

Political Choices:

The effect of additional parties on voter decision-making in
the UK



Keith Philip O' Brien

Department of Experimental Psychology

University College London

Thesis submitted for the degree of

Doctor of Philosophy (Ph.D.)

September 2016

-This page intentionally left blank-

Declaration

I declare that this thesis was composed by myself, that the work contained herein is my own except where explicitly stated otherwise in the text. This work has not been submitted for any other degree or professional qualification except as specified.

Signature: _____

London, September 15th, 2016

(Keith O' Brien, BSc. MSc.)

-This page intentionally left blank-

Abstract

This thesis explores the effects of additional parties on the decision-making processes of UK voters in lab-based studies. Specifically, it is concerned with the idea that intrinsic aspects of the democratic system, such as the inclusion of additional parties in an election, can reduce the likelihood of ‘*correct voting*’ (a voter choosing the candidate whose policies best match their own policy preferences).

Firstly, how correct voting is affected by increasing choice set size (i.e. the number of candidates available to choose between). We also examine how a suspected partisan heuristic, ‘*party label*’, affects rates of correct voting. We conduct four experiments using dynamic information environments, and materials from the five main UK political parties. Results show increasing choice set size negatively predicts voters’ ability to choose the best available option in the choice set. Results for party label are mixed, but strongly suggest party label acts as a beneficial aid to correct voting and may act to offset the effects of increasing choice set size.

Secondly, we analyse the patterns of information processing from the previous experiments, creating novel metrics of heuristic processing. We find party label and choice set size affect voters’ information processing, namely the amount and equality of search between alternatives.

Finally, we examine the effect of additional alternatives on political decision-making via the established ‘context effects’ paradigm. We test the ‘*attraction*’, ‘*similarity*’, ‘*compromise*’, and ‘*phantom*’ effects in a series of fictional and more realistic political scenarios, culminating in a field study during the 2015 UK General Election. We find evidence for the attraction and similarity’ effects, but inconsistent evidence for other context effects; and that asymmetric dominance patterns exist in a minority of UK voters’ political preferences (in contrast to a previous finding in the U.S).

-This page intentionally left blank-

To my mother, Frankie.

To my grandmother, Marie.

Whom both got me here.

What more needs to be said?

Acknowledgements

There is a risk of being formulaic in acknowledgements. The list of people one should thank in entirety would fill this thesis twice-over, and I apologise for not listing each soul kind enough to help me on this tasking journey.

To Dr. Adam Harris, who is a saint. Adam inspires respect and adoration; never have I been more humbled by a person's patience in my failings, or motivated by their praise. I have been better for his unyielding morality, his forensic research skills, his frenetic creativity, and his enthusiasm for *everything*. He convinced me on cricket. I am lucky to have him as my supervisor.

To Dr. David Lagnado and Pia Horbacki, who accepted a physiologist into UCL's Cognitive & Decision Sciences MSc. Thank you for the opportunities, from London to Mumbai, and your inescapable enthusiasm which was the final confirmation that my heart and mind belonged in UCL.

To those nameless folk on the IMPACT Award committee, who granted me partial funding for the duration of my Ph.D. To Final Mile Pvt. Ltd., in particular Ram Prasad, for their constant friendship and consulting opportunities at various points. Similarly, thank you to Steve Martin and Steen Tjarks, and all others who offered work during my PhD. You kept the lights on.

To all those of Room 201, for four years of camaraderie, hijinks, and help: Christos Bechlivanidis, Neil Bramley, Sarah Jenkins, and Paul Troop. In particular, Sarah Smith, for her friendship, warmth, and inspirational attitude to life, love, and whatever comes after both.

To Prof. Alastair McClelland, who allowed me to demonstrate statistics to first-year students for three years, and made me a far better statistician. I enjoyed every minute wandering the cubicles and will miss it, and the students, dearly.

To Dr. Stephanie Lazarro and baby Jack, whose timely appearance allowed me to achieve my dream of lecturing at university. Thank you for your advice, long emails, drop-in visits, adorable picture opportunities, and friendship. Memories I will treasure.

To Luigi and Hasan of Café Xclnt, who were partial credit providers when I didn't have enough money for coffee; who endured my constant requests for pound coins (and even started to bring in extra) for participants. I'm glad you finally trust me with a real plate and cutlery.

To John Draper, the red-sequin-shirted gentleman. John will never know how grateful I am for his open door, and his constant help in just about everything; data losses, funding, job advice, the loan of his car, boisterous Xmas parties, etc. John's ceaseless generosity, and dedication to student/staff wellbeing, is inspirational. Thank you for your friendship.

To Meena Patel, for her Spotify playlists that kept me sane during long days of writing, and for encouraging me to grow a beard. I'm slowly improving under her 'points-based reward system'.

To Dr. Bartley Rock, Dr. Jens Madsen, Dr. Laura de Molieré, Dr. (to-be) Toby Pilditch and Mr. Marcus Roberts; friends who have been there to listen, make me laugh, and launch me to further heights. I am deeply grateful.

To my parents- my mother and grandmother. My education cost you money and time apart from your son (too much of both). I hope you are proud.

Finally, to my failings, demons, and mistakes; named and unnamed: thank you. I am stronger for you, and I have endured regardless. At times I was unable to leave my bed, now each day is filled with determination and purpose.

"Strength and growth come only through continuous effort and struggle".

- Napoleon Hill (author)

Foreword

A foreword to a PhD thesis might be considered the height of self-importance, yet given the political climate in which it was conducted and written, and its topic, it seems remiss of me to not give some sort of personal comment.

