012, Ogden 2013, Schacht & Mulder 2015).

Returning to social role theory, many males struggle to fulfil gender-prescribed roles (Gallagher & Parrott 2011). For, just as females perform femininity, so do males perform masculinity (Butler 1990, Simpson 1994). These two examples from the Appendix exhibit exactly this aspect: “Irish schoolboys are challenged to arm-wrestling by teachers and then shown Laurel and Hardy films. It’s all part of a course to teach them how to explore their masculinity” [App. 231]; “On the one hand, drag aims to deconstruct – excuse my French – stereotypes of masculinity and femininity but without those conventional ideas of sexuality, would drag seem at all daring or outrageous?” [App. 205].

This all still fits snugly with socioecological theory, which allows for the fact that while we over-emphasise differences, we can examine trends whilst still acknowledging a certain behaviourally plastic repertoire. It could be that our own (youth-centric, male-dominated) culture is a veneer of generationally-taught behavioural strategies trumping root plasticity (cf. Doidge 2007). The pornography studies suggest this; the fact that we have had societies in the past with obligatory homosexual behaviour suggests this; and even the male–female behavioural-overlap studies suggest this. We are interpreting real patterns (I do not deny this) as “natural”, but we cannot prove that they are hard-wired instead of prejudices that are rigidly essentialised post-natally – and there is plenty of evidence supporting environmental-based influences, including my own thesis results herein.

7.5.6. Postgendered Behaviour, Beyond the Binary

7.5.6.1. Androgyny

We discussed physical and behavioural chimerism in males and females, though many physical traits overlap, and *no* human behavioural traits can be seen as solely male or female (Spence 1993, Hyde 2005, Carothers & Reis 2013). Psychologist Sandra Bem, who hypothesised the theory of acculturated gender polarisation (“the way in which behaviors and attitudes that are viewed as appropriate for men are seen as inappropriate for women and vice versa”, Ryle 2012:135) (Bem 1993), also hypothesised – in my view also correctly – in her Gender Schema Theory that via *schemata* (information networks in the brain), categorisation of some dichotomies – such as gender – is easier (1981). She thinks that this is due to acculturation; I believe it is more likely to be an evolutionary bias (cf. Gelman & Markman 1986, 1987; Gelman 2003, 2004). Where we converge again is that we both argue that *due* to this binarism other, perhaps unrelated, traits such as “masculine” and “feminine” become attached to this schema. Bem, who is probably the last century’s most prominent name associated with concepts of psychological androgyny, developed the well-known Bem Androgyny Test (BAT) (Bem 1974). 100 judges statistically assessed traits they considered male or female (*post hoc* reasoning by society itself). Thus binarised, one can see how “female”, “male” or “androgynous” one is. Bem hypothesised that truly androgynous humans – those with high levels of “feminine” behaviour and high levels of “masculine” behaviour, expressly *not* those who were merely neutral – would be the most adaptable and successful, though this is difficult to confirm without a longitudinal study (*American Psychologist* 1997).

Male *or* female – an either/or proposition – is problematic in much the same way as the Kinsey Scale is – it does not acknowledge one can be highly homosexually desirous and highly heterosexually desirous simultaneously or over time; similarly, one can have a great deal of “masculine” behavioural traits and a high amount of “feminine” behavioural traits. The BAT acknowledges that we do not operate on percentages that cancel other behaviours/preferences out. Moreover, there is an “opt-out” non-polarised “gender-neutral” category as well. (I note that, like gender-neutral, “non-binary” is just another binary – an essentialised category in opposition to a reified category [“binary”].)

By including tomboys, sissies, drag, transvestism and gender identity among my intermediary qualifiers, most humans on this planet are GNC and exist along a spectrum, which is rather the point. Why *are* the outlier points (male versus female) fetishised if most humans are not gender-conforming at all times in terms of behaviour? The conceptualisations of male and female behaviour themselves are problematic, rather than the vast majority of the human race’s inability to fit extreme outliers on a gender-behaving spectrum. If we could perhaps envision a postgendered world – and by postgendered I do not mean what is often meant, whereby one modifies one’s body surgically in a

transhumanist paradigm, instead a different extended sense of the self where gender is free-floating and not attached to male or female behaviour – then such liberationist strategies may be a mode of getting past fossilised schemata, something even more expansive than bodily change. Postgender in this sense might even be *more* radical than the necessity of changing one's body physically, for, like non-binary and gender-neutral, SRS implies an embodied gendered essentialism in itself.

In this brave new world it would difficult to say that males should be attracted to females, females to males, females to females, or males to males, if male/female exteriority is minimised and male/female behaviour exists only in overlapping trends (Spence 1993, Hyde 2005, Carothers & Reis 2013).

7.5.6.2. Postgendered Strategies

In humans, males who transition to females (MTFs) can retain fatherhood post-transition by making prior donations in sperm banks for the use of themselves and potential or current partners (HBIGDA 1998). An entirely different “postgendered strategy” is the existence of literal 3-parent children via artificial reproduction where the mitochondria in the female egg is replaced with another woman's mitochondria (Jones & Holme 2013) – another form of chimerism.

In MTE (male-to-eunuch) subcultures, male eunuchs, also self-described as “smoothies”/“nullos”, have both penis and testes removed. Not usually legal in the West, surgery commonly takes place in Thailand (Pellissier 2012). In direct fitness terms, eunuchs are maladaptive, but perhaps have increased survival chances and indirect kin selection benefits. Notably, hirjas (Hindu eunuchs, legally considered a “third gender” in India, Khaleeli 2014) describe successful business transactions using male grammatical forms, similarly towards other hirjas to convey respect (Cameron 2008:160). The human right to consensually castrate (an attempted form of gender nullification) one's own body can be seen, perhaps like the Dignity in Dying assisted-suicide campaign, as part of the greater morphological freedom movement. In functional terms, celibacy operates the same way as castration, though is less certain. Both physical and social eunuchs have been found in multiple societies: e.g., Italian castratos, Indian hirjas, chemically castrated Western sex offenders, ancient Greco-Roman Cybele devotees (physical); priests, nuns, some modern self-described “Aces” (asexuals) (non-physical). I note that humans are naturally sterile for sizeable parts of their lives – the first 11-14 years, then for women beginning again in their early 50s (males also experience a huge later-life decrease in fertility, Asadollahi *et al.* 2013).

There are disproportionate amounts of homoerotic inclinations in many of these historical subgroups previous to castration, including Catholic priests and nuns (Boswell 1994, Traub 2002); perhaps suggesting that, as in Iran, their eunuch-hood is correlated to homoerotic feelings. Modern “nullos”,

not forced by families or circumstance to sterilise themselves, could be more seen to be embodying morphological freedom and autonomy over one's own body, perhaps in similar modes to being tattooed or having elective plastic surgery.

7.5.6.3. Transgenderism as Empathy

There are few who could deny the connection between one's sex drive and one's sense of self (self-described asexuals say they struggle to integrate their non-sexual selves in a sex-driven world, O'Neill 2015). Why then would sex-based visual experiences (combined with haptic self-stimulation) via use of digital pornography *not* be formative in terms of how we ultrahumanise/dehumanise, and also in terms of how we empathise and whose viewpoint we take? We see this effect in treating depression (and engaging compassion) via virtual reality (Falconer *et al.* 2016). Humans – male, female, intersex, transgender, non-binary – are great empathisers; I have shown that we identify and prescribe (and humanise) fictional characters in our own images, gender and elsewhere. (Other social animals show compassion, too: elephants, corvids, great apes and canines, Plotnik & de Waal 2014).

If we watch pornography, or read fiction, or watch immersive films or engage in virtual reality, we naturally empathise (*Ibid.*). Nor does empathising need to be sex-based to spur great identification with a gender other than one's biological sex, though that would be a quick, effective mechanism. We empathise and identify in many different ways: one channel to empathy might be pornography, one might be the subjective experience of art, one might be emotional or mental concordance. It is reductive to say that pre-op transgender women are "autogynephiles" (the theory that many MTFs have sexual fetishes of themselves having female genitalia, Bailey 2003) when perhaps such MTFs are empathising with/identifying somatically to other physical, or indeed emotional, triggers.

The concept of cybersex potentially leading to transgenderism was mentioned early on, as "transgender high-priestess of cybersex" Helena Velena asserted: "it allows people to look at their inner feelings – to develop a new definition of themselves [...] at a certain point, cybersex and transgenderism fuse together. [...] They can experiment in a safe environment and see what happens [...] I believe the Net will play a big part in mutating gender identity. You start on the Net and then go out on the street fully transgendered." (Fuller 1995:36-39).

Transvestism, and to some extent transgenderism in a wider sense, can be seen as intentionality – purposefully putting one's self in another's shoes. This mechanism is something humans excel at (and is therefore found in our closest ape relatives such as bonobos). Humans *copy* more than other apes, too (Whiten 2005, Heyes 2009). This transformative experience could take place in a species with extreme empathy, good intentionality skills and high-fidelity copying behaviour. Chimpanzees

and bonobos have the former two, but not the latter; humans have all three. We do not need to shame such empathetic gender-responses – we need to research them more carefully.

7.5.6.4. Similarities, Not Differences

EP posits that males become jealous over sexual infidelity; and women over emotional infidelity, due to paternity uncertainty and parental investment, respectively. This has been challenged by studies on within-sex differences indicating that jealousy is more personality-based (Levy & Kelly 2010); studies that show high cultural variability, e.g., 75% of German males find emotional infidelity more upsetting than sexual infidelity (Buller 2009); that without a forced-choice methodology, the sex differences disappear (DeSteno *et al.* 2002) and that it is *heterosexuals* who behave in this way, rather than those in same-sex pairs (including bisexuals) (Frederick *et al.* 2016). (This makes sense, as heterosexuals essentialise gender more [Parker-Popejune 2008], and therefore operate in a more polarised gender construct, so behavioural differentiation would potentially follow.) All of this suggests cultural, not biological, jealousy differences.

I cited Hrdy in terms of looking for similarities rather than differences in primate behaviour earlier (1981) and how that shifts the paradigm; Janet Shibley Hyde has put forth an analogous Gender Similarities Hypothesis, which is strongly supported by the Carothers & Reis study, as well as previous work by Hyde and Spence that showed overlapping, non-taxonic male–female behaviours (Hyde 2005, Fiske 2010, Carothers & Reis 2013), complemented by studies showing only minimal difference in female and male verbal ability (“The difference is so small that we argue that gender differences in verbal ability no longer exist”, Hyde & Linn 1988:53) and complete brain similarities between males and females – as neuroscientist Daphna Joel says, “There are no ‘true’ ‘male’ and ‘female’ brains out there to discover.” (2011:4). Transgenderism, in many senses, is more open-minded than genderism since it begins with a starting point of looking for such *similarity*, rather than difference.

7.6. Concepts of Both/Many-Gendered Objects: “(Un)Binarised Bathrooms”

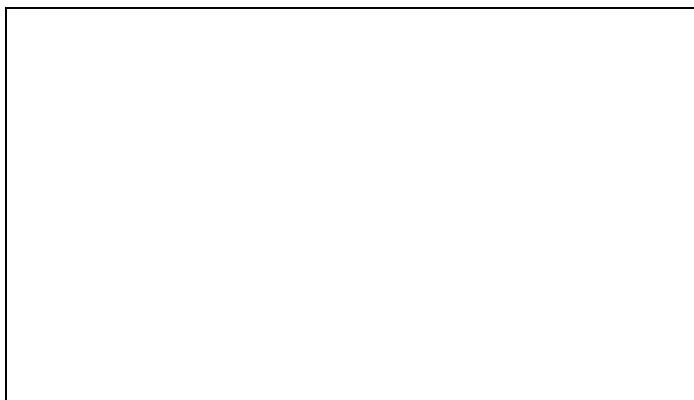


Fig. 35. Advertisement for *Beyond the Binary*: 2016 BBC documentary on non-binary individuals: © BBC News.

“A TRANSSEXUAL who was barred from a pub after complaints from regular customers won pounds 1,000 compensation yesterday and an invitation to return from the landlord. [...] But Ms Jones, who was told that women in the pub had not liked the fact she used the ladies lavatory, will not be taking up the invitation. ‘Just on principle, I won’t go back,’ she said.” [App. 224]

7.6.1. Gender is Unstable: Ungendered Facebook Designations, Bathrooms and Toys

There has always been gender subversion in popular media – e.g., male cartoon character Bugs Bunny in a dress from 1942 onwards – yet Western society has become of late *more* gendered in terms of children’s toys and literature and advertising, more so than even 50 years ago (Auster & Mansbach 2012, Sweet 2014). Perhaps gendered levels are always constant – sometimes we gender in languages, other times via sex roles or purported “brain sex”. We do see that Facebook in 2014 expanded its two-gender choice to 71 choices (Williams 2014). In the last four years, Germany, India and the US state of Oregon have all allowed for other designations than just male or female on their passports, birth certificates or driving licences (Nandi 2013, Khaleeli 2014, Dake 2016) (though Germany requires later binarisation for those born intersex, Morgan 2013), alongside similar legal measures by other countries such as Bangladesh, Nepal, New Zealand and Australia (Macarow 2015). On the other hand, UK parents of children are being told to classify their gender by 3 or 4 (*Guardian* 2016) – this may seem open-minded, but it is actually an essentialising mechanism, quite different from Sweden’s recent experiment with gender-neutral pre-schools (Leach 2016).

It is possible that in the last six years since my research time-slice concluded (the final year studied being 2010) that there has been a huge gender upheaval, but despite increased societal awareness of transgender issues I suspect not, as evidence for this would have showed up in the 2005-2010 results; the set-membership requirements may have shifted in the last six years, but the dichotomy of separated women and men (perhaps re-qualified to include transwomen and transwomen) remains roughly the same. Just as my results stay generally steady: we see gender-encompassment in

articles from 2005 onwards (“Stefani combines old-fashioned Hollywood glamour with tomboy cool.” [App. 248]), but also regular categorical boundary guarding (“let one woman – the real kind, not the pretendy drag-queen kind – pass a comment on gay male sexuality” [App. 266]).

That said, there have been recent backlashes against the toy-gendering that has been strong since roughly 2010 (Schwab 2016): “Pink kitties and unicorn ponies for boys, and rockets and blue dinosaurs for girls – scrapping gender stereotypes” (Revesz 2016; see also Gander 2015).

In the same way that we consider bicycles gendered, we currently have much debate over lavatories themselves being “gendered” (not just in terms of those who use them: bathrooms as objects (*Fig. 35*; see also *Fig. 28*).

Fig. 36. Brony: image taken from Guardian, © Matt Cardy/Getty Images 2012.

Finally, we see “Bronies”, a subculture of mainly heterosexual young adult men who are fans of the My Little Pony: Friendship is Magic™ toy franchise aimed at girls (*Fig. 36*). In theory, via rainbow-coloured sparkly ponies, this allows males to be more “feminine”/nurturing with other males in a non-competitive environment. As they challenge, rather than uphold, gender prescriptions, despite criticism that they have taken over a “female” space and masculinised it (and have been labelled “Trojan Ponies”, in an example of potential boundary control by females of a female ingroup), Bronies also have been described as the true male equivalent of the feminist movement (Allen 2014).

This interesting subversion of target markets is now a global phenomenon, with an emphasis on reciprocal friendship – male–male alliances, in evolutionary terms. As the *Guardian* puts it: “There’s no reason a quality cartoon about love and tolerance shouldn’t inspire passion in young straight men” (Angel 2012:1).

7.6.2. Ungendered Language

We have recent English examples of nongendered pronouns (*ze, hir, hirs, hirself*) (Dopp 2006), alongside examples in many other languages (Sweden officially recognised the pronoun *hen* in 2015 (AFP 2015). Alongside gender-neutral kin/lover relationships (“chibling” for a sibling’s child as opposed to niece/nephew; “grandwa” for either grandma/grandpa; “personfriend” for either girlfriend/boyfriend, NBN 2016), there are fanciful English declensions of such “nounself pronouns” for otherkin self-labelled faeries (*fae, fae, faer, faers, faeself*); bunnies (*bun, bun, buns, buns, bunsself*); Zodiac fans (probably intended to give Latin teachers heart attacks) (*aqua, aquas, aquas, aquariaself*); and even ale pronouns (*beer, beer, bier, beer’s, beerself*) (*Ibid.*:21). We see here too boundary reinforcement via some non-binary/trans people claiming such neo-pronouns mock trans/non-binary people and that cisgender people should not be allowed to use nounself pronouns (taking on transracial identities and real-life identities of other living people also is explicitly disparaged in this subculture) (OKF 2016).

A final note on language: in some cultures, it is women’s use of language (not men’s) that is direct, aggressive and obscene – cross-culturally, whichever linguistic pattern is determined “female”, those differences are used as a reason for why women *should not* be in power, whether New York City boardrooms or in Gapun (Papua New Guinea) where the “direct” nature of women’s language use is an attestation of a lack of self-control (Chamberlain 1912, Cameron 2008). Ungendered – yet still, rather depressingly, re-gendered.

7.6.3. Ungendered Genders

Fig. 37. Image taken from “The evolution of mate preferences, sensory biases, and indicator traits” (Grether 2010).

We can view all non-paradigmatic strategies as movements towards a more blurred, non-classificatory way of life. As seen, male strategies to attract females under most major paradigms are diverse: British-Indian evolutionary biologist Professor Haldane’s well-known quote – “I have no doubt that in reality the future will be vastly more surprising than anything I can imagine. Now my

own suspicion is that the Universe is not only queerer than we suppose, but queerer than we *can* suppose” (1927:286) – here can be applied to the interesting example of male guppies potentially imitating orange fruit in order to seduce (literally) hungry females, where it can be said that even gender has become ungendered: “A possible non-sexual origin of mate preference: Are male guppies mimicking fruit?” (Rodd *et al.* 2002:475, cf. *Fig. 37*; see also Lloyd 1980). This is a gendered male strategy; but from the female perspective, it could be argued that targets are not only *non*-gendered, but *fruit*-gendered, if we apply object-choice as faithfully as we do to human gendered mate choices (as would be attraction to dominants only, Simula 2014; or to blondes, Futuyma & Risch 1983). Invoking a gendered stereotype, perhaps the similar human equivalent would be if males disguised themselves as chocolate bars. This may be, in functional terms, a clear socioecological case of survival (food resources) trumping reproduction, and a rather ingenious long-term workaround plan by the males – but also a reminder that sexual-object choice is not inherently gendered, a concept we will now discuss in Chapter 8.

7.7. Summary

7.7.1. Infrachumanisation

- “Trans” has of late become an essentialised category.
- Like the “Trans”/“Cis” dichotomy which essentialises gender, “non-binary” [gender] also invokes a binary via negation of a gender-binary, the same for a gender-neutral/gendered pairing.
- Gender dysphoria as a result of strict gender roles common in biological men and women, too.
- Bem theorises categorisation of gender easier due to schemata and is acculturated post-natally; I suggest naturally selected evolutionary bias that, via gender schemata, manifests in post-natal (plastic) associations.
- We may be hardwired for gender essentialism regardless of the associations a gender schema takes: boys can be pink, girls blue; what matters is that there are separate sets of girls and boys.
- Tendency towards *human* sexual differentiation plays out *particularly* the more similar the sexes are, e.g., homologous sexual body parts or functions (clitoris/penis, nipples, ejaculatory fluid, lactation, body hair) or purposeful negation of the falsetto in adult males.
- Females uncanny-valley denizens in androcentric world limited by infrachumanisation, thus “crypticity” associations.
- Uncanny valley-type infrachumanisation reactions with non-prototyped transgendered people close enough to cause category confusion is likely to occur. We need to get used to seeing men who look like different kinds of men, or women who look like different kinds of women in both facial and bodily morphology. We probably can overcome acculturated gender prototypes – and be trans- and intersex-inclusive – though it appears less likely that we could proceed *without* any gender concepts altogether.

7.7.2. Ultrahumanisation

- Humans have biologically bisexual brains and are physically and behaviourally chimeric, making use of different strategies in different environments as necessary; this fits the socioecological paradigm. Many aspects of human gendered behaviour are more likely to be facilitated by plastic behavioural repertoires than hard-wired defaults. Preferential prejudices likely can be essentialised post-natally.
- Transvestism, and likely transgenderism, can be seen as ToM/empathy – putting one’s self in another’s shoes. Such empathy adaptations are likely the speciality of human-ape consciousness; we should not shame empathetic gender-responses.
- Just as with the trans intentionality-rooted empathy responses theorised above, if art=sexual selection by females towards artistic males, artistic abilities could evolve quickly and become female traits as well, due to the complete overlap in brain “modularity” (or at least function). Via empathy and high-fidelity copying behavioural adaptations, both abilities and appreciation would be selected for: both traits necessary for creativity; both traits passed down to both sexes: polymorphic adaptations. More generalised male/female differentiated behaviour could work this way as well. Moreover, this could go in the other direction, too, if females were the first to develop heavily symbolic representations – or, perhaps, art is not sex-linked, in the end.

8. HETEROSEXUAL–HOMOSEXUAL: “POLYMORPHOUSLY DIVERSE”



Fig. 38. Variable, concurrent temptations: “Sistine Chapel” by Michelangelo, ca.1508-1512.

“As Munch did not marry, painted many a male nude, adored the painted men of Michelangelo and found the phallus an irresistible symbol, many have thought him possibly homosexual; but of this diversion there is no other evidence and indeed too many of his subjects, suggesting a powerful response to heterosexual eroticism, contradict the assertion.” [App. 341]

In this chapter, we move closer via rigid categories of essentialised sexual behaviour from objects, to non-human animals, to other humans to ourselves, then flip the magnifying glass to withdraw it via an ultrahumanist framing, from fluid self-concepts of sexual behaviour all the way back to objects again. We begin this journey after a necessary initial discussion of major theories regarding sexual orientation.

8.1. Sexual “Orientation”

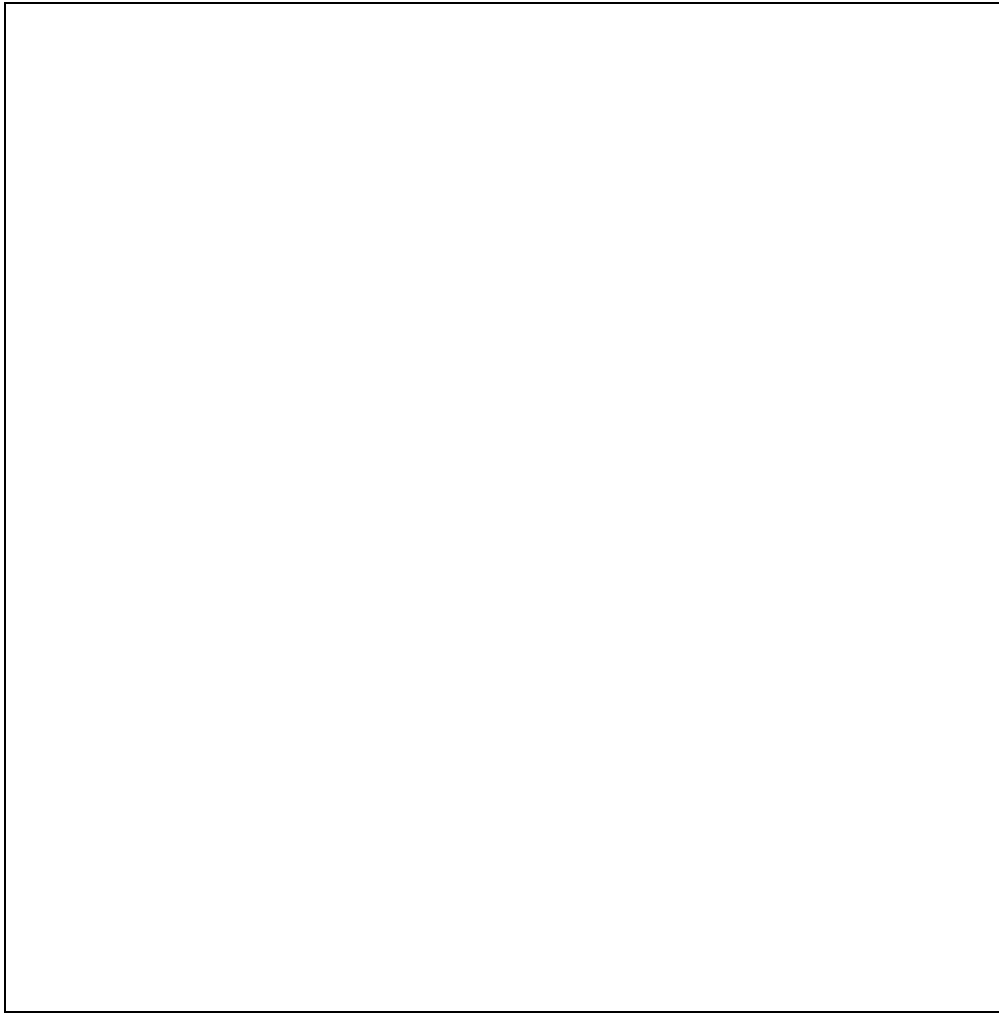
Humans often do not admit to either same-sex behaviour or desires; even less to same-sex identities. When comparing veiled vs observed studies measuring same-sex sexual experiences, we see that people obfuscate by 58-65% less reported homosexual behaviour to over 100% less, depending on religiosity (Coffman *et al.* 2013). Whenever a study estimates homosexual frequency based on “identity” (Painter 2014, Norris *et al.* 2015), it is flashing a pink neon light that it is vastly underestimating said homosexual behaviour (Savin-Williams 2009). This undue focus on identity is salient when we consider that half of men having sex with other men do not identify as gay or bisexual, and just under 40% of women (Laumann *et al.* 1994). A further study showed that 10% of

self-described straight New York men had “had at least 1 sexual encounter with another man during the previous year” (Pathela *et al.* 2006:416; see also Kirkpatrick 2000, *Tab.* 34).

To use a gender analogy, women admit to 69.2% more sexual partners (males 8.1% more) under polygraph (“lie-detector”) tests (Fisher 2013). Modern Western culture puts a premium on “low” female sociosexuality (“promiscuity”) (Sprecher *et al.* 2013); social diktats are intense, just as against homosexual behaviour, particularly male behaviour (Kerns & Fine 1994, Herek 2002, Steffens & Wagner 2004). If I were to take one of the largest and most in-depth sexuality surveys undertaken, the *Kinsey Report*, which reported male homosexual experience rates at 37.5% (1948), the results of a similar “liars’ skew” with males protecting knowledge of homosexual experience at the same rate as females protect their partner-number would be 63.5%. This is a thought experiment but a valid one.

Considering *sexual orientation* as a further refinement from sexual behaviour (Wallen & Parsons 1997) is argued by some in the sampled articles to be a new reification: “the society that incarcerated Oscar Wilde itself invented the very term ‘homosexual’. After Darwin, sexual behaviour could be regarded simply as an animal instinct, as open to classification as any other behaviour.” [App. 414]. Humans in the West essentialise sexual orientation (Hammack 2005), as seen in my own results (cf. *Fig. 2 (D)*, *Tab. 12*, *Tab. 20*). Sexual orientation is not an agreed scientific category, and this includes manifestations such as preference and identity, and reified sets such as heterosexual, homosexual, bisexual, pansexual, sexually fluid, etc. Homosexual orientation (preference) has been argued by Adriaens and De Block to be a particular type of societal “natural kind” that Canadian philosopher Ian Hacking calls interactive (2006): “a special subset whose nature and even existence are in certain ways dependent on the fact that we engage in acts of classification employing just these kinds. [...] dynamic nominalism, reflecting an interaction between the classification and what is classified” (Bird 2014:1; see also Hawking 1995, Diesendruck 2009, Khalidi 2010). This is a useful framing, though not, I think, homosexuality-specific: heterosexuality, bisexuality and even pansexuality also could occupy this interactive niche in particular contexts or cultures. My results regarding sexual behavioural categories highlight such conceptual flexibility (*Fig. 2 (D)*, *Tab. 12*, *Tab. 20*). American sexuality researcher Robert Francouer defined homosexuality as “the occurrence or existence of sexual attraction, interest and genitally intimate activity between an individual and other members of the same gender” (Francouer 1991), and when I do use the phrase “sexual orientation”, it is in that sense. When I refer to homosexual behaviour, this refers as well to *homoerotic* behaviour (just as it will in analogous heterosexual observations). I am using “fluid” and “flexible” in their colloquial sense, not reified terms as some researchers have argued (Selterman 2014). As noted in Chapter 7, I use the term bisexual to mean temporal, longitudinal or contemporaneous sexual attraction to both sexes.

Tab. 34. Cross-cultural and cross-historical homosexual behaviour: tables taken from Kirkpatrick 2000.



8.1.1. Proximate Theories

Heterosexual behaviour is not just a theoretical conceit or social mechanism to enforce ingroup/outgroup distinctions; it is the way in which our species – and many other types of organisms – reproduces. By surveying monozygotic twin studies, we see that for humans there is both a genetic and an environmental element to *both* homosexual and heterosexual behaviour (Kalmann 1952, Whitman & Diamond 1993, Hu *et al.* 1995, Pillard & Bailey 1998, Bailey *et al.* 2000, Kendler *et al.* 2000). Monozygotic twins “were found to have a concordance rate of 65.8% for homosexual orientation [...] [and] dizygotic twins [...] 30.4%” (Whitman & Diamond 1993:187). A study by Hamer *et al.* showed 50% monozygotic, 24% dizygotic and 19% adopted-brother concordance (suggesting environmental effects) (Hamer *et al.* 1993), though this has been challenged (Crewdson 1995, Rice *et al.* 1999). A further challenge is based on arguments that such studies polarise orientation as a first premise: “a large part of the human population is neither exclusively homosexual nor exclusively heterosexual” (Haynes 1995:91). With the caveat then that we are essentialising from the “get-go”,

additional non-twin sibling and familial studies also strongly suggest a heritable component to homosexual and heterosexual behaviour, respectively (Bailey & Bell 1993, Pattatucci & Hamer 1995): a framing that would not rule out the universal bisexuality theorised by biologist James Haynes (1995), though Haynes' framing is solely constructivist.

Regarding homosexual behaviour, many explanations are *proximate* for this “evolutionary paradox” (as exclusively homosexual organisms do not, in theory, reproduce): they theorise the mechanisms of transfer, but do not delve into deeper questions of how a trait might benefit survival or reproduction (Sommer & Vasey 2006): thus we often hear talk of “gay genes” without questioning 1) for what purpose such “gay genes” might exist; 2) what defines “gayness” (exclusive vs non-exclusive sexual behaviour; longitudinal or situational); 3) whether concepts such “heterosexual” and “gay” exist; and 4) whether we are conflating (perhaps hardwired) biological-sex binarism with sexual behaviour (Green 1987; see also Rieger & Savin-Williams 2012, Cox *et al.* 2016): engaging in a type of attached-“sexual orientation” *gender* schema. Daryl Bem points out that in many of the same “gay genes” twin studies (Bailey & Pilchard 1991, Hamer *et al.* 1993, Hamer & Copeland 1994, Bailey & Martin 1995), “even when sexual orientation is held constant, there is a significant correlation between the genotype and gender nonconformity [...] childhood gender nonconformity was significantly heritable for both men and women [...] even though sexual orientation itself was not heritable for the women” (Bem 1997:9).

Proximate explanations include genetic (Kalmann 1952, Hamer 1992) and hormonal arguments (Dörner 1976), as well as brain-based somaticity (LeVay 1991, Savic & Lindström 2008) and environmental/familial dynamic explanations (Freud 1905, Bem 2000). A well-known proximate explanation for homosexual behaviour in humans is the *Maternal Immune Hypothesis*, based on results that indicate that the more older brothers a male has, the more likely he is to be gay due to his mother's body's increasing reactivity to the H-Y antigen in male foetuses (females are not affected) (Ellis & Blanchard 2001, Blanchard 2004). Freud's *Pleasure Principle* (1921), which hypothesises that organisms move towards pleasure but away from pain, yet does not tell us *why* pleasure adaptations are in place, also is a proximate explanation for homosexual (and heterosexual) behaviour – in both non-human animals and humans.

A minor proximate explanation of genetics is epigenetics, and one 2012 (mathematical-only) model postulated that “epi-marks [...] may cause reversed effects, such as the feminization of some traits in sons, such as sexual preference, and similarly a partial masculinization of daughters” (NIMBioS 2012:2, citing Ngun *et al.* 2011). Gender inversion aside, these results have not been proved in real-life examples and though an attempt was made (Ngun *et al.* 2015), it was subsequently criticised for faulty data (Reardon 2015). Many gay-gene studies do not acknowledge that, rather than a unimodal source of homo-/bisexuality (a “silver bullet” explanation), the so-called gay gene is more likely to consist of polygenic traits across multiple alleles (Sommer & Vasey 2006, Sanders *et al.* 2015).

Another proximate theory is that of Gavrilets and Rice, who speculate that homosexuality is inherited on an autosomal- (not sex-) chromosome: they essentialise gender by arguing that masculine females desire females; similarly, feminine males desire males (Gavrilets & Rice 2006), which has been challenged by researcher Daryl Bem (2000). The homosexual=gender inversion is reductive in terms of the existence not only of many masculine gay men and feminine lesbians (Bailey *et al.* 1997), but also the fact that many homosexual actors as *adults* are not statistically morphologically/behaviourally GNC (Rieger *et al.* 2015) – additionally, many “heterosexual” actors are functionally *bisexual* actors (Kinsey 1948/1953). Bailey *et al.*, though, also report that lesbians are “sexually visual” like heterosexual men, and uncaring of the social status of their romantic targets (1994), suggesting an essential lesbian=male heterosexual correlation. Similar hormonal arguments point to testosterone-enabled longer fingers in both sexes, which supposedly indicates promiscuity. Such “gender-inversion” associations by Bailey and others (first postulated by von Krafft-Ebing in 1886) is cherry-picking and can go both ways: why are lesbians as equally monogamous as heterosexual women (*Ibid.*) if they are following (dubitable) “masculine” sexual behaviour as embodied by so-called masculinised fingers (Connor 2010)? Gay males are similarly equally “promiscuous” as straight males, not “female” in behaviour. Additionally, some studies suggest that lesbians prefer masculine female faces (Glassenberg *et al.* 2010) – when, if they were “synthetic males”, they should prefer feminine female faces as straight males do (*Ibid.*). Indeed a team of researchers including Bailey additionally report that “[a]lthough both studies confirmed that lesbians were more male-typical in their sexual arousal and nonsexual characteristics, on average, there were no indications that these 2 patterns were in any way connected. Thus, women’s sexual responses and nonsexual traits might be masculinized by independent factors” (Rieger *et al.* 2015:1).

