

Complexity, creeping normalcy, and conceit: sexy and unsexy catastrophic risks*

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Abstract

This paper considers a few cognitive and conceptual obstacles to scholarly and public engagement with global catastrophic risks (GCRs). It starts by considering cognitive biases that affect general thinking about GCRs, before questioning whether existential risks really are dramatically more pressing than other GCRs. It then sets out a novel typology of GCRs, whereby it is proposed that many risks commonly regarded as existential are “sexy” risks, while certain other global catastrophic risks are comparatively “unsexy”. In addition, it is suggested that a combination of complexity, cognitive biases and a hubris-laden failure of imagination leads us to neglect the most unsexy and pervasive of all global catastrophic risks: human overpopulation. The paper concludes with a tentative conceptualisation of overpopulation as a pattern of risking.

1. Introduction

The basic concept of a catastrophic risk is fairly self-explanatory: whether natural or anthropogenic, this kind of risk has the potential for causing severe harm to people’s lives and livelihoods. This paper concerns global catastrophic risks. By this I do not mean risks that would affect all areas of the world equally, or at the same time; such criterion would tend to define GCRs out of existence. For the purposes of this paper, a **global catastrophic risk** (GCR) describes potential events or developments presenting a significant probability of catastrophic effects in multiple countries as well as harmful effects (whether directly or indirectly) in multiple continents.

Existential risks are a sub-set of GCRs. I argue in this paper that standard existential risks can be re-interpreted as sexy risks, while our collective failure to tackle certain high probability, interconnected, sub-existential GCRs may be explained with reference to their unsexiness. I further argue that these unsexy GCRs are best understood as different aspects of the macro phenomenon of human overpopulation – an exceptionally unsexy risk, which I conceptualise in the final part of the paper.

There are significant cognitive, conceptual, structural and cultural obstacles to productive engagement with overpopulation and its component GCRs. We need not add the further obstacle of evaluative disagreements to the mix, if we can help it. One of the aims of this paper is to foster dialogue towards bridging differences in how we value the future. After all, there is no real disagreement that an existential catastrophe would be about the worst thing that could possibly happen to humanity. But we need to be mindful of how evaluative differences can hinder our ability to recognise the true nature and seriousness of unsexy GCR.

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2. Global catastrophic risks and human cognitive weaknesses

Before delving into the existential vs sub-existential and sexy vs unsexy dichotomies, it is useful to consider three cognitive weaknesses² that hinder recognition, engagement and rational responses to GCRs: probabilistic thinking, caring about people we cannot see, and valuing the future.

First, and stating the obvious, global catastrophic risks are *risks*. Engaging with risks of any kind requires probabilistic thinking, at which human beings in general are notoriously poor (Dawes, 2015; Tversky & Kahneman, 1974). We tend to inappropriately focus on specific rather than general information, neglecting base rates (Tversky and Kahneman, 1982; Welsh and Navarro, 2012). We are prone to overestimating the probability of positive events and underestimating the likelihood of negative ones (Sharot, 2011), in particular when predicting what will happen to ourselves (Weinstein & Klein, 2002; Weinstein, 1989 and 1980) or those we care about (Kappes *et al.*, 2018). We tend to be particularly optimistic in predicting outcomes that will not be known for some time (Armor & Taylor, 2002: 339-340), and our optimistic beliefs tend to persevere even in the face of contrary evidence (Garrett and Sharot, 2017). Faced with information about a risk, we tend to assume that it will not actually materialise, or that its consequences will not really be catastrophic.

We often disregard probability altogether, leading us to treat dramatically different levels of risk as worthy of the same response, to treat serious risks as though they were non-existent, or to overreact to less serious risks which are more emotively resonant (Sunstein, 2002; Sunstein and Zeckhauser, 2010). Even experts are prone to overlooking or, at any rate, miscommunicating the differences between *possible*, *probable*, or *plausible* outcomes (van der Helm, 2006). This can feed into a particularly complacent way to respond to GCRs: the tendency to think that a solution that is imaginable is *also* technically and politically achievable *and* likely to be developed *and* implemented in time *and* work sufficiently well to adequately mitigate a catastrophic risk. This kind of response amounts to a fallacious conflation of what *may be* with what *will be*, made all the worse by the heroic overestimation of conjunctive probabilities.

Secondly, by their very nature GCRs require that we consider the welfare of people who are distant from us geographically, in time, or both. Whether we like to admit it or not, in practice our moral horizon tends not to stretch much farther than our visual horizon. We are not quite the morally sophisticated creatures we might like to think we are. We seem to care disproportionately more about the suffering of specific, identifiable and ideally visible victims than about much more numerous but faceless “statistical” victims enduring a similar plight (Loewenstein *et al.*, 2006; Daniels, 2012). A single child known to be in distress tends to receive more attention and donations than information about the plight of hundreds of thousands of children. Dog and cat charities tend to be enormously more successful in raising funds than those campaigning for the prevention of cruelty to industrially farmed or working animals, though such animals, hidden from the view of donors but known to them, are far more numerous and typically endure considerably worse suffering than homeless pets.

Consider the millions of people in Burundi, Niger and Somalia (for example), facing catastrophic destitution and mass displacement as the populations of these already impoverished and environmentally fragile countries quintuple in size over the course of this century (UN, 2017). They are far too many for any of us to be able to picture them as individuals. In relation to most of us, they live far, far away - if they are already alive. While we cannot know the ultimate numbers of those who are not yet but will be born in Burundi, Niger and Somalia over the coming decades, we have every reason to believe they will be numerous and that they will find themselves trapped in desperate circumstances, alongside countless others who are children and young people today. Now consider a homeless person you walk by on your way to work, her face showing all the stress, exhaustion and sadness of her predicament. For most of us, the plight of the homeless person is likely to be more motivating in terms of demanding something be done, or being willing to expend our own resources to get something done,

² See also Yudkowsky (2002) and Torres (2017) for related discussions.

than the largely invisible hundreds of millions of young people in African countries heading towards catastrophe.