When I first came to UCL in 2011, I was engaged by the UK Labour Party to assist the London Mayoral and Assembly election campaigns for 2012. It was a handy earner and gave me hands-on experience of UK politics in and around London. I listened to Conservatives, UKIPers, Liberal Democrats, Greens, and of course Labour voters; seeking as a budding psychologist to understand their voting choices, but also to strategically influence them. I grew fascinated with the idea that there was a genuine disconnect between *who* people voted for and a voter's actual policy preferences. I wondered whether such a disconnect resulted in governments and policies that do not reflect the preferences of society.

This PhD was conducted against the backdrop of a Liberal Democrat collapse and a UKIP rise leading up to the 2015 UK General Election, fuelled by a working-class switch to UKIP. A recurring question in the political commentary was: why would working-class voters vote for UKIP or Conservatives, parties that traditionally do not align with working-class preferences and priorities?

On June 23rd 2016, during this thesis's completion, the UK voted 52 percent to 48 percent to leave the European Union, despite all the political parties (except UKIP), and various experts, advocating for a Remain vote. By June 25th 2016, news outlets were carrying stories of 'Leavers' experiencing 'buyer's remorse', while the British pound weakened significantly.

This thesis is concerned with whether voters' make correct decisions, as based on their own political preferences, and is agnostic as to whether those preferences themselves are 'good' or 'bad'. Oh, if I could have my time again to answer such questions.

- *Keith O' Brien, August 2016*

Published articles

The chapters in this thesis are based on the following articles (to date):

Chapter 2:

O'Brien, K., & Harris, A. J. L. (2014). Two is company, three is a crowd: Party labels and number of candidates as determinants of 'incorrect' vote choice. In P. Bello, M. Guarini, M. McShane, & B. Scassellati (Eds.), *Proceedings of the 36th Annual Conference of the Cognitive Science Society* (pp. 2705-2710). Austin, TX: Cognitive Science Society.

Table of Contents

Declaration.....	3
Abstract.....	5
Acknowledgements.....	8
Foreword.....	10
Published articles.....	10
Table of Contents.....	12
List of Figures.....	15
List of Tables.....	16
Chapter 1 : Introduction.....	18
1.1. Introduction to ‘Political Psychology’	20
1.2. Why does <i>political</i> judgment & decision-making matter?.....	22
1.3. ‘Correct’ Voting.....	25
1.4. Cultural Differences in Correct Voting.....	28
1.5. The cognitive psychology of additional options	31
1.5.1. Information Processing & Heuristics.....	33
1.5.2. Preference violations & ‘context effects’	36
1.6. Summary and Overview of Empirical Chapters	41
Chapter 2 : Correct Voting in dynamic voting environments.....	42
2.1. Background	42
2.1.1. Dynamic Processing Tracing.....	44
2.1.2. Partisanship.....	45
2.1.3. Directional vs. Proximal Models (of Correct Voting):.....	47

2.1.4.	Decision difficulty, confidence, and alternative similarity.....	51
2.2.	Experiment 1.....	52
2.3.	Experiment 2.....	69
2.4.	Experiment 3.....	79
2.5.	Experiment 4.....	91
2.6.	General Discussion.....	111
Chapter 3 :	Information processing in vote choices.....	114
3.1.	Introduction.....	114
3.1.1.	Heuristics & Processing.....	115
3.1.2.	Assessing heuristics & information processing via process tracing.....	118
3.2.	Research Questions.....	122
3.3.	Methods.....	124
3.4.	Results.....	132
3.4.1.	Experiments 1-3: Meta-Analysis.....	132
3.4.2.	Discussion: Experiments 1-3.....	143
3.4.3.	Experiment 4.....	149
3.4.4.	Discussion: Experiment 4.....	158
3.5.	General Discussion.....	161
Chapter 4 :	Context Effects in Political Domains.....	168
4.1.	Introduction.....	168
4.1.1.	Context Effects in Politics.....	169
4.2.	Experiment 5: Context Effects in Political Scenarios.....	173
4.3.	Experiment 6: Context Effects in Fictional Political Scenarios.....	188
4.4.	Experiment 7: Context Effects and ‘Desirability’.....	199

4.5. Experiment 8: Attraction Effects in UK General Election 2015.....	209
4.6. General Discussion.....	224
Chapter 5 : Conclusion	231
5.1. Summary of Main Findings	231
5.2. Future Directions.....	235
5.2.1. Correct Voting	235
5.2.2. Context Effects	238
5.2.3. Heuristics.....	241
5.3. Conclusion	243
References	245
Appendix A	271
Appendix B	306
Appendix C	312