8.1.2. Ultimate Function

For many years – and currently in folk biology – homosexual behaviour function has been explained away as a *population-control mechanism* (Denson 2013). As this is a group-selectionist argument (with the homosexual individual acting as the altruist), it does not hold up, as such altruism would not be selected for (Dawkins 2015). Human homosexual behaviour occurs at far higher rates than the 5% theorised to be necessary for a “successful” behavioural mutation (Adriaens & De Block 2004, Sommer & Vasey 2006; Kirkpatrick 2000 [cf. *Tab.* 34]), which strongly suggests adaptations towards homosexual and bisexual behaviour. Trivers makes the point that a *helpers-in-the-nest* functional theory would privilege asexuality rather than homosexuality (Trivers 1985).

Arguments also have been made that homosexual behaviour could be *practicing* for more-functional (in modern evolutionary synthesis terms) heterosexual sex, but as Sommer, Vasey and Bagemihl

have pointed out, while non-human exclusive homosexual behaviour is rare (males: black swans [Braithwaite 1981], possibly penguins [Bagemihl 1999], rams [Roselli *et al.* 2001]; females: parthogenetically reproducing lizards [Crews 1987], arguably black-headed gulls [News Medical 2006]), there are multiple examples where individual animals (as well as species) prefer homosexual sex at the expense of heterosexual sex, so an adaptation for the sole purpose of “practice” too is not likely to be adaptive (Bagemihl 1999, Sommer & Vasey 2006, de Waal 2006).

Some further theorised functional causes of homosexual behaviour aside from the above are *heterozygous advantage*, *kin selection* and *alliance formation* (the latter based on reciprocal altruism plus bisexual behaviour, Kirkpatrick 2000 [cf. *Tab.* 34], Kuhle & Radtke 2013). The heterozygous advantage is the theory that exclusive homosexuals have a double-recessive allele, but that their heterosexual relatives have a dominant-recessive combination that in some (as yet unknown) way improves fitness, i.e., two recessives make a doubly sensitive gay man; one dominant heterosexual gene + one recessive homosexual gene make an attractively “sensitive” heterosexual male. Most related theories tend to rely heavily on gendered stereotypes of behaviour, e.g., homosexually behaving males are more feminine. Researchers Adriaens and De Block have an argument against such a heterozygous advantage, pointing out that “nearly half of the male population is, or has once been, ‘opportunistic’ or ‘situational’ homosexuals [...] In short: homosexuality seems to be a much more common phenomenon than sickle-cell disease.” (2004:65).

Sommer and Vasey suggest a multifunctional root of homosexual behaviour (2006; cf. de Waal 2014). Additionally, as gender and sexuality scholar Jane Ward puts it, “Indeed, we may find (as Simon LeVay did) that men who identify as gay share a certain trait – a larger VIP SCN nucleus of the hypothalamus, for instance. But how do we know that this ‘enlargement’ is a symptom or cause of their homosexuality, and not, say, a symptom or cause of their general propensity for bravery, creativity, or rebellion?” (Ward 2013).

Considering the frequency of homosexual behaviour in both male and female humans, even when socially proscribed, and the fact that in fitness terms heterozygosity is often preferable to homozygosity (Kalmus 1945), a generalised Bisexual-Dominant/Heterosexual-Recessive heterozygosity might make more theoretical sense, where “Homosexual” exists as an outlier of “Bisexual” (although this also could be a “Bisexual-Dominant/Homosexual-Recessive” with the same conclusion of “Heterosexual” as an extreme outlier of “Bisexual”). (Note: an unknown heterozygous advantage also could be a physically manifested advantage, not just a behavioural one; I am merely examining one well-known theorised extrapolation based on a “sensitive male” model (cf. Miller 2000a).

Georgian bioinformaticist Giorgi Chaladze investigated the potentiality of (male-only) gay genes, and discovered that, although straight men have five times more children than (exclusively) gay men, gay

men come from larger families (potentially invoking kin-selection explanations), concluding that homosexuality could exist at “low but stable frequencies [...] if half of [all] the men and roughly more than half of [all] the women carry genes that predispose men to homosexuality” (Brooks-Pollock 2016:1). Those results might elide with the high frequency of homosexual/bisexual behaviour in *Tab. 34* (Kirkpatrick 2000; see also Savin-Williams & Vrangalova 2013). Coupled with the vast amount of unacknowledged homosexual behaviour in both non-human and human animals (Bagemihl 1999, Kirkpatrick 2000, Sommer & Vasey 2006, Poiani 2006, cf. *Tab. 34*) – and considering how extremely common human homosexual behaviour is in same-sex settings such as prisons and single-sex schools (Kirkpatrick 2000, cf. *Tab. 34*) – perhaps we should be framing single-sex environmental homosexual behaviour as a bisexual “default” rather than a “desperation”.

Another major functional theory is related to kin selection. This is the concept that one would forgo one’s own direct fitness and invest heavily instead in indirect fitness (likely nieces and nephews). This so-called “gay uncle” theory is a wide-ranging functional proposition that has some evidential support. In order for homosexual behaviour to be passed down generationally, there needs to be evidence in this paradigm of increased indirect fitness (Wilson 1978).

We see this increased fertility of female relatives in homosexual rams (LeVay 2011) and also in female relatives of some exclusively gay human males (Camperio-Ciani *et al.* 2004, 2008, 2010) (“sexually antagonistic selection [...] a scenario in which homosexual brothers are some sort of genetic fallout of sisters who enjoy boosted attractiveness”, Sommer 2011:576). There also is some evidence that gay men invest more in their nieces and nephews (Vasey & VanderLaan 2010), though these results have not been replicated outside of a Samoa-specific contest. Other studies indicate that gay men do *not*, in fact, give more resources to family members than heterosexuals (Bobrow & Bailey 2001, Rahman & Hull 2005). Until the very recent legal same-sex marriage rights in the West, gay men and lesbians had no choice if dying intestate: legally, money went to kin and not unmarried partners.

A final major functional theory that has scientific support is the alliance-formation theory (Roes 1993, Muscarella *et al.* 2005). There is a much higher survival rate for those primates who have tighter social bonds (Silke *et al.* 2003). Reciprocal altruism allows for same-sex alliance formation, which results in benefits for survival/reproduction for both sexes; this theory is dependent on at least part-time bisexual behaviour (Kirkpatrick 2000, Kuhle & Radtke 2013). Researchers Adriaens and De Block distinguish this theory from “the unrestricted plasticity advocated by some social constructivists”, as alliance-formation theory defines “the conditions that are generally conducive to the development of same-sex sexuality” (2006:13-14; see also Wilson 2005). Under alliance formation theory we would expect to see more bisexual behaviour than homosexual behaviour (which we do: Pew Research 2013); and increased fitness for the bisexual actors (which we also do, Burri *et al.* 2015). Nevertheless, Adriaens and De Block and many others assume heterosexuality as

a default unquestioned “orientation”. Though they argue that same-sex behaviour is not a “fixed trait”, let us recall that heterosexual behavioural clearly is not either, as shown in those same twin studies. There is an acknowledgment of this fluidity in the sampled articles: “The idea of a ‘true’ sexual orientation is perplexing and controversial for both researchers and the general public.” [App. 369].

All of these functional theories detailed – heterozygous advantage, kin selection and alliance formation – could exist in conjunction with a proximate mechanism. Perhaps more than one reason for homosexual behaviour is due to *causa finalis* in males and females, but then is inherited from both differentially as a polymorphic trait, e.g., increased fertility in bisexual women via hormonal adaptations could be due to reciprocal altruism or kin selection (or even both) in females; and due to “gay uncle” functional causes in males; and both sexes could in theory pass on such traits to offspring of both genders. As Kirkpatrick points out, many “gay” individuals have children if you include the bisexuals, too (2000).

It is worth asking whether exclusive heterosexuality and exclusive homosexuality would exist outside cultural frameworks where we consider both to be essential qualities, and where one “state” is highly discriminated against. This is similar to the “essential” qualities once (but no longer) associated with left-handedness within a dual-handed context, which Cordelia Fine has used as a simile comparing overlapping gender differences (2010), but which applies equally well to theories concerning – and often pathologising – homosexual behaviour: the metaphorical left-handers of the sexual-orientation essence. That is, if we were all ambidextrous, and perhaps we all are, to some extent.

8.2. Objects and Fictive Characters Have Concrete Sexual Orientations: “Cigars = Phalluses in Men’s Mouths”

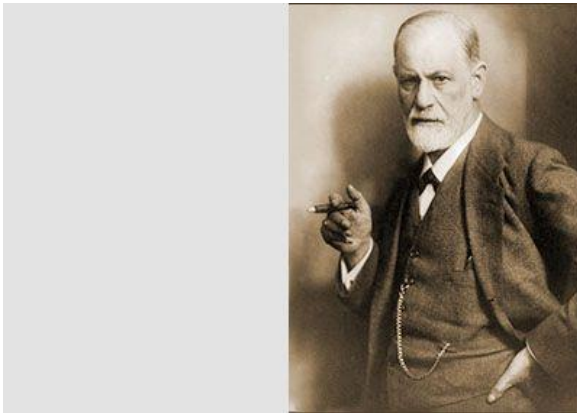


Fig. 39. Sigmund Freud holding a potentially homosexual cigar, with his famous quote regarding his theories of subconscious symbolism. Image and quote taken from NotableQuotes.com and modified; photograph is in the public domain.

“Every so often, Callow ponders Welles’ relationship with homosexuality.. [...] [Welles] visualised himself wandering through a castle full of dead men, each one with an unlit cigar in his mouth. Welles felt that the dream was an index of some ‘unpardonable sin’ he’d committed. Callow quotes someone who suspected that the ‘sin’ might be homosexuality.” [App. 304]

8.2.1. Fictional Characters Have a Sexual Orientation

Characters and objects are resolutely heterosexual, both when paired and singularly: often explicitly marked, sometimes assumed. Homosexuality is showcased seldom in media; I hypothesise potentially because it does not sufficiently exhibit gender differentiation. Western gay representation is more common these days (Keveney 2014, Mitovich 2015), but modern representation hardly approaches parity: 4% for all gay/lesbian/bisexual characters combined on US TV in 2015 (Mitovich 2015).

Bisexual behaviour is much more common than the parsimonious exclusively gay/lesbian behaviour – indeed, as most humans likely have bisexual inclinations if not behaviour (“[t]he majority of heterosexually identified young adults in this study [84% of women and 51% of men] reported the presence of same-sex sexuality in at least one sexual orientation indicator – sexual attractions, fantasies, or behaviors”, Vrangalova & Savin-Williams 2010:96-97) – character representational parity of same-sexuality perhaps should be at a fairer level of 50%. A recent cross-global internet study suggest that up to 35.8% of people – many of them in deeply homophobic countries – acknowledge same-sex attractions (Epstein *et al.* 2012), with at least some acting on those cross-cultural desires, sometimes much more – e.g., in the Arab Near East, 38% of men (Kirkpatrick 2000).

Yet parity is not the case, not just on television, but also not in literature (Lo 2011) and, formatively, most significantly in their absolute absence, not in the ubiquitous socialising culture of children’s Disney films, children’s cartoons and children’s toys (Fisher *et al.* 2007, Sandel 2015). In this way, a social prototype of sexual orientation (heterosexuality) is formed by the cultural negation of same-sex behaviour/desire.

Pressure for concrete sexual orientation in objects and fictional characters can occur from the “pro-homosexual” camp, though this is rebuffed by production companies or brand owners of franchises such as *Star Wars* or *Xena Warrior Princess*, who do not want their characters labelled as gay or lesbian despite fans’ appeals (NB: both *Star Wars* and *Xena* may be finally “coming out” after 40 and 20 years, respectively, Kyriazis 2016, Ahmed 2016); this is known as *heterosexism* (a bias towards – and privileging of – heterosexual interpretations: cf. Anderssen & Hellesund 2009). In 2011, 10,000 members of the public signed a petition urging TV’s *Sesame Street* producers to have long-time puppet male roommates Bert and Ernie acknowledged as a gay couple. The producers demurred: “Bert and Ernie are best friends [...] Even though they are identified as male characters and possess many human traits and characteristics (as most Sesame Street Muppets do), they remain puppets, and do not have a sexual orientation.” (Dorning 2011). This is notable, as we see that gender (“male characters”) remains salient even when sexual orientation does not, and indeed my own results suggest that the notion of concrete sexual orientation is flexible in a manner in which gender is not

(Fig. 2(C), (D)). The Sesame Street producers' reasoning was not consistent, as the *Los Angeles Times* pointed out by citing comments on the Sesame Street Facebook page that puppets do indeed have (heterosexual) orientations: "Muppets do not have sexual orientation? So...all along [rampantly heterosexual] Miss Piggy was after Kermit for...his frog legs for supper?" (Netburn 2011, brackets mine).

We see an interesting inversion of heterosexual representation by a brand intent on edginess: "THE ONLINE bank egg [sic] last night embarked on an unexpected change of image with a new advertising campaign [...] [The BAC Centre] ruled that two of the series of four adverts, which keeps viewers guessing about the sexuality of the male characters, were not appropriate to be shown during or between children's programmes. [...] Egg said yesterday the decision to portray the characters with ambiguous sexuality was part of its plan to create an 'edgy' image." [App. 326].

In a twist on this dynamic, the UK children's television Tellytubby character Tinky-Winky was "accused" of being gay by religious fundamentalist Jerry Falwell in 1999 – near the peak for concrete sexuality conceptualisations in my results (cf. Fig. 2 (D), Tab. 12, Tab. 20). This "accusation" was described by the producers as "absurd and offensive"; it also was denied by the BBC: "As far as we are concerned Tinky Winky is simply a sweet, technological baby with a magic bag." (BBC 1999). Echoing the sentiments of the producers that the mere suggestion of homosexual (though not heterosexual) orientation was itself intrinsically wrong and sexual ("to think we would be putting sexual innuendo in a children's show is kind of outlandish"), BBC News also described the Teletubbies as "innocent" in the "attack" of such so-called slurs (*Ibid.*). (Again, note that the Teletubbies are gendered: male and female).

8.2.2. Disembodied Body Parts Have a Sexual Orientation

Material (and digital) culture, as seen above, affects cultural mores via a heterosexual-saturated base culture. As discussed, culturally-sourced dichotomous concepts often are rigidified in contexts of threat and/or lack of threat. We therefore observe not only fluidity but essentialism in the articles via a bodily compartmentalisation of homosexuality (objectification via partialism): "gay hair whorls", "lesbian fingers" and the ever-popular gay-or-lesbian "brains" (corresponding with their inversed male/female brains) (LeVay 1991, Savic & Lindström 2008). Theorised differentiators in terms of sexual-orientation essentialism have included "fat distribution, metabolism, hair texture, body height, lisping, lipid levels, posture, mental health" (Klesse 2014, citing Murphy 1997; see also Gervais *et al.* 2012).

This 1995 "negative" article interestingly alludes both to "gay fingerprints" and to the fact that, in 1995, gay groups thought that sexuality was more fluid: "HOMOSEXUAL groups were irate last year

when Simon LeVay [...] said that he had found physiological differences in the brains of male homosexuals. The gay groups would rather believe that their sexual orientation is a matter of choice rather than biology. Now psychologists [...] have found an even more striking difference. Gay men are more likely than straight men to show asymmetry in their fingerprints.” [App. 291]. (My results confirm that the public at large, not just the gay groups/individuals themselves, felt sexuality to be fluid in 1995, cf. *Fig. 2 (D)*.)

Yet another body part discussed in terms of having an ambiguous “sexuality” (and gender) is the human voice: “It was almost as though the falsetto – a voice implicitly castrated – allowed women a unique access to man’s vulnerability and, dare one say it, femininity. [...] Two singers who tailored their styles to exploit the ambiguous sexuality of falsetto were Marvin Gaye and Al Green” [App. 296]. I have already noted the not-always-necessary genderedness of the adult male voice in Chapter 7 (Greene & Mathieson 2001). When we compartmentalise into separate body parts, we also engage in objectification; objectification facilitates dehumanisation (Fiske 2009, Nicholson 2009, Cikara *et al.* 2011, Klaassen & Jochen 2015). We animalise (dehumanise) those who engage in sex acts of which we may not approve: homosexual acts often are considered animal (Sommer 2006). In a form of subversive dehumanisation, see also the pejorative and clearly animalistic term “breeder”, used most often by gay people in reference to heterosexuals (Dumenco 2006).

8.2.3. Colours (and Language) Have a Sexual Orientation

Could we associate colours with particular sexual leanings: lesbian shades of light blue or “bisexualised” nouns? A “black-and-white” conceptualisation of either straight-or-gay is used metaphorically in English, and a “grey” (bisexual in-between state) sexuality also is debated: “he made a dignified and candid statement to the effect that his sexuality was ‘a grey area’ – thus pre-empting any more intrusions.” [App. 409]; “He has three options – homosexual, heterosexual or bisexual. Grey is not one of them.” [App. 310] (cf. Wright 2013).

Due to the fact that pink used to be a “boy’s colour” in the West ca. World War I (Maglaty 2011, Orenstein 2011) and therefore likely due less to pink=female associations and more to the pink triangle used by World War II Nazis to signify gay male concentration camp prisoners, pink is highly associated with male gayness (Plant 1986). It now stands for lesbians too, likely an additional androcentric example of female-category-subsumation, similarly with “gay” standing for both male and female same-sex sexuality (though not bisexuality). Lavender also has been associated with gayness, and specifically with lesbians as a refinement of the pink=gay association; feminist author Betty Friedan famously tried to dissociate lesbianism from the modern feminist movement, calling lesbian feminists the “Lavender Menace” in 1969 (Brownmiller 1999). Notably, other than the

black/white distinction – where which is straight and which is gay is unclear – heterosexuality is an assumed default state with no colour distinction.

The umbrella category LGBT+, which includes “bisexual” but also conflates sexual orientation with gender by adding “transgender”, is rooted in the mid-1980s (Gunderloy 1989) and is an ever-expanding umbrella term that is not always popular with gay/lesbian/bisexual/transgender individuals (Hurley 2015) – and a term very frequently used by heterosexual-identified people, so-called assimilationist gay, lesbian and bisexual people (Simpson 1996) and the mainstream media: perhaps because then the categories are “heterosexual” and “(everything else)” and because then one doesn’t have to say potentially uncomfortable words like “gay” out loud; the same goes for the logocentric term “non-heterosexual” (Dilley 2002). The existence of coded gay/lesbian vocabulary has existed long-time in subcultures when the dominant culture is homophobic; one famous example is the British “language” of Polari used by men who were usually behaviourally bisexual but hiding (and sometimes signifying to other such men) their same-sex liaisons (Baker 2002). The greater (“real”) language is both English and heterosexual; the subversive code homosexual (cf. “women’s languages”).

8.2.4. Physical Objects Have a Sexual Orientation

Note the homosexual-signifying cigar in the opening quote [App. 304]. In the same non-truncated article, homosexuality is seen as a “rite-of-passage”; the journalist’s opinions on same-sex sexual ambiguity appear ambiguous as well, with unchallenged associations with paedophilia.

In our wider culture, we have the electrician’s examples of “male” and “female” plugs and sockets (via penetrative or orifice shapes implying a heterosexual interaction), but even in the sampled articles is a figurative example of concrete sexual orientation applied to an object as abstract as “food” (including a disparaged “bisexual” option): “The meal service on Virgin Atlantic is like the late show at the Copacabana. Most of the cabin crew ask the question ‘Meat or fish?’ in a distinctly suggestive way and add with a camp sneer: ‘Or would sir like the vegetarian alternative?’ The implication is that it would be terribly downmarket were one to say yes. So I have always thought flying was a very gay experience.” [App. 325].

Cartoons, electrical plugs, figurative food and language highlight gender, certainly, but are also an aspect of Western culture described by writer Adrienne Rich as “compulsory heterosexuality” (“compulsory heterosexuality [is never] examined as an institution powerfully affecting all these; [nor is] the idea of ‘preference’ or ‘innate orientation’ even indirectly questioned”: 1980:631). Such compulsory heterosexuality has been mainly discussed in a sociological sense, but I apply it here additionally to scientific studies on sexuality.

8.3. Other Organisms Have Concrete Sexual Orientations: “Angry (Or at Least Threateningly Homosexual) Birds”

Fig. 40. L-R: “lesbian” albatrosses (© Eric VanderWerf for National Geographic: Zimmer 2013); “gay” male penguins (Blackstone 2013); “straight” fairywren birds, Benjamint444/GNU Free Documentation License/Creative Commons Attribution-ShareAlike 3.0 License.

“WATER POLLUTION 'MAY BE TURNING BIRDS HOMOSEXUAL [...] a threat to bird populations by causing males to mate with each other. Scientists believe poisonous metal compounds entering the food chain can affect sexuality, causing a reduction in offspring. They found that even relatively low levels of methylmercury in the diet of male white ibises caused the birds to pair up with each other, snubbing females.” [App. 427]

8.3.1. Paradigms and Fallacies

Let us look very briefly at the naturally selected results of mechanisms and functions (the contemporary bestial *milieu*) as regards concrete “sexual orientation”. Homosexual behaviour has been observed in all six major classes of animals on earth: invertebrates, amphibians, reptiles, fish, birds and mammals.

As noted, humans essentialise sexual orientation, but this is a prejudicial human convention: we have no way of knowing how non-verbal species conceptualise sexual behaviour or even if they do. We do observe them, of course, and when we do we see wide-ranging heterosexual, bisexual and homosexual behaviour across the animal kingdom (Bagemihl 1999, Sommer & Vasey 2006, Poiani 2006, Roughgarden 2009).

Observations extrapolated from non-human organisms (including fruit flies, Anaka *et al.* 2008, Bailey & Zuk 2009) are used as arguments for “gay genes” in human beings. Therefore, proximate mechanisms and functional causes spanning various types of animals have been theorised as to both exclusive and non-exclusive (essentially bisexual) homosexual behaviour. (Note that we are not pressed to “explain” heterosexuality; it is both a given and a default, Bem 2000.)

Science on homosexual behaviour often has been conducted based on four major fallacies: the assumption of (mainly) exclusive heterosexuality across the animal kingdom; the prevalence of unreported homosexual behaviour; a concentration on exclusive homosexual behaviour as opposed to bisexual behaviour and, lastly, an androcentric focus on male homosexual behaviour in terms of theories and studies (cf. Haumann 1995). There is a heterosexual bias – a Darwinian heterosexism

even, as has been acknowledged of late (McCaughey 2007) – but a gender bias too: human and non-human animal behaviour points to a dual-sex propensity.

8.3.2. Double-Binds

Bisexual behaviour in multiple species is very common, found in every major animal group (Bagemihl 1999) and often is explained away by arguing that this is not sexual, but rather social, behaviour, ape sexuality being a frequently used example – Bagemihl cites a quote by TL Maple of male–male orangutan fellatio being “nutritive” (“This behavior, however, may be nutritively rather than sexually motivated” (1999:115, citing Maple 1980:118). The paradigm that “sex is defined as male–female sexual behaviour; anything that is not male–female is not sex” is problematic because it puts us in a double bind, similar to how only human behaviour is allowed to be defined as culture (Sommer & Parish 2010). It also echoes arguments concerning the AI Effect and animal intelligence that we have already explored: “some researchers stipulated that behavior in nonhuman primates is sexual only when it occurs in oestrus – that is, only when the animal is in a fertile phase of its menstrual cycle and certain hormone measures are high. [...] stipulating that behavior can be sexual only if it occurs during a period of fertility.” (Lewens 2016:6). Reproduction is one functional element of sexual activity; others enhancing survival via emotional or affiliative bonds also would be important. Sociosexuality used in this sense is “explaining away” of same-sex sexuality by essentialising “sex” as heterosexual. Vasey, who acknowledges this pattern, describes sociosexual behaviours as “those that are sexual in terms of their external form, but are enacted to mediate some sort of adaptive social goal or breeding strategy” (2004:399).

Bisexual behaviour and desire in the animal called human – both states occurring against strong social proscriptions in the West – over lifetimes range from ca.20-84% according to self-reportings (*Tab. 34*; cf. Kirkpatrick 2000, Vrangalova & Savin-Williams 2010). *Exclusive* homosexuality occurs in species such as domesticated rams (6–10%, Roselli *et al.* 2001) and humans 5-7% (Kinsey 1948/1953). *Exclusive heterosexuality* over one’s lifetime is rare in those same bisexually-behaving species and in multiple others, although there is much unknown, as the field of homosexual/bisexual animal studies is relatively new. Biology has had heterosexist interpretations in the past (“the apparent lowering of moral standards in the Lepidoptera [butterflies]”, Tennent 1987), though Sommer and Vasey argue that it is possible that “scientists simply lack a theoretical framework for interpreting homosexual behaviour in animals and, as such, avoid studying the phenomenon” (2006:16). It is important to remember that until very recently observed homosexual behaviour in animals was considered “abnormal” (Bagemihl 1999).

Generally, the wider public is not aware of the nuances of function, proximate causes and bisexual animal behaviour, and my sample articles on fluid animal sexuality have a negative tone. As here,

where the greater article is pro-same-sex behaviour in overall tone, but not sexual fluidity:

“[g]enetically altered male fruit flies spurned females for other males” [App. 416]. Or here, where an interesting association was made between the changing of a bird’s sexuality and pollution: “Overall, male-male mating was blamed for 81 per cent of unproductive nests in the dosed groups.” [App. 427].

8.4. Other Primates, Apes, Hominins Have Concrete Sexual Orientations:

“Cavemen Only Go to Gay Bars Because There Are Free Buffets”

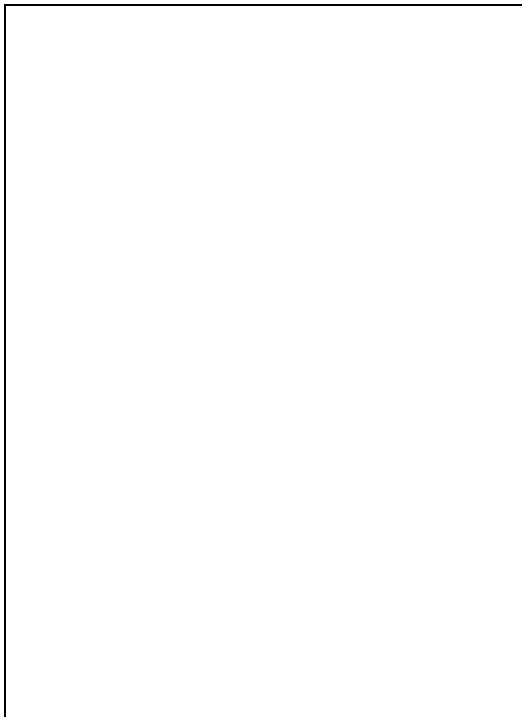


Fig. 41. Heterosexual hominins: depiction of Australopithecines who lived ca.3.7 million years ago © American Museum of Natural History, New York.

“Hollywood turned against one of its heroes: He was supposed to be the new James Dean but ten years on Mickey Rourke’s career is in ruins, he’s been arrested for alleged wife-beating and he’s an outcast in Beverly Hills. [...] Rourke simply survived. He paid the rent with every deadbeat job on offer and lived on shoplifted chocolate bars and bags of potatoes. He would hang around gay bars during happy-hour when the food was free.” [App. 433]

8.4.1. Heterosexual Hegemony

Our nearest, dearest (when not threatening our own status) evolutionary relatives such as hominins and non-human apes are notable when discussing concepts of sexual orientation precisely because their existence suggests links to ourselves. We do not know if they have/had concrete sexual orientations, but they are treated as if they do, with the same heterosexual hegemony (and bisexual

erasure) exemplified on nature programmes such as those of the BBC's David Attenborough (Mills 2013). Thus we presume heterosexuality in hominins, gorillas, chimpanzees and monkeys, occasionally salaciously acknowledging bisexual bonobos in the same embarrassed tones as when we discuss other "gay" animals.

Via stereotyping, it is not so difficult to envision King Kong-esque heterosexual dynamics in sexually dimorphic species such as gorillas and orangutans as well as our own: the image of a club-bearing caveman dragging a female by her hair saturates the mainstream, and the masculinity of such prototypes is upheld as somewhat heroic – see this section's opening quote, with an unusual "explaining-away" (free food) of potential bisexual behaviour in a hyper-masculine context.

We see many other such assumptions of heterosexuality as the "real" sexual orientation in other sampled articles, such as this financial (not sexual) motive for lesbian behaviour: "She has spent almost as much time trying to persuade us that she is a dyke as she has at the gym. [...] There was hardly a moment when Ms Ciccone was not anxious to prove her polymorphous perversity. [...] why in the world would someone who isn't gay invest so much in suggesting that they are? INVEST is perhaps the key word here. Sexual tourism sells." [App. 293]. Alongside alleged financial motives, we also see alleged (and no doubt sometimes practiced) "fake lesbianism" in humans to attract males (Neville-Jones 2014). (There is an interesting functional theory of lesbian sexual activity in Hanuman langurs as potential monopolisation of a rival female as a form of intrasexual competition, Srivastava *et al.* 1991).

Non-modern-human female primate examples where homosexual behaviour can be preferred over heterosexual behaviour include bonobos, at least one "lesbian" chimpanzee observation (Bagemihl 1999) and Japanese macaques. The majority of Japanese macaque sexual consortships are female (55%), and involve mate-guarding of females *by* females against males, and females who resist mating with males to continue their female consortships (Vasey 2004). Japanese macaques can in this sense be considered to have simultaneous *heterosexual* and *lesbian* orientations, where both "orientations" form regular discrete behaviours – or, alternatively, both labels could be integrated as *bisexual*. Similarly, whether it is the alpha-hero flanged orangutan (whilst ignoring orangutan same-sex alliances/sexual bonds, Fox 2001), or gorilla polygyny (harems) (whilst ignoring sex between gorilla males in all-male bands, Yamagiwa 2006; and observed lesbian wild gorilla behaviour at nearly the same rates as heterosexual behaviour, Grueter & Stoinski 2016); or homosexual behaviour amongst male as well as female Japanese macaques (Leca *et al.* 2014), if we only judge from popular media, we are left thinking that monkey/ape/hominin "default" sexual orientation is tidily classified as heterosexual: our anthropocentrism extends to our "anthropo-biases".

8.4.2. Prehistoric Invisibility

We cannot “see” homosexual behaviour in our prehistory as it does not leave a physical record, whereas the fact that we as humans individually, and collectively, exist today is a result of (pre-IVF) historical and prehistorical *heterosexual* sexual practices in which at least one party had an orgasm, including our own parents. Theorising from “invisibility” from the vantage point of one’s own, likely biased, culture is a problem for historians too (Garber 1995, Salisbury 1996, Angelides 2000). Yet homosexual behaviour leaves a trace in observed convergent evolution in other highly social species such as dolphins, as well as cross-cultural, cross-historical behaviour in modern humans (Kirkpatrick 2000; cf. *Tab. 34*). We have “evidence” – potentially – in our genetic makeup (as discussed) and via the fact that since all great apes engage in homosexual behaviour, same-sex behaviour is not likely to be a human-exceptionalist diverged trait, i.e., it is more parsimonious to assume fewer necessary evolutionary steps (“Parsimony Principle”, cf. *Understanding Evolution* 2016), suggesting here ancestral as opposed to derived behaviour (Bagemihl 1999, Sommer & Vasey 2006). We can reason by analogy and look at percentages of human sexual behaviour and infer our past; we can do this for NHPs and other non-primate animals, too.

Archaeological biases are observed in research concerning marriage-graves or double-graves. In my own experience as an archaeology undergraduate at Stockholm University, there were multiple pre-DNA-analysis (roughly: before the early 1990s, cf. Bramanti 2013) examples of marriage graves considered such merely on the basis of opposite-sex pairs, and similar same-sex double-graves being “brothers” or “sisters”. A double bind again: anything with a man and a woman is signified sexual orientation via marriage; anything not is not. A classic example is observed via archaeological romanticising over a potential heterosexual love triangle in the ca.24,000 BCE Dolní Věstonice burial in the Czech Republic (*Fig. 42*) (Owen 2007, DM 2016, Mingren 2016), until DNA analyses showed all three skeletons likely to be males: then the media (and archaeologists) stopped talking of “love” and instead chattered of “homosexual punishment” and/or murder (Owen 2007). On the bottom left of *Fig. 42* is an amateur gay archaeology buff’s re-rendering (now arguing for a gay love triangle, O’Donovan 2014).

In *Fig. 42*, we see a potential example of a double-dildo in Gorge d’Enfer, Dordogne, France implying lesbian sexual practices in ca.23,000 BCE (Taylor 1996); a potential homosexual male couple having sex in Grotte d’Enlène in ca.12,000 BCE; and an image additionally of what looks like two adult women caressing each other in a rock carving from Gönnersdorf, Germany, ca.10-11,000 BCE (“The Dancers”) and similar figures from Çatalhöyük, ca.5,800 BCE. Though not shown here, we also have a Prague media-star in the form of a so-called “gay caveman” from ca.2,700 BCE, which is a prime example of conflation of gender and sexual orientation, i.e., a biological man dressed in women’s clothes theorised therefore to be “gay” by the archaeologists (*Telegraph* 2011). To be fair, the “gay caveman” discovery was roundly criticised in a media backlash (Gast & Aarthun 2011) – partly due to

such inaccurate conflation and partly due, one feels, to the “distasteful” subject of gay prehistory overall.