Finally, GCRs, like other risks, require that we think about, and value, the future, whether it is our own or someone else's. The costs of mitigating a GCR tend to be more certain and located at or close to the present time, while the benefits of mitigation, in the form of avoided harms, are comparatively uncertain and located in the future - perhaps far in the future, when we will be long dead. This intertemporal trade-off is a near perfect recipe for indecision and inaction, adding the myopia of our present bias to the above-mentioned difficulties in thinking probabilistically and to our limited concern about what happens to those we cannot see. Human beings tend to favour immediate rewards even if they are modest, and to downplay the importance of the future – even our own (O'Donoghue and Rabin, 1999). We seem to mistakenly perceive a surplus of resources in the future compared to the present, leading us to conclude that resources are more needed now than they will be in future (Zauberman and Lynch, 2005). We are inclined to prefer avoiding a small pain now – the costs and closed off options involved in acting to mitigate a GCR - than avoiding an enormous amount of future pain from the crystallisation of a GCR.

There is a further issue arising from future-oriented, probabilistic nature of payoffs from mitigation of GCRs. Successful mitigation of a risk can create the perception that the risk did not exist in the first place, whereas a risk that crystallises (to at least some extent) can make the cost and effort expended in prior mitigation attempts appear wasted. It is difficult to *demonstrate* that the cost of risk mitigation is, or was, worthwhile. The cost will normally involve commandeering public resources that need to be offset elsewhere (via either reduced services or increased taxes) and/or a limitation of liberties (e.g. a prohibition on certain individual behaviours or business pursuits), as required to address the identified drivers of the GCR. We should expect the imposition of such costs to be unpopular. The persons who would bear the costs of mitigation may be powerful, numerous, powerful because they are numerous, or simply people who are already at a disadvantage and who we may be reluctant to see endure any additional setbacks to their interests. In other words: the mitigation of GCRs is inherently a hard sell.

We ought to be mindful of the cognitive biases at play when tempted to conclude that mitigation efforts in relation to a GCR can reasonably be delayed or foregone, e.g. in hopes that a cost-free technological solution will be developed in future³. We must also take into account the fundamental moral hazard involved in GCRs. The far away, anonymous people who are most likely to suffer the consequences of many unmitigated GCRs are generally voiceless and powerless in any deliberation about mitigation: today's children and teenagers, the world's poorest people, and those not yet born but likely to be in harm's way.

3. Catastrophic and existential risks

All GCRs are important, though not equally so. As with any risk, the relative seriousness of a GCR will turn on a combination of three dimensions: probability (likelihood of crystallisation), severity (how bad the consequences if the risk crystallised) and magnitude (how many people affected). A further consideration is that some GCRs are more amenable to mitigation than others. The more serious the GCR, and the more we can do to mitigate it, the greater the moral imperative that we do so.

An immediate conceptual tangle is that nearly any GCR may be reasonably assumed to contain an existential outcome within the range of possible outcomes with non-insignificant probability. There is a good argument, then, for regarding the categories of global catastrophic risk and existential risk as co-

³ For example, Ord (2014) argues that we should pay more attention to the benefits of larger populations, including the greater pool of innovators of a larger population and what he claims is the intrinsic value of the lives of additional (hypothetical) lives. Ord argues that even just properly accounting for the intrinsic value of hypothetical lives may be enough to suggest that the planet might be underpopulated, in essence suggesting that the risks and costs of existing population trends to real people are, or may be, justified by the value of reifying hypothetical people.

extensive, and this approach is sometimes taken in the literature⁴. With this caveat in mind, in the discussion that follows the GCRs I describe as **existential** (and “sexy”) have a characteristically polarised profile: a **low probability** of crystallisation, perhaps very low, but should they ever crystallise, the most salient scenario – the existential outcome – has about the **highest possible severity and magnitude**⁵. In contrast, the GCRs I shall describe as “unsexy” may also contain a low probability of an existential outcome, but what is most salient about them is the **high probability of sub-existential outcomes**. For the avoidance of doubt, it is not suggested that all GCRs are either unsexy or sexy, or that any GCR which is not existential will have the risk profile of unsexy GCRs.

Existential risks are standardly assumed to be especially serious – far more than any other GCR (Bostrom, 2013). Strictly speaking, an existential risk is a risk of human extinction. Nevertheless, risks to some version or another of what we may think of as the grand project of human civilisation are typically included within the concept (Bostrom, 2002; Häggström, 2016: 184; Farquhar *et al.*, 2017; Liu *et al.*, 2018). Few would disagree that a global catastrophe that nearly wiped out humanity while also bringing about a wholesale loss of valuable knowledge, culture, infrastructure and needful materials – here, the civilizational *acquis* – would be nearly as bad as one in which everyone dies.

But not everyone agrees on *why* the loss of civilizational *acquis*, or extinction itself, are very bad things. This reflects a broader challenge: in assessing the relative seriousness and urgency of any GCR, it is of fundamental importance that we clarify our value commitments. Different evaluative approaches can greatly alter our conclusions in relation to the severity and magnitude of any GCR, and in turn the urgency of mitigation strategies and the moral and practical justification for the costs of mitigation. I suggest there are two main perspectives which can be distinguished in the literature: one “normative”, the other “futurist”.

The normative perspective tends to track moral, political and legal philosophy within the liberal tradition⁶. Within this perspective, what makes the prospect of an existential catastrophe a very bad thing is the anticipated extent and severity of the harm to living, breathing human beings. Harm is standardly regarded as a wrongful or undesirable outcome, whether it takes the form of actual or risked damage, and whether it is to our physical health and basic needs, to the resources and freedoms each of us needs to pursue our own conception of the good life, or to our psychological wellness and social bonds. A GCR that brings about our extinction would entail maximum mortality, likely preceded by unprecedented human suffering. If there are survivors, then loss of civilizational *acquis* would severely damage their life chances (e.g. through the loss of medical, pharmaceutical and agricultural supplies, equipment and know-how). The normative perspective would not be indifferent to the loss of future possibilities entailed by extinction, and at least some versions of it would assign non-instrumental value to elements of the civilizational *acquis* (e.g. art works); but these would be comparatively marginal considerations.