List of Figures

Figure 1.1: Illustration of alternative placement for each context effect.....	37
Figure 2.1: Example of DPTE ‘flow’ screen in PL ^P condition.	54
Figure 2.2: Vote Choice by candidate condition.....	61
Figure 2.4: % Correct Voting by condition.....	63
Figure 2.5: Post-Ballot Measures by Condition. Bars are +/- SD.	64
Figure 2.5: % Vote Choice by candidate condition	70
Figure 2.6: % CV rates by condition	72
Figure 2.7: Post-Ballot Measures by condition. Bars are +/- SD.	73
Figure 2.8: % Vote choice by candidate condition	82
Figure 2.9: % CV rates by condition	83
Figure 2.10: Post-Ballot Measures by condition. Bars +/- SD.	85
Figure 2.11: % Vote Choice by candidate condition	102
Figure 2.12: % CV by condition.....	104
Figure 2.13: Post-Ballot Measures by Condition. Bars are +/- SD.	105
Figure 3.1: Items Accessed by condition. N= 308.	147
Figure 3.2: Preferences for Chosen using IA. N=308.	133
Figure 3.3: Average Duration (seconds) by TB	147
Figure 3.4: Preference for chosen using AD. N=308.	134
Figure 3.5: IA(S) by PL and NOC. N=308.	147
Figure 3.6: IA(F) by PL and NOC. N=308.	136
Figure 3.7: AD(S) by PL and NOC.	137
Figure 3.8: AD(F) by PL and NOC.	137
Figure 3.9: Items Accessed over TB (by PL & NOC)	150
Figure 3.10: Preference Measures (IA) over TB	150
Figure 3.11: Average Duration over TB (by PL & NOC)	150
Figure 3.12: Preference Measures (AD) over TB	150
Figure 4.1: Placement of UK parties on Left-Right scale by GB population (darker bar).	172
Figure 4.2: Average Lab/Con/Lib Dem/UKIP voter self-rating on Left-Right scale	172
Figure 4.3-7: Option stimuli plotted for each context effect (Exp 5).....	176
Figure 4.8-11: Option stimuli per context effect scenario (Exp 6)..	204
Figure 4.12: Option stimuli plotted for each context effect (Exp 7)	226

List of Tables

Table 2.1: Candidate Names, Party Affiliation, and Party Label.....	55
Table 2.2: Post-Ballot Box Questionnaire; text and scale points.....	59
Table 2.3: Attribute Text, and scores for candidates [in parentheses].....	56
Table 2.4: Logistic Regression results of Party Label and Number of Candidates on CV rates. (N=120).....	62
Table 2.5: Logistic Regression results of ‘distance’ between ‘best’ and ‘next best’ options on CV rates.(N=120).....	71
Table 2.6: Logistic Regression results of Party Label and Number of Candidates on CV rates. (N= 93).....	83
Table 2.7: Logistic Regression results of ‘distance’ between ‘best’ and ‘next best’ options on CV rates. (N= 93).....	74
Table 2.8: Logistic Regression results of Party Label and Number of Candidates on CV rates.....	83
Table 2.9: Logistic Regression results of ‘distance’ between ‘best’ and ‘next best’ options on CV rates.....	86
Table 2.10: Candidate Names, Party Affiliation, and Party Label.....	94
Table 2.11: Attribute Text, and scores for candidates [party/name/pronoun in parentheses].....	95
Table 2.12: Logistic Regression results of Party Label and Number of Candidates on CV rates.....	103
Table 2.13: Logistic Regression results of ‘distance’ between ‘best’ and ‘next best’ options on CV rates.....	106
Table 3.1: Logistic Regression results of main effects, controlling for IA and AD, on CV rates. (N=308).....	141
Table 3.2: Logistic Regression model including main effects, IA(S), and AD(s), for CV rates. (N=308).....	141
Table 3.3: Logistic Regression results of main effects, controlling for IA(F) and AD(F), on CV rates. (N=308).....	142
Table 3.4: Logistic Regression results of main effects, IA, and AD, on CV rates. (N=117).....	155
Table 3.5: Logistic Regression results of main effects, IA(S2), and AD(S2), on CV rates. (N=117).....	156
Table 3.6: Logistic Regression results of main effects, IA(F) and AD(F), on CV rates. (N=117).....	156
Table 4.1: Option stimuli for each attribute, per task (Experiment 1).....	175
Table 4.2: Choice Proportions for the Attraction Effect, per condition. Total counts in parentheses.....	178
Table 4.3: Choice Proportions for the Similarity Effect, per condition.....	179
Table 4.4: Choice Proportions for the Compromise Effect, per condition.....	180
Table 4.5: Choice Proportions for the Phantom Effect, per condition.....	181
Table 4.6: Planetary Scenarios; attribute values per options per condition.....	190
Table 4.7: Attraction Effect; Options per choice-set condition, total counts, and percentages.....	193
Table 4.8: Similarity Effect; Options per choice-set condition, total counts, and percentages.....	193
Table 4.9: Compromise Effect; Options per choice-set condition, total counts, and percentages.....	194
Table 4.10: Attribute stimuli values for each option, per context effect scenario.....	202
Table 4.11: Attraction Effect; Options per choice-set condition, total counts and % share.....	204
Table 4.12: Similarity Effect; Options per choice-set condition, total counts and % share.....	205
Table 4.13: Compromise Effect; Options per choice-set condition, total counts and % share.....	205
Table 4.14: Phantom Effect; Options per choice-set condition, total counts and % share.....	206

Table 4.15: Overall mean Desirability Ratings per issue per Party, and Standard Deviations (N=226).	214
Table 4.16: Vote Choice per Perceived Asymmetric Dominance Structure. % share of structure in parentheses.	216
Table 4.17: Binomial Logistical Regression Analyses of Choice.....	218

Chapter 1: Introduction

“The best argument against democracy is a five-minute conversation with the average voter.”

- *Anonymous¹*

What is it to ‘vote’? A beguilingly simple question about an act that is considered so intrinsic, and commonplace, to the western world and its method of democratic self-governance. Democracy asks of us a simple task: choose the people, representing the policies, which you believe are best for you and (ideally) society. The physical act of voting is, in the main, effortless: requiring a few scratches of a pencil, or a press of some buttons, to indicate your choice. Such small moments are what determine the future; our political choices, and those of billions of others in democracies world-wide, fundamentally dictate the lives we live, the societies we create and maintain, and the people that lead those governments charged with these same responsibilities. To vote is to craft a shared vision and future. All this, in a scratch of a pencil, every few years.