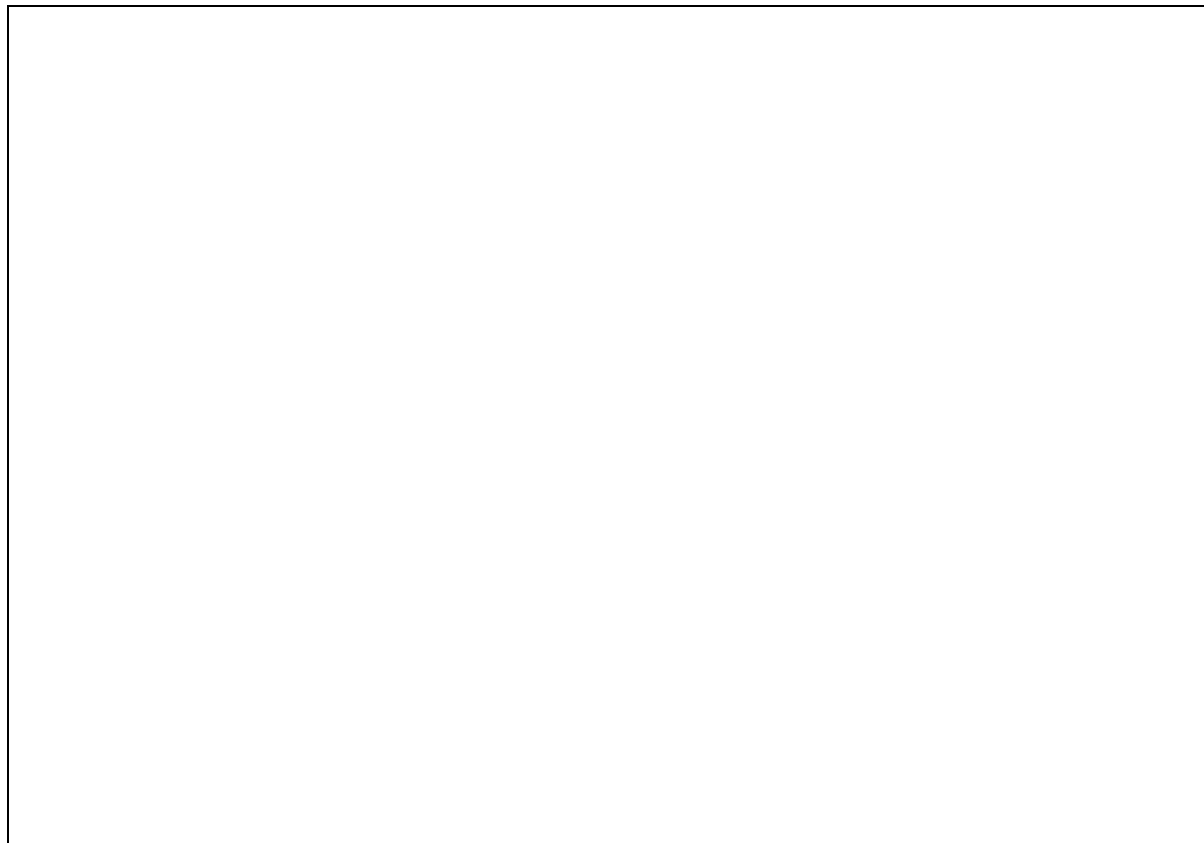


Fig. 42. TL and BL: Dolní Věstonice, Czech Republic and an alternative interpretation, adding the unmentioned (yet truthful) dowel near the lefthand male's groin, ca.24,000 BCE: image taken from O'Donovan 2014; TC: potential male–male intercourse, Grotte d'Enlène, France ca.14,000 BCE: image © Giraud et al. 1982; TR: Çatalhöyük, ca.5,800 BCE: © turizm.net; centre: “The Dancers”, Gönnersdorf, Germany, ca.10-11,000 BCE, © Don's Maps 2012; CR: potential double-headed dildo, Gorge d'Enfer, France ca.23,000 BCE: image taken from Cuesta & Díez 2007; BR: Çatalhöyük, ca.5,800 BCE: © Elixir of Knowledge 2013.

Aside from the bisexual Neanderthals (and bisexual moderns) envisioned in erotic novelist Leona Rhys' *Primal Skin* (2000) (presciently mentioning their red hair a full year before an Oxford DNA analysis by Dr Rosalind Harding revealed the same, *Oxford Blueprint* 2001, Stringer 2001) and science fiction writer Robert J Sawyer's *Neanderthal Parallax* series (2002/2003), we do not discuss non-heterosexuality in hominins. At least not in the mainstream: both erotica and science fiction are outsider genres. Gay Neanderthals, like lesbian dinosaurs, do not fit our (heterosexist) prototypes (McCaughey 2007). We do not know the exact mores of ancient cultures, even as anthropologists try to correlate modern hunting gathering cultures as directly analogous (and, with the huge variability of human cultures, with less evidence than for comparisons between humans and other apes). Similarly to how we cannot know the mind of another human being (“What is it like to be a bat?”, Nagel 1974), we claim to espouse cultural relativism but cannot truly know a culture's “mindset” either, unless we

live within it. This is one of the biggest problems in anthropology in general and palaeoanthropology and palaeoarchaeology in particular: an imposed dichotomy in terms of subjectivity/objectivity (“alterity”). Some analogies by observation will be flawed due to plastic behaviour (and this methodology problem can apply to human-ape comparisons, too), and most of them tainted by cultural prejudices (Harding 1987, 1991), as reflected in this sampled article: “Civil rights leaders and others became deeply suspicious, especially after one leading scientist cited monkey violence and sexuality as the research rationale.” [App. 2] (cf. [App. 38], [App. 55]).

If our own mores towards same-sex sexuality are flexible, and as we have observed so many cultural variations in contemporary or recent historical cultures, why should we assume social mindsets in prehistoric times, or that their sexual orientations were less (or more) concrete? Foucault’s early work assumes a *lack* of cultural concreteness and by doing so is rigid himself (1976), the same for Adriaens and De Block (2006). Levels of categorical essentialism vary temporally, and as concerns homosexual prehistory, we are having difficulty maintaining our cultural relativism.

8.5. Other Humans Have Concrete Sexual Orientations: “Normal Straights, Honest Lesbians, Insidious Bisexuals”

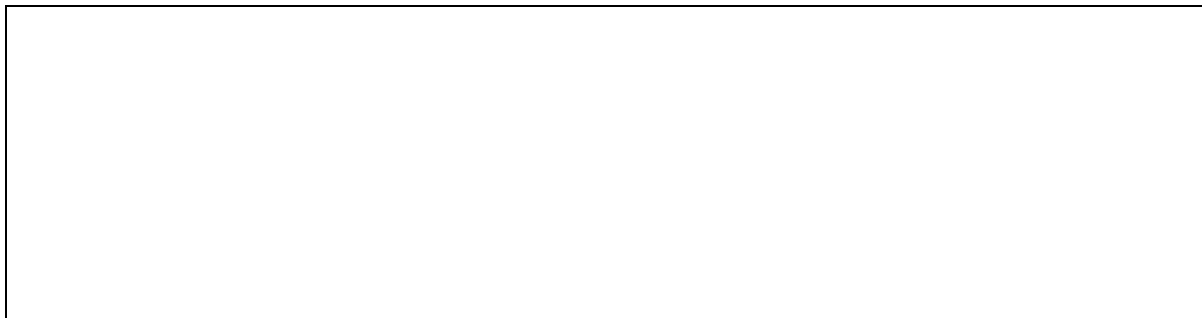


Fig. 43. Heterosexuality: Mr and Mrs Wedding Signs © LittleRetreats; Male Homosexuality: © www.couplescounselingchicago.net; Lesbianism: © Thea Dodds/Authentic Eye Photography.

“This is the overt face of lesbianism. Militant, yes, but also honest in the openness of its avowals. How different, how much more disturbing, is the insidious influence of the lipstick lesbians and the lithesome, pretty women kissing as lovers on TV.” [App. 196]

8.5.1. Category Crystallisation

“In 1983, only 16% of Americans believed that ‘homosexuality is something that people are born with’ [...] by 2000, that figure had more than doubled to 35%” (Bem 2000:532). My own results (cf. *Fig. 2 (D); Tab. 12*) show the same Anglo-American pattern of increasing biological determinism as it relates to “homosexuality” by 2000.

Writer Hanna Blanks draws attention to the newness of such essentialism: “ ‘heterosexual’ and ‘homosexual’ were coined [...] in a letter written by Austro-Hungarian journalist Karl-Maria Kertbeny to the German legal eagle and proto-gay rights crusader Karl Ulrichs. Technically speaking, before that fateful Wednesday [6 May 1868], it was impossible for anyone in the world to be either a heterosexual or a homosexual, because the words didn’t exist yet.” (Blank 2012:2).

Sexual-orientation identification as presented to others is usually seen in concrete terms: gay, straight male/female, lesbian and, much less frequently, bisexual male/female – the last set more marginalised despite greater numbers of bisexuals than lesbians or gay men (Pew Research 2013). (I include self-labelled transmen and transwomen in the “male” and “female” categories implicitly.)

Although “bisexual” can be viewed as a societal “monstrous hybrid” between two natural kinds (“gay” and “straight”) (cf. Jacobs 1992, Wagner *et al.* 2010), it too has been reified in self-identification terms, alongside putative less-recent reifications of the “homosexual” category in the West as argued by Foucault (1976) and others (Adriaens & De Block 2006).

Heterosexuality itself may be a construct. Daryl Bem goes so far to hypothesise that genetic transmission of heterosexuality is, strictly speaking, not necessary “as long as most baby ducklings encounter other ducks before they encounter an ethologist, evolution can simply implant the imprinting process itself into the species rather than the specific content of what, reproductively speaking, needs to be imprinted. Analogously, because most cultures ensure that boys and girls will see each other as exotic, it would be sufficient for evolution to implant exotic-becomes-erotic processes into our species rather than heterosexuality *per se*.” (1997:11). I find this interesting because, as I have argued, it seems crucial for cultures to ensure that males and females see each other as what Bem terms as “exotic”. In the West we differentiate non-heterosexuality along gender lines too, associating gayness with femininity, lesbianism with masculinity, and bisexuality with a “dangerous” promiscuous potential, but again, we may be trying to link sexual preferences with a dichotomy that we are perhaps hard-wired to construct (Male–Female) (Gelman & Markman 1986, 1987; Gelman 2003, 2004), and any category that challenges this hegemony – such as bisexual potentiality – is suspect (Yoshino 2000). I note that concepts of heterosexual and homosexual would not be possible without first having a gender construct.

To examine whether sexual-orientation categories are constructs, we must acknowledge that concept-malleability can exist (even gender, though the *need* to distinguish gender may be unmalleable (Gelman & Markman 1986, 1987; Gelman 2003, 2004).

Certainly concept malleability is present in my own results from 2000-2010 (*Fig. 2 (D), Tab. 12, Tab. 20, Tab. 21*). This was a time of great political change for gay rights, with same-sex marriage movements gaining great ground in the West, and also a post-millennial greater acceptance of homosexuality/bisexuality as viewed by the broadsheets. Other unrelated studies bear this out, for

example *Fig. 9*, showing a UK similar homophobia millennial rise that is followed by tolerance (Wilkinson 2010).

My results (cf. *Fig. 2 (D)*, *Tab. 20*, *Tab. 21*) suggests that that Heterosexual–Homosexual paradigm has been challenged, reacted to (at first negatively), and then re-shifted. Unlike Male–Female, the Heterosexual–Homosexual alterity may be, as Adriaens and De Block put it, an “interactive natural kind” (2006:575). Yet despite such social malleability, most studies investigating homosexual behaviour consider heterosexuality the most natural of all “natural kinds”. In the wider article pool, heterosexuality is so assumed that it is referred to as just “sexuality”. Lately, the last century and a half, starting with German activism by Karl Heinrich Ulrichs in 1867 and sexuality theories by Richard von Krafft-Ebing in 1886 (Kennedy 1988), there has been a Western reification of exclusive homosexual behaviour as an alterity to such presumed heterosexuality. Though many modern sexuality theorists suggest that identity concepts are modern inventions (Foucault 1976, Adriaens & De Block 2006), there are, and have been, varying examples of sexual orientation categories. These orientation categories are sometimes based not on gender preference but sexual experience (virginity), literal sexual positions (active/passive) or power (dominant/submissive) (Faderman 1981, Boswell 1994, Bullough & Brundage 1996, Murray & Roscoe 1998, Simula 2014). However, since gender is so salient for humans cross-culturally (Henslin 2001, Hughes & Hughes 2001, Strozier 2002, Ciccodicola 2012), we do find that gendered sexual orientation categories have indeed existed before, as in Ancient Rome and Greece. If our cultural sexual orientations fade, similar gendered categories almost certainly will exist again, I believe, as we essentialise gender to such a high degree.

Those same Ancient Greeks, like us, acknowledged (and prescribed) a crystallisation of sexual/romantic desires in early adulthood (Boswell 1994), just as eventually happens for most GNC young adults (Cantor 2016) (though Greek culture allowed for a rare bisexual get-out clause: “Zeus came as an eagle to god-like Ganymede, as a swan came he to the fair-haired mother of Helen. So there is no comparison between the two things; one person likes one, another likes the other; I like both.” (*Anthologia Palatina* 650 BCE, cited in Boswell 1994:74). It has been hypothesised that non-gender-polarising cultures (there are some: Graham 2001) may have more bisexuals (Fleischman *et al.* 2015). (I note additionally a rarer type of sexuality crystallisation, that of being “crossorient”-(ed) or “vari-oriented”, where one is exclusively sexually attracted and romantically attracted to different sexes, i.e., one falls in love with men only, but is sexually attracted to females only, cf. Ace 2016.)

De Block and Adriaens make associations between gay men and sexual submission. We then enter a double-bind of concrete sexuality, since the sexual partners of submissive partners, aka the “dominant” men, identify as straight and presumably act heterosexually in terms of sexual behaviour too. This is one of the problems with rigid concepts of sexual orientation – which De Block and Adriaens eschew, but yet in this manner retain, allowing for a minimisation of same-sex behavioural

observations (De Block & Adriaens 2004). *Both* actors – the submissive “gay” one and the dominant “straight” one – are acting homosexually.

Group identification also can mean that a subset of homosexually-behaving people use strategic essentialism to raise self-esteem and create ingroups (Guha & Spivak 1988, Azoulay 1999). Possibly the much-referenced “coming-out journey” (where one “admits” to oneself and others that one is gay, lesbian or bisexual) *crystallises* and socially enforces concrete concepts of sexual orientation, just as living in heterosexually dominant cultures does (adherence to stereotypes/prototypes often feels “right”: Cameron 2008, Dovidio *et al.* 2010).

While bisexuals have the same “sexuality milestones” that gay men and lesbians do, bisexuals often do not consider themselves to have gone through a “coming-out” process, and indeed are “out” to fewer people (Parker 2015). I also note that human males in general are more “essentialist” across the dichotomies at a consistent but non-significant level according to my own results (*Tab. 17-20*), *and* that males are the empowered ingroup, so this elides with the upholding of the status quo. Men in general also are more concrete about sexuality concepts (Haslam & Levy 2006), even when they do about-faces in terms of their personal sexual orientations (Westwood 2014). Moreover, both straight and gay men seem to be directed towards their preferred sex when sexually aroused, whereas women’s arousal is strengthened more generally (Welling 2013). This, naturally, could be culturally/environmentally influenced.

Polarised biological determinism has been the sexual-orientation narrative since the late 1990s – before that, a more plastic potential was theorised (albeit with a highly heterocentric focus) (Bem 2000). We observe evidence of cultural influence on essentialist assumptions via evidence that stereotype lift of such a crystallised “type” has been shown in gay men by invoking “fashion sense” (Cotner & Burkley 2013).

8.5.2. Future Sexuality Categories

In terms of future categories, it is possible that “bisexual” might itself embody a rarefied birth quality (become essentialised) complete with biologically determinist arguments regarding a tripartite, rather than binomial, conceptualisation of sexual orientation, with “pansexual” then becoming the outlying ambiguous category (I note that pansexual is in part encompassing transgender and non-binary romantic/sexual objects, not just biological males or females). Some argue that the crystallisation of bisexuality has already occurred: “[R]esearchers often place participants into one of three discrete sexual categories (heterosexual, bisexual, or gay/lesbian), and this is particularly true of sexual identity. These three categories have become so culturally and politically entrenched in contemporary societies that they have achieved the status of ‘natural kinds’ [...] individuals are

expected to summarize their sexual orientation components as belonging to and consistent with one of these three categories.” (Vrangalova & Savin-Williams 2012:85).

In terms of potential category-collapse/subsumation, the categories of gay and lesbian may become much more rare: if I had to wager a guess, it would be that the next sexual-orientation neologism will be more conflated with gender concepts, which has been a connection previously avoided in Western gay and lesbian politics in the last few decades via arguments that sexual attraction encompasses a different group of categorical sets than gender sets.

8.5.3. Latency and Pathologisation

Suppression of bisexual impulses from the ardently heterosexual vantage point is noteworthy. In terms of “ex-gays”, the de-programming process usually (perhaps universally) involves the suppression of the “gay” instincts/behaviour, not the integration of desiring both sexes, either sequentially or concurrently. The “patients” wish to be heterosexual monosexualists. Sexuality researcher Robert Spitzer was involved in reports that conversion therapy could be successful (Spitzer 2003), a position he later publicly renounced in 2012 on grounds of methodology. However, Spitzer was not analysing a monosexual sample group: “only a minority of the participants (about 40%) were exclusively attracted to partners of the same sex before they attempted to change. [...] including bisexuals in studies evaluating the outcomes of conversion therapies tends to inflate the proportion of ‘successes.’” (Herek 2012:6). There is a strong impetus to change in this context, as homosexual behaviour is stigmatised. The concept is laid out as either/or, bimodal (“forced choice”: see Fechner 1889). A subsequent conversion therapy study undertaken found only 3% achieving what was considered to be “heterosexuality” (Shidlo & Schroeder 2002). The study leaders there noted that participants had experienced mental harm from trying to shift “sexual orientation”. Again note that these participants pathologise bisexual as well as exclusively homosexual desires.

Suppression of one’s bisexual impulses could also be salient in quite a different context. In a separate arousal study, Rieger and Savin-Williams mark that “[the pupils of] bisexual men dilated significantly *less* [indicated less sexual arousal, emphasis that of authors] to their more arousing sex, compared to both heterosexual and homosexual men [...] This effect was weaker, in magnitude, than bisexual men’s greater pupil dilation to their less arousing sex, compared to other men” (Rieger & Savin-Williams 2012:6). This could be explained as a novelty reaction to men not used to considering their “B-side” attractions.

Suppression of bisexual impulses from a gay vantage point, not just heterosexual, can also occur. As one sample article puts it, with writer Matthew Parris criticising another gay man’s take on concrete sexuality: “Dancing with women I have sometimes noticed an involuntary arousal; is something

being suppressed? In intimate physical contact with other men, men who think they are completely heterosexual often experience the same. [...] Sullivan thinks sexual orientation is fixed early, finally and unambiguously. For my part I believe that we are all placed somewhere on a scale between other-sex and same-sex attraction; and that it is human conditioning which 'herds' us towards the most accessible pole. If it is true that many who call themselves bisexual are actually homosexual, it is equally true that many who call themselves heterosexual are actually bisexual. If so, then homosexuality can indeed be promoted, just as heterosexuality so relentlessly is." [App. 297].

Here is another appendix example by gay campaigner Peter Tatchell that alludes to such (flexible) crystallisation: "I remain unconvinced that sexuality is a fixed biological given [...] This suggests there is an element of flexibility in sexual orientation [...] In an enlightened, gay-friendly society, more people would explore the queer side of the street." [App. 347].

The concept of an orientation-crystallisation upon adulthood is interesting. The American phenomenon of "Lesbian Until Graduation" of female college students ("LUGs") (Twenge *et al.* 2016), also found in the "skinship" relationships of young women in contemporary Japan (Robertson 1998, Summerhawk *et al.* 1998, Subramian 2011; see also Shamooin 2012), is seen cross-culturally and historically (Tab. 34). Accordingly, there is resentment amongst the sexually crystallised (perhaps) gay men and lesbians regarding "sexual (orientation) tourism" (Davis 1999). This is notable, as it could be related to fear of fakery and an infrahumanistic reaction against dishonest signals. Evaluating "trans-orientational" ambiguous categories such as bisexuality may be driving such uneasiness.

Latency is a concept conceived by Wilhelm Fleiss and expounded upon by Sigmund Freud in the late 1800s (Freud 1887–1904) that assumes a default bisexuality in humans, where children are born as *tabulae rasae* ("blank slates", an erotic plasticity he referred to as "polymorphous perversity"). As the founder of modern psychology, Freud was a keen observer of behaviour. I am sympathetic to his observed view of children as ungendered and pansexual beings, with my caveat that we have a hardwired gender schema that then becomes culturally "filled", as studies on essentialism suggest (Gelman & Markman 1986, 1987; Gelman 2003, 2004). Are humans then "naturally" pansexual, potentially erotic unto "anything that moves" (*Anything That Moves* was, incidentally, a long-running US bisexual politics/lifestyle magazine: 1990-2002)? We observe default bisexual behaviour when our inhibitions are lowered via drugs or alcohol (slang is "six-beer queer": Taylor 2009) (Harawa *et al.* 2008) or social permissiveness (Parker 1991), suggesting across-population bisexual latency (one heterosexually-self-labelled Frenchman has successfully argued in court that using a drug for Parkinson's disease made him a gambling gay sex addict, Williams 2012). There is a correlation with sexual behaviour outside one's "normal" orientational preferences under stressful situations such as mental breakdowns or hypomanic episodes (Downey *et al.* 2016) – or even celebratory ones such as carnivals (Parker 1991). Poor bisexual mental health, for that part, has been directly related in one

qualitative study to feeling pressure from both “straight and gay” communities (Boon 2008; see also Ross *et al.* 2010, Lincoln *et al.* 2015). This is important when recalling that dealing with ambiguity – perhaps particularly ambiguity that involves one’s self concept – carries a cognitive load (high mental illness rates also are seen in other marginalised communities such as some transgendered, mixed-race and disabled people, all “non-prototypes” in terms of self-concept in Western hegemonic systems (Sanchez *et al.* 2009, Honey *et al.* 2011, Pflum *et al.* 2015). Furthermore, bisexual people constantly deal with the stress of “repeatedly disclosing their bisexual identity, by contrast with the experience of gay men and lesbians [and heterosexuals], whose sexual identity is implicit in the disclosure of the gender of a current or past partner” (Ross *et al.* 2010:497, brackets mine).

Often *both* homosexuality and bisexuality are seen as pathological, incorporating a frequently used metaphor of contagion (Dececco & Scarce 1999, Filip-Crawford & Neuberg 2015). It makes sense that in a culture where heterosexuality is prescribed that due to “uncanny valley”/infrahumanisation reactions it will be the ambiguous category (bisexuality) that is more reviled, for that category is more threatening to sexuality essences: “ ‘[B]isexuality’, ‘pansexuality’, ‘omnisexuality’, ‘paraphiliacs’ . Because the definition cannot be controlled, it becomes insidious, its believers perverted or indecisive, considered ‘untrue’ to themselves as they haven’t yet taken on all definitions of either side of the binary split.” (Bryson 1998:3; see also Pitt 2006, Schildcrout 2011).

A sample article elides bisexual latency with excrement and Nazism: “Confusing sexuality, which he considered ‘exceedingly filthy’ with the act of excretion, Hitler was both impotent and a ‘fully fledged masochist’. [...] To further complicate matters, the Fuhrer may also have been a closet homosexual. According to Dr Murray he found himself in awe of strong homosexual characters.” [App. 338]. We have a telling 2006 quote (unsampled) from a UK gay/lesbian student representative at a NUS conference: “many of the points [...] against bisexuality were [...] that they are pretending/confused/promiscuous/uncommitted and generally unhealthy. One lesbian suggested that if we allowed bisexuals into our group then we should also allow ‘dog f***ers and other perverts’ ” (Henley-Einion 2006, asterisks are the article author’s).

Bisexuals are viewed as individuals who cannot make commitments to either sex, judged as faithless by gay men, lesbians and straight people (Boon 2008, Ross *et al.* 2010, Klesse 2014). There may be some validity to the stereotype that bisexuals will revert to heterosexuality: most bisexuals (84%) are in opposite-sex relationships (Parker 2015).

Perhaps bisexuals *are* more insidious, at least in the sense that they hide their sexuality more often: “Only 28% of bisexuals say all or most of the important people in their life know they are bisexual. By comparison, 77% of gay men and 71% of lesbians say the important people in their life know about their sexual orientation.” (Parker 2015:1). This “insidiousness” may be the result of living as an ambiguous category in a concretely categorised world; it could also be viewed that bisexuals – rather

than monosexuals either straight or gay – are the ones being more honest, even if just to themselves, regarding plastic eroticism/romanticism capacities.

8.5.4. Bisexual Erasure

Superseding categories of essentialised gay and straight means many scholars argue that bisexuality does not exist at all: I hypothesise this is primarily due to ambiguity intolerance and protection of the heterosexual ingroup. Rosenthal *et al.*, with J Michael Bailey as the senior author, published a controversial study in 2011 that claimed this for bisexual men. Men from the original experiment were unimpressed with the test conditions: “They used videos where the women looked cracked out, had long press-on nails and seemed miserable [...] The idea that you could accurately judge someone’s bisexuality by showing them that kind of porn was really astonishing to me. If you do love and respect women, that kind of porn should repel you.” (Denizet-Lewis 2014:8).

As noted, societal disbelief in both male and female bisexuality is quite common (Brewster 2008). After first claiming bisexual men did not exist, and after accusations that their sample population was not truly bisexual nor representative, Bailey’s research team recruited men who had had romantic relationships with both sexes and re-ran the experiment – and then published U-turn results indicating bisexual men now *did* exist (sort of): “[g]iven that bisexual arousal patterns have not previously been detected among even bisexual-identified men, an underlying bisexual orientation may be uncommon.” (Rosenthal *et al.* 2011:112). A different team of researchers that same year found that bisexual men did indeed become aroused by a bisexual stimulus (Cerny & Janssen 2011), but Bailey then argued that these “bisexual” men instead might be gay men not sexually inhibited to females. Bailey’s requirements questioning Cerny and Janssen’s results were that for a bisexual, the bisexual sexual stimulus should be greater than that of a homosexual stimulus to “count” as bisexual – in a sense, crystallising and rather specifically reifying bisexuality (Bailey *et al.* 2011). For one’s attraction for a set does not always trump an attraction to an individual, i.e., one could be attracted strongly to an individual female, and generally strongly to males as a set. Some call *this* sexual orientation – if it is, then it is a very flexible set. I call this longitudinal bisexuality. Bailey, at least prior to refuting the 2011 Cerny & Janssen study, does not: “I’m not denying that bisexual behaviour exists [...] but I am saying that in men there’s no hint that true bisexual arousal exists” (Wolchover 2011). Bailey’s current theory that bisexual men may be just open-minded gay men is problematic; firstly, as noted, in that it assumes gayness as a concrete category (with a carefully defined “bisexual”-ness) and, secondly, via its framing, for why are these considered inevitably to be “gay” men exhibiting bisexual tendencies, rather than bisexual men being incorrectly-labelled open-minded gay men? Bailey’s *a priori* assumption is that gay men (and straight men) exist as concrete categories.

Contrary to Bailey’s requirements and seeming surprise in his second 2011 study that bisexuality is

not equally divided (“It appears that some men may identify as bisexual because they are sexually aroused by both sexes, even if they experience considerably more arousal to one sex than the other”, Rosenthal *et al.* 2011:115), most bisexuals’ attractions are not evenly divided 50/50 between the sexes – rather, *most* are “mostly heterosexual” (Vrangalova & Savin-Williams 2012; see also Thompson & Morgan 2008) and *some* are “mostly homosexual” and *some* are in-between as well. This has been suggested by many studies: “our [...] data strongly suggest that intermediate categories – which we have termed Bi-Heterosexual, Bi-Bisexual, and Bi-Gay/Lesbian – are also valid constructs. People in those categories are not merely oddly chosen heterosexuals and homosexuals grouped together in varying proportions.” (Weinrich & Klein 2002:27); “[t]he results support a fluid-continuum model of sexual orientation” (Epstein *et al.* 2012:1356); “a continuous variable that is heavily skewed towards heterosexuality in both men and women” (Vrangalova & Savin-Williams 2012:98). Finally, many bisexuals are not simultaneously bisexual (Cerny & Janssen 2011). That said, bisexual men in Bailey’s second 2011 study *did* react more to the mixed-gender threesome scenario than did gay-identified or straight-identified males (Rosenthal *et al.* 2011). There have been studies since that not only indicate a great deal of (bi)erotic *desire* (Rieger & Savin-Williams 2012, Epstein *et al.* 2012, Savin-Williams & Vrangalova 2013, Fleischman *et al.* 2015), but also marked forms of so-called bisexual *arousal* (Rieger & Savin-Williams 2012).

Erasure takes other forms. Psychologists and advice columnists alike assure clients/readers that everyone has homosexual fantasies; in fact, the argument by advice columnists often seems to be that despite homoerotic feelings, one remains reassuringly straight (“A lot of young people go through a gay or bisexual stage. Having crushes on members of the same sex is part of growing up” [App. 330]). As one gay man in an interview on bisexuality put it, “That some men like men and other men like women, I can understand. But when some men and some women like men and women, I am thrown. It is not that I don’t believe in it, more that bisexuality throws my mind out of its comfort zone” (Adkins 2006).

This type of erasure may be connected to the surprising result regarding the conservative paper *Evening Standard* (and its proxies) having been shown in one multinomial analysis to be more ambiguity-tolerant than the liberal vanguard of the *Guardian*, using a *Guardian*-based alternative baseline (Tab. 21) (cf. final sub-table, Tab. 24), though it was also the most negative, save the *Mail*, using a *Mirror*-based alternative baseline in another (also Tab. 21). I reiterate here that an individual (or newspaper-group of averaged individuals) can be both essentialist and non-homophobic (pro-gay, but not pro-sexual-fluidity). It appears that here it is the inverse: conservative papers (and potentially class) “protect” potentially bisexually acting conservatives such as William Hague or Archbishop David Hope (and even homosexual behaviour at private boys’ schools such as Eton, cf. Edwards 2013), defending or explaining away ambiguous sexual behaviour in the hopes that one’s heterosexuality will win out (so: heterosexist-ly tolerant of potential bisexuality at the expense of

homosexual behaviour – I’ll call it an “Eton/William Hague” effect). In the 2010 sampling alone, 6.48% (14 out of 216) of total articles dealt with William Hague’s potential bisexuality after the foreign secretary and former Conservative party leader was spotted with a 25-year-old male “special advisor”. Protection of one’s political (class) ingroup trumped sexuality-ambiguity-tolerance: the (liberal) *Guardian* giving very negative assessments of bisexual potential (“lurid”, “innuendo”, “allegations” [App. 361]). “Allegations” of course allude to criminal behaviour, mitigating what otherwise could be seen as a neutral defence of same-sex sexuality against homophobia. Also from the sampled *Guardian*: “A dark side of gay liberation: Officially no one cares about a politician’s sexuality. The Hague case shows that isn’t true” [App. 417].

As seen in sampled articles not included in *Appendix A* (therefore noted by publication, format and date by the convention established in Chapter 2), the *Times* was more lenient and explained away potential bisexuality: “Hague, surely, is too honest and clever for that, even though he was evidently not astute enough to see that, as the past week has shown, innocent actions can be misconstrued.” [BT05.09.10A; “[politicians] must spend their lives imagining the worst possible interpretations that might be put on their behaviour and then acting to forestall that possibility. If they don’t, they lay themselves open to having their reputations trashed” [BT05.09.10B]. The *Daily Mail* did similarly: “Cruelly, it was the absence of children which fuelled the gossip about Mr Hague’s sexuality” (also in the same article: “scurrilous”; “damaging”) [TM03.09.10]. Like the *Guardian*, the liberal *Mirror* instead blamed Hague’s “judgement” rather than misinterpretation or misconstruction by others: “RUMOURS about his sexuality have swirled around Commons corridors for years. [...] the fact he has let himself be forced into this position means questions will be asked about his judgement. And that may prove more damaging to his ambitions than internet tittle-tattle about exactly what went on in hotel rooms on the campaign trail.” [TD02.09.10]. While generalised infidelity may have played a role in liberal assessments, there remains a focus on the potential same-sex element.

Only for the Heterosexual–Homosexual MAM (*Tab. 20*) was “Newspaper” salient in terms of ambiguity tolerance, and the excerpts above may give some suggestion why. The tabloidism trend of lower ambiguity-tolerance, while not statistically significant, went across multiple dichotomies (*Tab. 11*) – that said, conservatism also was a non-statistically significant trend suppressing ambiguity tolerance when looking at the complete model (*Tab. 14*). The linking of political leaning, format and even newspaper brands might benefit by being viewed as a series of interactive kinds themselves, affecting differing modes of categorisation – particularly in terms of the “Eton/William Hague Effect”.

It is not just conservative UK newspapers erasing same-sex sexuality by “proof” of opposite-sex partners; historical approaches also use “that [...] historian’s trick, using an actual heterosexual love interest or partner to distract from and erase same-sex loves. Examples: Shakespeare, Eleanor Roosevelt. Nathaniel Hawthorne. Herman Melville.” (Kelly 2001:18). This is frequently done in contemporary times by Hollywood PR companies for celebrities: once the celebrity is in a public

heterosexual relationship, this apparently “erases” any possibility of simultaneous, past or future homosexual behaviour (Defares 2014; see also Bryson 2008). This is only possible in societies that consider “heterosexual” and “homosexual” as (undiluted) concrete categories.

We do have an interesting example of a crystallisation of *bisexuality* itself, normally an ambiguous category, as gay rights activist Peter Tatchell insists that an archbishop is not allowed to have a self-labelled “grey” (in-between) sexuality: “He has three options – homosexual, heterosexual or bisexual. Grey is not one of them.” [App. 310].

Academic Kenji Yoshino theorises that bisexual erasure (sometimes colloquially referred to as *biphobia*) – the dismissals, ignoring and masking that we have discussed – is due to sexual orientation stabilisation; the maintenance of gender categories and the maintenance of societal monogamy (the latter of which is challenged by the potential prospect of extra-pair attractions if bisexuals are inherently non-monogamous, which many people falsely believe, Yoshino 2000): “polyamorous bisexuality is even more effective than monogamous bisexuality in troubling ‘the male/female and straight/gay binary constructs at the root of compulsory heterosexuality’ ” (Klesse 2014:92, citing Barker 2005). It is worth noting that threesomes and bisexuality are very different things, though often conflated (though the former may require some degree of bisexuality/homosexuality, the inverse does not follow, i.e., bisexuality does not require group-sex).

There are legal and personal ramifications to bisexual erasure. For example, the plethysmograph (penis meter that measures erections) is used as a “gay male” purity test to prove that asylum seekers seeking refuge on grounds of sexual orientation persecution aren’t really “gay”: “If any of the applicants got aroused at the sight of men and women having sex they were automatically denied asylum rights.” [App. 429]. According to the Czech authorities, bisexual men cannot experience gay persecution since they can “choose” to live heterosexually, which also was a recent reasoning in a ruling by the UK Home Office regarding deporting individuals (Duffy 2016). This is a common pattern: “Research demonstrates that it is extremely difficult for asylum seekers to demonstrate persecution on the basis of sexual orientation, if they present a bisexual identity or life story” (Klesse 2014:87, citing IGLHRC 2007; see also Rehaag 2008).