The futurist perspective, best exemplified by Nick Bostrom’s body of work, can be loosely defined as a techno-progressivist or transhumanism-inflected version of total utilitarianism⁷. While not indifferent to human suffering and loss of human life⁸, the futurist perspective focuses on how human extinction

⁴ For example, Cotton-Barratt and Ord (2015) propose a definition of “existential catastrophe” as “an event which causes the loss of a large fraction of expected value”, which does not obviously distinguish existential risks from other GCRs.

⁵ At least theoretically, there may be worse outcomes, e.g. the wholesale enslavement of humankind or any other hellish scenario where human beings are left in a situation of permanent torment.

⁶ See for example Caney (2015), Finneron-Burns (2017), Rieder (2016), Cafaro (2012), and Cripps (2015).

⁷ Many non-total utilitarians would tend to fall within the normative perspective. See for example Narveson (1967; 1973), Rashdall (1907, ch VII-VIII), and Dasgupta (1988, 2016).

⁸ In keeping with its valuation of human biological expansion, the futurist perspective is generally indifferent to the suffering and extinction of non-human animals, and to the loss of opportunities for the evolution of non-human animals of intelligence comparable to or greater than that of the average human being.

would prevent the coming into being of a potentially enormous number of descendants, and on how the loss of civilizational *acquis* would or could prevent the human lineage from producing highly technologically advanced, space-faring beings. Under the futurist perspective, is not so much harm to what *is* that makes an existential risk a very bad thing, but loss of what *could be*. Both the normative and the future perspectives value the welfare of actual human beings, but the futurist perspective also values the potential welfare of hypothetical human lives, in some versions giving them as much weight as the wellbeing of actual people⁹. It also assigns value to technological progress, either as a presumptive instrumental good or as a teleological imperative for our brainy species.

The two perspectives would consider the same factors when assessing a GCRs, e.g. relative probability, severity and magnitude of various GCRs, amenability to mitigation, cost of mitigation, uncertainty about the effectiveness of various approaches to mitigation, etc. But the differential value commitments of the futurist approach would mean that existential risks would be scored as having much greater magnitude than they would be under a normative approach. This magnitude lensing arises from characteristically total utilitarian assumptions: that creation is *per se* beneficial to the created (via the stipulation that the life of the created will be good) and that humanity must go forth and multiply (i.e. that the expansion of our numbers, or of non-humans descended from or created by us, is a goal in itself). These pronatalist premises lend themselves to a calculation of future value which dwarfs into insignificance virtually any sub-existential GCR¹⁰.

To illustrate the differences between the two perspectives, consider a scenario where a global catastrophe causes 99% of the human population to slowly starve to death, but leaves open the possibility¹¹ that human numbers and civilizational progress would eventually recover and greatly expand. Under a futurist perspective, this would be decidedly preferable to a scenario where the human lineage gently dwindles into extinction without any suffering (e.g. because individuals lose interest in procreation). In contrast, the normative perspective would regard the gentle extinction scenario as sad and probably undesirable, but in no way comparable to the badness of billions of people starving to death. In a scenario where the same, slowly-starve-to-death catastrophe causes 100% of the human population to suffer and die, this would be judged as an incomparably worse outcome under the futurist perspective. The badness of it would lie in the trillions of beings which potentially might have descended from our deceased population, and the exciting, high quality lives they might possibly have led¹². Under the normative perspective, in comparison, the badness of the extinction scenario is probably greater than the 1% extra death and suffering, but nowhere near as much as under the futurist perspective. Though most endorsing a normative perspective would regard a premature end of the human story as regrettable in itself, they are unlikely to regard the loss of opportunity of biological expansion of the human stock, or of the postulated benefits from hypothetical technological developments, as doing much work in explaining why extinction is bad.

Future vs hypothetical people

It should be clear, at this point, that the main point of divergence between the two viewpoints lies in whether the welfare of hypothetical persons is taken into account along with that of future persons. In brief, a future person is a human being who is assumed to be alive at a future time, whereas hypothetical

⁹ See for example Ord (2014).

¹⁰ For example, Nick Bostrom (2013: 19) puts forward the argument that “*even the tiniest reduction of existential risk has an expected value greater than that of the definitive provision of any ‘ordinary’ good, such as the direct benefit of saving 1 billion lives.*”

¹¹ I shall resist the standard futurist approach of stipulating positive future outcomes.

¹² We should expect that such beings would cease being humans over the very long term, having evolved into something else. The human lineage could also split off into different species. Homo sapiens have existed for maybe 300,000 years; our lineage branched off from what are now chimpanzees around 6 to 7 million years ago. The fossil record suggests that vertebrate species generally do not persist as recognisable species for longer than a few million years. For more discussion, see Solomon (2016).

persons are lives which could be caused to exist at a future time, but until such time are merely imaginary¹³.

The normative perspective is concerned with safeguarding the interests of and preventing harm to *actual* human beings, whether alive now or in future. The futurist perspective is concerned with safeguarding the potential utility to be held or derived by all human-descent lives¹⁴ that already exist or could exist in future. Someone subscribing to the futurist perspective will be more reluctant to regard the costs or risks of population growth as a problem at all, and more willing to countenance specific strategies to maximise the number of humanity's descendants that come to exist in a distant future.

I hold no pretence of neutrality between the two perspectives. I consider that the lives of actual people matter, and so does the fair apportionment of harms and benefits within a society; but merely hypothetical persons are not persons at all. "They" are merely abstractions, linguistically useful in considering future scenarios, but not actual entities of any kind. Hypothetical persons have no interests, no preferences, and cannot be harmed or benefitted by whatever we do.