As is the way with things that seem simple, delve a little deeper and one often finds profound complexity. The ‘simple act’ of voting is truthfully, anything but. A person casting a vote is the culmination of countless processes: the accumulation and formation of beliefs and values; the state of current affairs; input from social groups, the media, and political leaders; the argumentation and persuasion of political party campaigns and rhetoric; considerations of strategic voting tactics given the electoral context and system (e.g. first-past-the-post, or proportional representation); and many more. Democracy, at the most fundamental level, begins in the minds and choices of every citizen and manifests itself through the aggregate behaviour of all individuals in society.

As such, one would presume that the field of psychology would have much to say about the judgments and decisions voters (i.e. people) make in politics. Surely there is no richer field for research and exploration for understanding human behaviour ‘in the field’, than politics? Surprisingly, until the last two decades, the opposite seems mostly true, with the general sentiment being that genuine interdisciplinary research between

¹ Often misattributed to Winston Churchill, debunked in *Churchill by Himself: The Definitive Collection of Quotations* (Langworth, 2011). First appeared attributed to Churchill online [in 1992](#).

the fields of political science and psychology has been lacking (Druckman, Kuklinski, & Sigelman, 2009). In the last decade, interest and interdisciplinary research between the two fields has led to a new field emerging, aptly termed '*political psychology*', which we introduce below to familiarise the reader with the field, and also to establish the central theme for this thesis: the exploration of voters' psychological processes in the democratic system.

There is no shortage of potential questions to be asked and explored in politics as psychologists (e.g. examining the popularity of Donald Trump in America²), but this thesis is concerned with a simple one: do voters chose well? Or more specifically, do voters choose '*correctly*': based on their needs, preferences, and desires? Common opinion, held not least by the historical goliath whose wry quotation opens this chapter, suggests not. In such cases, why do voters not choose '*correctly*'; and what factors may help or hinder them?

This is a question surprisingly overlooked in research in political science in favour of *who* people vote for, and why people *do* (not) turn out to vote. Yet in psychology, such questions of *how* choices are made, the accuracy of our judgments, or our ability to maximise benefit given individual/group goals, are at the heart of fields such as judgment and decision-making, and consumer psychology. For the better half of a century.

These questions lie at the core of this thesis and are present throughout all its chapters. We investigate these using two differing paradigms: one rooted firmly in 'information processing' approaches to voter decision-making (Lau & Redlawsk, 2006). The other, via consumer psychology, examines how violations of rational preference arise from contextual changes with the addition of more options (Huber & Payne, 1982; Tsetos, Usher, & Chater, 2010).

To pre-empt the conclusions of this thesis, we find evidence that increasing the number of additional parties being considered by voters as part of their 'choice set', dramatically affects their ability to choose an option that best matches their own political preferences. While, as with all science, our results are caveated and more research is recommended, our findings challenge a core assumption of democracy: providing voters with more choices negatively impacts their ability to vote in line with their own preferences. This is an open challenge to policy-makers, democrats, and psychologists; to seek ways of either a) changing the democratic system, or b)

² See Jonathan Haidt's (2012) work on the moral psychology of conservatism in the USA.

providing novel ways of aiding voters in their decision-making as to make the best choices possible, based on their own preferences, values, and beliefs.

The last ‘great change’ to modern democracy was the introduction of the secret ballot, a change now so commonplace as to rarely be questioned. However, studies have demonstrated increased voter participation by re-introducing social norms and making local voting history information available (Green & Gerber, 2010), leading many to argue that the secret ballot has been the major factor contributing to the fall in voter turnout in the late 19th and early 20th centuries (Issenberg, 2012)³.

While we cannot claim our findings necessitate a change in how our democratic system(s) should function, we argue they raise fundamental questions that should be addressed. We examine the only requirement of democracy itself: a choice, a vote.

1.1. Introduction to ‘Political Psychology’

‘Political scientists’ and the field of political science as a social science, can be traced back to the times of Plato (427–347 BC), Xenophon (c. 430–354 BC), and Aristotle (‘The Father of Political Science’; 384–322 BC), albeit in its earliest form of ‘political philosophy’. The foundations of modern political science, and its aim to model itself after the ‘physical sciences’ (Lipsett, 1969), emerged during the Progressive Era in the United States (1890s-1920s). Over the last century political science has “*borrow[ed] prolifically from other disciplines, including psychology, cognitive science, economics, statistics, sociology, geography, anthropology, philosophy*” etc. (Druckman et al., 2009, p. 486.), evolving from socio-economic models of explaining (and predicting) human political behaviour, to more cognate models (Cutler, 2002). Yet, only in the last two decades has ‘*political psychology*’ grown from a small subset of where the fringes of political science, psychology, and sociology, meet into a field of its own right. The first *Oxford handbook of Political Psychology* was published in 2003 (2nd Ed, 2013), and the field now boasts its own landmark journal, the ‘*Journal of Political Psychology*’⁴.

³ “Abolish the Secret Ballot”, Sasha Issenberg. *The Atlantic*, July/August 2012

⁴ [http://onlinelibrary.wiley.com/journal/10.1111/\(ISSN\)1467-9221](http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1467-9221)

In general, political psychology can be divided into three areas: how individual political actors make political decisions (citizens or politicians) through studying individual preferences; how voters search for information, how they make evaluations, judgments, and (eventually) decisions; and a second domain regarding how institutions of politics make decisions. We are interested in the first two areas.