Finally, in terms of concrete monosexual orientations, bisexuals may be “erasing” themselves: bisexual men and women are much less likely to say that their sexual orientation is very important to them (20% vs 50% for gay men and lesbians) (Pew Research 2013). The monosexual focus of self-labelled homosexuals is echoed (or perhaps originally “shouted”) by that of heterosexuals, and we will briefly discuss that focus now.

8.6. I Have a Concrete Sexual Orientation: “Unequivocal, Not Ambiguity-Riddled”

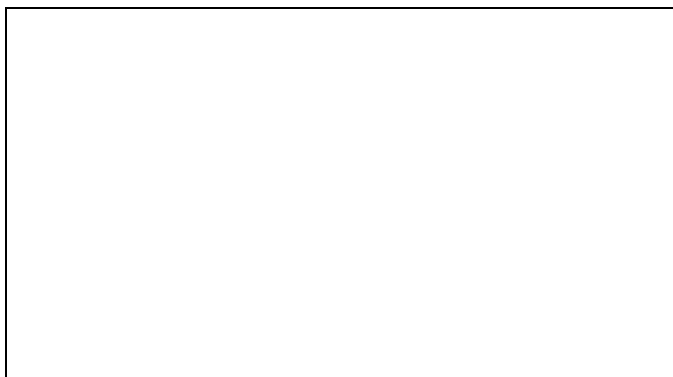


Fig. 44: Literal labels, clockwise from top: gay © LGBT Laughs; straight © evolvefish.com; bisexual © <http://www.bisexualindex.org.uk>.

“Later riddled with ambivalence, Spender’s sexuality in the Thirties was unequivocally directed at his own sex” [App. 305]

8.6.1. Flux to Fetishism

Sexual orientation concepts are in flux. There is less mention of “gay” or “lesbian” or “bisexual” in the general modern news media, as these are subsumed under the umbrella term “LGBT” (Simpson 1996, Bindel 2014; see also Sycamore 2005). The reification, not just the subsumation of categories, is important due to strategic essentialism via group identity to gain political power and awareness – there are very similar courses taken by both the bisexual and transgender sub-categories of LGBT in the last two decades that follow previous monosexual gay/lesbian group identity trajectories, and also those of other liberation movements (Guha & Spivak 1988, Azoulay 1999).

Unstable sexual-orientation categories are pathologised most (Yoshino 2000). Yet it might be monosexuality itself that is the culturally learned behaviour. The objectification of non-sexual body parts is a cognitive process also long-associated with sexual fetishism (“sexual excitement in response to an object or body part that’s not typically sexual, such as shoes or feet” (Collins 2016), sexual fetishism of objects being linked to males but exhibited by females to nearly the same degree in a recent sex survey (Joyal *et al.* 2015) (in widest evolutionary terms, surely sexual selection by females of male body parts is a form of “fetishism”, Zahavi 1975, Scorolli *et al.* 2007).

Scorolli *et al.* hint at a hardwired possibility of such body partialism – sexual orientation usually involves attraction to a specific set of sexual organs (therefore by definition not normally considered fetishistic, though sometimes considered partialism, Kafka 2010); could this attraction not also be seen as a type of genital fetishism – or even *gender* fetishism? Interestingly, heterosexual psychological interpretations have long argued that homosexual behaviour is a fetish (Ellis 1922). Extending this metaphor to instead look at *both* forms of monosexuality (homosexuality *and*

heterosexuality) as fetishes is rare, though this is what “gay-conversion” psychologist Joseph Nicolosi accuses Daryl Bem of doing in terms of Bem’s EBE theory (Nicolosi 2016), a theory discussed in more detail in Section 8.7.3.3.

Yet perhaps the refinement of exclusive heterosexual/homosexual desires into reified abstractions *is* a crystallisation: and therefore perhaps unequivocal heterosexuality and homosexuality – at the expense of each other, negotiated via a reality much more ambiguous – are fetishes themselves. That said, by privileging the term and defining the set so explicitly in essentialist terms, we possibly might be “fetishising” (reifying into an essence) the concept of fetishism itself.

8.7. I Have a Flexible Sexual Orientation: “Reciprocal Desires, Reciprocal Altruism”

Fig. 45: “Come, gentle Ganymede and play with me; I love thee well, say Juno what she will”: quote from “Dido, Queen of Carthage”, a play by Christopher Marlowe, ca.1593. Ganymede and Zeus statue by Richard Westmacott, 19th century.

“[A]gainst our modern concept of homosexuality as an innate and exclusive sexual variant, Marlowe endows his characters with a high-pressure male sexuality, almost equally likely to be attracted by women and young men, and to be reciprocated by both.” [App. 321]

8.7.1. Interactivity

The Heterosexual–Homosexual binary truly *is* more flexible: in terms of the multinomial logistic regression, *Binary* is a statistically significant predictor variable when dichotomies are congregated, implying differences in reporting between dichotomies. In *Tab. 14*, we saw that the Heterosexual–Homosexual dichotomy echoes the Male–Female dichotomy, suggesting that the potentially linked sexual-orientation and gender dichotomies behave in similar ways. This occurred despite the fact that the Male–Female dichotomy was *stable* and Heterosexual–Homosexual *volatile*. The similarity in

dichotomy-behaviour might also be due to gender correlation, as bisexual intermediaries appeared in the greater pool for Heterosexual–Homosexual as “LGBT”, which, while including the sexuality-intermediary concept “bisexual”, also contains the gender-concept “transgender”. The stable genderedness of the Male–Female dichotomy therefore could be hyper-affecting the more malleable category of sexual orientation, and the plasticity of the Heterosexual–Homosexual alterity, already noted, may be even more plastic than is already shown in my results (“interactive kinds”: Adriaens & De Block 2006); future research to explore this influence might be fruitful.

Not that such sexual-orientation interactivity, although acknowledged, is unreservedly seen as positive. An unsampled 1995 article in my larger article pool (penned by bisexually-behaving journalist Charlotte Raven) sums up common attitudes towards specifically *bisexual* interactivity: “Bisexuality has been touted as the 1990s equivalent of Free Love. But is gender-surfing the way ahead if you fancy Kate Moss and Liam Gallagher, or just a greedy distraction from genuine commitment? [...] Gay identity, as outing shows, will always demand a commitment. [...] There is a kind of affectlessness in failing to come down on either side.” [App. 418].

By 2013, a headline for an unsampled article in the *Evening Standard* read “We’re all pansexual now” in an article on Olympic athlete Tom Daley. “[n]ot gay, not bi, not labelled: as Tom Daley says he’s seeing a man but hasn’t ruled out women [...] the new fluid sexuality” (Brisbane 2013:1). Positive trans-implicit inclusion aside, *pansexual* is an interesting embrace of a cultural neologism (the word *pansexualism* first appeared in 1917) (Harper 2016). There is a less positive aspect to neologisms: the possibility that people won’t use the word bisexual *because* of negative reactions to that same interactivity and potential for sexual fluidity – and so new words keep appearing. Pansexual. Queer. Bi-curious. Fluid. Mostly Gay. Mostly Straight. Demisexual. Flexisexual. Omnisexual. Homoflexible. Heteroflexible. Gay Till Graduation. Hasbian. AC/DC. Switchhitter. Yestergay. Homoromantic. Heteroromantic. Homosocial. Heterosocial. Homoerotic. Heteroerotic. MOGAI (Marginalised Orientations, Gender Alignments, and Intersex). We see the same neologistic patterns for words used for transgender people, American racial minorities such as African-Americans and Native Americans (Means 1996, JBHE 1997, Kesler 2009) (potentially also “interactive kinds”), and we observe it for pejorative terms in the gay/lesbian categories as well (Lowenstein 2011, GLAAD 2016). Perhaps these are indeed “monstrous hybrids” (Jacobs 1992): the reinforcement of categorical norms via “othering” more gradualist categories (perhaps even via “self-othering” by disenfranchised parties). We notably *don’t* see widespread neologism trends for males, for white people or for straight people.

8.7.2. History and Identity

Bisexual prehistory almost certainly began with an ancestor long before the Miocene human-chimpanzee split (commonly thought to be 5-7 million years ago [Kumar *et al.* 2005], but potentially as far back as 13 million years ago [Venn *et al.* 2014]) – and is alluded to in the recorded Sumerian myth of Gilgamesh (ca.2750 BCE) – but explicitly bisexual written history begins with the Ancient Egyptian ca.1200 BCE *King Neferkare and General Sasehet* fragments (Meskell 1999), and generally is noted in nearly all cultures with written or pictographic records, possibly universally (Kirkpatrick 2000, cf. *Tab.* 34). Most “homosexual” actors were, like Marlowe’s 16th-century plays referenced in the Appendix article above [App. 321] and Shakespeare’s 17th-century sonnets, fluid in object choice, bisexual in nature. In the West we eventually approach the theories of von Krafft-Ebing in 1886 and Freud in 1909. The former reifies the conceptualisation of (homo)sexuality via (gender) inversion theories; the latter suggests innate bisexuality in the form of polymorphous perversity. Contemporaneous to and post-dating von Krafft-Ebing and Freud, Westerners were aware of (and, as has been done through millennia, participating in) bisexual behaviour – cf. the poetic works of Whitman, Dickinson, C. Rossetti, St Vincent-Millay and the Bloomsbury Group; let alone the between-war years in 1920s/1930s Weimar Germany and Paris *demimonde* communities – but this could be argued to be in an artistic context, perhaps not what “normal” folks do or did. Then we come to the paradigm-shattering *Kinsey Report* in 1948/1953.

In the middle of the last century, from 1938-1963, Alfred Kinsey lead a team of researchers at Indiana University in conducting an investigative series of interviews on the sexual practices of over 18,000 people (Kinsey 1948, Kinsey *et al.* 1953, Schaffer 2007). The published *Kinsey Report* is a “self-report measure that allows participants to provide a single rating for their sexual behaviours and interests. Scores for this scale range from 0 (exclusively heterosexual) to 6 (exclusively homosexual). Scores 1 through 5 identify individuals with varying levels of same- and other-sex attraction and sexual behavior.” (Galupo *et al.* 2014); this is known as the *Kinsey Scale*. The *Kinsey Report* revolutionised Western cultures’ sexual assumptions by exposing the great extent of bisexual behaviour of American males (37.5%) (1948) and females (13%) (1953), respectively. That was a radical reveal coming in the ultraconservative post-war 1940s/1950s. The advantage of the Kinsey Scale lies in its spectrum nature; the disadvantage is, as noted, that a given percentage cancels the other out; one cannot be highly homosexual and highly heterosexual at the same time. We see this problem in modern identity studies as well: “Having more same-sex sexuality did not necessarily imply having less other-sex sexuality, and vice versa.” (Vrangalova & Savin-Williams 2010:85; see also Dunne *et al.* 2000).

Fritz Klein’s *Klein Sexual Orientation Grid* (1978) and Michael Storm’s 1979 *Storms’ Model* (1980) both tried to account for spectrum limitations: in the former, by using seven different domains of sexuality: sexual attraction, sexual behaviour, sexual fantasies, emotional preference, social

preference, lifestyle preference, self identification; and in the latter, by also including an asexual category. A politicised Western bisexual identity was a nascent concept then, though the first US national group formed in 1972 (Binet 2016), and grew in political strength through the 1980s and 1990s. The focus in the West became less centred on sexual *behaviour* in the last two decades of the 20th century and first decade of the 21st, and, as with the larger gay/lesbian sexual-orientation set, far more on sexual *identity*, which, as noted previously, meant far smaller numbers in case studies, e.g. 0.5% and 0.7% of the US population identifying as bisexual (Joloza *et al.* 2010, *Washington Post* 2014).

In 1993, the *Janus Report* investigated *behaviour* in the US, and found that 22% of males and 17% of females had had one or more homosexual encounters (Janus & Janus 1993). In 1995, Sell *et al.* also investigated *behaviour* and found that “20.8, 16.3, and 18.5% of males, and 17.8, 18.6, and 18.5% of females in the United States, the United Kingdom, and France report either homosexual behavior or homosexual attraction since age 15” (Sell *et al.* 1995:235). A study 15 years later (the last year of my results: 2010) found that in a “convenience sample of heterosexually identified U.S. college students, 84% of women and 51% of men reported at least some same-sex attraction, fantasies, or partners” (Vrangalova & Savin-Williams 2010:86: but see Hoberg *et al.* 2004: 30%).

Identities too, though traditionally underestimating homoerotic behaviour, are changing these days, with one study suggesting that bisexual plasticity with a heterosexual slant, aka “mostly heterosexual” is more stable of an “orientation” than those who identify as bisexual: half of “mostly heterosexual” adolescents remain that way as adults (Angelowicz 2013). A study by Lisa Diamond shows that while bisexuals fluctuate in identity labels, perhaps these distinctions too are reifications: “2/3 of women changed the identity labels they had claimed at the beginning of the study, and 1/3 changed labels 2 or more times [...] These findings demonstrate that the distinction between lesbianism and bisexuality is a matter of degree rather than kind” (2006:5). Interestingly, as one writer puts it, “ ‘Mostly heteros’ are more attraction than action. [...] Meaning, they were more likely to ogle someone of the same sex from afar or fantasize about them than to actually take them home and do the deed.” (Angelowicz 2013:2).

Humans inherently seem to “get” that sexual orientation is exactly that kind of interactive category shown in my results. In the West there is quantitative evidence that same-sex sexual behaviour has increased over the last four decades, for example – in fact, bisexual behaviour specifically has almost doubled for American men and more than doubled for American women since 1990 (Twenge *et al.* 2016). More indication that essentialism is linked to intolerance is shown via the fact that the more biologically-based explanations for homosexuality given to students, the more prejudiced against homosexuality students become (Hegarty 2010; see also Hegarty 2002, Boysen & Vogel 2007). Similarly, the fewer determinist explanations given, the more likely to embrace ideas of fluid sexuality students were, and the less homophobic in general (*Ibid.*; see also Duran *et al.* 2007).

Perhaps this is because if essences are not “set in stone”, one can see oneself as part of the homosexually-behaving outgroup. As with gender, we often centre such essences and sense of self in our “brains” (Stoléru *et al.* 2012, cf. Sylva *et al.* 2013), and much research that argues for crystallised sexuality has been along lines of differentiated brains. However, it has been shown that there are no male brains or female brains when it comes to human beings (Joel 2011: strongly contested by neuroscientist Larry Cahill, who states that males and females, whilst having “mosaic” brains, do not have “on average the same combination of masculine and feminine traits” [Cahill 2014:4, emphasis added]; rebutted strongly by Joel *et al.* 2015). If Joel is right – the rejoinders often are based on *a priori* essentialist orientation assumptions and gendered modalities – this also would mean that there are no heterosexual, gay male, lesbian or bisexual brains, either. This result has been shown too in the lesbian-behaving Japanese macaques, all of whom have so-called mosaic brains (like humans, cf. Joel 2011) (or just brains); they do not have masculinised brains (Vasey 2004).

In terms of (bi)sexuality, it is possible that Niche Construction Theory with reciprocal causation (Bandura 1986) could function with androphilia and gynephilia being passed down to both genders but initially evolved by the opposite gender, but Crews’ unisexual brain theory also is likely – possibly more likely in view of how common bisexual behaviour is – in terms of ancestral function allowing for plastic sexuality behaviour (2012). In derived sexually-reproducing species such as the clade Mammalia, propensity for both opposite-sex and same-sex plastic sexual behaviour could be enabled by kin selection or the various advantages of alliance formation, and would be adaptive. Regardless, there is the interesting possibility that via ToM arguments, and via the intentionality of being able to put ourselves in our opposite-sex conspecifics’ sexual shoes, social animals may be inevitably same-sexual-orientational as well.

Adriaens and De Block have an intriguing take on human bisexuality: “human beings [...] feel awkward about the polymorphous character of their sexuality. They are bothered, not by the lack of sexual instincts, as most French psychoanalysts would claim, but rather by the abundance of instincts. As a result, human beings think of sexuality as something that should be ‘solved.’ Most of the time, human beings do not simply accept their sexual ambivalence, but experience it as an existential paradox they should eliminate.” (Adriaens & De Block 2004:72). In short: we compulsively essentialise sexual-“orientation” variability.

Humans have historically done this for bodily functions such as digestion and menstruation too, needing to think of one’s digestive process (Koerth-Baker 2016) or menstrual periods (Saranga 2011) as either “normal” or “abnormal” even in the light of much variation. This suggests, again, a human tendency towards essentialism and a ranking of particular binary halves, once reified and compared.

8.7.3. Behaviour and Desire

8.7.3.1. Homophobia and Sperm Competition

Fig. 46. Potential sperm competition/erotic interest: image taken from an eyetracking study: Ruel 2007:6.

Rather than a hard-wired disgust mechanism as some have argued, homophobia appears instead to be a symptom of sexism: expressly *not* a modality (Olatunji 2008). I use the term *homophobia* here to mean “the tendency to discriminate against homosexual people through psychological and social aversion, and in some cases, even with the manifestation of acts of violence” (Ciocca *et al.* 2015:214). One element of black-and-white thinking in terms of homosexual behaviour bears particular scrutiny, and that is the correlation between high levels of homophobia and high levels of homoeroticism (Adams *et al.* 1996, Weinstein *et al.* 2012): over 20% of so-called “straight” people (Weinstein *et al.* 2012) operate within this homophobic=homoerotic paradigm. These “heterosexuals” may be reacting with an anger-based systemic (sympathetic) arousal, and that arousal may be connected to homophobia (cf. Zillmann 1998).

Homophobia is strongly associated as well with intolerance of ambiguity (MacDonald *et al.* 1974, Perez 2002). In the West, those who are measured to be homophobic *also* hide this same homophobic tendency: “it is perceived as socially undesirable [...] to be unaccepting of gay individuals.” (Coffman *et al.* 2013:1).

Homophobia relates directly back to sexism – men and women stepping out of their socially prescribed roles where what is biased against is not homosexuality *per se* but gender-role non-adherence (Rieger & Savin-Williams 2012). This *possibly* could be viewed in concordance with

another recent study that supports a dominance hierarchy theory of male homosexual (or rather, bisexual) behaviour, arguing that the only cross-cultural aspect of homosexual behaviour in heterosexual men is a correlation with dominance and being a childhood bully (Cardoso & Werner 2013) – perhaps reflecting here an aspect of the hierarchical Priority of Access (PoA) model of mating with females preferring dominant males (cf. Altmann 1962): in human males, sperm competition may have enabled *both* homoeroticism and homophobia (via comparative and competitive interest in the penises of others) simultaneously. For regardless of sexual “orientation”, human males are extremely interested in the penises of other males (more interested than females are: Ogas & Gaddam 2011, PornHub 2016). When participants taking part in a (non-sexual) eye-tracking study were asked to elicit information regarding a baseball player’s position and sport (*Fig. 46*), men tended “to focus on private anatomy as well as the face. For the women, the face is the only place they viewed.” (Ruel 2007:6). Further suggesting a hard-wired sperm competition interest and not, I feel, bestiality impulses, “[m]en tend to fixate more on areas of private anatomy on animals as well, as evidenced when users were directed to browse the American Kennel Club site.” (*Ibid.*, interviewing study co-leader Kara Pernice Coyne).

Ogas and Gaddam’s Google pornographic research backs up this generalised male interest in penises, with popular searches regarding multi-male/one-female interactions (“gang-bangs”) as well as “Big Cock” ranking highly (Ogas & Gaddam 2011). We see this in the PornHub male top searches as well, most of the viewers being presumably (statistically, at least) heterosexually identified: the second-most popular search category for men was “Big Dick”; for females it made only third place, though the ranking of second place for females of “Gay Sex” suggests an interest in penises also (“topped” only by general female interest in lesbianism, the No. 1 category searched: PornHub 2016). In summary, many self-labelled straight men are aroused by other men’s penises.

Vasey and Gauthier argue that “sex-segregation in all-male groups seems to create a social context in which homosexual behaviour is more readily expressed” (2000:19). Trivers and others have theorised that perhaps first there are multi-male groupings, then “transvestism” (sexual mimicry of females) means that such “imposter females” are mounted by unsuspecting males but the mountees then mate with harem-females, whereby the alternative-strategy male “invades” a more dominant male’s territory (Trivers 1976); the argued adaptive behaviour of permitted-mounting would then develop into a more hardwired sexualised male–male mounting and androphilia. Leaving aside the fact that most human gay male behaviour is not “mounting” aka anal or intercrural sex, but rather oral or manual sex (Rosenberger 2011), this explanation is again an androcentric default to the male: female “flexible sexuality” also could be a mechanism with androphilia and gynephilia being passed down to both genders but initially evolved by females alone. However, Trivers’ argument could explain how (male) sexual flexibility could be selected for *biologically*. It is noted that in functional terms, “social/demographic causes are at best a partial explanations for the expression of

homosexual behaviour, even in situations where opposite-sex individuals are rare or non-existent” (Vasey & Gauthier 2000:19).

When other males are present, the volume of sperm increases per ejaculation (Pound & Gage 2004, Ramm & Stockley 2007). As Salmon puts it, “This may also explain the popularity of scenes in pornography that contain multiple males and just one female. [...] because of the adaptive response to the scenario of male sperm competition” (2012:157). (Perhaps also correlated to female sex fantasies preferring multi-males (FMM) over MFF or FFF near times of ovulation, Nummi & Pellikka 2012.) The idea of male homosexual behaviour as a byproduct of sperm competition/arousal has been suggested by MacIntyre and Estep in terms of a heterozygous-advantage explanation for homosexuality (1993; see also Pound 2002), though this would not explain female homosexual behaviour, nor low-sperm-competition species such as gorillas with a fair amount of male homosexual behaviour (Yamagiwa 1987, 2006).

Returning to homophobia’s connection to homoeroticism, it indeed is quite possible that human social homophobia could be a vestigial primate cultural trait resulting from an intrasexual homophilia rooted in an intersexual mate-competition context. An equally valid interpretation for human males, though, would be that these “straight” men are operating within universal potentialities, but – as they have been reified and *identify* as “straight” – already exhibit a pattern of low-ambiguity tolerance: homophobia being directly correlated with other forms of essentialism, prejudice and low ambiguity tolerance (Budner 1962, Aosved & Long 2006, Aosved *et al.* 2009, Hodson *et al.* 2009, Hodson & Busseri 2012). Essentialists operate best in black-and-white hierarchical systems and straight men are privileged in such patriarchal systems: essentialists often become homophobic (racist, sexist) bullies (Hubbard & de Visser 2015). Straight (and gay) men may be more essentialist, then, merely because they are operating within a heteropatriarchal context.

Many studies (and indeed sexual-orientation theories, cf. Bailey 2009) have found “women are more likely to be bisexual than exclusively homosexual, whereas the reverse is true for men. Non-heterosexual women are also more likely to see their sexual orientations as flexible, even ‘chosen,’ whereas men are more likely to view their sexual orientations in essentialist terms, as inborn and unchangeable.” (Bem 2001:64, citing Whisman 1996; Baumeister 2000). Yet: this does not match the high amount of bisexual *behaviour* that we observe in human males (Kinsey 1948, Dunne *et al.* 2000, Vrangalova & Savin-Williams 2010), as well as male homoerotic desire (Vrangalova & Savin-Williams 2010, Anderson *et al.* 2012, Dahlgreen & Shakespeare 2015; cf. *Fig. 47*). It’s almost as if males (gay and straight) are conceptualising one way and behaving in an entirely different way. Daryl Bem in his EBE theory – addressed shortly – suggests that this may be due to females operating with less of a gender structure (2000).

We do find that when an individual’s assessment of non-heterosexual identities is argued in terms of

sexuality being “biologically based, immutable, and fixed early in life”, this predicts “antigay prejudice independently of right-wing authoritarianism, social dominance orientation, and political conservatism.” (Haslam & Levy 2006:471). As previously noted, this is further shown in the work of psychologist Peter Hegarty: “Students characterised belief in the fluidity of sexual orientation categories as enlightened and empowering in their own words. [...] sexual *prejudice* is causally related to ‘natural kind’ beliefs about sexual orientation.” (Hegarty 2010:3, emphasis added).

Still, for every action such as increased societal acknowledgement of sexual fluidity (Waites 2009), there is a reaction, and none so much as that of a threatened ingroup. A 2015 study found that in the time period after 2010, directly after same-sex marriages became debated and then legal in the UK (2013) and US (2015), respectively, there was a rise of antigay violence (Morris 2015). Western homophobic rap lyrics also exhibit spikes in 2000/2001 – matching my own millennial results – and also 2010 and 2013, perhaps as a result of gay-marriage wins in the UK, the US and other Western nations: “[f]ar and away, the most ruthless year in the homophobic category is 2000. [...] 2001 comes in second on our list [...] [t]he year with the third-highest rate of occurrence for the word was 2013” (Powell-Morse 2014:8). This fits my own results only too aptly.

8.7.3.2. Bi-Erotic Desire

Tab. 35. Pornhub 2015 results of top porn searches by women and men: table taken from © Pornhub 2016.



Sexual fantasies cross gender, bodily and orientational boundaries (Bryson 2003). Women make up 24% of the viewers of Pornhub, the largest pornography site on the internet (News.com 2013; cf. *Tab. 35*). A *Marie Claire* survey similarly suggests that 33% of Western females watch online pornography (Sandhu 2015). This crossing of “orientational” boundaries in terms of sexual fantasies becomes clear when we see that women have “Lesbian” as their top search item and top category

search (PornHub 2016). Again, we do not know the “true” sexual orientation of online pornography viewers, but likely self-identified lesbians are outweighed by heterosexually identified women in terms of population statistics. In terms of general desire, “[l]adies are more interested in lesbian and group sex content, based on what we see here” (PornHub 2016:26). Women, as noted, regardless of sexuality, also sexually objectify other women to a high degree (Gervais *et al.* 2012).

And though we might like to culturally “separate” desire and action, perhaps that need for distinction is in itself salient. A study four years previous measuring pupil dilation and sexual arousal concluded that, “[e]ven though the majority of women identify as straight, our research clearly demonstrates that when it comes to what turns them on, they are either bisexual or gay, but never straight.” (Lang 2015:3, interview with study leader Gerulf Rieger, citing Rieger & Savin-Williams 2012).

What’s more, men are “fluid” after all, with a recent study giving evidence that, as with women, “men, similar to women, are distributed from exclusive heterosexuality through various levels of bisexuality (nonexclusive) to exclusive homosexuality” (Savin-Williams *et al.* 2013:698; see also Rieger & Savin-Williams 2012) – expressly, as the Savin-Williams team put it (2013:699), *not* supporting “the conceptualization of sexual orientation as a bifurcated or tripartite construct but lend[ing] data to the longstanding view that sexuality exists along a continuum” – even for men. As Fleischman *et al.*, who found evidence for homoerotic behaviour in both sexes in affiliative contexts, say, “[T]he sex difference observed in the degree of continuity of the distributions of sexual orientation likely stems from the greater proscriptions applied by Western cultures to male homoerotic behavior relative to female homoerotic behavior.” (Fleischman *et al.* 2015:1402).

8.7.3.3. Age

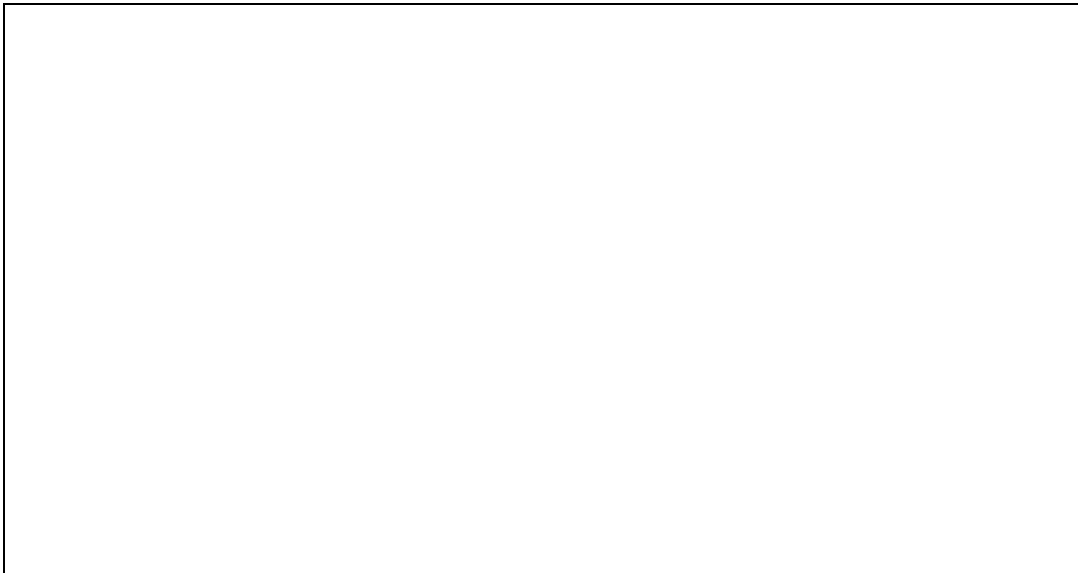


Fig. 47. Flexible youth and the less flexible aged: © YouGov sexuality study results (YouGov 2015).

We have previously discussed age as being a factor in terms of “sexual orientation” crystallisation. There is evidence of this in recent UK YouGov research based on the Kinsey Scale, with nearly half of the young adult population saying that they are not completely heterosexual (Dahlgreen & Shakespeare 2015; cf. *Fig. 47*).

However, category flexibility does not just apply to young adults: “23 percent of the British people surveyed determined they were something other than 100 percent heterosexual” (*Ibid.*). The chart at *Fig. 47* may show evidence for age-based sexual orientation crystallisation patterns – or it may suggest age-cohorts from time periods when homosexual behaviour was much more stigmatised (and for males, illegal); to not acknowledge the influence of stigma in terms of social categories would be disingenuous. The potential *non*-crystallisation – after all – of identity in later adulthood also sees sexual orientation shifts such as “late-in-life” lesbians, which indicates also general fluid sexuality, and possible non-gender specificity (Wilton 2002, Moran 2010, Peart 2015). This “phenomenon”, where previously heterosexual women embark on lesbian relationships mid- or late-life after divorce or widowhood (Wilton 2002) has something in common with the “phenomenon” of testosterone-injecting post-transitional FTMs’ – previously often lesbian – sudden sexual interest in men, when before they desired women exclusively (Auer *et al.* 2014, Godfrey 2015). A variable and circumstantial bisexual default would explain both of these patterns quite easily. (As people couple up in any given life stage, they are, nearly inevitably, in monosexual couples and may identify accordingly.) It is worth noting that late-in-life lesbians often acknowledge their previous heterosexual relationships as real; this is not always the case for “late-in-life” gay men (Shackelford & Hansen 2015; see also Calzo *et al.* 2011), suggesting continuing male adherence to strict orientation categories. It is worth noting that “sexiness” as a desired partner trait is not particularly important for all but gay men when choosing a life mate for over-50s; however, “even in this subgroup, general relationships based on friendships appear to be more important than sexual relationship[s]” (Mudraya 2011:1). And for the general female population, gender-specificity in terms of object choice often does not seem to be the case (Baumeister 2000, Rupp & Wallen 2008, Diamond 2008, Peart 2015).

Self-identity also therefore can be integrated in non-concrete “orientation” terms, moving from Kinsey (1948/1953) and Klein (1978) to more recent studies dismissing first premises of heterosexual and homosexual altogether such as Daryl Bem’s Exotic-Becomes-Erotic (EBE) theory (2000). Bem’s EBE theory, along with analyses by several others such as Kirkpatrick (2000), Muscarella *et al.* (2005) Fleischman *et al.* (2015), and to some extent Epstein *et al.* (2012) and Vrangalova & Savin-Williams (2013), does not start with an assumption of heterosexuality as a natural-kind given. EBE is groundbreaking simply for this aim, along with including females at an equal theoretical level and seeking to account for “bisexual orientations, orientations that are not enduring but fluid and changeable, and sexual orientations that are not even based on the gender of potential partners.” (2001:52).

The central proposition of EBE is, as Bem puts it, “that individuals can become erotically attracted to a class of individuals from whom they felt different during childhood. [...] the theory claims that every child – conforming or nonconforming – experiences heightened, nonspecific physiological arousal in the presence of peers from whom he or she feels different. For most children, this arousal is neither affectively toned nor consciously experienced. Regardless of the specific source or affective tone of the childhood arousal, it is subsequently transformed into erotic attraction.” (2001:55).

This idea of physiological arousal triggering eventual eroticised arousal reactions could perhaps also be associated with the homophobic/homoerotic arousal (Adams *et al.* 1996, Weinstein *et al.* 2012) and the homophobic/homoerotic bullying (Cardoso & Werner 2013) studies noted previously.

8.7.4. Friends with Benefits

Some proponents of alliance formation argue that there would be preferential heterosexuality in such bisexual systems, though this would not be necessary in a cost/benefits ratio as long as one receives other benefits that ultimately improve fitness. There is some indication of diminished male *and* female homoeroticism when prompted by heteroerotic potentialities in human and non-human animals. Amongst flamingos, “extra-pair and extra-trio copulation activity is directed towards the opposite sex in both male-female pairs and atypical partnerships” (King 2006:103). Although a taste in “adultery” does not indicate a default orientation – there could be, as noted previously in humans, a novelty correlation – Fleischman *et al.* also noted that “[m]en primed with words about opposite-sex sexual contact showed the lowest scores on homoerotic motivation and there was negative albeit non-significant correlation between conception risk and homoerotic motivation in women” (Fleischman *et al.* 2015:1401). Fleischman’s team first showed a link between affiliation and homoeroticism in both males and females, with their results also then suggesting a potential proximate mechanism of progesterone (“a hormone that has been shown to promote affiliative bonding”, *Ibid.*:1395) in both sexes. Progesterone has not been comprehensively investigated in human males (Andersen & Tufik 2006) – perhaps because, like estrogen, progesterone is considered a “female” hormone and we like to sexually differentiate.

Amongst chimpanzees, there is evidence that male–male alliances are rooted in reciprocity (Berman & Chapais 2004). Indeed, in humans we see male–male eroticism in affiliative contexts in heterosexual young male UK adults: “89% have, at some point, kissed another male on the lips which they reported as being non-sexual: a means of expressing platonic affection among heterosexual friends. Moreover, 37% also reported engaging in sustained same-sex kissing, something they construed as non-sexual and non-homosexual.” (Anderson *et al.* 2012:421).