At this point one sympathetic to the futurist perspective might (correctly) raise the point that until such time as a person actually exists, they are hypothetical. How, then, does the normative perspective take account of the interests of future persons without valuing the "lives" of abstract linguistic constructs?

Insofar as the normative perspective also reflects strongly held moral intuitions and the treatment of future generations in international human rights law, many aspects of enduring philosophical debate, such as the non-identity problem, hold at best limited relevance. The normative perspective is concerned with what human beings owe each other as a matter of justice, with a view to guiding practical ethical and policy choices. The prevention of harm to others is uncontroversially a ground of limitation of freedoms and imposition of duties; the harm will be wrongful if it is foreseeable and sufficiently serious¹⁵ to justify an obligation on the agent to avoid that harm (or to contribute to the avoidance of that harm)¹⁶. Existence is a logical precondition for sustaining harm, but the harm may be caused by actions or events preceding the victim's existence. For example, if a murderous hermit sets a well-concealed, lethal booby trap in a forest path they know is occasionally walked by hikers, they have uncontroversially done wrong by the hikers. It is normatively irrelevant whether the person who meets a sticky end in the trap is a seasoned hiker who falls into it next month, or a (not yet existing) six-year-old child on a walk with her parents ten years from now; either way an innocent person has been wrongfully killed by the trap set by the hermit.

The impact of GCRs to future persons can be serious and foreseeable in much the same way as in relation to persons currently alive. Barring a human extinction event, we can be quite certain that there will be additional people alive next year who are not yet in existence right now, much as we can be quite certain that some people alive now will not be next year. We can be quite confident that there will be around 10 billion human beings alive in 2050 – a mix of currently alive persons and future persons – and reasonably (though less) confident that there will be around 11 or 12 billion people, nearly all future persons, alive in 2100 (United Nations 2017b). On the basis of what we know about the world,

¹³ See Weinberg (2008, 2013) for a similar distinction and a related discussion of the non-identity problem.

¹⁴ Or even, in more exotic formulations, all intelligent lives that either are, descend from, or are created by human beings, with the latter class comprising artificial intelligence.

¹⁵ In relation to some harms, freely given and informed consent by the victim may make the harm non-wrongful. This criterion is irrelevant to GCRs.

¹⁶ This necessarily assumes the harm is in fact avoidable, meaning that something can be done to prevent, mitigate or remedy the harm without creating an even greater harm. There can be no moral, prudential or logical imperative in relation to wholly unavoidable hazards.

we can expect that there will be human beings alive for at least hundreds of years into the future¹⁷, all potential victims of GCRs.

In relation to most if not all GCRs, reducing fertility rates and therefore the size of our future population would tend to reduce the number of people in harm's way, that is, the potential magnitude of the GCR. If the GCR is driven or aggravated by population pressures, reducing the number of people created would also reduce its severity and probability. In taking steps to reduce future population size by preventing births we are not snuffing out the lives of helpless future people who never come to be. There are no lives to snuff out. Wondering about the lives that could have been is undoubtedly philosophically interesting; however, it is almost always¹⁸ normatively irrelevant, much like wondering what it would be like if one's parents had not conceived oneself, but instead created a different person. Future scenarios are not alternative realities,¹⁹ but instead a basic tool we use for coping with thinking about the future – which we are cognitively badly equipped to do.

There is only one timeline, only one version of the future that will be actualised, with however many people turn out to be in it. In this sense, and to the best of the information available to us, future people exist ahead in our timeline, much like formerly alive persons still exist behind us, in the past²⁰. We can influence the future in a way we cannot do the past, and this generates moral obligations on us in relation to foreseeable hazards to future persons. But we owe nothing to imaginary people. The imposition of significant risks on actual people – whether alive now or in future - cannot be plausibly justified with reference to the goal of producing a larger population.

4. Sexy and unsexy risks

Existential risks are sexy

Some global catastrophic risks are sexier than others. There is something about them that catches our imagination. A meteor strike that consigns humanity to the fate of the dinosaurs. An outbreak of a highly contagious, highly deadly disease that spreads around the globe before we even know what is happening. Hastily deployed nuclear weapons that precipitate a devastating nuclear winter. The emergence of an all-powerful artificial superintelligence that regards humans as a threat, or (say) as useful raw materials for paperclip manufacture, and decides to hunt down and kill every last one of us. Sexy risks, I suggest, are neat, quick, and techy.

Epistemic neatness

Sexy risks have relatively clear disciplinary homes. It is not particularly difficult to identify the academic fields that would be best placed to understand these risks, even if multiple disciplines may need to be involved in devising or implementing potential responses. Astronomers are best placed to investigate the risk of asteroid and comet impacts; likewise, epidemiologists and biologists in relation to pandemics, physicists and meteorologists in relation to the risk of a nuclear winter, and computer and neuro scientists together with philosophers in relation to AI risks. One need not work in the field to have a good intuitive grasp on where to look for the experts on sexy risks. The reasonably transparent disciplinary ownership bypasses much of the well-known difficulties in conducting inter- and multi-disciplinary research, and is likely also conducive to public trust on these experts.

¹⁷ Demographers do not normally bother estimating population sizes beyond 100 years in the future, as the projections become too speculative to be of much use. Indeed, most population projections look at considerably shorter periods of time.

¹⁸ I grant that it may be relevant in situations of harm to a specific future person (e.g. through the mother's drug-taking during pregnancy).

¹⁹ Even if we assumed future versions are alternative realities, as some might by endorsing some version or another of multiverse theory, there are no contingent lives on the timeline. That additional lives come into existence in an alternative universe, or that our universe has lives that never come into being in other universes, is neither here nor there.

²⁰ Quine (1987: 73-75) and Narveson (1967) have made similarly structured arguments about the irrelevance of hypothetical lives.