The initial use of psychological constructs from social psychology such as ‘*attitudes*’ and ‘*motivation*’, has provided a deeper understanding of voter behaviour than gross ‘ideology’ or socio-demographic perspectives (Cutler, 2002). Research has explored the foundations of political attitudes via ‘*moral psychology*’ (Graham, Haidt & Nozok, 2009; Greene & Haidt, 2002; Haidt, 2001; 2007; 2013), and the formation of ‘*voter preference*’ (Druckman & Lupia 2000; Druckman 2004). There is even evidence that it is possible to predict people’s dating preference from their political orientation (Klofstad, McDermott & Hatemi, 2012).

More recently, political psychologists have started to examine political behaviour through the lens of cognitive psychology and cognitive neuroscience (Lakoff, 2008; Western, 2008), examining how political campaigns use emotion to influence attitude formation and decision-making (Ridout & Searles 2011), and how personality traits predict vote choice (Barbaranelli, Caprara, Vecchione, Fraley, 2007; Schoen & Schumann, 2007).

Of particular interest are judgment & decision-theoretic (JDT) approaches used to understand political behaviour, in particular looking at ‘*voter choice*’ in elections. Lodge, Steenbergen, and Brau (1995) were some of the earliest to examine how voters evaluate candidates (see also: Funk, 1999); with others investigating and how ‘*priming*’ and ‘*framing*’ of attributes and issues (e.g. by the media; Ha, 2011) affects voter processing of candidate evaluations (Druckman, Jacobs, & Ostermeier, 2004).

There has also been an upsurge of interest in the role of emotion in the cognitive processes of judgment (Clore & Huntsinger, 2007), with researchers investigating the effect of emotion on vote choice (i.e. anxiety: Ladd & Lenz, 2008; 2011⁵), and voter participation (Valentino, 2008; 2011). Miller (2011) reviewed the view of emotion in political science as being an ‘irrational’ influence on the uneducated masses (i.e. via the use of persuasive, affectively laden, rhetoric), arguing that those highest in political knowledge and information

⁵ For a critique see Brader (2011).

(political ‘*sophisticates*’) are more likely to experience emotion in reaction to politics and allow it to influence their political behaviour.

Despite all these streams of research, this new field is still fraught with fundamental issues arising from its (initially) one-way appropriation of concepts and discussion, from psychology to political science, by political scientists whom have “*mischaracterized concepts and used them in casual and ad hoc or post hoc ways, limiting both theoretical and empirical progress and undermining any realistic prospect of contributing back to psychology*” (Druckman & Kuklinski, 2009, p. 498). This according to Druckman and Kuklinski (2009) is because “*political scientists have [in]sufficiently immersed themselves in the relevant psychological literatures on which they have drawn*” (p. 498).

While not untrue, this seems a harsh judgment of political scientists, and it seems unfair to place such blame entirely on political science as a field. There must be a pro-active involvement from psychologists in these disciplines- not least to ensure the theories and constructs that have arisen in psychology are correctly understood outside of our discipline, but also to ensure our models and understanding of human behaviour are borne out in real-life contexts. This thesis embraces this sentiment insofar as practicable, aiming to contribute to the greater shared understanding of human behaviour, particularly in the political domain.

1.2. Why does *political* judgment & decision-making matter?

“Nobody would say, ‘I’m voting for this guy because he’s got the stronger chin,’ but that, in fact, is partly what happens.”

- **Daniel Kahneman⁶**

Historically, there has been little differentiation between ‘judgment’ and ‘decision-making’, with the two often conflated (Slovic & Lichtenstein, 1971; Gilovich & Griffin, 2010). This is understandable- a decision-maker *should* choose an alternative (i.e. candidate, or party) if it is the most preferred on a set of criteria. Yet, “***choosing one alternative from a set can invoke different psychological processes than judging alternatives***” (Johnson & Russo, 1984, p. 549; emphasis in original). A judgement constitutes the evaluation of a single (or multiple) entities along one or more dimensions (e.g. cost, efficiency, weight, size), while a decision involves

⁶ Interview: *The Truth About How We Think*. Gallop, Inc. [20th March, 2012](#).

an active choice between two or more alternatives that have, presumably, been evaluated on differing dimensions (e.g. *what* gym to go to, *whom* to marry, *which* candidate will deliver on healthcare pledges). As such, decisions also involve beliefs about the outcomes associated with each alternative. For example, one may prefer a candidate on all policies, but believe they may have a low probability of electoral success, and opt for a lesser preferred candidate with a higher perceived likelihood of electoral victory.

Judgment, and decisions, lie at the heart of all politics. Easton (1953) defines politics as the ‘authoritative allocation of values’, arguing any study of politics must include how those authoritative allocations are made. In modern societies, in the main, this is through systems of representative democracy.

Representative democracy relies on the assumption that voters vote in line with their preferences and/or best interests; in order to empower a relatively small number of people to reflect and design society in line with those presumed preferences. If people are not accurate in their vote-decisions, the quality of democratic representation provided by the electoral system, and the legitimacy of elected governments and any decisions they make, are in question (see also, Lau, Patel, Fahmy, & Kaufman, 2013). In majoritarian democracies where marginal vote differences determine one party’s overall control of the government (e.g., UK, USA), inaccurate voting can lead to governments that are not just unrepresentative but opposed to the preferences of broad swathes (or even the majority) of the public. Voting is the primary way that citizens influence their government, yet even freely chosen decisions can be misguided. The democratic system is founded on the notion that on an aggregate level, votes for a candidate or party endorse policies and values that determine the future of the nation, and distribution of resources amongst its populace. It assumes that voters are rational, unbiased, and approximate the best decision possible themselves based on their preferences and goals (and/or societal goals).