In terms of female alliances, the idea that sexual fluidity in women evolved to promote alloparenting is a major theory: “[S]exual fluidity in women is a contingent adaptation that increased ancestral women’s ability to form pair bonds with female alloparents who helped them rear children to reproductive age. [...] Under this view, most heterosexual women are born with the capacity to form romantic bonds with both sexes.” (Kuhle & Radtke 2013:304). Why would there be intrasexual selection for a second female parent when there already might be grandmothers and extended kin (cf. Hawkes *et al.* 1997)? This is similar to questioning why a female would pair-bond with an unrelated-to-her male when there is extended family around. A sire might have a great investment (or not, depending on levels of paternity uncertainty and/or infanticide risk) in raising offspring (cf. Opie & Power 2008); so might a pair-bond of either sex – human females expressly need extra help to raise children (*Ibid.*, Hrdy 2009). Interestingly, human female same-sex attraction seems even to trump reproductive competition in humans: the Nummi & Pellikka study showed no preference (in sexual fantasies) by more fertile-age females for FFMM (female-female-male-male) or FFM over that of older females, contrary to authors’ predictions (2012).

Allomothering lesbianism as reciprocal altruism clearly could be very advantageous in terms of sexual alliances and survival help without the risk of pregnancy (perhaps in this context even preferential to male alliances if one is already raising offspring and said females “take turns” for several years). This has been theorised in a “helper” sense, but (Kuhle and Radtke aside) not often in a lesbian sense, though it is acknowledged that alloparenting in general may be necessary for humans: “Mothers must have been producing these costly offspring with the expectation that should help from fathers not be enough, there might be recourse to help from others as well.” (Sarah Hrdy, cited in Townsley & Tyson 2009:2). Furthermore, though it was once thought not to be the case, our close relatives the female bonobos engage in substantial alloparenting and reciprocal altruism in addition to same-sex sexual behaviour, as noted by Kuhle and Radtke (2013) (see also Furuichi 1989, Parish 1996, de Waal & Lanting 1997, Furuichi 2011, Kano 1992, De Lathouwers & Van Elsacker 2004, Radtke 2012). Kuhle & Radtke’s proposal is food, quasi-literally, for thought.

8.7.5. Category Flexibility

Many have observed female fluidity (Wallen 1995, Baumeister 2000, Peplau 2003, Diamond 2008), and although it is received cultural knowledge that women are more sexually fluid than men, it does not necessarily follow that men are “natural” sexual orientationalists and women are more fluid, as Baumeister argues in the “erotic plasticity theory” (Baumeister 2000). As Connell puts it in the case of working-class men, “[w]e must recognize, then, a continuum of homoerotic experience [...] in a number of social settings. At the same time we must acknowledge that this experience is silenced” (Connell 2000:5). There is a recent acknowledgment of this in the media: “The number of men who

engage in same-sex sexual behaviour or report same-sex sexual attraction consistently outstrip estimates of those who self-identify as homosexual or bisexual – suggesting that many straight men carry the ‘gay genes’ too.” (Brooks-Pollock 2016): perhaps we ought to think of such (possibly multiallelic) genes instead as “bisexual genes”.

We – particularly men – may have a cultural investment in thinking of bimodal male sexuality, when such thinking may instead be part-and-parcel of male tendencies towards essentialism, which is in itself open to cultural influences, as shown in my results. As noted, gay and straight males also are more bimodally *aroused* compared to females of all self-labelled sexual orientations (Welling 2013). Yet it is entirely possible to have an essentialist structure affect one’s behaviour and reasoning, even sexual arousal. We see such acculturated effects in adults’ racial sexual preferences, for example (Rudder 2009, Paquin 2014).

Indeed, in reference to new research on “sexual fluidity” likely intended by Lisa Diamond to be more dimensional than binaristic (2008), the term “sexually fluid”, ironically, may be becoming a new reified form of sexual orientation: “Sexual fluidity is not the same as bisexuality. [...] sexual fluidity is [not] merely just bisexuality. This claim is false. Everyone has a sexual orientation (e.g., straight, gay/lesbian, bisexual, pansexual, asexual, and others), but the degree to which a person is sexually fluid is a separate variable that operates alongside sexual orientation.” (Selterman 2014:4). This is notable, as that same writer – psychologist Dylan Selterman – invokes natural-kind thinking whilst still including ambiguous/fluid categories such as “bisexual” or “pansexual”. All this despite the fact that “there is considerable evidence that both the targets of attraction and self-construed identity often vary across time, particularly in women [but also in men]” (Fleischmann *et al.* 2015:1402, brackets mine).

As noted, Daryl Bem argues that sexual-orientation essentialism is rooted in childhood group dynamics: “The greater fluidity of women’s sexual orientations is consistent with EBE theory. [...] women grow up in a (phenomenologically) less gender-polarized culture than do men. [...] This implies that girls are less likely than boys to feel differentially different from opposite-sex and same-sex peers and, hence, are less likely to develop exclusively heteroerotic or homoerotic orientations” (2001:64).

Criticism of EBE comes from Krisel, who argues that EBE does not explain the 91% of GNC children who turn out non-homosexual (Krisel 2011). Krisel’s statement was not accurate, however, for GNC children are indeed skewed towards homosexual behaviour as adults (not necessarily exclusively [which Krisel ignores]; cf. Rieger & Savin-Williams 2012); nor necessarily in terms of one’s adult identity) and, as should have been clear by now, far more than a paltry 9% of adults have homoerotic behaviour: 37.5%*M*/28%*F* (Kinsey 1948/1953; see also Sell *et al.* 1995); let alone desires (51%*M*/84%*F* (Vrangalova & Savin-Williams 2010); 67% of “heterosexual females” (Morgan &

Morgan-Thompson 2011: but see Ellis *et al.* 2005). I note that in these same studies males *behave* more bisexually than females, while admitting to less desire. Cross-gendered fluidity tolerance seems to vary: straight men will usually have relationships with bisexual women (sometimes for more sexual purposes, cf. Elliott 2015); but – despite the extreme female sexual interest in gay male sex (cf. Tab. 35) – straight women usually are not interested in *relationships* with bisexual men (Cruz 2015). Here, it is the straight *women* engaging in sexual-orientation essentialism: they tend to think that such men are really “gay”; males do not appear to have the same fears regarding female bisexuals. That said, such apparently open-minded males may be approaching bisexual females for short-term sexual relationships alone – though this perhaps is due to societal stereotypes regarding sexual fidelity, as bisexual women are judged to be more promiscuous (Yoshino 2000).

Earlier I mentioned that not as many bisexual people – despite being far more in number than gay men and lesbians combined (Pew Research 2013), and, “identity surveys” aside, arguably more in number than heterosexuals too, subsocietally – do not come out. Coming out in the West involves a negation: it not only codes who one desires, but also who one does not desire. Perhaps coming-out for bisexuals is difficult not due to internalised homophobia but due to confusion/uneasiness regarding their own sexuality because they still remain “partially” heterosexual (and conversely, “partially” homosexual). Indeed, when explicitly bisexual viewpoints were analysed, a common theme was that bisexuals resisted a “binary conceptualization of sex, gender, and sexual orientation” (Galupo *et al.* 2014:419). While females exhibit this more than males (*Ibid.*), Fleischman *et al.* put it in context: “recent research reveals not only greater continuity in the distributions of sexual orientation in each sex than previously recognized, but also cohort effects explicable in terms of changing cultural norms that shape both action and identity” (Fleischmann *et al.* 2015:1402, referencing Savin-Williams & Vrangalova 2013).

8.8. Other Humans Have Flexible Sexual Orientations: “Dawn of the Flexisexual”



Fig. 48. Flexible human beings: images taken from © www.v3.co.uk and © www.yogarelieftips.com.

“DAWN OF THE FLEXISEXUAL [...] the new word for the women who refuse to play it straight. First there was that infamous on-stage kiss between Madonna and Britney Spears. Then Katy Perry sang that she kissed a girl and she liked it. Now a new word has been coined for the growing number of straight women who flirt with bisexuality ... flexisexual.” [App. 370]

8.8.1. Gauging Plasticity

However concretely we conceive of our own sexuality, the way we conceive of sexual orientation as a whole is malleable. We have an awareness that bisexual attraction does not need to be – nor is it, usually (Klein 1978, Savin-Williams & Vrangalova 2013) – a 50/50 split or concurrent. A quote from a bisexual writer reflects this cognisance: “I want to map new territory. I want to find my tribe: bisexuals-like-me, bisexuals-not-like-me, the 50-50 bisexuals, 90-10 bisexuals, 99-1 bisexuals. I want to know I’m not alone.” (Morrison 2001:20). The Heterosexual–Homosexual results of *Fig. 2 (D)* that embody our reactions towards others’ sexual flexibility have the same dip in positive codings and rise in negative codings in the year 2000 as seen in the congregated dichotomies data (*Fig. 1*), with the familiar corresponding recovery by 2005 and 2010.

With nearly half of the male population showing homosexual *behaviour* (Kinsey 1948) in a society where such behaviour is heavily proscribed, and with 100% of US females in one study showing same-sex sexual *arousal* (Rieger & Savin-Williams 2012), we likely are dealing with a majority of both men and women engaging homosexually/homoerotically, most of them bisexually/bierotically, most of them calling themselves heterosexuals.

In this sense, the article “Americans Greatly Overestimate Percent Gay, Lesbian in U.S.” suggests that Americans, rather than being “uneducated” and “uninformed”, as the article suggests, are telling the unspoken truth about the commonness of same-sex behaviour/desire: “[t]he American public estimates on average that 23% of Americans are gay or lesbian, little changed from Americans’ 25% estimate in 2011” (Newport 2015).

We used to speak of leanings or preference, but this changed by 2000 when it became taboo due to cultural biological determinism (“natural-kindism” of sexual orientation, cf. Bohan & Russell 1999), which also matches my results (though “orientation” over “preference” had been suggested by some gay/lesbian psychologists even by the early 1990s, CLGCAPA 1991). “Leanings” (or preference) suggests a particular attitude towards sexual orientation in others – sexual orientations, indeed, that are not concrete. It is to our evolutionary advantage to anticipate, if not acknowledge, behavioural plasticity in others in terms of predictability and our own survival. Like the very specific Swedish medieval strictures against *tidelag* (intercourse with animals: Granlund 1974), we have behavioural proscriptions *due* to behavioural plasticity. To have behavioural plasticity, one generally must have genetic variability to begin with (van Schaik 2013), vis-à-vis Crews’ unisexual brain (Crew 2012; see

also Doidge 2007). Natural selection often selects towards complexity (Heylighen 1999) and an overarching toolkit of behavioural variability would in the context of a long-lived, cooperative, social animal be more advantageous to a population than being highly specialised and “successful”, and this likely also applies to varied sexualities and gender strategies. Primates are an order of mammals that “specialises” in generalities (Campbell *et al.* 2011). It therefore is not surprising that there are a variety of overlapping behaviours both in terms of gender “roles” as well as sexual targets in costs/benefits dynamics – perhaps even a “universal bisexuality” in humans (and likely our closet evolutionary kin): “All the world is queer save thee and me, and even thou art a little queer” (Welsh socialist Robert Owen 1928 [cited in Partington 1998:503], which I quote out of context yet apropos to the subject at hand).

8.8.2. Just Friends

If, as alliance-formation theory posits, bisexual adaptation is about getting along (sexually or friendwise) with both sexes, do bisexuals have more friends? In the West, bisexuals tend to hide their sexuality (Parker 2015); the majority of bisexual friendships are with straight people (Galupo 2007) – so cross-gender friendships possibly may be more adaptive if already reaping alliance-formation benefits (Gillespie *et al.* 2015). The non-disclosure of bisexuality is likely due to perceived ambiguity prejudice: bisexuals do not enjoy hiding their bisexuality; it causes them stress (Galupo 2007, Alpert 2013). Moreover, the overall concept of friendship is important for bisexual people of both genders, and also lesbian women (less so for self-labelled gay men and heterosexual people) (Gillespie *et al.* 2015), though of course it hardly needs mentioning that gay men, straight men and straight women too have many friends.

Friendship is generally valued across the entire LGBT community (*Ibid.*), which makes intuitive sense in marginalised communities, especially those that – unlike most – risk direct family support due to societal homophobia. This is exemplified via highly invested *fictive kin* – the 1990s queer culture saying of “families we choose” is commonly reflected in queer communities (Weston 1991; see also Ebaugh & Curry 2000, Tierney & Venegas 2006, Ciabattari 2016). A great factor influencing whether previously-rejecting families experience paradigm shifts in accepting non-heterosexuals is *because* their adult children, siblings or grandchildren come out as gay, lesbian or bisexual (Herek & Capitanio 1996; see also Heatherington & Lavner 2008). Such previously prejudiced family members ultrahumanise those of different sexual orientations – probably initially not because they have family members who are *gay*, but because they have gay family members who are *kin* (Jones *et al.* 2014).

8.9. Other Primates, Apes, Hominins Have Flexible Sexual Orientations: **“Both Kisses and Candy”**

Fig. 49. Flexible female bonobo: image taken from © www.doyouyoga.com.

“[Iowa bonobo] Nyoto loved to get kisses and to eat sweets, so he worked out a way to ask for both. Pointing at the words ‘feel’ and ‘kiss’, then ‘eat’ and ‘candy’, he got what he wanted.” [App. 396]

8.9.1. Intrasexual Competition

Non-human primate models are used to elicit potential information about our own primate human species. As elsewhere, the below examples are not exhaustive nor comprehensive, but illustrative.

There are indications in human females of sexual flexibility adaptations, e.g., masculine females being preferred facially by lesbians (Glassenberg *et al.* 2010), and also in NHP females: inter-sexual mate competition *between* males and females for same-sex mates in Japanese macaques; female facial symmetry attracting female baboons but not males (Boulton & Ross 2013); female bonobos at maximum sexual swelling spending more time with other females (Takahata *et al.* 1996) – not necessarily highest fertility, so a dishonest signal (Nunn *et al.* 2001) – all of these potentially point to *females* sexually-selecting other females. Phenotypes and hormotypes may have resulted from intrasexual sexual selection, a process that has been minimally investigated in humans, but even less so in non-human primates. (There is one observational study that indicates an almost-entirely lesbian-preferential chimpanzee [Bagemihl 1999], but most NHPs are generally bisexual in behaviour to greater – such as bonobos and Japanese macaques – or lesser degrees.)

Vasey considers Japanese macaques on their own terms in terms of female–female consortships: “female sexual activity during homosexual consortships is not uniformly ‘masculine’ in expression, but rather is a mixture of male- and female-typical behaviors.” (2004:397). He additionally argues against the alliance-formation theory, which he states would necessitate preferences for acquiring and maintaining high-ranking females, and shows that “the overwhelming majority of affiliation (for example, approaches, sexual solicitations, interventions) flowed in a remarkably bi-directional manner with no statistical differences between dominant and subordinate consort partners”

(2006:209). However, in a reciprocal altruism context of “allies”, dominance would not necessarily be preferred – often primates prefer to associate with “friendly” con-specifics: humans invest more in those who are likely to show reciprocal altruism (Milinski *et al.* 2002), and prosocial reciprocity has been observed too in capuchin monkeys (Suchak & de Waal 2012). We may gain more advantages from *non-dominant* alliances (indeed, they have more investment in making a friendship work). Furthermore, there is some evidence that even in heterosexual contexts, female Japanese macques do not necessarily prefer dominant males (Perloe 1992). The PoA model favouring dominant males (and, extended, dominant same-sex friends-with-benefits) therefore is questionable (Utami *et al.* 2002, Sommer & Vasey 2006, Dubuc *et al.* 2011, Young *et al.* 2013).

8.9.2. Bromances and Essentialism

Male–male alliances and homosexual reciprocal behaviour too are common in primates. Even in great apes with high degrees of sexual dimorphism (often phenotypical evidence of sexually selected male–male competition in addition to sexual selection by females), there are observations of low-antagonistic male–male interactions, such as gorilla male–male alliances helped by previous same-sex sexual encounters (Yamagiwa 1987, 2006). This would not necessarily negate a sperm-competition argument: many adaptations can have multiple functional explanations, a “silver bullet” functional explanation is not necessary.

There are intriguing examples of highly tolerant, cooperative male–male alliances and strongly-bonded male–male bonding in hierarchical species such as wild Guinea baboons, and Patzelt *et al.* have suggested therefore a potential analogous model for human males (2014). Such baboons have low agonistic behaviour towards each other and females, certainly compared to hamadryas baboons (*Ibid.*). We additionally see male–male grooming amongst the hierarchical chimpanzees (Chapais & Berman 2004, Watts & Webster 2012). It is worth noting that – nearly universally – most studies of natural selection and sexual selection in primates are in their very nature heterocentrist if not heterosexist, as reflected in sampled article [App. 55], although [App. 71] neutrally alludes to – presumably sexually flexible, as per bonobo stereotypes – bonobo and human sex-similarities.

I touched on the difficulty of ascertaining whether NHPs have sexual orientation concepts, and discussed the possibility that primates such as chimpanzees might have gender constructs (de Waal & Pokorny 2008). NHPs may have *other* essentialist categories as well: in gorillas and feral cats (and in some human cultures), age can influence sex roles during same-sex behaviour in terms of mounter/mountee (Sommer & Vasey 2006; see also Gelman 2003). Regardless, and as noted, in order to exhibit plastic sexual behaviour, this wide-ranging repertoire would need to be sourced from an already coded genetic variability. Whether such evolved plastic behaviour is due to kin selection or reciprocal altruism, it is there because it enables reproduction and survival, or both: “kisses” and

“candy” (apt for bonobos, who operate under systems of reciprocal altruism in terms of sexual reciprocity: Douglas & Moscovice 2015: but see Jaeggi *et al.* 2010; see also Tan & Hare 2013). Finally, due to the fact that we see such sexual flexibility in all the other great apes, under the Parsimony Principle (cf. *Understanding Evolution* 2016) it strongly suggests similarly flexible sexual behaviour in pre-Miocene apes as well as in other hominins along our ancestral line.

8.10. Other Organisms Have Flexible Sexual Orientations: “Flippant, Flexible Flippers”

Fig. 50. “Dolphins have been found to spend 80 per cent of their lives in ‘sexual play’ ” (Wheatstone 2014): image taken from Mirror/Wheatstone 2014.

“[T]he point is horribly flippant. [...] There is the old chestnut, of course, about celebrities and charity. If they care so much about bisexual dolphins or diabetic squirrels or whatever, why don't they just bung the charity whatever it needs, write it off against tax and get on with the day job” [App. 419]

8.10.1. Explainings-Away

Media attitudes (acting as societal proxies: Fowler 1991, Miljan & Cooper 2003) towards sexual flexibility in other organisms such as plants, birds, butterflies, guppies and cetaceans can be dismissive, as in the above quote, but the bisexual behaviour, dolphins or otherwise, remains no matter how humans “feel” about it. As noted, there has been repression of the subject in scientific literature (Bagemihl 1999, Sommer & Vasey 2006). We observe media-hyped “explainings-away” of homosexual behaviour, such as in this 2013 *Independent* article: “[b]illions of insects are having gay sex ‘accidentally’ [...] despite up to 85 per cent of male insects engaging in homosexual acts.” (Saul 2013, citing Scharf & Martin 2013). Scharf and Martin argue that it costs more in time to identify gender than otherwise; additionally that it might be because males carry male pheromones from previous matings with females – the everything-but-the-kitchen-sink denial of potential bisexual behaviour. Technically, the animals are bisexually behaving; they’re not “heterosexuals making mistakes” as both the article and the study authors appear to be suggesting and, by doing so, appear to be displaying sexual-orientation essentialism.

Dominance-related PoA theories in terms of general homosexual behaviour often do not hold up: “[M]ounting did clearly not depend on high testosterone levels per se. [what is more] [i]n 78.0% of all cases, a smaller buck mounted a larger one. Therefore dominance was again no good predictor for the direction of a mount.” (Bartos & Holečková 2006:163). We do, on the other hand, see alliance-formation advantages in *bisexually* behaving male greylag geese that allow for both sexual pair-bonding and resources (15% of greylag geese are exclusively homosexual), with no evidence of “gay uncle” helper advantages for indirect kin (Kotrschal *et al.* 2006:69). The functional advantages of same-sex behaviour may differ with the type of animal: primates might have shared contexts (or not), fruit flies another, dolphins yet another (although dolphins too seem to have alliance-formation advantages, at least for males [Connor *et al.* 1992], and they, like humans, chimpanzees and bonobos, are a highly gregarious animal, Nishita *et al.* 2015).

8.10.2. Most Gay Animals are Bisexual Animals

Sommer and Vasey point out that nearly *all* of these “gay animals” are behaving bisexually (2006) – there is, therefore, no evolutionary paradox to homosexual behaviour as long as there are benefits (Kirkpatrick 2000). I lean towards reciprocal altruism – “kisses and candy” – affiliative functional benefits, but also recognise, as Sommer and Vasey argue, that there could be multifunctional explanations (most likely then to be kin selection – with both reciprocal altruism and kin selection enabled by a unisexual brain [with encoded bisexual capabilities: Crews 2012]). There is additionally the possibility of Bisexual-Homosexual heterozygous advantage (which, although I hypothesise, I think unlikely), or bisexual behaviour as a co-evolved empathy trait in terms of males and females unto each other, *à la* the art silver bullet in previous chapter. However, functional drivers of reciprocal altruism and kin selection would have greater selective force (and certainly, a shared “bisexual empathy” mechanism enabling alliance-formation would at most make up only part of a multifunctional reinforcement).

Very occasionally in the sampled articles, heterosexual monosexuality is presented negatively: “It is a bleak view of *Homo sapiens* that is perfectly encapsulated in the words [...] *The Matrix*: ‘[...] You move to an area and you multiply. You multiply until every natural resource is consumed. The only way you survive is to spread to another area. There is another organism on this planet that follows this pattern. A virus. Human beings are a disease of this planet. You are a plague.’ This is overstating the case. Nevertheless, it is clear that our monopolistic status on Earth has not been a healthy one for the planet, no matter how it occurred.” [App. 25]. Perhaps this is an extreme case where what is traditionally argued to be the most “natural” (heterosexual monosexuality in the animal kingdom) is not good at all in the end: the very opposite of a “naturalistic fallacy” (Moore 1903); arguments on the superiority of (monosexual) homosexuality as a cultural refinement have been

made on the same (inaccurate) grounds that homosexual behaviour is not “natural” for animals (Sommer 2006). In this chapter, I have argued the “naturalness” of plastic sexual behaviour, but this does not mean morally better compared to monosexual behaviour: though it may mean *adaptively* better for highly social, long-living organisms. In evolutionary terms, successful functional adaptiveness, plus luck as per genetic drift, are the only “arbiters” that count amongst our reddened teeth and claws (and perhaps our reddened sexual swellings). I attest that sexual flexibility is one of those adaptations.

8.11. Objects, Colours and Fictive Characters Have Flexible Sexual Orientations: “Partialism, Pigments and Protagonists”

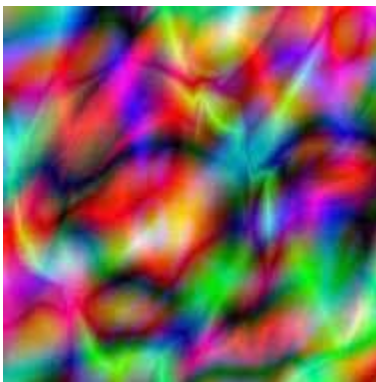


Fig. 51. Multichromatic: image taken from “Abstract Background Free Stock Photo”, <http://www.publicdomainpictures.net>.

“[G]ay men have begun heading the other way: just straight enough. [...] Curiously, he loves Britney's midriff, and is the first to pass comment on women's breasts and bums. ‘Well, I can still appreciate a body,’ he smiles.” [App. 323]

8.11.1. Partialism and Objects

As humans we are fictive (as are likely other apes: Gómez & Martín-Andrade 2005, Goldman 2013), and we play with applications of cultural mores pasted onto our abstractions. The partialism alluded to in the above quote is objectification, an intriguingly flexible example. Psychologist Ogi Ogas argues that thinking of fetishism as a paraphilia is misguided (note his focus on a “male” brain): “underlying biological predisposition in the male brain towards developing fetishes. [...] In contrast, female brains are far more likely than male brains to develop *objectum sexualis*: a romantic, emotional attachment” (Ogas 2012:2). Although I reject the implicit dichotomising and genderising of desire, fetishistic tendencies for both sexes may exist in the sense that a tendency for essentialism may be hard-wired (and then, as I have argued, the blank schemata become culturally filled, cf. Sandra Bem 1981, Daryl Bem 2000). [App. 323] (cited in the beginning of this sub-section) is a prime

example of this “flexibility” for a gay man. Due to the volatility of the Heterosexual–Homosexual dichotomy found in my results (*Fig. 9-10, Tab. 20*), I assert that we do not have a “sexual orientation” schema, though we may have a “sexual” one. Some argue that men are more “naturally” essentialist (Fisher 2011, Mendoza 2011, Weissenstein *et al.* 2014.), but men also are culturally trained to be essentialist, and one study shows that males are more likely to reveal same-sex attraction when prompted with a comment that men are more bisexual than women (Clarke *et al.* 2015), and also when put in the context of still desiring females (Anderson & Adams 2011), perhaps what one might term “essentialist even in terms of ambiguous sexual behaviour”. The capacity for essentialism and fetishistic focus may be in us all (Sternberg 2014), but so is our capacity for flexibility and inclusive gradualist sets.

As with “late-in-life” lesbianism (implying late- or mid-life orientation changes, Wilton 2002, Rowntree 2015), we also observe “late-in-life” fetishism such as adult men developing boot fetishes in arousal experiments (Delameter & Hyde 2013). We also observe *fluid* fetish tastes; some people are more prone to learning new fetishes than others, such as introverts (Lehmiller 2014). People also can develop low-level temporary fixations, some non-sexual (a sudden taste for mid-century furniture) and some specifically sexual or emotional: arguably the state of *limerence* (obsessive infatuation) might be seen as a sudden “fetish” directed on a specific individual. There is some truth to Ogas’ assertion that, “[t]he terms fetish and paraphilias marginalize and pathologize natural and healthy sexual interests” (Ogas 2012:4).

Object fetishism – called “it-sexuality” by William Stayton (1980) – is exemplified in fiction, such as Victor Hugo’s Quasimodo the bell-ringer in love with his bells or mythic Pygmalion-statue romances, and in real life, too: humans falling in love with the Statue of Liberty or the Eiffel Tower (Ogas 2012) or the empathetic fondness (Suzuki *et al.* 2015) for potentially alluring robots. We saw so-called non-sexual “it-sexuality” before when we discussed humans who are attracted to dominants regardless of gender – and, even more dissociated from sex, humans who are attracted to brunettes, redheads and blondes regardless to gender (again argued to be a fetish). We additionally saw that gender is not necessarily salient in partner-choice (Peart 2015).

As regards a hypothesised fetish of monosexual focus, ambiguous sexuality can be objectified too – metaphorically, yet tellingly in this mixed assessment: “most of the ambiguity was supplied by singer Brett Anderson, who famously declared that he was ‘a bisexual man who never had a homosexual experience’. *His sexuality became an object of fascination*, even though Suede’s drummer, Simon Gilbert, had quietly come out early in the band’s career.” [App. 373, emphasis added].

Perhaps our human attraction to sexual novelty (both males and females: Dawson *et al.* 2013; see also Chivers & Timmers 2012), as opposed to crystallised fixations, suggests more flexibility in object-attraction than we give ourselves credit for. Several studies suggest that self-identified

bisexuals may be more attracted to sexual novelty than other orientations (Rieger & Savin-Williams 2012, Stief *et al.* 2014): and, since the “self-identifiers” are only the tip of the sexual-orientation iceberg and most of us are likely “bisexual” to some degree, let us apply this novelty-attraction to ourselves then, too.

8.11.2. Language and Colours

As I noted the “sexual-orientationalising” of abstract concepts such as language or colours, I also note less concrete conceptualisations in those same arenas. Such flights of fancy invoke the breadth of the human imagination, suggesting that we are not necessarily corralled by societal prescriptions and proscriptions. First, a half-limiting, half-freeing linguistic example: the use of sexual orientation (or gender) concepts that are adjectives as nouns is considered derogatory, i.e., “a gay”, “a transgender”, a “straight” – and really only commonly used for lesbians and bisexuals (*LGBT Health* 2015). This could be seen as (homophobic) concept avoidance, but it is similarly degrading to say “a straight”, so the linguistic use here may instead suggest that we think of sexuality as adjectives (descriptors), *not* nouns (nouns being more concrete essences, Weaver 1953). The fact that the exceptions are “lesbians” and “bisexuals” may suggest more cognitive prejudice applied to those categories (likely against female gender and ambiguous categories). That we in part conceive of sexuality as adjectival shows flexibility in terms of conceptualisation.

With a different abstraction such as “colour”, we also see the afore-mentioned grey association with ambiguous sexuality in positive contexts, e.g., in a Ted Talk entitled “Fifty shades of gay”: “the release form that asked people to quantify themselves on a scale of one to 100 percent gay. [...] Once they got over the shock, though, by and large people opted for somewhere between 70 to 95 percent or the 3 to 20 percent marks. [...] I found that most people fall on a spectrum of what I have come to refer to as ‘Grey.’ ” (Wright 2013:6). The merged colour within the “bisexual flag” is purple (possibly due to combining “blue=boy” and “pink=girl” colours, cf. Rosiek 2005) – here then “purple” bisexuality would be seen as all-encompassing, rather than either/or. (I note that purple, not just a Western royal shade, is also the colour associated with the late pop-funk singer Prince, whose lyrics contained explicit references to love and sex with both sexes, and whose symbol was the androgynous combination of male-female symbols).

Finally, the rainbow symbology of the LGBT freedom flag has since 1978 been associated with the wider gay movement representing a panoply of differing sexualities (Baker 2007), including gay, lesbian, bisexual and transgender (and these days many more) – perhaps also associated with the 1970s kinky back-pocket handkerchief colour-code of sexual positions and acts by gay men representing an “assortment” of sexual flavours (Stryker & Van Buskirk 1996). The flag also is argued to be due to association with Judy Garland (not only a gay icon but also bisexual in behaviour

on her own terms, cf. Schaefer 1993) and her famous rendition of the song “Over the Rainbow”, but the original flag designer Gilbert Baker says he was inspired more by the rainbow iconography of the US leftwing hippie movement (Goupil & Krist 2005). Regardless, in all mentioned potential sources, rainbow colours as gaily polychromatic are intended as all-encompassing: multiplicity and plasticity (and also implied acceptance of variety).

8.11.3. Characters

In film and television, like gay and lesbian characters, bisexual characters almost always end up dead or punished (TVTropes 2016) – in the latter case often because bisexuals are portrayed as evil or murderous (Coffman 2006, San Filippo 2013); the observations at this chapter’s beginning of homophobia in film and television holds. Yet more positive attitudes towards flexibility do exist: the lead in *Orphan Black* (2013-present), a cloning TV drama, has multiple sexualities amongst the manifestations of one clone, and each is treated as “natural” as another. The subtext is that an individual could be straight, lesbian, bisexual or transgender depending on environment, so certainly a “plastic” televisual example. For nearly all the vampire characters in the TV drama series *True Blood* (2004-2014), bisexuality is simply acknowledged as something that occurs over the range of one’s (very long/immortal) life.

Online, there are orientation-free characters – facilitated by the internet and in the hands of fans and fan-fiction, copyrighted characters devised as heterosexual become *multi*-sexual, everything and anything to every/anybody: heterosexual, homosexual, bisexual, asexual, omnisexual (FFN Research 2011). This is not new; historical Norse mythology gives us the Norse shape-and-gender-shifting (and sexual-orientation-shifting) god Loki (VAL 2016), amongst multiple additional cross-cultural examples such as similarly labile Japanese foxes (Conner *et al.* 1998), the aforementioned pansexual Greek god Zeus (Pequigney 2002) and the bisexual Hawaiian *aikāne* (Morris 1990).

As Klesse puts it, critics argue that modern identity studies “are primarily and exclusively concerned with gendered object choice, sex/gender positions are treated as foundational and same-sex and other-sex desires are not conceived as potentially non-correlated traits.” (Klesse 2014:85-86). Yet, we can break from these limits – this section has a few such examples. Here I reference artists such as Magritte and the preoccupations of the post-structuralists regarding whether the “true” (essentialism alert!) artistic experience lies in gleaning authorial intent or in subjective experience. As journalist Paul Valleley puts it in the *Guardian*, “Ambiguity is the enemy of stability, which is why societies come up with a range of taboos on everything from property and promise-keeping to diet and drugs to suicide and sex. [...] Western culture since the Enlightenment has been about challenging such rules in a way that allows individuals to take greater control of their personal destiny.” (Valleley 2010:3). The tension between a (false) dichotomy of creator-intent vs user-intent –

i.e., “who owns the object/character”, objectification and the endowment effect aside – likely has subversive effects when the user (the individual) takes control in a system intent on barb-wiring imaginal possibilities.

8.12. Summary

8.12.1. Infrahumanisation

- UK humans during this examined time period of 1995–2010 more tolerant of Human–Animal ambiguity (and Human–Machine ambiguity) than of sexual ambiguity.
- Some researchers require ovulation for sexual activity to be defined as “sexual”, thus implicitly coralling sexuality as heterosexuality and exhibiting infrahumanist “moving goalposts”.
- Human social homophobia could be vestigial primate cultural trait resulting from intrasexual homophilia rooted in intersexual mate-competition context.
- Exclusive heterosexuality and homosexuality – at the expense of each other – could be fetishes – though we then possibly might be “fetishising” (reifying into an essence) the concept of fetishism itself.
- People possibly don’t use the word bisexual *because* of negative reactions to sexual fluidity – and so new words keep appearing.
- We think of sexuality as adjectives (descriptors), *not* nouns (nouns being more concrete essences). Exceptions are “lesbians” and “bisexuals”, suggesting more cognitive prejudice applied to female gender and ambiguous categories).
- The next sexual-orientation neologism may be highly conflated with gender concepts, a connection previously avoided in Western gay and lesbian politics in the last few decades.
- “Sexually fluid” may be becoming a new reified form of sexual orientation.
- I observed essentialism in scientific articles and also my Appendix articles via a bodily compartmentalization (aka biological essentialism) of homosexuality (objectification via partialism).
- Conservative papers “protect” potentially bisexually acting conservatives in the hopes that one’s heterosexuality will win out: the “Eton/William Hague Effect”.
- Bisexual erasure is not just problematic in terms of theory, but studies show it is problematic in legal terms for asylum seekers.