Sudden onset

Sexy risks are expected to crystallise abruptly, with obviously catastrophic outcomes from as little as a few hours to, at most, a few short years. There may be an unexpected strike, or a tipping point; suddenly all hell breaks loose. Or at least, this is how we tend to imagine these risks to unfold. With the arguable exception of long ago global pandemics²¹, we have no real experience with these risks.

Technology is involved

Sexy risks have a close relationship with rather flattering ideas about human ingenuity and intellectual prowess. Technological progress is seen as either the cause (nuclear war, deadly AI) or the only plausible solution (destruction or deflection of collision hazards in space, new vaccines to solve pandemics; solar flare shields). For many of us there is intrinsic intellectual appeal in thinking about potential technological fixes that could swiftly save large numbers of people from untimely death or untold suffering. Others may find even greater appeal in thinking through the ways in which existing or anticipated future technology could unleash powers we cannot control, to catastrophic consequences; a fittingly Promethean punishment for humanity's titanic inventiveness, perhaps.

Collective action GCRs are unsexy

Unsexy risks, in contrast, are conceptually disturbing, “wicked” problems (Head and Alford, 2015; Levin *et al.*, 2012) that strain the mind's eye. Among these risks are climate change,²² topsoil degradation and erosion, biodiversity loss, overfishing, freshwater scarcity, mass un- and under-employment, fiscal unsustainability, and last but not least, the black elephant²³ of overpopulation.

Unsexy risks arise from gradual damage to collective goods which are indispensable to the survival and flourishing of human beings and human societies. The harm is neither a matter of blameless bad luck, nor blameable conduct by villainous or blundering agents. Instead, the harm is driven by the aggregate impact over time of human populations, people behaving as they normally do, going about our individual lives in fairly ordinary ways. Unsexy risks are messy, creeping, and politicised.

Epistemic messiness

Unsexy risks resist precise definition and do not map well onto traditional disciplinary boundaries or institutional *loci* of governance. Robust research into the causes of and possible solutions to unsexy risks require the combination of perspectives from multiple wildly different disciplines, which is a daunting prospect to many researchers and a poor match to how centres of research tend to be organised and funded. For example, in order to achieve an in-depth understanding of overfishing, it is not enough to understand the biological processes involved (e.g. catching valuable species at a higher rate than fisheries can replenish, the disproportionate removal of mature fish with higher reproductive fitness, etc). One must appreciate the all major facets of the problem, including its drivers, whether demographic (population growth generating greater demand for fish and a greater number of people seeking livelihoods through fishing), economic (e.g. drivers of over-capacity of in the fishing sector), or behavioural (environmentally damaging fishing techniques and practices) as well as social factors complicating a solution (e.g. the prevalence of pirate fishing and modern slavery in certain countries'

²¹ The last (or perhaps first) global pandemic was the influenza outbreak of 1918, which infected about one-third of the world's population but killed only about 10% of those; it is long dimmed from our collective memory. The far more deadly (and far more distant in time) medieval Black Death killed an estimated 30-50% of the European population between 1347 and 1351 (DeWitte, 2014) but was not a global pandemic.

²² While it may be argued that climate change is not lacking in research attention or public debate, this overlooks the fact that climate change is already crystallising, still the subject of fiercely ideological denial, and that not much at all has been achieved by way of mitigation. In addition, the population linkage remains something of a taboo. See for example Wynes and Nicholas, 2017 and Murtaugh and Schlax, 2009 on the connection between procreative choices and individual climate change impact.

²³ The term “black elephants” refers to a cross between a “black swan” and the “elephant in the room”. A black elephant is an unpalatable problem visible to everyone, yet no one wants to address it even though we know that sooner or later it will have catastrophic consequences. When the catastrophe can no longer be ignored, those who stayed silent before will claim it was an unexpected black swan. See for example Canova (2011).

fishing fleets). And last but not least, one must be able to engage with the ethical and legal framework to which any solution would need to conform, as overfishing, like all other unsexy risks, is closely related to people's freedoms and livelihoods.

The epistemic messiness makes research inherently more complicated in practice. It also reduces the chances of there being individual experts able to advise policy-makers and productively engage with the public. Instead, in relation to unsexy risks we tend to see *fractional expertise* from individuals situated within non-overlapping silos (natural scientists, philosophers, legislators, social scientists, economists, activists), whereby most experts are only able to speak knowledgeably about specific, disjointed aspects of the GCR. Those other aspects of diagnosing or mitigating the risk which fall outside the expert's field are liable to neglect, mischaracterisation or misunderstanding, for example by misguided reliance on false or outdated received wisdom. Much like the proverbial blind men patting seemingly different creatures and struggling to conceptualise the overall elephant, these fractional expertises can lead to contradictory pronouncements, undermining public trust in experts while creating a misleading impression that the very existence of the unsexy risk is a matter of subjective opinion.

Gradual build up

The complexity of unsexy risks is not assisted by their incremental onset. These are “boiling frog” phenomena that play out in slow motion – at least as perceived by humans. The creeping nature of unsexy risks obscures the extent and momentum of accumulated and latent damage to collective goods²⁴, while shifting baselines²⁵ tend to go unnoticed, misleadingly resetting our perception of what is normal²⁶. Even where we recognise that something is a problem, we may still not recognise the underlying, catastrophic trendline, or just how much damage is already baked into states of affairs that we come to regard as normal.

Farmsteads slowly turning into desert (UNCCD, 2017; Gomiero, 2016). Unusually mild winters and exceptionally hot summers gradually becoming the norm (Hansen, Sato and Ruedy, 2012). Wildlife quietly vanishing (Dirzo *et al.*, 2014; Ceballos *et al.*, 2017; Hallmann *et al.*, 2017). First one, then another, then several major cities facing major water shortages (Welch, 2018; Mekonnen and Hoekstra, 2016). Commercial fishermen going farther and farther afield to catch any fish, and using ever more extreme techniques (McKie, 2014; Roberts, 2012). Younger generations increasingly struggle to get decent work, while public debt continues to balloon (ILO, 2018; WEF, 2017). These are manifestations of unsexy risks, the symptoms of an underlying ailment we do not quite comprehend, or do not want to acknowledge.