Yet psychology has shown over the last few decades that humans are not perfectly rational beings (Gigerenzer, 2015), and are prone to biased and sub-optimal decision-making (Kahneman, Slovic, & Tversky, 1982). Counter-intuitively, increasing available information can lead to inaccurate decisions, but greater confidence in the decisions (Hall, Ariss, & Todorov, 2007). We are prone to violations of rationality just by adding an extra option to a binary choice (Huber, Payne, & Puto, 1982; Busemeyer, Barkan, Mehta, & Chaturvedi, 2007). People engage in ‘*confirmatory screening*’ (Nickerson, 1998), leading to poor decisions by neglecting otherwise useful information. We even engage in motivated reasoning to support our political

viewpoints leading to “*biased decision-making*” (Lodge & Taber, 2000, p. 186; Taber & Lodge, 2006), often strengthening our beliefs in the face of disconfirming information (Redlawsk, Civettini, & Emmerson, 2010).

Yet these are not the only ways research has shown voters can be biased when making political decisions: voters can even be influenced at the point of voting. Badawood & Wood (2012) have shown that there existed a clear bias in the 2010 London local elections for names that were closer the top of the paper, a classic ‘*primacy effect*’. As do Meredith & Salant (2013) in California’s local council and school board elections. Johnson & Miles (2011) argue that primacy effects for alphabetical listings disappear when using real UK parties in a general election setting, they predict primacy effects should appear in ‘lower-order’ elections, such as UK Local Elections, where multiple candidates appear under the same partisan banner. Johnson & Miles (2011) suggest primacy effects might arise because more positive arguments are generated in their favour by virtue of being first. Augenblick & Nichelson (2016) offer another explanation, ‘*choice fatigue*’, finding conducting multiple decisions before a given contest significantly increases the tendency to abstain or rely on decision shortcuts (‘*heuristics*’), such as: voting for the status quo (due to the ‘*incumbency bias*’, or a ‘*recognition heuristic*’), or the first listed candidate.

Even voter turnout levels display inherent voter irrationality (Downs, 1957). While it may seem rational to vote, one’s chances of exerting a meaningful influence on the outcome are usually statistically unlikely (dependent on actual voter turnout). Therefore, the rational option is to minimize one’s costs associated with the act of voting, as they are more likely to outweigh the expected benefits⁷. This is what is known as ‘*Downs paradox*’ (Downs, 1957); a standard problem for ‘*public choice*’ theory (for a conflicting view, see: Aldrich, 1993). Yet people vote, and they do so in the majority in 158 of 269 countries (Pintor, Gratschew, & Sullivan, 2002).

Given these findings about the fundamental nature of human decision-making, what implications exist for democracy? As the fundamental nature of representative democracy encourages the proliferation of differing political options, does the number of options a voter faces at the ballot box (i.e. candidates, parties, referenda

⁷ “*Is it irrational to vote?*”, The Economist, 23/10/2012.

<http://www.economist.com/blogs/democracyinamerica/2012/10/presidential-election-0>

policies) help them choose (e.g. by increasing the variety of options available), or is there such a thing as ‘too much choice’ (Haynes, 2009; Iyengar & Kamenica, 2010)?

Do voters ‘get it right’? And what, or when, is a vote ‘correct’?

1.3. ‘Correct’ Voting

Lau and Redlawsk (1997; 2006) are the main contributors to the political decision-making literature, positing an information-processing approach to voter decision-making. Following in the tradition of Simon (1972; 1982) and his work on ‘bounded rationality’, Lau and Redlawsk (2013) view voters as “*limited information processors*” (p. 136) who are unable to meet the computational requirements as expected by rational choice theory (Anderson, 1983; Gilovich & Griffin, 2010). The limitations of memory, both in working memory capacity and long-term memory, means that information is unlikely to be perfectly processed, consolidated, and retrieved, and as such, political knowledge and preferences are also unlikely to be fixed and available at any given point (Weber & Johnson, 2009; Zaller & Feldman, 1992). For all of these reasons, voters could be liable to err when making a vote-decision.

Lau and Redlawsk (1997; 2001; 2006) have explored this concept, proposing that the accuracy of voter decision-making can be considered in terms of the degree to which voters choose the candidate whose policies best represent their preferences – a ‘*correct vote*’ (Lau & Redlawsk, 1997). Lau and Redlawsk (1997; 2001) operationalized CV using *dynamic information boards*⁸ in two differing ways. The first, by measuring the rate of choice switching voters engaged in, from a chosen candidate to an alternative in a mock US Presidential election (or primary). The second, by constructing a ‘*normative naïve*’ measure of voter preferences. In the former, after making their initial vote decision for a candidate, voters were given additional time and all possible information about the candidates in the race, as to mimic having ‘perfect information’ (Lau & Redlawsk, 1997), with a ‘correct vote’ ascribed if voters stayed with their original choice.

In the latter normative naïve measure, the assumption is that all voters attempt to vote correctly given the information available (naïve decision-making). Lau and Redlawsk (1997) constructed an objective determination of whom voters *should* have voted for given their own political preferences, and the information

⁸ We cover dynamic information processing board methods in more detail in Chapter 2, as it forms a key part of our experimental methodology. See Lau & Redlawsk (2001, 2006) for an in-depth discussion.

to which they were exposed (through intentional access), using the distance between the artificial candidates' positions (compiled via expert judgments: Lau & Redlawsk, 1997; 2001) and participants' self-reported positions, on various policy/values scales. This model assumes that voters average the overall favourableness (or 'utility') of the information for each candidate, and choose the candidate with the highest evaluation. In essence, following the *weighted additive rule* of decision-making (Payne, Bettman, & Johnson, 1993), and is the method assumed by many popular models of the vote decision (e.g., Fiorina 1981; Kelley & Mirer, 1974; Lodge, McGraw, & Stroh, 1989; Lodge, Steenbergen, and Brau, 1995).