8.12.2. Ultrahumanisation

- Due to the volatility of the Heterosexual–Homosexual dichotomy, it is likely that we do not have a “sexual orientation” schema, though we may have a “sexual” one.
- Gay and straight males are more bimodally aroused than females. Essentialist structures, however, can affect one’s sexual arousal, e.g., in adults’ racial sexual preferences.
- Prehistoric homosexual behaviour leaves a trace in observed convergent evolution; near-universal cross-cultural behaviour in modern humans; genetic makeup and via the Parsimony Principle.
- Due to the great deal of cross-cultural and cross-historical same-sex bisexual behaviour, along with multiple studies on same-sex desire and behaviour, a majority of humans may be “naturally” bisexual, enabled via functional advantages, e.g. potentially alliance formation [for alloparenting], heterozygous advantage, kin selection, etc.

- As bisexual behaviour is so common in humans, Bisexual-Dominant/Heterosexual-Recessive heterozygosity (with homosexuality being an outlier of bisexuality) makes more sense than Heterosexual/Homosexual heterozygosity (with bisexuality being an outlier of homosexuality); this also could be hypothesised to be a “Bisexual-Dominant/Homosexual-Recessive” with the exact same premise of heterosexuality being an outlier of bisexuality.
- Multiple primate adaptations potentially point to females sexually-selecting other females.
- In derived sexually-reproducing species such as mammals, propensity for both opposite-sex and same-sex plastic sexual behaviour could be enabled by alliance formation or kin selection. Furthermore, via ToM arguments, and intentionality of being able to put ourselves in our opposite-sex conspecifics’ sexual-orientation shoes, long-living social animals may be inevitably same-sexual-orientational as well as opposite-sex-orientational.
- The "Ex-Gay" movement is dependent on bisexuality.
- Studies show that self-identified bisexual men’s pupils dilate less to their more arousing sex. This could be explained as a novelty reaction to men not used to considering their “B-side” attractions. Perhaps human attraction to novelty (found in both males and females) suggests flexibility in object-attraction – several studies argue that self-identified bisexuals are more attracted to sexual novelty than others.
- Studies show that self-identified bisexuals tend to hide their sexualities, and the majority of bisexual friendships are with straight people – bisexuals’ cross-gender friendships may be more adaptive if already reaping same-sex alliance-formation benefits.
- Under alliance formation, dominance would not necessarily be preferred – often primates prefer to associate with “friendly” con-specifics.
- Studies show that the fewer determinist explanations given to us, the less homophobic we are. Perhaps because if essences aren’t set in stone, one still can see oneself as part of the homosexually-behaving outgroup. Perhaps coming-out is difficult not due to homophobia but because people are confused and uneasy about their sexuality because they still remain “partially” heterosexual (and conversely, “partially” homosexual).
- Prejudiced family members can change to ultrahumanise those of different sexual orientations – possibly initially not because their family members are *gay*, but because their gay family members are *kin*.
- It is to our evolutionary advantage to anticipate, if not acknowledge, behavioural plasticity in others in terms of predictability and our own survival.

9. CONCLUSION: “SURVIVAL OF THE STRETCHIEST”

As with the four classic dichotomy chapters, my conclusion travels an infrahumanist route to our magnified animal-exclusionary, machine-exclusionary, female-exclusionary and homosexual-exclusionary selves – then shifts the focus to expand outwards again – ultrahumanistly – from our animal-adjacent, machine-adjacent, female-adjacent and homosexual-adjacent selves, including intermediary permutations of animal- and machine-hybridity, malleable gender identity/physicality and bisexual behaviour/desire.

I first directly address my research questions and empirical findings in both quantitative and qualitative terms, thus synthesising science and the humanities, then consider the theoretical implications of observed and potential infrahumanisation and ultrahumanisation, and finally discuss the real-world applications of ultrahumanism and similarity-based conceptualisation.

9.1. Introduction

The central questions of my thesis are if – and if so, how – juxtaposed mechanisms of black-and-white thinking affect our wider cultural concepts, socio-political world and our scientific understanding of “truth”. My thesis is poised between social constructivism and biological determinism.

The theoretical scientific literature – and folk-scientific and cultural categorisations – within Human–Animal studies, AI studies, gender studies and sexuality studies is based on binaristic assumptions of Humans versus Others (Animal or Machine), Male versus Female and Heterosexual versus Homosexual: essentialised natural kinds such as “species”, “gender”, “biological sex” and “sexual orientation”. These categories do not reflect a nuanced reality that includes gradualist, “stretchy” sets in which both humans and animals are included, xenotransplantation, hybridisation, gradation in evolutionary theory, overlapping gendered phenotypical traits and trends, intersex and transgender people and the human capacity (and frequency) of and desire for sexually engaging with both males and females over the course of one’s lifetime.

9.2. Empirical Findings

My main empirical findings are summarised at the end of the following empirical chapters: Chapter 3: Results; Chapter 4: The Millennium; Chapter 5: Human–Animal; Chapter 6: Human–Machine;

Chapter 7: Male–Female and Chapter 8: Heterosexual–Homosexual. This section synthesises the empirical findings to answer my research questions.

9.2.1. Do juxtaposed mechanisms of dichotomous black-and-white cognitive patterns exist?

9.2.1.1. *The Millennium*

My quantitative findings show that during the millennium – a time of war and economic upheaval – the British public's general tolerance for all dichotomies, and all newspapers, sees a dip in positive codings and, with one exception, a notable rise in negative codings (the rise in the Male–Female dichotomy is there, though not statistically significant). The negative codings then dip in 2005 and sink further in 2010, while the positive codings recover from their year-2000 nadir and then continue to rise to their original level (*Fig. 1 (A)*, *Tab. 10*, *Tab. 17-20*).

There exists therefore a clear indication of temporally affected essentialism.

9.2.1.2. *Larger Dichotomatic Sets*

The two dichotomies protecting the human ingroup (Human–Animal and Human–Machine) behave in more similar ways when compared to the potentially linked sexual-orientation (Heterosexual–Homosexual) and gender (Male–Female) dichotomies (cf. *Tab. 14*), suggesting that we specifically protect the human ingroup via specific mechanisms when primed. The Male–Female dichotomy is the most resilient to temporal change, suggesting potential hard-wired underlying psychological mechanisms for gender-specific distinction. The Heterosexual–Homosexual dichotomy is the most volatile dichotomy, both in term of tolerance and polarising, suggesting a conceptual flexibility in terms of essentialising sexual orientation (*Fig. 2(D)*).

My quantitative findings show that four major dichotomies encompassing highly differing categorical sets exhibit a deep-rooted essentialism present in modern UK culture that is, nevertheless, similarly temporally affected across three out of four alterities.

9.2.1.3. *Smaller Dichotomatic Sets*

Binary was a statistically significant predictor variable when dichotomies were congregated, implying differences in reporting between dichotomies (*Tab. 14*), which is well established in Chapter 4. The complete-model MAM (*Tab. 14*) showed that in terms of *Binary*, there were differences *between*

dichotomy reports; the dichotomy-specific Heterosexual–Homosexual MAM (Tab. 20) revealed that this particular dichotomy fluctuated most. *Binary* affected the MAM when the dichotomies were congregated, implying differences in reporting between dichotomies: it was further seen using Heterosexual–Homosexual as the baseline in Tab. 14 that the potentially linked sexual-orientation (Heterosexual–Homosexual) and gender (Male–Female) dichotomies behave in more similar ways. I hypothesised that this was due to the explicit priming effect of “human”-related articles and subsequent protection of the human ingroup. Similarly, Male–Female and Heterosexual–Homosexual could be linked due to the implicit (though perhaps unnecessarily) gendered construct of the latter.

In terms of the *Gender* variable, my quantitative findings suggest that females embody more ambiguity tolerance than males. Even though *Gender* is not statistically significant in my multinomial regressions, it cannot be removed without raising the AIC, and the general trend of males being less ambiguity tolerant than females holds steady across four dichotomies; this was the same for the *Expert* variable with “experts” being more tolerant (for both *Gender* and *Expert*, cf. Tab. 17-20).

In terms of *Format*, my quantitative findings, both chi-squared tests and regressions, show that more millennial dyps are exhibited by *tabloids* than *broadsheets* (Fig. 5, Tab. 21). The complete-model MAM suggests that it is tabloidism that drives the ambiguity-intolerance effect rather than conservatism (Tab. 11).

In terms of the *Political Leaning* variable, my chi-squared quantitative findings show that *liberal* newspapers are more ambiguity tolerant than *conservative* in overarching terms, and *Political Leaning* is a necessary component of the Human–Machine MAM (Tab. 18) for my multinomial regressions. There was, moreover, statistical significance to *Political Leaning* in the complete dichotomy models (Tab. 13).

In terms of the *Newspaper* variable, my chi-squared and residual findings not only show that *Independent* could be considered to be the most positive towards ambiguity (followed by *Guardian*), the conservative tabloid *Mail* the least tolerant and the liberal broadsheet *Independent* again the most neutral towards ambiguity (Fig. 7, Tab. 21, Tab. 24), but also suggest in one analysis that the conservative tabloid *Evening Standard* too can be very tolerant towards ambiguity (Tab. 21; cf. final sub-table in Tab. 24). *Newspaper* is a necessary component of the Heterosexual–Homosexual MAM (Tab. 19) for my multinomial regressions.

Year also was a necessary variable for the Human–Machine MAM (Tab. 18). There was statistical significance to *Format* in the complete dichotomy models (Tab. 13), but not in the MAMs (Tab. 17-20). *Format* did, however, appear as a contributing MAM variable in one dichotomy, and that was Male–Female (Tab. 19). I hypothesised that perhaps this was because format-salience for the Male–Female MAM (Tab. 19), in conjunction with the ratio of male-to-female authors (Tab. 9), results in

male journalists exhibiting ingroup protection behaviour against females in a gender-specific context where said males have been reminded of their gender by the nature of the gendered article-topic.

In terms of the *Seasonality* variable, seasonality does not affect ambiguity tolerance, according to the chi-squared results. A statistically significant increase in negative codings in the complete model falls away in the MAM, suggesting that other factors correlated with seasonality have stronger influence.

My quantitative findings therefore show that not only temporality, but also gender, expertise, format, political leaning, individual newspapers and specific dichotomies – though not seasonality – affect whether article-authors exhibit essentialist attitudes in modern UK culture.

9.2.1.4. Observed Infraculturalisation

9.2.1.4.1. Human–Animal

I have shown in a qualitative analysis that the closer we biologically get to humans, the more we are threatened and reinforce boundaries via sub/dehumanisation in the mainstream and scientific press. I have highlighted that moving goalposts regarding definitions of speech, tool-making, ToM and, more recently, types of learning and types of traditions/culture, are constructed to explicitly exclude non-human apes (an argument others have made previously, cf. Wildman 2003, Capozza *et al.* 2009, Sommer & Parish 2010), other animals and also extinct hominins, e.g., the closely related (sub)species hominin Neanderthal. These flexible qualifiers follow the same sub/dehumanising patterns that humans display towards other ethnic groups when these “encroaching” groups get too close to the ingroup, e.g., portrayals of low intelligence, primitivism, lack of sophisticated thinking, lack of language and symbolic thought.

9.2.1.4.2. Human–Machine

Japanese roboticist Masahiro Mori’s uncanny valley mechanism (1970: but see Hanson 2005) theorises that when machines encroach on our human ingroup in appearance and behaviour, we recoil. Reactions to the purely mechanistic do not involve boundary-patrolling, and are much more positive than to the ambiguous “mixed” category of cyborgs, which theorist Donna Haraway has previously observed (Haraway 1991). I have qualitatively argued that cyborgs, as liminal categories, trigger human hard-wired cheater-detection systems regarding who is “human”: responses that concern visual appearance, vocal cues, haptic response, predictability, agency attribution and olfactory signals, which Saygin *et al.* (2012) and Wang and Quadflieg (2015) also have argued. I have moreover drawn attention to the fact that there exists a theorised “AI Effect” (Hofstadter 1979,

Kahn 2002, McCorduck 2004) whereby machine intelligence is discounted by arguing that it is not genuine (human) intelligence every time AI passes another “test” (similarly for “strong AI”, successful human mimicry as sign of “true” artificial intelligence, cf. Turing 1950). This, I have noted, is very close to infrahumanisation behaviour regarding non-human animal intelligence/abilities such as making tools, ToM, etc., noted above. I additionally have qualitatively argued that there exists a social dichotomisation between cyborgs-by-necessity (“natural” cyborgs) and cyborgs-by-choice (“artificial” cyborgs) that invokes natural–unnatural essentialised reactions; and, that while we might think of machines as something “different” from ourselves, once we are personally intermingled (e.g., via pacemakers), we remain human but others are part-machines. This is similar to attitudes towards human recipients of xenotransplantation and modern Europeans who, as of 2010, have discovered that they have on average 2.4% Neanderthal admixture and have started “embracing” Neanderthal ancestry (ScottH 2011).

9.2.1.4.3. Male–Female

I have qualitatively observed that a tendency towards human sexual differentiation plays out particularly the more similar the sexes are, e.g., behaviour, homologous sexual body parts or functions (clitoris/penis, nipples, ejaculatory fluid, lactation, body hair, voice register) that echo the infrahumanisation patterns found in the other dichotomies. The positioning of males as centric or prototypical of all humans means that “femaleness” is inevitably other-ed and not seen as representative. I have noted a potential protection of the biologically female ingroup against transgender women. I also observed the reification of gender terms such as “trans” and “cis” becoming essentialist categories – including even “non-binary” (gender), which in itself invokes a binary via sheer negation of a gender-binary, the same for a “gender-neutral”/gendered pairing.

9.2.1.4.4. Heterosexual–Homosexual

Professor Tim Lewens (2016) has observed that there have been scientific arguments that “true” sexual behaviour only occurs in oestrus; I concur with his argument that therefore sexual behaviour is often specifically and exclusionarily defined as heterosexuality, a mechanism that I have qualitatively argued is similar to infrahumanisation mechanisms such as the goalpost-moving of classificatory human qualifiers for non-human apes, hominins and machines. Furthermore, there exists multiple prejudices against the liminal category of bisexual (Yoshino 2000), where potential bisexual behaviour also is downplayed in both cultural and scientific conceptualisations (*Ibid.*, Dworkin 2001, Hutchins 2007).

My qualitative analysis therefore indicates that there exist infrahumanistic mechanisms present in all four dichotomies studied; my quantitative analysis confirms this.

9.2.1.5. Usefulness via Objectification and Sub/dehumanisation

With research animals, machines, females and homosexuals – all less empowered “halves” of the dichotomies studied – I observed an essentialism present in the sampled articles that manifested via a bodily compartmentalisation (objectification and subsequent sub/dehumanisation via partialism). Furthermore, I qualitatively argued that we react most favourably to machines when they – in addition to appearing different to humans – exhibit helpfulness and usefulness, and that this also may be connected to societal female sexual objectification; and that we do the same for “useful” animals when they can “help” us via bioresearch or via learning more about our own species (cf. Walsh *et al.* 2009). Finally, following evidence that linguistic genderedness predicts androcentric conceptualisations (Hamilton & Henley 1982, Hamilton 1988, Bojarska 2012), I qualitatively observed that via English linguistic mechanisms we often think of sexuality as adjectives (descriptors), not nouns (nouns being more concrete essences) unless used as slurs (“a gay”), e.g., a gay man, a straight person. I noted that exceptions are “lesbians” and “bisexuals”, suggesting more cognitive prejudice via objectification applied to female-gendered and ambiguous categories.

My qualitative analysis indicates that there therefore exist sub/dehumanising and objectifying mechanisms – mitigated via usefulness – directed towards non-privileged dichotomy “halves”.

In answer to the first research question: I have shown quantitatively that juxtaposed mechanisms of dichotomous black-and-white cognitive patterns do exist. I have made additional qualitative observations and arguments in support of these findings.

9.2.2. How do such mechanisms affect culture and scientific concepts of reality?

9.2.2.1. The Millennium

My qualitative analysis suggests that the millennial drive for ingroup protection may be linked to the imminent mapping of the human/chimpanzee genomes, but is more likely to be affected by societal shakiness (economy, war, etc.) that results in the public protecting the human ingroup, where we “animalise” (or “other”) when under stress. This has robust theoretical support (Harris & Fiske 2008, Azoulay 2009, Peterson 2013, Murrow & Murrow 2015), and I observed this millennial effect across multiple dichotomies in my quantitative analysis (cf. *Fig. 2*). Both wider society and scientific theory

(scientists are not immune: cf. Harding 1991, McCaughey 2007) would be affected by such an ingroup response where humans are inclusive until 2000 – then draw boundaries between themselves and other animals; between humans and machines; and between heterosexuals and homosexuals – and then five years later “integrate” again.

My quantitative results suggest clear indications of temporally modified cultural attitudes, which will include scientific discourse.

9.2.2.2. Larger Dichotomous Sets

I qualitatively observed that, for all years, there are multiple fear-of-replacement articles where the human ingroup is subsequently defended for both the Human–Animal and Human–Machine dichotomies; this ingroup defence is seen most strongly in 2000, as noted above.

My analysis additionally argues that we see millennial cultural and scientific effects in the larger dichotomous sets in the following arenas: via biologically determinist texts in the popular science book market invoking not just essentialism of what we consider “real” categories but also human exceptionalism (Ridley 1999, Hrdy 1999, Buss 2000, Pinker 2002); via the rash of “millennium bug” fears potentially associated with fear of (Human–Machine-based) disease (Mitchell 2009); via the millennial and post-millennial upswing in “natural” farmers’ markets, organic food and herbal alternative medicine (Young 2011); via the millennial rise and post-millennial decline of negative public attitudes towards genetically modified food; and via the millennial rise and post-millennial decline in negative attitudes towards homosexual behaviour in the UK.

My quantitative results (*Fig. 9-10, Tab. 20*) show that the Heterosexual–Homosexual dichotomy appears to be the one most affected by cultural swings. Interestingly, during the millennial dip of 2000, humans are more tolerant of Human–Animal ambiguity (and Human–Machine ambiguity) than of sexual ambiguity, though relative attitudes towards sexual ambiguity become highly positive by 2010 (*Fig. 2*). Cross-cultural Western homophobia, xenophobia, murder-rates, homophobic/misogynist rap lyrics and global-warming fears show infrahumanisation millennial spikes against the “othered” half of the dichotomy, i.e., spikes against women, gay people and other minorities alongside fear/violence effects that also match my own millennial results (Wilkinson 2010, Jones 2011, Enten 2012, Tewksbury-Volpe 2012, Powell-Morse 2014, Malone 2016; cf. *Fig. 9*). In terms of direct cultural and research effects, I additionally concur with arguments that acceptance of sexual *identity* as reflective of *behaviour* results in bisexual erasure via the discounting of bisexual behaviour and is very problematic in legal terms for asylum seekers (IGLHRC 2007, Rehaag 2008, Klesse 2014).

Both my quantitative and qualitative findings show that three out of four major dichotomies encompassing highly differing categorical sets exhibit a deep-rooted essentialism present in modern UK (arguably: Western) culture that treats oppositional sets as natural kinds, thus defining cultural and scientific “reality”. For the fourth – Male–Female – I argue that despite the levels of ambiguity tolerance staying stable, this does not indicate tolerance of the less privileged binary “half” (“logocentrism”: cf. Klages 1929, Derrida 1967, Bryson 1998, Prasad 2007) or less essentialism – it indicates rather that the *levels* of essentialism are not particularly flexible. The ambiguity tolerance that *is* present, to put it plainly, simply does not shift more than slightly. There likely still will be an observed ingroup protection-effect directed against the less privileged dichotomy “half” (here, females) in shaky times, an observation lent support by Allison Aosved and Patricia Long (2006, 2009), who have shown evidence that essentialists tend to be “all-around” essentialists, and also by theories that such essentialism kicks in only when the more privileged party feels threatened – such as in times of war or societal upheaval (Morton *et al.* 2009; see also Todd 1992, Anahita & Mix 2006). As originally theorised by Donna Haraway (1991) and also by philosopher Luce Irigaray (1977/1980), I suggest that in the Male–Female dichotomy that perhaps it is the category of “female” that is the liminal category (via not quite adhering to the *male* prototype), not necessarily merely trans*, intersex and GNC individuals as ambiguous categories between “male” and “female”.

9.2.2.3. Smaller Dichotomatic Sets

In terms of the *Gender* variable, as noted, my quantitative findings suggest a general male tendency towards essentialism; this clearly has potential cultural and scientific effects (particularly in male-dominated fields). Indeed, the *Expert*-variable salience in my Human–Machine regressions suggest culturally we may be treating males as “experts” in male-dominated fields such as computer science more than we do for females in female-dominated spheres such as Gender Studies (“dominated” in at least sheer number-of-journalist terms, cf. *Tab. 9*) – this would make sense in a patriarchal system where males have higher status (leaders=experts, Lazarsfeld *et al.* 1944). I further note that in terms of classifying sexual orientation, males (both gay and straight) also are more essentialist (Eliason 1995, Conrad & Markens 2001, Haslam & Levy 2006; see also Davies 2012); this is supported by my own results (cf. *Tab. 9*). There have been studies showing that one’s adult sexual racial preferences can be affected by one’s essentialism (Callander *et al.* 2015), and similarly *any* tendencies towards essentialism (tendencies often held by the more culturally privileged, Kraus & Keltner 2013: therefore not an “essential” essentialism) might have an effect on sexuality and gender conceptualisation: concept-malleability of sexuality essentialism has been shown in a study where prompting males with the concept that “males are the more bisexual sex” resulted in more revealing of bisexual behaviour (Clarke *et al.* 2015).

In terms of the *Format* variable, format-salience for the Male–Female MAM (*Tab. 19*), in conjunction with the ratio of male-to-female authors (*Tab. 9*), suggests that male journalists exhibit ingroup protection behaviour against females in a gender-specific context where said males have been reminded of their gender by the nature of the gendered article-topic. My results that suggest higher levels of female ambiguity tolerance (*Tab. 17-20*) possibly complement other studies arguing the same (Fisher 2011, Mendoza 2011, Weissenstein *et al.* 2014) as well as studies suggesting high female levels of empathy (Batson *et al.* 1996, Gault & Sabini 2000, Schieman & Van Gundy 2000), as ambiguity tolerance is correlated with empathy (Wayne 2011).

In terms of both the *Format* and *Political Leaning* variables, as noted, tabloidism seems to drive the conservative-ambiguity-intolerance effect (cf. *Fig. 5, Tab. 19*); that said, in my qualitative discussion I suggest that tabloids also are less substantial (and therefore information-poor) compared to broadsheets, and so even with “tabloidism” the real driver could be “expert”-level information-richness (cf. Sparks & Tulloch 2000). Furthermore, my Human–Machine MAM regression results with both *Year* and *Political Leaning* as required MAM components (*Tab. 18*) support research arguing that conservatives are less ambiguity tolerant and more reactive to external social factors – potentially fear-invoking situations such as economic or war threats – than liberals (Castelli & Carraroa 2011). Indeed, the chi-squared results that indicate a more concentrated effort in the year 2000 by conservative papers as opposed to liberal papers to distinguish between humans and non-human animals (*Fig. 4 (A), (E)*) also ties in with theories regarding political conservatism being linked with essentialism (Kraus & Keltner 2013).

In terms of the *Newspaper* variable, it is clear in terms of my quantitative results (*Fig. 7, Tab. 20, Tab. 24*), as well as common-sense, that via media transmission readers of particular papers will be taking in a particular slant when it comes to both ambiguity and essentialism, and therefore publication-specific views towards ingroups and outgroups, e.g., generally *Independent* is the most tolerant towards ambiguity and *Mail* the least (cf. *Fig. 7, Tab. 21, Tab. 24* [inc. final sub-table]). As seen, the *Binary* variable in the multivariate analysis suggests not only a flexible concept of sexual orientation (*Tab. 14*), but linked protection-patterns between the human-ingroup-protecting alterities Human–Animal and Human–Machine, which differ from the gender-based alterities of Male–Female and Heterosexual–Homosexual. *Year* is most salient in the most male-dominated field (Human–Machine, cf. *Tab. 13*), perhaps indicating a male susceptibility (either cultural or hard-wired) to stress-provoked millennial essentialism. Seasonality does not affect ambiguity according to my quantitative regression results (cf. *Tab. 13, 14, 18*); as such, this variable was not qualitatively analysed further.

Both my quantitative and my qualitative findings therefore show that there are cultural and scientific effects driven by gender, expertise, format, political leaning, year and individual newspapers – though not seasonality – and that these have cultural and scientific resonance.

9.2.2.4. Observed Infraculturalisation

As discussed in my qualitative analysis of the Human–Animal alterity, the millennial/post-millennial documented rise in Animal Studies programmes/think-tanks (Taylor & Twine 2014) potentially indicates a gap, rather than a link, between humans and animals, since humans in this paradigm often are posited to the side, rather than as an integral animal called *Homo sapiens*. I furthermore qualitatively observed multiple millennial references to disease transmission between humans and non-human primates – possible fears of dangerous pathogens associated with ingroup/outgroup system justifications; this is echoed in the Human–Machine alterity by cultural worries of dangerous machines (a worry that has eased since 2000). Indeed, according to my quantitative results, both dichotomies “recovered” from such pathogen-worries, suggesting similar cultural responses in terms of the human-ingroup (years (cf. *Fig. 1 (A)*; *Fig. 2 (A)*, *(B)*). Other potential human-category protection examples are observed via the scientific downplaying of potential hominin admixture (Eriksson & Manica 2012, Lowery *et al.* 2013); and via sub/dehumanisation mechanisms applied to Neanderthals in the popular and academic scientific literature that I have qualitatively hypothesised.

In my qualitative analysis I additionally observe cultural and scientific side effects of essentialism in terms of the Male–Female and Heterosexual–Homosexual dichotomies, such as sexism, androcentrism and misogyny; alongside homophobia, “compulsive heterosexuality” (Rich 1980) and heterosexism. Both the ambiguous and oppositional categories experience discrimination via prescriptive gender identity social pressure (gender dysphoria is common in non-trans* men and women; males have high suicide rates linked with social masculine role pressure, Payne *et al.* 2013) and transphobia (including high rates of trans* mental illness that I have argued are potentially correlated to perceived lack of societal categorical adherence to the desired sex phenotypes, Ainsworth & Spiegel 2010, Gerhardstein & Anderson 2010); and via worries regarding sexual orientation from people of *all* sexual orientations (Gilman *et al.* 2001, Williams 2008), biphobia and bisexual erasure (with similarly high rates of mental illness amongst bisexual individuals, cf. Boon 2008, Ross *et al.* 2010, Lincoln *et al.* 2015). Particularly the Heterosexual–Homosexual dichotomy seems to be affected by essentialist cultural assumptions, and I argue that the scientific assumption of sexual orientation and exclusive heterosexuality as “givens”, reinforced by a male-and-heterosexual-biased wider culture, has done a disservice to studies of human and non-human sexuality studies.

My qualitative analysis argues, therefore, that there exist infraculturalistic mechanisms present in all four dichotomies studied, and that these have clear cultural and scientific ripples.

9.2.2.5. Usefulness via Objectification and Sub/dehumanisation

In terms of my Human–Animal dichotomy qualitative analysis, I suggest a corollary between semi-vegetarians only eating “animals without faces” (e.g., scallops or mussels) and sub/dehumanisation techniques, where the sub/dehumanised individual is denied the right to individuality. I also note this tendency towards “individuation (but not personhood) of the useful” regarding the sub- (but not de-) humanisation of Ham the Astrochimp, who proved himself useful upon completion of his space journey, and was immediately granted a name and not a number: this cultural pattern, I argue, is common, as is the use of closely related animals such as chimpanzees as *de facto* jesters for human entertainment, most of it based on “humour” derived from sub/dehumanisation attributions. I analyse qualitatively the sub/dehumanisation of machines, and the act of considering ourselves and other humans (particularly females) as machines and objects as well, and the implications of such mentalising mechanisms, e.g., *agalmatophilia* (statue syndrome) is not a rare paraphilia if we extend the “statue” definition to video, TV, film and comic book human representations. Furthermore, applying gender to artefacts potentially humanises artefacts but also stereotypes artefacts’ “behaviour”, particularly in a gender-biased system (as seen in our mentalisation patterns resulting from gendered nouns and abstractions, Hamilton & Henley 1982, Hamilton 1988, Bojarska 2012, Javadi & Wee 2012), just as applying sexual orientation categories does (Duran *et al.* 2007, Hegarty 2010): again, “individuation (but not personhood) of the useful” (here, females). Relatedly, I concur with arguments that just because we have empathy towards objects, see them as intelligent or as having agency does not mean we see them as human (Hackel *et al.* 2014). Humans treat some humans as mechanistic foreigners automatically and unfairly, at both biological and societal levels. I further point out in my analysis that, as with helpful non-human animals via bioresearch, entertainment, disability or dog policework) and “useful” girls’ toys (whereas “boys” toys get to be more frivolous and adventuresome, Quaiser-Pohl & Endepohls-Ulpe 2012), we like helpful machines with lifesaving functions or novel experiences. My qualitative analysis therefore indicates that sub/dehumanising and objectifying mechanisms – mitigated via usefulness – directed towards non-privileged dichotomy “halves” have cultural and scientific effects.

In answer to the second research question: I have shown quantitatively that juxtaposed mechanisms of dichotomous black-and-white cognitive patterns affect culture and scientific concepts of reality. I have made additional qualitative observations and arguments in support of these findings.

9.3. Theoretical Implications: Infrahumanisation and Ultrahumanisation

In this section, I will show the synthesised theoretical implications of my research questions.

I assert that there is essentialism in children (Gelman 2003), even infants (Lourenco & Longo 2010), as well as in adult humans (Medin 1989), potentially also amongst other non-human animals (de Waal & Pokorny 2008, Vonk 2010, 2013). The “slate” indeed may be blank but the fact that the slate exists is due to adaptations that indicate that ingroup/outgroup thinking was (or is) evolutionarily advantageous, and that such blank slates are filled very quickly for specific categories. However, my hypothesised criterion of plasticity differs from the “modalities” of evolutionary psychology and is indeed reliant on a suite of evolutionary adaptations that enable wide-ranging plastic behaviour. In the words of anthropologist Claude Lévi-Strauss, “All games are defined by a set of rules which in practice allow the playing of any number of matches.” (1969:30), which also applies to natural selection.

I begin with this tendency of infrahumanisation and expand the theoretical implications to what I have reified as the – counterintuitive yet potentially rewarding – mechanism of *ultrahumanisation*.

9.3.1. Infrahumanisation: The Millennium

The theoretical implication of likely my most important finding – temporally affected essentialism during the millennium – is wide-ranging, as it suggests that our materialist experience of reality may not be as objective as we argue it to be. This finding is in line with social constructivists such as Peter Berger and Thomas Luckmann (1967) and philosophical nominalists such as David Hume (1739).

Writer Nicholas Carr theorises that we “re-wire” our brains to think in more basic (essentialist) ways through using search engines such Google and online technology that emerged ca.1998-2000. One could make a case that this is suggested in my year-2000 results across three out of four dichotomies (*Fig 2. (A), (B), (C), (D)*). Yet the Human–Animal dichotomy is a non-technology-related dichotomy (bioresearch and xenotransplantation aside) and effectively functions as control group to Human–Machine when examining human ingroup protection patterns. I have argued that if the low-ambiguity-tolerant Human–Machine results of 2000 are due to the fact that we had truly “re-trained” our brains to be essentialist, as Carr suggests, then there should not have been a subsequent adjustment across three dichotomies towards less essentialism in the following years once we became more familiar with the new technology, though *exactly this happened*. That this recovery pattern occurred in two unrelated human-ingroup-protecting alterities and one sexuality-based alterity following a time of war and upheaval suggests a temporally bound wide-ranging social pattern as a result of ingroup protection (thus potentially adaptive) and is consistent with ingroup/outgroup mechanisms theorised by Henri Tajfel and John Turner (1986), as well as essentialism research conducted by Douglas Medin (1989), Susan Gelman (2003) and Nick Haslam (2007), and infrahumanisation research by Stéphanie Demoulin and Jacques-Philippe Leyens (2000).

Although my quantitative findings further suggest that people “think” *en masse* (Durkheim 1912; see also “informational cascades”, Bikhchandani *et al.* 1992, Lohmann 1994), and that there is an arguable “social influence”, my hypothesis of hardwired essentialist mechanisms driving such groupthink contradicts “pure” social constructivism, including a challenge to the Google-rewiring theorised by Nicholas Carr (2008).

9.3.2. Infrahumanisation: Larger Dichotomatic Sets

My qualitative analysis argues that we see millennial scientific effects in the larger dichotomatic sets in arenas of popular science, computer technology, the food and medical industries and overarching public sentiment trends. That these scientific and cultural arenas would react negatively to ambiguous categories as threatening to the status quo is suggested in writings by anthropologist Mary Douglas (1966), and has been argued previously by theorist Donna Haraway (1989, 1991). There is furthermore a tendency towards what I call the “individuation (but not personhood) of the useful” regarding both non-privileged alterities and ambiguous categories that I have noted is present across all four dichotomies.

9.3.2.1. Human–Animal

I have hypothesised that we struggle first to think of humans as animals at all, before an additional distinction of “ape”; we therefore are wrestling with two separate natural-kind categories – this causes cognitive load and so we exclude chimpanzees, our “closest kin”; this hypothesised struggle with ambiguous categories is supported by essentialism research by Medin (1989) and Gelman (2003), as well as research on how political leanings (conservatism being associated with essentialism, cf. Castelli & Carraroa 2011, Kanai *et al.* 2011) are affected by cognitive load (Haidt 2013). Similarly, I hypothesise that a capacity for essentialism of concepts/abstracts likely is present in closely related animals, which would be expected under gradualist evolutionary theory (Darwin 1859). This hypothesis is supported by evidence that Neanderthals and other extinct hominins had symbolic thought and art (Zilhão 2010, Rodriguez-Vidal 2014); that orangutans and gorillas conceptualise biological categories (Vonk 2013); that chimpanzees may essentialise gender (de Waal & Pokorny 2008); that chimpanzees distinguish not only “chimpanzee” categories but also distinguish symbolic chimpanzee faces from human faces (Tomonaga & Imura 2015); multiple examples of symbolic thought in non-human animals, including imaginary toys and insects in non-human great apes (Gómez & Martín-Andrade 2005, Romain 2009, Goldman 2013); that non-human great apes have pictorial competence of symbols (Persson 2008); and that there seems to exist an uncanny valley effect in other primates such as baboons (Steckenfinger & Ghazanfar 2009). Such

cognitive capabilities of symbolic thought (and by extension, essentialism) in non-human primates for which I have argued qualitatively likely would be disputed by human-exceptionalist psychologists such as Michael Tomasello (Tomasello & Call 2008) and animal behaviourist Herbert Terrace (Wayman 2011).