Behavioural and attitudinal drivers

Unsexy risks are driven primarily by the procreative and livelihood-seeking behaviours constitutive of population growth and economic growth. These behaviours are supported by attitudinal predispositions to oppose the kind of regulation of individual freedoms that could address the GCRs while curbing free riding. Technology could help mitigate these risks, but *only* in combination with fairly dramatic changes in the causative attitudes and behaviours – what I tentatively refer to as the memplex of growthism in the next section. Without such changes, technology can at best delay catastrophic outcomes.

The behavioural and attitudinal drivers of unsexy risks make them inherently controversial and politically, culturally and ethically charged. Not many experts have the stomach for pursuing research or devising policy recommendations which will expose them to the prospect of public denunciations claiming questionable motives, insensitivity to social justice issues or religious mores, or a supposedly foolish rejection of “common sense” wait-and-see strategies seemingly beckoned by the creeping nature

²⁴ Collective goods are normally non-excludable goods, including rivalrous *common pool resources* (e.g. fisheries, aquifers, a public health service) as well as non-rivalrous *public goods* such as stable climatic systems, a well-functioning democracy, etc.

²⁵ See Klein and Thurstan (2016) for a good explanation of the phenomenon.

²⁶ Jared Diamond (2005) refers to this as “creeping normalcy”.

of these risks. And yet, the nature of these problems calls for active engagement by experts not only with researchers in other disciplines, but with policy-makers and the public²⁷. In other words, researchers must be willing to develop highly complex analyses pushing at the outer boundaries of their epistemic comfort zones, stick their necks out, and say something unpopular.

The politicised, creeping and epistemically messy nature of unsexy risks means there are serious practical challenges in producing analyses that are scientifically robust, honest about the causes and able to offer plausible and practicable solutions to any of these risks. While it is no longer controversial for experts to identify population growth and economic growth as the drivers of unsexy risks, few are willing to publicly acknowledge that without tackling these drivers we are highly unlikely to achieve effective mitigation.

5. The unbearable awkwardness of overpopulation

As noted above, unsexy risks are hard to visualise. This alone can lead us to seriously underestimate their probability (Tversky and Kahneman, 1974; Lichtenstein *et al.*, 1978). There are too many moving parts and feedback loops, complex patterns of cause and effect that impose a high cognitive cost onto anyone attempting to engage with these problems. Timothy Clark (2016) aptly speaks of the “chameleonic insidiousness of overpopulation”. Virtually any unsexy GCR can be reinterpreted as overpopulation, which is the nature of the beast and its main disguise. We can endlessly reinterpret aspects of overpopulation as a vague *something else*: consumerism, greed, social inequality, excessive corporate power, an unexpected delay on the promised saviour technology that will expiate our sins. There is always something else we can call it, some way to recategorize one or another aspect of overpopulation as a symptom of some other, more appealing or ‘real’ problem that is supposedly easy to solve, via non-existing technology to be implemented by a non-existing world government, the supposed power of justice-based demands to multiply resources, or some other hand-waving sophistry.

In addition to combining the complexity of other unsexy risks, thinking on overpopulation is further complicated by moralised and deeply politicised anxieties about the supposed primacy of procreative liberties over all other human rights and interests, in addition to broader enmeshment with religious and cultural beliefs and considerations relating to gender, social and intergenerational justice. An expert delving into overpopulation or one of its component GCRs will find themselves having to piece together fractional and not always coherent contributions from disparate disciplines, making it difficult to see the full picture, while operating in a highly politicised and moralised environment where the fear of *saying the wrong thing* fosters circumlocution, self-censorship and the downplaying of risks.

There is something more at play here: conceit. Engaging with overpopulation requires critical engagement with the deeply ingrained ideas behind the behavioural and attitudinal drivers of unsexy risks: the growthism memplex. By this I mean a group of inter-connected, mutually supportive, culturally transmissible ideas²⁸ that were likely selected for during the “empty world”²⁹ phase of our evolutionary history. These ideas are maladaptive in our full world, groaning under the pressure of unsustainable demands and aspirations of a global population that has been living off natural capital rather than income. There are five main memes, or meme clusters, within the growthist memplex

- (1) Indefinite economic growth is both possible and desirable, either intrinsically or instrumentally, to support population growth, social and technological progress, etc. (*Endless economic growth*)

²⁷ See Mann (2014) for an elegant statement of this claim in relation to climate change scientists.

²⁸ The concept of a “meme” was introduced by Richard Dawkins in his 1976 book *The Selfish Gene*. See also Blackmore (1999).

²⁹ Herman Daly conceptualises the “empty world” as a time (real or imagined) during which our population and economy were small relative to the containing ecosystem, and our technologies of extraction and harvesting were not yet particularly powerful (Daly, 2015).

(2) Population growth promotes economic growth, dynamism, innovation, and military might; it is a sign of prosperity and freedom. (*Bigger is better*)

(3) Population ageing and de-growth are calamitous prospects, leading to enfeebling loss of economic, political and military might and vulnerability to more youthful competitors. It's up or out. (*Fear of shrinkage*)

(4) Our reproductive behaviour is not within meaningful agential control anyway; normal human beings feel an irresistible urge to procreate and to centre their lives around child-rearing. (*Pronatalism*)

(5) Humans are too rational and inventive to be bound by the physical limits of this planet, so we need not worry about resource constraints or environmental degradation. We can and will fix any of these problems, sooner or later. (*Cornucopianism*)

The memplex pervades the ideologies animating all major world religions, nearly all economic systems, and attitudes to procreation and parenthood worldwide. It seems to specifically obstruct clear thinking and open discussion on overpopulation; it poses nowhere near a comparable difficulty to other GCRs, and none at all in relation to sexy GCRs.