Lau and Redlawsk (1997) argue that as their measure significantly predicted sixty-six percent of correct vote choices (rate of non-switching after learning all information about the candidates under unlimited time), this measure did "*almost as well in determining correct voting decisions as did voters themselves*" (p. 590). Later, Lau and Redlawsk (2008) define correct voting (CV) as "*the likelihood that citizens, under conditions of incomplete information, ... vote for the candidate or party they would have voted for had they had full information about those same candidates and/or parties*" (p. 396). We raise two issues here with such an approach to CV.

Firstly, it is difficult to ascertain under Lau and Redlawsk's (1997) method of assessing 'perfect information CV', if voters stay with a chosen alternative because it *is* the correct choice, or because positive evaluation of the chosen option increases as a result of being chosen (*choice-supportive bias*; Benney & Henkel, 2006). Alternatively, voters may switch in order to reduce uncertainty arising from being asked to reconsider their choice and any foregone hedonic utility (Brehm, 1956; Liebermann, Ochsner, Gilbert, & Schacter, 2001). There is no evidence on how voters' re-engage with the information in Lau and Redlawsk's (1997) paradigm; participants may seek to reduce dissonance by searching for (dis)confirmatory information, though research suggests voters generally reduce dissonance arising from challenges to vote choices/intentions by engaging in confirmatory information search, bolstering support for their candidate (Redlawsk, Civettini, & Emmerson, 2010). Further issues around preference retrieval are elucidated by research on '*choice blindness*' (Hall, Johansson, & Strandberg, 2012). The authors show that for moral and political preferences (which are considered strongly held attitudes and beliefs; Maio & Haddock, 2010), the majority of people do not recognize when their moral and political choices have been reversed, and in fact offer plenty of introspective justifications for their apparent choices. It is difficult to say which choice (the initial or subsequent) is the 'correct' choice.

Therefore, directly asking participants to consider their vote choices in retrospect is possibly not the best measure of how accurately they voted given their preferences.

Secondly, using a measure of CV that considers only the information that participants accessed ignores whether they could have accessed more (or all) of the information and didn't (intentionally or otherwise), limiting access to potentially diagnostic information. Indeed, this is the naïve assumption of Lau and Redlawsk's (1997) measure, that participants try to vote correctly given available information.

We conceptualise a normative naïve measure of CV that differs operationally from the Lau and Redlawsk (1997) but stays more closely to the original conception. We base our normative naïve measure on all the information present for each candidate's position on various policy stances, and those of the voter's self-reported stances, regardless of whether that item was accessed for a candidate or not. Our measure is normatively stricter than Lau and Redlawsk's (1997; 2006; 2008), but we argue better approximates decisions made under conditions of perfect information, and is a better benchmark of accuracy. There are other practical methodological issues in the CV framework (e.g. *directional* versus *proximal* distance models), and we discuss these in more detail, and where we diverge from Lau and Redlawsk (1997; 2006), in Chapter 2. We also discuss more general limitations and considerations of the correct voting framework in the General Discussion.

There are certain known factors which influence CV rates. Research conducted in the USA suggests greater ability (political knowledge, or 'political sophistication'; Luskin, 1990), experience (age; Marsiske & Margrett, 2006), and effort (the motivation to vote correctly) are positively associated with higher rates of CV (Lau & Redlawsk, 2006). Lau, Patel, Fahmy, & Kaufman (2013) find in a comparison of CV across thirty-three democracies, that information availability (as measured by media density), the distinctiveness of party ideology (choice clarity), and majoritarian or presidential style democracies, were all positively predictive of increased CV.

Correct voting is not an idle consideration: it an important qualification to views of democratic health, as typically measured by raw voter turnout. Lau et al. (2013) argue that the rate of electors voting correctly is a higher normative standard than turnout or voter accessibility by which to judge the health of democracies, as even freely chosen decisions can be misguided. As voting is the primary way that citizens influence their government, election returns provide the most immediate feedback to government officials about the electorate

opinion of their performance, and correct voting ascertains the accuracy of the signals that are sent to elites, and thus the quality of democratic representation provided by an electoral system (Lau et al., 2013).

This thesis, therefore, constitutes the first body of experimental research on correct voting using outside of the USA, in a majoritarian democracy (the UK), that the author is aware of. Therefore, we explore some of the cultural differences between the UK and the USA, and how it relates to correct voting, below.

1.4. Cultural Differences in Correct Voting

An obstacle to reviewing the extant literature on political behaviour and JDM is that the majority of studies are largely conducted in the USA. When attempting to garner and use insights from the political psychology literature, we must question are they applicable to a multi-party context such as in Europe (e.g. Britain & Ireland). Serious differences exist between the UK and the USA, and some are discussed below.

Firstly, the bipolar ideological spectrum of ‘liberal’ and ‘conservative’ that is so frequently used in American political science literature for self-identification or classification of participants, does not easily apply outside of the USA. ‘Liberal’, in simple terms, exists on a two-dimensional scale: social liberalism (pro-welfare collectivist policies), and economic liberalism (neoliberalism, free-market). Similarly, for ‘conservative’ as it consists of economic conservatism (fiscally frugal, low government spending), or social conservatism (e.g. ‘traditional family values’, preserving the status quo, anti-immigration).