Category-enforcement via essentialism suggests that the more precise our definition of “us” becomes, the less inclusively we categorise similar (but perhaps more-ambiguous) set members – similarly, we attribute humanity to non-human ambiguous faces more readily when our own ingroup is not “threatened” (Capozza *et al.* 2009). My results support exactly this, that we protect the humanity of our own ingroup far more ferociously than we protect the humanity of other outgroups.

When we “other” others, we also sub/dehumanise, as has been shown by Susan Fiske and Lasana Harris (2006, 2009); I qualitatively argue that these same distancing mechanisms present in the Human–Animal dichotomy – and observed qualitatively by theorists such as Peter Singer (1975), Donna Haraway (1989) and Marc Bekoff (2007), and quantitatively by Corinna Most (2008) – also are present in similar contexts of “usefulness” or lack of “usefulness” and objectification in the general *Human–Machine*, *Male–Female* and *Heterosexual–Homosexual* dichotomous arenas. This argument is supported by animal research on useful animals by Walsh *et al.* (2009); gender research regarding the above-mentioned tendency towards “useful” girls’ toys (Quaiser-Pohl & Endepohls-Ulpe 2012); and AI research by Jamais Cascio (2007), Lasana Harris and Susan Fiske (2008, 2009; [regarding female objectification]), and Ayse Saygin, Thierry Chaminade and Hiroshi Ishiguro (2012). For humans, extreme dehumanisation can take the form of homicide and slavery (humans as objects, Harris & Fiske 2006) and also sub/dehumanising/objectifying females, non-white people, gay people (Spinney 2014) and encroaching categories such as apes and cyborgs (Haraway 1989); I argue that murderers and soldiers dehumanise, subhumanise and/or dissociate in order to kill and use con-specifics – as well as use such practices for ritualistic ingroup bonding – and that potentially humans do the same to make use of animals and to hunt and eat meat, which also has been observed previously by Peter Singer (1975), Craig Stanford (2001 [in chimpanzees]), Dale Peterson (2003) and Garry Marvin (2007).

We subhumanise closely related hominins, too. I have qualitatively argued that the same patterns have played out with Neanderthals just as they did with non-human primates: Neanderthal exclusion from humanity via the denial of “human” traits such as symbolic thought and language abilities; othering via exploitation and jestership (cf. Haraway 1989); fears of contagion via diabetes and autism (Rincon 2014): dehumanisation and subhumanisation. This then is further linked to subhumanised “usefulness” for near-human categories: we exploit non-humans (sub/dehumanised humans, primates, hominins, animals, even machines) for research or work precisely because they are very similar to us and therefore useful, but not allowed full humanity – “individuation (but not personhood) of the useful”.

In terms of both Human–Animal and Human–Machine, I qualitatively observed that, for all years, there are multiple fear-of-replacement articles followed by a subsequent defence of the human ingroup found in the larger article pools and also in the sampled articles: a linked ingroup defence seen most strongly in 2000, as shown. Perhaps infrahumanisation is rooted in hard-wired niche protection, where we protect our environmental niche most from those “almost” like us (Darwin 1859): border-control against intermediary states (animal or mechanical “sub”-humans). Replacement fears connected to technology (though not animals) have been hypothesised previously by AI theorists (cf. Hofstadter 1979, Kahn 2002, McCorduck 2004); I further hypothesise that fear-of-replacement is proximate for both dichotomies and that the real evolutionary driver of such a mechanism in functional terms would be fear/avoidance of death (mortality salience) (connected to millennium-bug pathogen fears and potential niche-protection already noted); this line of reasoning is not solely dependent on abstract concepts of one’s mortality, abstractions potentially found in non-human animals as noted above, for an animal can have disease-and-danger-avoidance mechanisms without knowing why they function (“behavioural immune system”: Schaller 2006). My theory that the human-primed Human–Animal and Human–Machine dichotomies behave similarly in a temporal context of human ingroup protection is supported by my quantitative results (cf. *Tab. 14*); that infrahumanisation occurs during threat-states is supported in research by Stéphanie Demoulin and Jacques-Philippe Leyens (2000).

We treat our closest kin and friends well at the expense of others (implicitly more human and less animal), as Robert Trivers first argued in 1971; this makes sense in terms of ingroup kin-selection as theorised by William Hamilton (1971): research by Jacques-Phillipe Leyens (2000, 2001) supports this, showing that we think of ourselves as the “most human human of all” (Cortes *et al.* 2005, Park *et al.* 2016). This too makes evolutionary sense; as noted, we are 100% related to ourselves (Haslam *et al.* 2005).

9.3.2.2. Human–Machine

Many aspects of technophobia correlate with standard human hard-wired survival mechanisms, such as pathogen avoidance (*à la* millennium-bug), agency and predictability evaluations and mortality salience. As theorists such as Donna Haraway (1989) argue, and I concur, cyborgs invoke potential conflicts between “natural” states and masked signals, conflicts resulting from an implied natural-kind essentialism that may involve dead/living essentialism-related categorisation. I hypothesise that if we cannot overcome our “machine-bigotries”, we likely will build machines that mimic us *almost* perfectly in physiognomy in order to not invoke uncanny valley responses, while perhaps still retaining *unseen* (and potentially deemed therefore suspect) as well as *seen* micro-physical differences triggering evolved ingroup responses; and that such “almost perfectly” imitative machines therefore would

be discriminated against via infrahumanisation mechanisms. This hypothesis has empirical support from uncanny valley researcher Masahiro Mori (1970) and Jamais Cascio (2007); though has been counterargued by AI theorist David Hanson, who theorises that we merely need to mimic accurately and precisely (2005a).

When we engage in abstract-heavy, imaginary spaces, I concur with studies that suggest that we dissociate from our behaviour, which implies cognitive automaticisation, and loss of a sense of a unified self; this has theoretical support from both sociologists and psychologists such as Ivan Pavlov (1927) and Donald Broadbent (1958), AI/gaming theorists Tilo Hartmann, K Maja Krakowiak & Mina Tsay-Vogel (2014), neuroscientists Todd Feinberg (2001) and philosopher Thomas Metzinger (2009) (and to some extent the philosopher René Descartes, 1647). While having some support in terms of the conceptualisation of an automaticised body by cognitive psychologists such as Steven Pinker (1994), this also has ramifications in terms of sub/dehumanisation, as such stereotyped/shortcut thoughts would mean we individuate less.

I give the example that the breakdown of long-distance, primarily virtual relationships potentially is not just due to idealisation as theorised by Laura Stafford and Andy Merolla (2007), but potentially also due to conceptualisation of the long-distance partner as a virtual being and therefore perhaps not as “real” as the haptic and the corporeal. This matches objectification mechanism patterns seen in use of digital pornography (Fiske 2009). This is lent support by research on the necessity of in-person and haptic contact by Robin Dunbar (2010).

I further argue that we are already “mating” (engaging sexually) – and potentially emotionally interacting (Suzuki 2015) – with machines: in order to “use” machines in this way, yet not see them as human, subhumanisation towards machine elements is likely (e.g., attitudes towards [usually female] sex robots). This has some support in research by Joanna Bryson (2010), and specifically sex robot research by Kathleen Richardson (2015). I briefly address the fact that the dream of some transhumanists to genetically modify humans to lose their selfishness (Persson & Savulescu 2012, Savulescu 2012) will not work in generational terms unless they plan on modifying every new generation: as we’re social animals who engage in mutualism and reciprocal altruism, not true altruism, such “true-altruistic” traits would not be selected for in evolutionary terms.

9.3.2.3. Male–Female

The temporally affected discomfort I have observed in my own sampled articles regarding the “mixing” of human and machine morphology adheres to Gelman’s research of discomfort regarding natural-kind category mixing (2003), and also was observed in my results in the arena of Human–Animal hybridity. This is lent support again by qualitative theories by Donna Haraway (1991). Similarly, the fear of “cryptic” cyborgs associated with sexualised female bodies potentially due to association with female cryptic bodily processes and sexual strategems (qualitatively argued by Donna Haraway [1989, 1991] and Klaus Theweleit [1987]; quantitatively shown by Taylor & Schwab [2009] and Munoz [2014]) also may be due to a cultural association between females and (sub/dehumanised) animality (Roylance *et al.* 2016), or via a lack of prototype (e.g., male) adherence. The lack of female adherence to the male prototype having societal effects in general terms has been argued by Mykol Hamilton (1991) and also by linguists Peter Siemund (2003) and Laure Gardelle (2015).

The “Female as Cyborg” concept also can be synthesised with ease into my results and my assertion is that females are uncanny-valley denizens in an androcentric world limited by infrahumanisation. I qualitatively argue associations between females-as-cyborgs and observed subhumanisation mechanisms whereby females are treated as tools by males under some sexual contexts (Fiske 2009). Drawing attention to similarities with Human–Machine and Human–Animal uncanny valley responses, I hypothesise that uncanny valley-type infrahumanisation reactions with non-prototyped transgendered people close enough to cause category confusion are likely to occur if detected. Similar societal adherence to prototypes (particularly gender prototypes) affects intersex medical decisions, often immediately from birth (Dreger 1999, Fausto-Sterling 2000, Karkazis 2009, Kim & Kim 2012). Again, “close but no cigar” is problematic in terms of ingroup inclusion: as with the moving “personhood” qualifiers for chimpanzees, as with the AI Effect, as with clitoral/penile homology: all previously noted. This is supported by research showing that phenotypical adherence to the desired sex in transgender people increases happiness and mental health (Ainsworth & Spiegel 2010, Gerhardstein & Anderson 2010; see also Pfafflin & Junge 1992). The “problem”, I reiterate, is with the strict qualifiers and polarities required by the wider society, not with the prototype-challenging individual.

I further hypothesise that because the Male–Female dichotomy is the most resilient to temporal change that this suggests potentially hard-wired underlying psychological mechanisms for this gender-specific distinction. This quasi-deterministic stance likely would be contested by constructivist evolutionary biologists such as Richard Lewontin, Steven Rose and Leon Kamin (1984); but is supported by research by Andrea Welder and Susan Graham (2006); George Newman *et al.* (2008) and Stella Lourenco and Matthew Longo (2010) showing that essentialism is present in infants; and by studies that suggest that small children essentialise gender and age most (Gelman 2003: but see

Piaget 1937). Psychologist Sandra Bem has hypothesised a post-natal gender schema (1981); I take this further and suggest a naturally selected evolutionary bias as regards the need to “fill” that gender schema, but I differ with hardline evolutionary psychologists such as David Buss (2000) and Matt Ridley (1999) that the set requirements themselves are hard-wired: I argue instead that boys can be pink, girls blue; what seems to matter for us is that there are separate sets of girls and boys. Due to the 100% overlap in male–female behaviour (and brains too, Joel 2011, Joel *et al.* 2015), I hypothesise therefore substantially plastic, post-natal associations when it comes to filling a hard-wired gender schema tendency, including capacities to genderise those whose adult identity does not match their biological birth-sex.

I argue that despite Male–Female ambiguity tolerance levels staying stable, this does not indicate tolerance of the female less-privileged binary “half”. As females make up a societal outgroup (nearly universally: cf. Lewontin *et al.* 1984, Henslin 2001, Ciccodicola & Palmeri 2012), then there would be an observed ingroup protection effect directed against females in shaky times; as previously noted, this is supported by research by Allison Aosved and Patricia Long (2006, 2009).

I note that females are more ambiguity-tolerant according to my quantitative results (*Tab.* 17-20), lent support by Weissenstein *et al.* (2014), Fisher (2011) and Mendoza (2011) (but see Erten & Topkaya 2009, Kamran 2011), and therefore likely might *not* boundary-control their female ingroup to the same degree that males might, though in my qualitative Male–Female chapter I argue that biological females in actuality do this in varying degrees to transgender women, and also towards “encroaching” males in the Brony subculture. I further note that ambiguity tolerance is associated with risk-taking (Furnham & Marks 2013), said to be a “masculine” trait (Wilson & Daly 1985, Van Vugt *et al.* 2007), and that this is notable in terms of other studies with contrasting results regarding male and female tendencies towards ambiguity tolerance (Kamran 2011, Erten & Topkaya 2009, Weissenstein *et al.* 2014).

Most importantly, I have drawn attention to the fact that cultural sexual differentiation occurs most in the arena of overlapping cultural and biological traits, i.e., lack of bodily sexual dimorphism in humans means a strengthened occurrence of differentiating male and female clothing, word-use and behaviour, etc. in the former; and clitoral/penile homology means a strengthened scientific and cultural focus instead on women’s vaginas in the latter. My hypothesis is supported by research showing the lack of clitoral research in scientific and sexuality studies (Ogletree & Ginsberg 2000); by the downplaying of the fact that human females achieve orgasm nearly solely by clitoral stimulation (Masters & Johnson 1966, Lloyd 2005, Wade *et al.* 2005, Hite 2008, Dingfelder 2011, Wade 2013b, Puppo & Puppo 2014; see also Rodriguez 2014); by the fact that males and females usually dress dissimilarly likely *in order* to sexually differentiate (McIntyre 2016); that males often avoid their entirely “natural” falsetto vocal range (Greene & Mathieson 2001); that women often shave their “natural” body hair and men often do not (Braun *et al.* 2013); that we find talk of female

ejaculation (Kilchevsky *et al.* 2012) and male lactation (Swaminathan 2007, Kunz & Hosken 2009) socially disturbing; and via the “need” for linguistic gendered differentiation when not strictly necessary (Cameron 2008); similar to arguments for the necessity of early treatment for intersex individuals with overlapping primary sexual characteristics as argued by John Money (1972).

9.3.2.4. Heterosexual–Homosexual

The theoretical implication of my findings that the Heterosexual–Homosexual dichotomy is the one most affected by culture – and therefore an indication that sexual orientation concepts are not hard-wired – is interesting as the modern gay rights political movement (and theory, of late) is based on a “Born This Way” narrative (Copland 2015). Unlike the Male–Female dichotomy, I hypothesise that it is likely that we do not have a “sexual orientation” schema, though we likely have a “sexual” one. I have qualitatively argued that the flexible nature of sexual-orientation categories lends support to this assertion, and have suggested that people possibly do not use the word bisexual because of negative reactions to sexual fluidity as investigated by Yoshino (2000). Flexible sexual-orientation conceptualisation and behaviour has been recorded since Ancient Egypt ca.1200 BCE (Meskell 1999) and Ancient Greece (*Anthologia Palatina* ca.650 BCE) and cross-historically in multiple cultures (Kirkpatrick 2000; cf. *Tab. 34*), later by Sigmund Freud (1909), Michel Foucault (1976-1984) and Andreas De Block & Pieter Adriaens (2006) (though I counterargue Foucault and De Block and Adriaens’ claims that homosexuality is a “new” sexual category; and also suggest that they [at least initially, in terms of Foucault] privilege heterosexual behaviour as an assumed societal natural kind, as does Freud). A historical flexible sexual-orientation conceptualisation also aligns with studies that have shown the contemporary cross-cultural frequency of bisexual behaviour by Kinsey (1948), Kinsey *et al.* (1953), Kirkpatrick (2000), Diamond (2006), Muscarella *et al.* (2005) and Vrangalova & Savin-Williams (2010), or potential for such behaviour, as hypothesised by Daryl Bem (2000, 2001). It additionally is lent support by studies that have qualitatively argued kin selection and survival advantages in terms of bisexual behaviour (Kirkpatrick 2000, Muscarella *et al.* 2005), and quantitatively tested such alliance-formation theories (Fleischman *et al.* 2015).

The major theoretical implication is heterosexual bias (and a resultant monosexual bias) with studies of sexual orientation as they currently stand. Such studies assume heterosexuality as a default state, and then proceed accordingly (Rosenthal *et al.* 2011, Bailey *et al.* 2011). Many sexuality studies ignore the cross-cultural aspects of bisexual behaviour as tabulated by RC Kirkpatrick (2000) and ignore the frequency of bisexual behaviour *within* cultures that is socially unacknowledged (often deeply proscribed) (support: Kinsey 1948/1943, Vrangalova & Savin-Williams 2010, Epstein *et al.* 2012, Savin-Williams *et al.* 2013). I argue that this perhaps is because bisexual behaviour exhibits, like homosexual behaviour – a lack of adherence to gendered differentiation. Many sexuality studies

also theoretically minimise female-female sexual interactions (the last point also argued by Bem 2000). These major examples of heterosexist and biphobic bias naturally affect social policy, as statistics are often based on identity and not behaviour (cf. Pathela *et al.* 2006). I similarly have argued a bias in legal terms against bisexual asylum seekers escaping homophobic persecution due to not acknowledging a human capacity for bisexual behaviour, as studied by Sean Rehaag (2008).

Finally, such biases additionally affect human evolutionary theory, which often relegates homosexual behaviour to several pages or paragraphs in an entire textbook and, when mentioning homosexual behaviour at all, has focussed on exclusive homosexual behaviour (e.g., *Primates in Perspective*, Campbell *et al.* 2011; *How Humans Evolved*, Boyd & Silk 2009) and implied aspects of “natural kindhood”. Past studies of non-human sexual behaviour also have traditionally minimised or “explained away” reports on bisexual behaviour in non-human animals, as observed by biologist Bruce Bagemihl (1999); and psychologist Paul Vasey and primatologist Volker Sommer (2006). If we continue to prioritise heterosexual behaviour to such an exclusive degree as the most natural kind of all natural kinds (a theoretical vantage facilitated by its opposite-gendered nature, a perhaps-unavoidable schema), then metaphorically not just *paragraphs* but a good number of textbook *chapters* on human (and non-human) sexual behaviour are being left out. Similarly, we might consider that we are likely to be adapted for both heterosexual and homosexual behaviour – in this sense, we indeed are “born that way” (in terms of adaptive advantages for long-living, social organisms with a bisexual capacity (cf. Muscarella *et al.* 2005); it is rather that in Western culture, great proportions of the capacities with which we are born are societally and scientifically ignored.

9.3.3. Infrahumanisation: Smaller Dichotomatic Sets

I have synthesised and correlated the *Expert, Gender, Format, Political Leaning, Year* and *Newspaper* variable effects to argue the following theoretical points.

Firstly, cognitive load decreases the more expert-level knowledge one has, perhaps because one enters automatic processing, argued by Bargh (1994) to have low cognitive load (cf. Allen *et al.* 2014, Haidt 2013). Children are theorised to have more cognitive load than adults (Alibali & Siegler 2004), perhaps why children are more essentialist than adults (Gelman 2003): my quantitative results suggest a trend of both experts and females being more ambiguity-tolerant than non-experts and males; studies by others have shown that conservatives are less ambiguity tolerant than liberals (Frenkel-Brunswick 1948, Amodio *et al.* 2007), which also was suggested in my results. I point out, however, that as experts know more, they have less cognitive load, and are less likely to be essentialist under stress. This matches studies by Allison Aosved and Patricia Long (2006) showing that the more college-educated an individual is, the less likely they are to be sexist, racist, xenophobic, homophobic (and essentialist/ambiguity-intolerant). Complementing this, some social

theorists of mass communication such as Katherine Miller have argued that such experts also tend to be highly educated people who speak out when in positions of authority (2005), making up part of a “vocal minority” (Neolle-Neuman 1974), a group which Em Griffen (2009) argues is able to change mass opinion.

Although Douglas Medin, Elizabeth Lynch and Scott Atran have argued that there is some suggestion that experts too rely on “folk taxonomies” (1997), James Tanaka and Majorie Taylor have pointed out that experts making categorical decisions differ in that there is more categorical specificity (1991): arguably, in my opinion, experts therefore may use more *individuation* as opposed to essentialism (cf. Rosch *et al.* 1976). Indeed, in all years of my results, being an expert in all four dichotomies means a decreased response in mixed reactions and a decrease in negative reactions towards ambiguity. That experts are less stressed and therefore more individuating supports theories of infrahumanisation responses under stress theorised by Nick Haslam (2006), and also would fit in with Gelman’s hypothesis that essentialism responses may be hard-wired (2003), as I have argued in terms of a potential Male–Female gender schema waiting “to be filled”; as well as essentialism responses that may be more culturally influenced, as I have argued with the Heterosexual–Homosexual dichotomy.

One observed effect in my results was that tabloids in general (*Evening Standard* being the exception) are more negative to ambiguity than broadsheets. I have interpreted these results to be due to the information-poor nature of tabloids (Sparks & Tulloch 2000) (as opposed to a “class” interpretation, which also is possible, cf. Haidt 2012). This theorised lack of information driving ambiguity intolerance would require lower ambiguity tolerance amongst non-experts (support: Tanaka & Taylor 1991; see also Rosch *et al.* 1976, ISI 2010, NatCen 2014: but see Medin *et al.* 1997), just as there is lower ambiguity tolerance amongst conservatives (Amodio *et al.* 2007), which was what I observed in my own liberal–conservative residual results (*Tab. 16*). Furthermore, even with tabloidism driving ambiguity intolerance, the real driver could be lack of “expert”-level information-richness (cf. Sparks & Tulloch 2000), potentially then with an additional cognitive load (Haidt 2013) *resulting* in conservative essentialist attitudes, as noted. Some studies have linked lower IQ (which often is environment-dependent: Deary 2001) with conservative politics including racism and homophobia, theorising that due to a lower IQ there is an increased desire for hierarchy (Hodson & Busseri 2012) – desire for hierarchy has been correlated with ambiguity intolerance in previous studies (Frenkel-Brunswick 1948, Demoulin *et al.* 2008): again, the driver towards essentialist thought here could be lack of information (but see Garlick 2002, who theorises variable degrees of innate neurological plasticity, which also could be a factor).

Conservative politics are associated with amygdala-based fear responses (potentially therefore more stereotyped [essentialist] thinking) (Castelli & Carraroa 2011, Kanai *et al.* 2011); Jonathan Haidt argues that conservatives perhaps are operating under more dichotomy requirements (such as

“sanctity/degradation”) when evaluating issues than liberals (2012). I synthesise this by arguing that conservatives in general also are more likely to believe in a god (Pew Research 2012) and believing in the supernatural may diminish the cognitive load (cf. Siltan *et al.* 2014) under which Haidt theorises that conservatives operate (2012). If conservatives are more likely to be experiencing cognitive load, this would result in less ambiguity tolerance and stronger fear responses to outgroups particularly during temporal periods of great stress, as exemplified by my millennial results: the most male-dominated field (males also being more generally essentialist in my results: cf. *Tab 17-20*) in terms of number of journalists (Human–Machine) also was the dichotomy for which *Year* was most salient in the multinomial regressions (*Tab. 13*).

Relatedly, in terms of ingroups, I point out that conservative newspapers “protect” potentially bisexually acting conservatives in the hopes that one’s heterosexuality will win out: what I termed the “Eton/William Hague” effect – where ingroup protection (here, class-based) trumps sexual-orientation essentialism (though not heterosexist prejudice) – conservatives here might be struggling in that case with cognitive load of *both* ingroup resource-protection (class) and desired sexual-orientation exclusion – and choose to protect the individual in terms of the class ingroup. At the risk of “essentialising essentialism”, I suspect that in addition to potential low-information (thus “cognitively loaded”) conservative individuals, the individuals driving the Eton/William Hague effect may be a different “type” of conservative who is information-rich (well-educated). This resource-salient ingroup protection that I hypothesise would once more suggest sexual orientation as a moveable conceptualisation that doesn’t “matter” as much as resource protection under a forced-choice dynamic between two separate, societal “natural kinds” (“class” and “sexual orientation”). Viewing sexual orientation as a type of social natural kind known as an “interactive kind” has been previously theorised by Andreas De Block & Pieter Adriaens (2006). My hypothesis of resource-protection trumping sexual-orientation protection is backed up by studies showing that bisexual behaviour is tolerated in rich and privileged groups even if homosexual (including bisexual) behaviour is proscribed in wider society (Kerns & Fine 1994, Herek 2002, Steffens & Wagner 2004).

To summarise, if times are shaky then being a male and writing for a tabloid might make one more likely to exhibit essentialist responses, but these responses likely have more to do with lack of information and living within a patriarchal culture, and less to do with gender (more males than females write for tabloids, but more females write for tabloids than broadsheets, cf. *Tab. 9*). Research has shown a dimensional and non-taxonic aspect to gendered behaviour, backed up by studies by Janet Spence (1993) and Bobbi Carothers and Harry Reis (2013), and by studies by Daphna Joel (2011, 2015) showing no distinct difference in brains between males and females (we *all* have gender-mosaic brains), views to which I adhere but which are contested by Simon Baron-Cohen (2004) and Larry Cahill and Dana Aswad (2015), amongst others.

I assert further that such brains are “made” by the individual in their experienced life on this planet – such post-natal neural plasticity is argued by sexuality researcher James Weinrich (1987), psychiatrist Norman Doidge (2007), neuroscientist Martin Teicher (Teicher *et al.* 2011: but see Cohen *et al.* 2006) and social psychologists Patricia Devine and William Cox (2012) – and likely can be “unmade” to become less (or more) essentialist, too.

9.3.4. Ultrahumanisation: Avoidance of Repeated “Millennial” Effects?

As per my own results (cf. *Fig. 1-2, Tab. 10-14, Tab. 17-20*) and studies by others (Morton 2009; cf. *Fig. 9*), now that we know that ingroup-protection patterns will show up again in societal times of great stress and affect how we conceive of cultural and scientific categories, we can take measures against this process. We can do this via not just a societal but also an academic awareness that societies will show xenophobic spikes at particular times, and that this is perhaps unavoidable. My proposed reified alterity to infrahumanisation is “ultrahumanisation”, the cognitive act of considering others to have “personhood” (human) traits and the mechanistic process of including those individuals into one’s ingroup. Ultrahumanisation has theoretical support in several arenas. The expansionist position implied therein can be argued to be associated with philosophical nominalism, which posits that ideas themselves are not real but instead relativist (cf. Ibn-Sīnā ca.1000, William of Ockham ca.1310). Forcing concepts/beings into pre-made social (and even evolutionary) systems may be socially “real” (and it feels so, due to hardwired infrahumanistic instincts), but does not adhere to observed-world Darwinian gradualism on which biological science is paradigmatically based (Darwin 1859) and indeed we also can conceive of overlapping, gradualist sets as theorised by Ludwig Wittgenstein (1953), and as exemplified by arguments that the natural world itself overlaps by evolutionary biologist Alan Rayner (2004; see also Tyler 2012). Secondly, psychologist Janet Shipley Hyde has theorised that we should be viewing gender through modes of similarity rather than difference (2005) – I attest that this could have applicability to species-dependent biology and sexual orientation studies as well (and potentially AI studies). Finally, and perhaps most importantly in terms of ultrahumanisation, it is to our evolutionary advantage to anticipate, if not acknowledge, behavioural plasticity in others in terms of predictability and our own survival, though “perceiving a threatening out-group as agentic” does not necessarily equal empathy (Hackel *et al.* 2014:22; see also Harris & Fiske 2008). The adaptive advantages of anticipating others’ plasticity in behavioural terms – applying a lens of similarity – has been theoretically observed by those who study machine predictability (Henson & Rug 2003, Grill-Spector *et al.* 2006, Krekelberg *et al.* 2006, Saygin *et al.* 2012).

9.3.5. Ultrahumanisation: Inclusive Larger Sets

9.3.5.1. Human–Animal

Human exceptionalists do not always “other” animals to degrade them, e.g., people can privilege other animals at the expense of humans. We already know that 20% of Americans prefer animal company to human company (Subramanian 2013). Furthermore, we appear to be able to conceive of animals as kin, for we do this with pets, whom research has shown that we conceive of as members of our immediate families (Persson *et al.* 2015). As noted, dogs also conceive of humans as family members (Berns *et al.* 2015). To take this theoretically further, if we can envision *pets* as kin, then we conceivably could extend this “ultrahumanisation” to other species to save them from extinction and bioresearch. We possibly may even be able to spare such animals whom we individuate from being eaten as meat – we often don’t eat animals that we consider pets (or, outside of ritual purposes, kin, in terms of human animals), as argued by Podberscek (2009). There is some evidence for such ultrahumanist inclinations in the Great Ape Project, a personhood campaign for non-human great apes (GBF 2011) spearheaded by Paola Cavalieri and Peter Singer that emphasises our relatedness to other great apes (“Brother chimp, sister bonobo”, and also in Derek Wildman’s argument for the inclusion of chimpanzees in the *Homo* clade (first argued by Morris Goodman in 1963) based on DNA analysis (2003). We thus may be ultrahumanising more with the animals most closely related to us; Corinna Most’s research showed that great apes are privileged over other primates in the UK media (2008).

If we do become more *scientifically* integrative, it is more likely that we would allow other apes to become “low-functioning” humans (*Homo troglodytes/paniscus*) than the inverse (humans becoming high-functioning *Pan sapiens*): great apes, including humans, don’t like to lose status (Hopper *et al.* 2011, Freeman *et al.* 2013). In summary, I advocate studies that take into account this high degree of interrelatedness with chimpanzees and bonobos, and acknowledge that under both gradualist and convergent principles we should not assume a paucity of capability, nor dismiss the potentialities of capabilities that we do not share. This applies to non-primate organisms as well.

9.3.5.2. Human–Machine

Cybernicity can take different routes, through necessity or choice – and often is considered “superhuman” (though not always fully human), and such cybernicity – like human responses to non-human animals – does not always involve degrading forms of “othering”. If we are to include machines (or those who are partially “machine”) into our human sets, we likely need to train ourselves to accept other types of personhood and/or humans, certainly in terms of aesthetics, as

research shows that, emotionally, we warm most to robots who look *least* like humans (and then we often subhumanise such robots) (Mori 1970, Knight 2014). That we may be flexible in this perception is supported by Saylor *et al.* (2010) and Kahn *et al.* (2012). There is some theoretical support that we can indeed train our brains to become more inclusive towards robots, with children showing different (higher) levels of inclusiveness than adults (Turkle *et al.* 2006, *Ibid.*); interestingly, as children generally are more essentialist (Gelman 2003): perhaps adults have been culturally trained to discriminate: taught that robots are neither alive nor persons. This indicates that the human *prototype* for an actual human being may be flexible – I hypothesise that possibly humanoid machines are neurologically processed as fulfilling an “ethnic” (outgroup) schema that we have been taught, via culture, how to fill (similar perhaps to language concept learning, Bartlett 1932 [see also Roberson 2000]) – this is lent support by research showing not just potential hard-wired concepts of ethnicity (Gil-White 2001), but also a more ultrahumanistic plastic flexibility that suggests that the more ethnic groups we are exposed to as children, the less racially essentialist we are as adults (Rhodes & Gelman 2009, Deeb *et al.* 2011). These life-time plasticity arguments (cf. Doidge 2007) match the already-noted robot-tolerance exhibited by children. This scenario also points towards the possibility that we may *not*, after all, have set-specific qualifiers that concern visual appearance, vocal cues, haptic response, predictability, agency attribution and olfactory signals when it comes to robots and cyborgs, who may be standing in generalised proxy for an ethnic group-schema. We may instead have the capacity to incorporate more plastic, “ultrahumanising” categories of “others” and appear able to address such bigotries – even if we are “naturally” bigoted as theorised by neuroscientists such as Elizabeth Phelps (Kubota *et al.* 2012) and anthropologists such as Francisco Gil-White (2001). Future robotics producers might consider making robots look less like humans – as some are already doing (Knight 2014) – but perhaps is better for our general ambiguity-tolerance capacities to stretch our human-categories in uncomfortable ways in a safer context, and so perhaps the more uncanny valleys we ford the better.

9.3.5.3. Male–Female

David Crews (2012) argues that humans have biologically unisex brains and are physically and behaviourally chimeric, making use of different strategies in different environments as necessary; this fits the Gender Similarities Hypothesis (Hyde 2005) and the socioecological paradigm concerning general organism behaviour (van Schaik 1996). Indeed, Janet Shipley Hyde’s Gender Similarities Hypothesis has empirical support in terms of overlapping gendered behaviour (Hyde & Linn 1988, Hyde 2005, Carothers & Reis 2013), and support regarding overlapping brain physicality (Joel 2011, Joel *et al.* 2015: but see Baron-Cohen 2004, Cahill 2014, Cahill & Aswad 2015). Cordelia Fine additionally has observed that such overlapping behaviour, when gendered, tends to be culturally influenced and plastic in form (2010); this is supported by linguistic studies by Deborah Cameron

(2008). I have asserted therefore that many aspects of human gendered behaviour are more likely facilitated by a plastic behavioural repertoire than hard-wired defaults; as noted, this is complementary to Hyde (2005) and also to Sandra Bem (1981), but differs via my argument for hard-wired general essentialism mechanisms. Further to this, I have qualitatively argued that if we watch pornography, or read fiction, or watch immersive films or engage in virtual reality, we naturally empathise, which can spur identification with a gender other than one's biological sex. This is supported by AI research that shows that humans can feel empathy and compassion for fictional and the non-living (e.g., robots or beloved dead conspecifics) – this likely is connected to our capacity for abstract thought shared with other apes, already noted (Persson 2008, Vonk 2013). I have additionally argued that it is reductive to say that pre-transition transgender women are “autogynephiles” (the theory that many MTFs have sexual fetishes of themselves having female genitalia, Bailey 2003) when perhaps such MTFs are empathising with/identifying somatically to other physical, or indeed emotional, triggers.

Transvestism, and initially transgenderism, can be seen as ToM/empathy (cf. Fuller 1995) – figuratively as well as literally putting one's self in another's shoes. Such empathy adaptations are likely the specialty of human-ape consciousness, and is supported by research that ToM and empathy is found in bonobos, amongst other primates and also in other highly social, long-lived animals such as wolves/dogs, elephants, corvids and cetaceans (Bekoff 2007, Plotnik & de Waal 2014). Humans *copy* more than other apes, too (Whiten 2005, Heyes 2009), and we enjoy performing as the “opposite” gender, as argued by Judith Butler (1990). We should not shame such empathetic gender-responses.

Artistic capacity in females is underemphasised (Coe 2003, Nettle & Clegg 2006); art usually is theorised in evolutionary terms to be a sexually-selected (by females) male trait (Darwin 1871, Miller 2000, Dutton 2003). Just as with the trans ToM-rooted empathy responses theorised above – potentially facilitated by high-fidelity copying adaptations – if art (and artists) result/s via sexual selection by females towards artistic males (Miller 2000), artistic abilities could evolve quickly and become female traits as well, due to the complete overlap in brain “modularity” (or at least function) (Joel 2011, Joel *et al.* 2015; see also Crews 2012: “unisex” brains). Via empathy adaptations, both abilities and aesthetic appreciation would be selected for: both traits are necessary for creativity; theoretically, both traits could be passed down to both sexes as polymorphic adaptations (traits that have two or more functional causes, and separately inherited from both females and males), polymorphic-art traits being adaptive in species with extreme empathy and good intentionality skills, and facilitated via high-fidelity copying behaviour. Chimpanzees and bonobos have the former two traits, but not the latter, as shown in research by Whiten (2005) and Heyes (2009); humans have all three. Moreover, this could go in the other direction, too, if females were the first to develop heavily symbolic representations (or perhaps art is not sex-linked at all, in the end).