Scientific discoveries about the age of the Earth, its relationship to the Sun, and of long extinct species initially strained religious beliefs but were ultimately (largely) accommodated; but not the theory of evolution. Evolution tells us that, rather than being created by God in its divine image, we humans descend from primordial pond scum, just like all other creatures in this planet. We are animals, closely related to chimpanzees and gorillas; our genome is 85% identical to that of lowly mice³⁰. Though a cornerstone of modern biology, the theory of evolution is unflattering and at odds with the narrative of human exceptionalism provided by Abrahamic religions. I suggest the growthism memplex performs a similar ideational role to religion, in that it tells us an attractive, hubristic story of human exceptionalism that we are very reluctant to abandon. But engaging with overpopulation as a GCR is all but impossible without fundamental rejection of this memplex.

This deep embeddedness of the ideas behind the behavioural and attitudinal drivers of overpopulation are a powerfully motivator for the denial³¹ or reinterpretation of the issue. This is the case notwithstanding the empirically and logically evident role of population growth as a driver and magnifier of every other unsexy risk. Though the other unsexy risks are increasingly recognised, this is of little comfort. Their combined effect may be even more catastrophic than a mere sum of the parts. By considering these GCRs in separate we are likely hampering our understanding of the whole elephant.

An attempt at conceptualising overpopulation

In seeking to engage with overpopulation as a GCR, it is probably helpful to have a reasonable grasp of its nature, even if we cannot tell what overpopulation looks like. The definition I tentatively propose below is intended to do as much conceptual work as possible in helping us understand the basic 'shape' of the problem so that we can tease out the most pressing normative issues. It is also intended to work across a variety of moral perspectives while not prejudging or distorting empirical considerations.

To start with, let us consider how *not to do it*. A common way to think about overpopulation is as describing circumstances where collective goods are already so degraded or depleted that there is a sharp increase of mortality (e.g. through famines, war, or collapse in public services). This type of

³⁰ See "Why mouse matters" (2010) National Human Genome Research Institute (<https://www.genome.gov/10001345/importance-of-mouse-genome/>)

³¹ See for example Coole (2013) and Mora (2014).

‘apocalyptic’ conceptualisation is akin to describing dangerous driving with reference to traffic collisions. It confusingly elides a particularly serious, end-point harm with the problem causing the harm, leading to predictable and serious evaluative mistakes. Most notably, it disregards the accumulation of risk and sub-catastrophe harms as though of no normative significance, while focusing on too late a stage to be useful.

Consider the analogous (if much simpler) problem of overfishing. The concept does not describe a situation where a fishery has already collapsed or a high value fish species has become extinct; it does not even describe a situation where there is a noticeable reduction in the amount of fish being caught. Fishers’ overall catch may remain the same or even increase due to increased fishing effort even as fish stocks become seriously compromised. Overfishing describes an underlying pattern of collective action that plays out over time: fishers catching fish at a faster rate than stocks are able to regenerate, progressively increasing the likelihood of collapse of fish stocks and the loss of fishers’ livelihoods.

As with overfishing and dangerous driving, overpopulation is much more clearly understood as a *pattern of risking*, rather than with reference to specific end-point harms.

Proposed conceptualisation

Overpopulation is best understood as a state of affairs where all of the following conditions obtain:

- (1) one or more collective goods required to satisfy minimum wellbeing requirements of a given population are being progressively strained, damaged or depleted (*downward resource trend*);
- (2) the downward resource trend is primarily or wholly caused by the ordinary use of the collective goods by the general public (*caused by collective actions*);
- (3) a reasonable extrapolation of the downward resource trend reveals a risk to the satisfaction of minimum wellbeing requirements that becomes serious within a period of time corresponding to the life expectancy of the youngest individuals within that society (*threshold of significance met within moral time horizon*).

Thus understood, overpopulation is about negative resource availability trends driven by people simply going about their lives that create serious risks within the lifetimes of children already born. Because the nature of the risks is cumulative, there is an inherent asymmetry: the risk is generated or made worse by people who are currently adults, but disproportionately borne by younger generations who have had no say in the response to the risks to which their creation contributes. This amounts to a serious moral hazard, and argues for a particularly robust justification if the catastrophic risks created by overpopulation are to be accepted and not acted upon.

This is a conservative conceptualisation of overpopulation which assumes a fairly minimalist standard of protection of human wellbeing and does not take account of the interests of future generations. It could be easily adapted to reflect a more expansive (and I would argue, more plausible) moral outlook, for example, replacing minimum wellbeing requirements with the higher standards reflecting the conditions for human flourishing; accord at least some normative force to collective goals such as a principle of progressive realisation, or at least non-retrogression, of fundamental human rights

protections; take the interests of non-human animals into account (for example, as a matter of environmental ethics); and expand the moral time horizon to take account of the interests of at least a few non-overlapping future generations.

Standard objections: the hope of a techno-fix and recategorization as over-consumption

Two lines of argument are standardly raised in objection to any conceptualisation of overpopulation as a GCR: one, that future technological developments may create additional resources such that population growth will not lead to real hardship, and second, that the ‘true’ problem is overconsumption.

There is great appeal in the proposition that a (cost-free) technological solution may be just around the corner. It plays right into our cognitive biases. We do not *want* to bear any costs to mitigate GCRs generally, let alone the embarrassing overpopulation or the kill-joy climate change GCRs. We think we will be richer in future than now, we do not much care for future or geographically distant people, and we are optimistic about our own chances. But the option of foregoing mitigation in hopes of a technological solution amounts to simply embracing the GCR and doing nothing. It is unclear that a technological solution is realistic; technological advances to date have greatly increased (rather than done anything to reduce) per capita consumption³², while automation breakthroughs may lead to catastrophic unemployment. And whether it is realistic or not, a technological solution is not *real*. We do not yet have effective technological solutions in place for any unsexy risk. Until such time as a technological solution actually exists and actually solves the problem, we simply have no grounds for *assuming* that it *will* exist and that it *will* solve it. It would be unconscionable to rely on a non-existing solution to a global catastrophic risk we contribute to, and which is disproportionately likely to impact people much more vulnerable than ourselves – children, the young and poor, and those not yet born.