Such an Art/Aesthetics feedback loop has been previously alluded to by evolutionary psychologists John Tooby and Leda Cosmides (2001), and my hypothesis of it being a dually inherited, polymorphic trait is supported by niche construction theory (Bandura 1986, Odling-Smee 1988, Laland 2015). Artistic appreciation (and creation) in this manner also could take place in species that already had adaptations towards cooperation mechanisms, as this would enable greater empathy and inclusiveness. More generalised male/female differentiated behaviour could work this way as well; this would explain the complete overlap in human “gendered” behaviour observed by Hyde (2005) and Carothers and Reis (2013), which would forever keep begging the chicken from the egg in terms of “male” and “female” behaviour.

In terms of the Male–Female alterity, gender researchers and psychologists should be aware that they are operating within strongly affecting cultural and influential paradigms (cf. Hamilton & Henley 1982, Pfaus *et al.* 2010), as I have conclusively shown in my results. Such researchers may be unintentionally protecting ingroups, be such ingroups consisting of essentialised biological females (cf. Stone 1996) or essentialised trans* groups (in opposition to cis-female groups). Study results are not immune to potential cultural influence, particularly in terms of what are considered to be “true” gendered categories of behaviour or phenotype. The varying results concerning male and female ambiguity tolerance in the wider research area (though not my own study) should be taken into account – as they are contradictory – females may be more ambiguity tolerant, and also theoretically then also more risk-taking – but risk-taking is a “masculine” trait, according to much literature (Wilson & Daly 1985, Van Vugt *et al.* 2007). This clearly requires greater investigation. I suggest that both these traits (ambiguity tolerance and risk-taking) are culturally learned. One additional recommendation, alongside an awareness of culturally influenced capacities, is a further awareness that we may have a hard-wired need to differentiate between males and females specifically, even when no difference exists. It would be hard to work around such a prejudice empirically, but, again, awareness of the issue is a start, and would likely support greater female, intersex, trans* and non-binary category inclusion in terms of research and theory.

9.3.5.4. Heterosexual–Homosexual

Similarly to the hypothesised pre-transgender intentionality in terms of (perceived) sex differences, via empathising via ToM and thus enabling us to put ourselves in our opposite-sex conspecifics’ sexual-orientation shoes, social animals may be inevitably same-sexual-orientational as well as opposite-sex-orientational. Yet this act is probably is not necessary, or is at the very least facilitated by the fact that, likely, most humans are quite bisexual to begin with, an argument supported by research by Kinsey (1948), Kinsey *et al.* (1953), Pathela *et al.* (2006), Vrangalova & Savin-Williams (2010), Epstein *et al.* (2012) and Joyal *et al.* (2015).

I argue that prehistoric bisexual behaviour – although we do not see its homosexual elements via proof of our own existence as per heterosexual acts – leaves a trace via observed convergent evolution of other bisexually-behaving, long-lived species dependent on social cooperation, such as elephants (Bagemihl 1999), cetaceans (Mann 2006) and corvids (Clayton & Emery 2007); via near-universal cross-cultural behaviour in modern humans (Kirkpatrick 2000); via our own genetic makeup as per twin studies (Kalmann 1952, Whitman & Diamond 1993, Hu *et al.* 1995, Pillard & Bailey 1998, Bailey *et al.* 2000, Kendler *et al.* 2000); and via the Parsimony Principle where we observe bisexual behaviour in closely related species such as the other great apes and other primates, i.e., it is more parsimonious to assume fewer necessary evolutionary steps than those required to evolve a uniquely derived state, suggesting here ancestral as opposed to derived behaviour (Bagemihl 1999, Sommer & Vasey 2006).

As noted, the Heterosexual–Homosexual dichotomy is the most volatile dichotomy, both in term of tolerance and polarising, suggesting that essentialising or categorising sexuality in black-and-white terms is not hard-wired. Rather than a fixed orientation identity liberating both ourselves and social attitudes, the fewer determinist explanations given to us, the less homophobic we are (Hegarty 2010). Perhaps this is because if essences aren't set in stone, one still can see oneself as part of the homosexually behaving outgroup: ultrahumanisation. Furthermore, I hypothesise that coming-out is “confusing” not solely due to homophobia, but also because people are ambivalent about their sexuality because they still remain “partially” heterosexual (and conversely, “partially” homosexual) – living exemplars of Wittgenstein's overlapping sets (1953).

In sexually-reproducing species such as mammals, propensity for both opposite-sex and same-sex plastic sexual behaviour could be enabled via alliance formation or kin selection. This is supported by Kirkpatrick (2000), Muscarella *et al.* (2005), Kuhle & Radtke (2013) and Fleischman *et al.* (2015). I argue that under the alliance-formation theory of evolved homosexual behaviour, dominance would not necessarily be preferred – often primates prefer to associate with “friendly” con-specifics (for humans: cf. Milinski *et al.* 2002). This is in contradiction to Paul Vasey's arguments against alliance-formation requiring preference for dominant allies, which his research has indicated does not occur in female Japanese macaques (2006), but my argument is supported by Sapolsky & Share (2004), Utami (*et al.* 2002), Dubuc *et al.* (2011) and Young *et al.* (2013), who have shown that choosing dominants as allies and/or mates is not always the best strategy. Multiple primate physical and behavioural adaptations potentially point to females sexually selecting other females, and this has theoretical support via research on clitoral placement (Alcock 1980, Hrdy 1981: but see Lloyd 2005) and the adaptiveness of the female orgasm (Pavličev & Wagner 2016); via the indication that some female macaques compete against males for sexual access to females in female-specific patterns (not just mimicking male behaviour) (Vasey 2004) and possibly even via the synchronising of ovulation that promotes female–female cooperation and emotional bonding (Hrdy 1981, Power 1990,

Knight 1991). This also is supported by sex research showing that lesbian pornography is the number-one choice of viewing for all women (PornHub 2016). Other studies show that women of all sexual orientations sexually objectify women to a high degree (Gervais *et al.* 2016) – and one study measuring sexual arousal concluded that *no* heterosexual women exist at all, only bisexual and lesbian women (Lang 2015, citing Rieger & Savin-Williams 2012).

In the spirit of “ultra-sexual-orientation-ism”, bisexual male behaviour also is common in humans and great apes, with some quantitative studies in a bisexual context, as opposed to an exclusively homosexual or heterosexual context, supporting alliance-formation theory (Fleischman *et al.* 2015); studies finding in straight-identified men high interest in penises (Ogas & Gaddam 2011, PornHub 2016) and sex with other men (Pathela *et al.* 2006) (potentially a byproduct of sperm competition, Trivers 1976). Self-identified bisexuals (a tiny minority of bisexually behaving individuals are self-identified as such, e.g. 0.7% Ward *et al.* 2014; cf. ONS 2010: such noted statistical studies have been strongly criticised in their methods, cf. Duhaime-Ross 2016) are more attracted to sexual novelty than those of other orientations (Stief *et al.* 2014), suggesting that perhaps novelty is a driver for flexibility in object-attraction in an already behaviourally plastic species, as in a study where bisexual men’s dilated less (indicating lower sexual arousal) to their more preferred sex (and *vice versa*, to a lesser degree) (Rieger & Savin-Williams 2012). This could be explained as a novelty reaction to men not used to considering their “B-side” attractions, but does not suggest that such men are not overall exclusive in sexual desire unless one wishes to essentialise. Primordial-unisex brain theories also suggests a capacity for flexible sexual behaviour (Crews 2012).

Sexuality theorists should not assume that heterosexuality is a natural kind. Similarly, scientists should run empirical sexuality tests within the paradigm of potential bisexual behaviour. There should be no reports on “gay and lesbian populations” that are based on identity, as that self-reported measurement has been shown to be greatly flawed in terms of behaviour. Finally, the heterosexism present in all sexuality studies and wider evolutionary studies makes for bad science but also is inextricable from a particular culture’s prejudices; scientists therefore should be aware that potential prejudices in favour of heterosexist and sexual-orientation natural-kind thinking affects their own research – as does sexism in general, e.g. the huge focus on male homosexual behaviour with far fewer studies devoted to female homosexual behaviour and even fewer looking for “heterosexual genes”, etc. Finally, researchers should be aware that the observed concreteness of male sexuality identity (and perhaps even male sexual *behaviour*) (gay or straight) may be due to unrelated essentialist tendencies in males that have very little to do with sexual “orientation” – again, an argument for studying behaviour as opposed to identity.

9.3.6. Ultrahumanisation: Smaller Dichotomatic Sets

I have argued a connection between expertise and information-richness, and a subsequent tendency to ultrahumanise. The information-retention aspect of expertise is plastic and affected by stressful situations and abuse: for examples, the hippocampus (the part of the brain associated with forming new memories) of an adult who is the past victim of abuse and trauma has up to 25% less volume (Teicher *et al.* 2011: but see Cohen *et al.* 2006). This means that to ultrahumanise, it helps to have been brought up in a safe, non-abusive environment.

Gender, *Expert* and *Year* were qualitatively argued by myself to be interrelated, particularly my results that indicated that males are more likely to be treated as experts than females. Following on from the interrelated *Format*, *Newspaper* and *Political Leaning* variable patterns noted previously, the expansion to include others can occur amongst otherwise resource-protecting groups such as conservatives, e.g., where certain ingroup protections (here, class) trump other ingroups such as “homosexuals” also is supported by my results showing the otherwise-conservative tabloid *Evening Standard* being quite “ultra” in humanising terms in at least one analysis (*Tab. 21*; cf. final sub-table in *Tab. 24*).

9.4. “Real World” Implications: Applied Anthropology

9.4.1. Social Engineering

The situational lack of ambiguity tolerance – while a potentially useful adaptation in our evolutionary prehistory and adaptive prejudice that cognitively isolates others to one’s own fitness benefit; cf. De Dreu *et al.* 2015) – also causes social afflictions (from the point of view of the less-empowered dichotomy “half) such as xenophobia, racism, sexism, homophobia, anthropocentrism, human-exceptionalism, transphobia and biphobia/bisexual erasure. Such infrahumanisation as a mechanism is made great use of during genocide, war, slavery, sexual exploitation, etc. (prejudice might facilitate survival and reproduction for some prejudiced individuals). The correlation between one type of essentialism and others – e.g., those who are homophobic also are essentialist when it comes to race and gender – is well established (Budner 1962, Aosved & Long 2006, Aosved *et al.* 2009, Hodson *et al.* 2009, Hodson & Busseri 2012).

In addition to infrahumanist patterns, my chi-squared and multinomial regression results showed malleability across multiple dichotomies at particular time-points. This indicates plasticity in human

category conceptions, with the possible exceptions of the male–female alterity (which, I have noted, may still be flexible in content if not in structure). I drew attention above to the possibility that I was perhaps “essentialising” by describing some individuals as essentialist. Yet this is not an essentialist assessment if I believe that such brains can be changed, and I believe this to be the case. To plasticise our thinking and de-prejudice our natural bigotries – and change our behaviour – we may have to shove (rather than “nudge”) our conceptualisations towards similarity-thinking rather than differential thinking in categorical terms: trick ourselves into treating others as kin and thereby ultrahumanise.

There are multiples studies that indicate such neuroplasticity (the ongoing malleability of the brain over the course of one’s life) (Weinrich 1987), from the famous study of the enlarged (thicker) hippocampi in London cab drivers, who are required to memorise labyrinthine streets as part of their qualifying exams (Maguire *et al.* 2006), from studies of patients recovering from brain damage (Feinberg 2001, Doidge 2007), from a study showing new neural pathways in Alzheimer’s patients facilitated by singing as opposed to language (Oostendorp & Montel 2014) to a study that shows measurably less cortical thinning amongst those who meditate regularly (Lazar *et al.* 2005).

In terms of tackling essentialism, there are indications that we can in fact train our brains to be less biased through practice: “In a 12-week longitudinal study, people who received the intervention showed dramatic reductions in implicit race bias.” (Devine *et al.* 2012: 1267); there have been similar effects of fewer homophobic responses amongst authoritarian homophobes who have more contact with gay people – or who have friends who have more contact with gay people (Hodson *et al.* 2009; see also McCann *et al.* 2009), whereby their high levels of heterosexual identification for *themselves* also changed. Similarly, when it comes to facial attraction, a recent study indicated that it is our experience that creates attraction to particular faces and not genetics after all (identical twins differ substantially; only 1/5 of attraction appears connected to genetics) (Germine *et al.* 2015). These are all changes that can occur in adulthood.

One solution to infrahumanisation is exposure of children to a variety of ethnic groups when young, which has been shown to have an effect of children being less racist as adults (Rhodes & Gelman 2009, Deeb *et al.* 2011). I would hypothesise that this would result in children not crystallising a “prototype” of ethnicity at an early age; this ties in to the idea of flexible prejudices. Yet: there is no flexibility against a given culture’s mores unless the environment is variable. In a multicultural, more-connected world, prototype-flexibility in varying arenas may be valuable.

Children are not born as pre-programmed machines; they internalise the lessons of our culture to fill their “blank” essentialist schemata (schemata that, for gender, I have argued are hard-wired). Children usually become wiser adults. That may be cold comfort, as societally enforced prejudices will still be present, but children’s ambiguity tolerance generally improves (Gelman 2003). It is our

responsibility as adults to ensure that their basic categorisations are infused with nuance, variability and exceptions. Childhood training of the brain to be more plastic – expanding our sets and ingroups – with a regular inclusion-of-others workout – would be a good start.

Reducing conflict is another important aspect to limiting essentialism responses. Working towards peaceful, reconciling social structures has been shown to have a societal effect towards less structural violence (Watts *et al.* 2016; see also Lee 1988), as has the promotion of secular societies, which research shows allows for fewer ingroup protection responses (Zuckerman 2014a, 2014b). Similarly, the common-sense solution is less war, and therefore less stress and more tolerance, empirically suggested by my results. I note that wars are often (if not always) based on resource acquisition.

In regards to conservative and liberal societies, it has been shown that the more educated people become, the more tolerant (inclusive) their politics are (ISI 2010, NatCen 2014). In the USA, 39% of people with bachelor's degrees supported same-sex marriage as did 46% of those with master's degrees, as opposed to only 25% of those with a high-school diploma (ISI 2010). With education also being considered a “resource”, it thus seems that one element in creating a more equal society would be universal free schooling.

Equal distribution of resources and avoidance of war are two forms of social reformation; a third is the cognitive leap of including others in our ingroup (ultrahumanisation) – via attribution of personhood and individuation of the specific sets we dichotomise. Equality, therefore, not only towards ambivalent categories such as cyborgs, apes, hominins, bisexuals, transgender, intersex and GNC individuals, but also equally towards the disempowered “halves”: homosexuals, females, the machinic and animals. This ultrahumanist aim would include an awareness that any moving goalposts will cause infrahumanisation reactions against all disempowered and ambiguous sets. Such potential biases against “lesser”-and-ambiguous sets should be anticipated, acknowledged and guarded against via public/social policies. This may have the interesting run-on societal effect of beginning with multiple dichotomous/essentialised categorical sets, yet “ending” with far fewer such sets, because as we individuate more, so will we essentialise less. This can be facilitated through the supporting of equality movements such as personhood campaigns for non-human great apes and other animals (including the acknowledgment of animal cognition), and also applying to these and other sets individuation and agency; attributing the potentiality of modern human cognition to extinct hominins; tolerance of prosthetics and non-prototyped disabled/non-disabled human bodies; sexual equality and sexual-orientation equality; and the support of in-between sets such as trans*, GNC, non-binary, intersex and bisexual individuals.

This type of sociocultural evolution – facilitated by flexible, variable strategies from a suite of physical and genetic adaptations that enable latent behaviour – falls under the concept of *sociogenesis*, first

conceived by American sociologist Lester Frank Ward in the late 1800s: “the science of shaping the evolutionary process itself to optimize progress, human happiness and individual self-actualization” (Sztompka 2002:500-501).

If we then consider such “isms” as racism, heterosexism and sexism (and similar prejudices) to be problems, as I do, then an applied anthropology that works towards more equal societies – and thus happier societies (Wilkinson & Pickett 2009) – should not be a pipe dream. My assessment of infrahumanisation as a “problem” is in line with the strategic values of the Society for Applied Anthropology: “Anthropologists demonstrate a particular capability in helping to solve human problems through building partnerships in research and problem solving; acknowledging the perspectives of all people involved; focusing on challenges and opportunities presented by biological variability, cultural diversity, ethnicity, gender, poverty and class; and addressing imbalances in resources, rights, and power.” (Bennett 1999:2). What I have detailed above then are my recommendations for policy implications that can be undertaken in applied anthropological terms that make full use of our plastic potential.

9.4.2. Fictional Kin

“Fictional kinship” (sometimes also “fictive kinship”) is a term first used by anthropologist Edward Curtis in 1913 to describe the phenomenon of friends treated as genetic kin. Pre-existing adaptations that we have towards kin selection in terms of cooperation suggest hard-wired adaptations (Hamilton 1964, 1971, Trivers 1971, Engelhardt *et al.* 2004); in concordance with social anthropologists and sociologists (Ebaugh & Curry 2000, Tierney & Venegas 2006, Ciabattari 2016), I hypothesise that we can expand the definition of “kin” to include very close friends and that this is to our evolutionary advantage: the classic example being alloparenting as researched by Sarah Blaffer Hrdy (2009).

We treat unrelated conspecifics as family – e.g., we do not expect or need immediate or even delayed payback of favours – such fictional kin includes longterm platonic friendships, adoptive child-parent relationships, so-called pair-bonded spouse relationships, possibly pets. None of the preceding examples involves true-altruism; all involve far-future mutual survival or reproductive benefits for all involved parties. Therefore, if we can manipulate people into considering others as kin, we may trigger such hard-wired adaptations.

9.4.2.1. Animals as Fictional Kin

We may be prone to infrahumanisation, but a new paradigm of interconnectedness with animals based on shared traits rather than diverging ones would be a conceptual shift: linking rather than

separating: similar to Janet Hyde's theorised Gender Similarities hypothesis (2005). We require therefore large-scale "family"-imprinting, fictional kinship exercises where we artificially force ourselves to invest in other animals as partial kin – a two-pronged strategy that one hand emphasises other-animal-uniqueness (so that it does not trigger infrahumanist attitudes) and on the other emphasises kinship with us, a human type of animal: "ultra-zoo-ification".

This strategy already has been seen to be effective in longterm evolutionary contexts: we expand our fictional kin category to see dogs and cats as kin (cf. Subramanian 2013), alongside evidence that dogs see humans as family themselves (Berns *et al.* 2015). Non-human animals "ultra-zoo-ify" by exhibiting friendship adaptations outside their own or the human species (McGraw 1985, BBC 2005, Parikh 2016). As we exhibit less prejudice to "useful" outgroups (cf. Chapters 5 and 6), this may require emphasising "useful" benefits we receive from such associations, such as studies showing that high blood pressure goes down in the presence of pets (Allen 2003).

9.4.2.2. Machines as Fictional Kin

Cyborg is a hybrid category and that means positive associations too, despite the attitudes regarding infiltration and sub/dehumanising mechanisms previously detailed. If we extend the capacity of ultrahumanisation towards the human elements of cyborgs (abstract or concrete) *and* towards the wholly machinic via "human training for machine tolerance" (not just the inverse where machines adjust to humans), then potentially we can treat cyborgs holistically as kin, as they are "human-adjacent". This would likely have positive effects in prototype-expansion as per acceptance of different types of human bodies.

Research has shown that we can consider robots as family members (not unlike pets: subhumanisation may still be present). This category-widening may be due to hard-wired human kin-selection mechanisms combined with the endowment effect (Coombs *et al.* 1967). A recent study shows that humans also can exhibit compassionate responses to humanoid robots, an "ultrahumanistic" reaction (Suzuki 2015). The more common family robots become (sometimes engaging in alloparenting themselves, Biever 2012), the more like we are to "imprint" on them as quasi-kin, as shown by a study where children have more positive reactions to robots than adults do (Saylor *et al.* 2010, Kahn *et al.* 2012).

9.4.2.3. Females: Parity

We will need to get used to seeing men who look like different kinds of men, or women who look like different kinds of women in both facial and bodily morphology. We probably can overcome

acculturated gender prototypes through orchestrated early exposure to differing prototypes and in this way become more trans- and intersex-inclusive. Societally, we also could emphasise bodily similarity: a good start might be clitoral parity in terms of orgasmic research and scientific focus. Further studies show that emphasising behavioural similarity between men and women at an early age allows for later widened views of what a “male” does and what a “female” does” (Deutsch *et al.* 2001; Fulcher *et al.* 2008) – all these strategies are promising, though it appears less likely that we could proceed without any gender concepts altogether; perhaps the best we can hope for our limited minds, then, is to expand the prototypes.

9.4.2.4. Homosexuals: Parity

Finally, in terms of the Heterosexual–Homosexual dichotomy, as noted above, prejudiced family members ultrahumanise those of different sexual orientations – notably not because their family members are *gay*, but because their family members are *kin*, e.g., gay rights acceptance rises more when it is emphasised that gays are members of our own families rather than (implicitly) potential sex-partners regardless of orientation (Herek & Capitanio 1996, Jones *et al.* 2014; see also Heatherington & Lavner 2008). I qualitatively observed that in the aftermath of the recent Orlando, Florida, USA June 2016 gay club massacre, there was a huge media emphasis on the grieving families – resulting in some of the most gay-positive American media reactions ever exhibited – perhaps because the wider public understood (and empathised with) the fact that family members had lost (gay) family members. Therefore societal and policy emphasis on “they/we are us/them” and “they/we are our/your family members” in terms of gay, lesbian and bisexual people potentially may have wide-ranging positive ripples as regards diminishing infrahumanisation.

9.4.3. Pseudo-Altruism and Artificial Empathy

Perhaps the saying “fake it till you make it” has some resonance here: harnessing humans’ cooperative instincts either cynically or openly for the greater good (humans might be highly cooperative, but with such ingroup favouritism likely comes also a tendency to punish outsiders and “aggress out-groups”, De Dreu *et al.* 2015:572) may be easier than it seems. It is interesting to note that if the Prisoner’s Dilemma – one of the economic games where the “rational” self-interest move would be to betray the other co-player – is played over long periods of time, strategically altruistic behaviour (including occasional retaliation) is more successful than greedy behaviour (Axelrod 1984). Even in general terms, humans have been shown to have a regular bias towards cooperative behaviour in this game (Fehr 2003). Far from being solely xenophobic and infrahumanistic, humans’ tendencies towards cooperation makes them good candidates for positive social

engineering/manipulation – perhaps via some of the “hard shove” policies I suggest in the Fictional Kin section.

Although I have argued for a similarity paradigm, part of such a framing necessitates that we all are similar in that we differ from each other, too: we are individuated even when not recognised by others. We indeed may need to train ourselves to accept difference and personhood in others, not just personhood by way of similarity to ourselves. This empathy towards individuation (not just prototyping, agency acknowledgment or subhumanising) has been argued in wider species-level terms by primatologist Frans de Waal: “How likely is it that the immense richness of nature fits on a single dimension? Isn’t it more likely that each animal has its own cognition, adapted to its own senses and natural history? It makes no sense to compare our cognition with one that is distributed over eight independently moving arms, each with its own neural supply, or one that enables a flying organism to catch mobile prey by picking up the echoes of its own shrieks.” (2016:4).

Just as the downside of empathy-without-sympathy can be argued to be the Machiavellian insight shown by sociopaths (aka social cheaters), who understand others’ motivations but lack compassion (Oakley 2007), the downside of individuation might be the idea of personhood attributed to wider groups like corporations who are not acting for equal (or even mutualistic) distribution of resources for the common good – like the fellow who argued that his corporation was the second passenger in the car (Sankin 2013), or Fortune 500 companies who have successfully argued that a corporation has legal human rights (NPR 2014). So vigilance against “personhood exploitation” by social cheaters may be necessary, too.

We can condition ourselves to not socially cheat, as well. There is evidence that via virtual reality we can train ourselves to be non-violent, more compassionate/sympathetic (including self-compassion, Holden 2015) and more empathetic, with particularly good results resulting from VR (Falconer *et al.* 2016). Social engineering via social exercises and also virtual reality that trains our brains to see things from the perspective of others (ToM/empathy) has been shown to be effective in increasing empathy and compassion (proto-“sociopaths” potentially can be trained to empathise, if “caught” young [psychologist Paul Frick, cited in Kahn 2012b]). There also are promising “training” results in terms of depression and phobic reactions (fears) – I previously have noted that fear is strongly correlated with essentialist thinking and infrahumanisation mechanisms. Psychologist Chris Brewin indicates the potential of VR for tackling such fears: “When people are embodied in an avatar in a virtual world, their perception and emotional responses change to be consistent with that avatar.” (psychologist Chris Brewin, cited in Witts 2016:1).

9.5. Study Limitations and Recommendations for Future Research

As stated in Chapter 1, I acknowledge the irony of using binarism to “tackle” binarism in my discussion of cultural relativism, and reiterate that I am purposefully reductive in my search pools and coding – as well as in my analyses of various articles and the wider dichotomies in a Western context: I acknowledge too that I am a part of my own culture and bound by my human brain. I have philosophical blind spots, inevitably connected to gender, biological sex, class, sexual orientation, political orientation, ethnicity, national/regional origin(s) and adherence to or lack of religious beliefs: when even conditionally aware of them I have attempted to draw them to the reader’s attention, and sometimes defended them, e.g., I have a “lumper” not a “splitter” bias when it comes to arguments regarding “species” and likely a so-called similarist bias for other categories. I assert, however, that working within this alternative framework allowed me to question on first premises social givens based on dissimilarity, which has enriched the qualitative analysis of my quantitative findings, and meant that via observing between-set patterns in sexual orientation, gender, biological sex and definitions of humanity that I could see similar patterns arise within very differing alterities.

Further, I did not delve deeply into the dynamic of outgroups being essentialist against other outgroups (and against ingroups), and have focussed on a top-down relational process. Although structural prejudice exists, so too do inter-group, intra-group and internalised prejudices and bottom-up deindividuation and prejudice, e.g., misandrist women, transphobic FTMs, white-hating black people. Such intra-structural, inter-relational processes are nuanced, but it is my assertion that the distancing/objectification/(sub)dehumanisation and essentialism mechanisms remain the same: even so-called outgroups create their own ingroups and outgroups.

Similarly, some subjects are treated more lightly than others. There exists great wealth on these larger subjects such as consciousness, neuroscience, animal behaviour, kin selection, genetics, linguistics, cooperation, policing-and-punishment mechanisms, AI theory, trans*-specific discourse and intra-sexual minority studies. Space and lack of knowledge do not permit me to pay due intellectual respect to these areas. I have taken pains to highlight when subjects were treated lightly, while at the same time noting that I am linking broader ideas holistically, such as in the observed similarities between the AI effect and the “moving goalposts” requirements of non-human personhood.

Other limitations were more concrete and related to the paucity of specific newspaper publications in digital archives, e.g., I initially attempted to use the online *Sun/News of the World* as a source, but the parent company News International folded in July 2011, meaning that *Sun/News of the World* no longer had accessible archives online as of June 2012 – even those previously paid for, as I had done in July 2011.

Additionally, some newspapers had no searchable archives at the time of my research, such as the *Telegraph*. At the time of the study, there also were no accessible digital *Mirror* listings for Jan-April of 1995, so these were substituted by the *Evening Standard* and *Daily Mail* in turn. This often was difficult to do, and due to the degree of 1995 replacements for *Mirror*, it was difficult to undertake concrete month-analyses for seasonality infrahumanisation rates for the spring months (March, April, May) for 1995 (though the other years also showed no seasonal effect).

Therefore, although seasonality showed no statistical significance in my findings, due to my 1995 substitutions I cannot entirely discount a potential seasonality effect. In 2016, more newspapers are online – indeed, now we have specifically online newspapers and not just digital archives of paper versions – and the richness found in these online collections and in digital archives of many newspapers old and new likely would assist those who wished to use a similar method to explore potential seasonality affects.

In terms of future research, these are specific arenas of potential exploration.

- A study of essentialism and infrahumanisation patterns in the UK concerning age, particularly old age. I suspect we treat generational cohorts such as “Baby Boomers” and “Millennials” as societal natural kinds. I am curious whether infrahumanisation occurs against old people in the context of “resource-use” within the NHS and welfare systems. A multivariate analysis of attitudes towards single mothers and foreigners concerning resources (potential outgroups) also might be salient.
- An analysis of individuals’ non-kin Facebook friends in terms of (a) how many friends they have kissed; (b) how many friends they have been romantically/sexually attracted to and (c) how many friends have been romantically/sexually attracted to them. The purpose would be to gauge potential reciprocal altruism in a bisexual sense via friendship advantages, in terms of the Alliance-Formation theory of homosexual behaviour (Roes 1993, Muscarella *et al.* 2005). This would be an anonymous survey, but could be done very easily and likely be popular as an opt-in link on Facebook.
- With a greater change in the transgender category in the last 5 years, I would be highly interested in whether the Male–Female dichotomy stayed stable in terms of ambiguity tolerance in the years 2010-2015. Additionally, it would be fruitful to investigate further whether concepts of sexual orientation are affected by a societal tendency to distinguish gender. The similarity in dichotomy-behaviour between Male–Female and Heterosexual–Homosexual might also be due to gender correlation, as bisexual intermediaries appeared in the greater pool for Heterosexual–Homosexual as “LGBT”, which, while including the sexuality-intermediary concept “bisexual”, also contains the gender-concept “transgender”. The stable genderedness of the Male–Female dichotomy therefore could be hyper-affecting the more malleable category of sexual orientation, and this would be useful to explore.
- A research project to explore whether there is evidence of essentialism in closely related species such as apes and hominins, but also including potentially convergently similar animals such as baboons (similar social hierarchies to humans), corvids and dolphins.
- A study of online UK media patterns of infrahumanisation in terms of xenophobia towards immigrants in the wake the recent EU Referendum vote (2016) in a multinational context.

- A quantitative and qualitative exploration of how one could, in fact, train an adult's brain to think in terms of similarity rather than differences, and what that would entail – how to plasticise our thinking and de-prejudice our natural bigotries.

9.6. Conclusion

I have shown that our concepts of so-called concrete categories are temporally malleable, my results indicating that essentialism – as expressed by ambiguity (in)tolerance in socially empowered individuals – is culturally influenced by stressful situations to protect one's perceived ingroup, be that humans, males or heterosexuals. I have additionally proposed useful shifts in terms of wider research focus that may allow less anthropocentrism, less androcentrism, less heterocentrism.

Finally, looking at all sets through a lens of shared similarity rather than one of difference has great potential to directly affect societal and scientific environments. Due to the fact that I have shown a cultural influence on concrete categories and prejudice, my findings have wide-ranging implications in terms of structural (in)equality.

For juxtaposed mechanisms of black-and-white thinking do exist, and they do affect our wider cultural concepts, socio-political world and scientific understanding. Research is affected in multiple fields. I suggest that specifically biological anthropology, evolutionary theory, robotics theory, media studies, animal studies, gender and sexuality studies, zoology, primatology, evolutionary psychology and more widely sociocultural anthropology and sociology move in a direction of more impartial research and possibly in a more similarist paradigm – a place of permeability, with softer borders.

Ultimately, I suggest social engineering to shake ourselves from adaptive prejudices, so that our biased minds are more open to accepting others in our ingroups, a process I have termed ultrahumanisation. We have a widely used word for our exclusionary cognitive processes (infrahumanisation), but not for a mechanism that we also do frequently, as well as a trait shared with our closest evolutionary relatives and likely many more beings via convergent evolution. Social engineering to enable more egalitarianism, increase cooperation and investment in fictional kin will enable more ultrahumanisation.

Although I have argued for the grey area throughout this thesis, metaphorically we need both black and white to achieve the near-countless shades of grey negotiated through dichotomous concepts, and I similarly acknowledge that we need categories to hold structure to our experienced world. The categories are not real, but our experienced world very much is. Therefore, whether infrahumanisation is causal or reflective has been investigated throughout my thesis. It may be in part causal and thus difficult to alter, but those sets (schemata) are at most loose structures and

doubtful as hard-wired or as causal as we believe them to be (even gender likely is only a generalist schema, seemingly to be filled socially and stretched as we will it). Environments mould thoughts and categories, and social and intellectual engineering have a chance. Here, there is a direct link to applied anthropology, and perhaps a “call” to a manifesto where we address the previously assumed fatalism of biological determinism, and advocate that we can indeed change our brains, and our thinking patterns, and thus our world, to a less prejudiced and more tolerant one.

With this latest point, I am leaving behind any attempt to remain “objective” and becoming an anthropological activist. This leads me to express opinions such as the following: Perhaps we need to “deal with our own dichotomies” in order to loose ourselves from binary traps. Such an ultrahumanisation would include those “lesser” portions of dichotomies – encompassing, amongst others, the animals, the females, the homosexuals and perhaps even the machines; including too the ambiguous, the apes, the hominins, the cyborgs, the transgender, the intersex, the gender non-conforming, the bisexuals – into the category of *human*: in short, us.

This ultra-large family, all descended together through natural selection from one common ancestor and now kin, therefore may be “stranger than we can imagine”, to paraphrase once again the quotable evolutionary biologist JBS Haldane (1927). Haldane’s other notable quote concerns the so-called “Devil’s Algebra” of Hamilton’s Law of how quickly one can calculate inclusive fitness to justify potential fitness costs of saving blood-relatives from drowning (Hamilton 1971; cf. Bradley 2007) (Haldane famously quipping that he would not save a brother, but that he would “save two brothers or eight cousins”, McElreath & Boyd 2007). Contrary to arguments that this might be “maladaptive” altruism, and in an ultrahumanist, though still evolutionarily beneficial context as befits our inevitably selfish nature – if in a world of 7.4 billion people where all humans are all fiftieth cousins to each other (Murchie 1999) and 230-thousandth cousins to chimpanzees, 10,000 times removed (Swain 2010), not to mention our inclusive fitness of relatedness to the sum total of other animals, fungi, plants, bacteria, archaea and diverse protista, it makes perfect sense to incur costs under Hamiltonian selection for the inclusive fitness of the good of the world. Let us incur a few such initially uncomfortable “costs” and open up our family.

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