I shall now turn to consumption. To avoid introducing further complexity, from this point on I shall refer to population growth and consumption from a global perspective.

Population growth is driven by procreation. Having a biological child will contribute to population growth whenever the birth rate exceeds the death rate. From a normative perspective, each child is born with the same rights as their parents, and consequently the same claims to the collective resources required to give effect to those rights. All human beings engage in at least subsistence level consumption, and virtually all either already consume more than required for survival or would if given the opportunity.

My proposed conceptualisation of overpopulation is neutral on whether it is caused by an increase in individual consumption or by an increase in the number of consumers. I could just as easily have labelled the collective action problem as “systemic overconsumption”; the description would not change. The ordinary use of collective goods by the general public in limb (2) of my definition includes both subsistence consumption and above-subsistence consumption. It is intended to reflect the typical use of basic resources by the general public, on realistic assumptions and known facts about the relevant population. It includes both direct and indirect consumption, for example taking account of the water an individual uses to drink, shower, cook and clean, but also the consumption of products that require water to produce. Whether ordinary use strains, damages or depletes collective goods depends on the combined impact of population size x average per capita consumption at any given point in time. Population growth will increase the overall impact on resources unless it is *fully* offset by a reduction in average per capita consumption. But logically it can *never* be fully offset. Population multiplies the number of consumers, while individual consumption can only ever be reduced marginally.

There is one important difference, however, between the risk contribution of population growth and of increases in per capita consumption. Population growth always entails an increase in **committed consumption**. The commitment corresponds to the minimum resources required to meet aggregate subsistence needs of all the individuals within the population through their natural lifetimes. The

³² See for example Magee and Devezas (2017) on Jevons paradox.

increase in commitment is long-term in nature, reflecting not only life expectancies but population momentum (Blue and Espenshade, 2011). Population growth takes decades to arrest, and can take well over a century to reverse via anti-natalist policies. Lest we fall victim to a moralistic fallacy, it is important to note that the committed nature of this type of consumption tells us nothing about its feasibility. In contrast, increases in per capita consumption are normally non-committed. Reversing these increases may be deeply unpopular from a political perspective and would almost certainly impair wellbeing, but if need be, a reversal is normally possible at short notice – for example, war time rations.

This has profound normative implications. Population growth reduces the leeway to respond to downward resource trends, in some cases dramatically so. It does something else, too. Even if a downward resource trend is wholly unrelated to population growth - say, if it was entirely due to localised overconsumption or to damage to natural resources from non-anthropogenic causes - population size would still matter. A larger population generally means more people in harm's way. Even where mitigation or adaptation are possible, it will almost certainly be costlier and more likely to fall short. In our full world, further population growth is always risky.

6. Conclusion

Many GCRs standardly regarded as existential are sexy. They are easy to visualise, are reasonably contained from an epistemic perspective, and we anticipate they would play out in an excitingly sudden (if horrifying) manner. Further adding to their sexiness, these risks typically have a technological cause or solution. Other GCRs risks are much more likely to crystallise, if in sub-existential ways, but are unsexily driven by collective action problems. These risks are epistemically all over the place and tend to both accrue and materialise in a creeping, gradual manner that is easy to miss until crystallisation is well underway. There is no sexy, cost-free technological solution available that will realistically do away with the need for awkward, unpopular behavioural and attitudinal adjustments; to assume that one will exist in future is indistinguishable from doing nothing about these grievous, cumulative hazards.

Our cognitive biases make it tempting to ignore any GCR, however sexy. But there is something more going on in relation to unsexy risks. If we accept these risks are deserving of serious and urgent engagement – as logically and morally we must - then we will need to move past the firmly ingrained growthist memes animating our social, political and economic arrangements. And this is a tall order. It rather complicates matters that the growthist ideas we need to reject seem compatible with the futurist perspective that tends to regard existential risks as far more important and urgent than sub-existential catastrophic outcomes. If anything, by filling the world to the brim with people, overpopulation seems to make extinction less likely.

Perhaps we can reconcile the normative and futurist perspectives by focusing on the areas of agreement. The concept of existential risk uncontroversially encompasses more than extinction risk. Normative and futurist perspectives are concerned with safeguarding the prospects for future societal progress and human wellbeing as contained within the civilizational *acquis*, including its more subtle elements, such as social cohesion and trust, and well-functioning governments, which may be at particular risk from the progressive crystallisation of unsexy GCRs. Most if not all unsexy GCRs hold a probability, however slim, of an existential outcome; climate change certainly holds a substantial existential risk component. That alone should mean unsexy GCRs are urgent and serious. But there is more. Unsexy risks are systemic in a way that sexy risks typically are not. Our efforts at producing food and livelihoods for ever more people are driving climate change, freshwater depletion, soil degradation, overfishing and biodiversity loss, all of which are threats to food production and livelihoods. We seem stuck in something of a vicious circle with bewildering and as of yet poorly understood feedback loops. The existential risk arising from the interconnectedness of so many GCRs and possible knock-on effects may be much more serious than we realise, and may at any rate increase our vulnerability to other, sexier GCRs.

We have been running our societies as though part of a reckless experiment in unfunded expansion at the planetary level. We are taking unjustifiably high risks with our future wellbeing, and imposing even greater risks onto younger and future generations. Scaling back our procreative and lifestyle aspirations would represent an undeniable cost, but cost-free mitigation is unrealistic. We must give up on some of our preferences to secure that which we cannot live without.

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