Research has pointed to the USA being increasingly polarized along one-dimensional party/ideological lines (Bartels, 2000; DiMaggio, Evans, & Bryson, 1996; Levendusky, 2009), which makes for more consistent understanding and identification of the parties and one’s position relative to them and their policies⁹. In a European context, people tend to identify on a multi-dimensional ideological space, holding (in)consistent left/right-wing stances on both economic and social issues (Steinmo, 2007). Europe is also less polarized to its extremes both in its elites and popular attitudes, allowing for moderates to emerge and be represented by a formalized party structure (Sartori, 1966; 1976), and makes clear ideological divisions between parties more difficult.

⁹ Pew Research Centre (2014) have a fascinating summary of data on America’s increasing polarisation, accessible at <http://www.pewresearch.org/fact-tank/2014/06/12/7-things-to-know-about-polarization-in-america/>

To add further complication, the terms ‘left’ and ‘right-wing’ are more common in usage outside of the USA and are incorrectly assumed by many as to be interchangeable with ‘liberal’ and ‘conservative’ respectively. On a one-dimensional scale ‘left-wing’ is generally identified with market regulation/state ownership and social liberalism, while ‘right-wing’ is generally conflated with economic liberalism (light-touch or no regulation) and social conservatism (i.e. racism, fascism, ultra-religiosity etc.); e.g. one can be a social liberal *and* an economic conservative and identify as ‘right-wing’, but collapse them on a single linear dimension for ease of discussion and identification.

These ideological differences result in and are compounded by, electoral differences between the USA and Europe. The USA has, for all intents and purposes, a two-party system where voters chose between 2 main parties that share over 95 percent of the vote (Bartels, 2000), share all the media coverage, and are represented (barring a few ‘independents’, e.g. Bernie Sanders, until the 2015/16 Democratic primaries¹⁰) exclusively by members of those two parties in both legislative houses. In the UK and Europe more generally, multi-party elections are commonplace, with parties representing a variety of points along the ‘left-right’ spectrum (used here for simplicity). Often parties will share values/issues/traits, usually those in ideological proximity, but it is not uncommon for a party (i.e. on the left) to hold a position that might be seen as belonging to the right (i.e. pro-privatization of state services or resources, strong punitive stances on crime). For example, New Labour under Tony Blair greatly expanded the Private Finance Initiative (PFI), started by the Conservative Party, following his election in 1997¹¹, and campaigned on “*massively*” increasing privatization in New Labour’s 2001 re-election¹². This resulted in the privatization of public services such as London Underground’s infrastructure, elements of the NHS, and the introduction of privately sponsored schools (‘academies’).

For voter decision-making, this means voters outside of the USA do not have a simple ideological divide represented by two main (ideologically consistent, and opposing) parties. At all levels¹³ of elections (e.g. local, general), voters are faced with an enlarged choice set of candidates and parties to choose from, with various attributes/traits associated with each, that may or may not be shared by one or more parties/candidates. Also, unlike the system of primaries as in the USA, there is no ‘knock-out’ round to narrow down the field of possible

¹⁰ <http://www.sanders.senate.gov/>

¹¹ Report by World Bank. ‘*The U.K. Treasury Infrastructure Finance Unit: Supporting PPP Financing During the Global Liquidity Crisis*’. March, 2010

¹² http://news.bbc.co.uk/news/vote2001/hi/english/newsid_1333000/1333532.stm

¹³ Termed ‘*orders*’ in political science (i.e. *first-order*, *second-*, etc.)

candidates to choose from; so all decisions are expected to be made by evaluating and comparing the full range of candidates/parties on a ballot paper, the number of which can run into double and triple digits. A recent example is the Senate race in the 2013 Australian elections, where a record ninety-six candidates from thirty-nine groups (plus independents) were nominated for the Senate, requiring a ballot paper 1 metre long and magnifying glasses to read the small print¹⁴.

The voting system is yet another key difference. In the USA, voting systems are decided at the state level and are usually one-seat one-choice ‘*first-past-the-post*’ (FPTP; or ‘*majority vote*’) elections. In the UK for parliamentary elections, this is at least somewhat consistent. However recently in the USA, particularly at lower-order elections (local/congressional), ‘*ranked choice*’ (a.k.a. ‘*multi-alternative vote*’ or ‘*single transferable vote*’ [STV]) has been used. To add further complexity, many countries in Europe have ‘*proportional representation*’ (PR), with constituencies being ‘*multi-seat*’; this means voters have the option of choosing as many candidates as there are seats available with the most popular candidates (as determined by FPTP or STV/AV) being elected to fill those seats, as is common in UK local elections. There also exist hybrids of all of these systems, and *list* systems in Europe, but we will not delve into them in any detail here.

The ballot paper is also a key difference. Ignoring discussions on paper vs. electronic ballots, an obvious difference is when one goes to vote there are a variety of cues present or absent on the ballot paper that a voter could utilize. Normally a candidate’s name and party affiliation (if any) are present on the paper, however, some states in the USA place a candidate’s image on the ballot paper by their name (as is common in Ireland and other countries). Therefore, trait inferences from candidate images can arise and factor largely in voter’s decision-making especially in the absence of other cues (Olivola & Todorov, 2010a). While unexplored, if candidate images are replaced with party logos (as is standard in the UK), partisanship may become the dominant cue during candidate evaluation, or cause heuristic use resulting in biased judgments (Tversky & Kahneman, 1974; Kahneman, 2011).

These voting systems allow for large amounts of decision-theoretic concepts to be at play and examinable. We could expect voters to engage in some amount of strategic voting behaviour and counter-factual thinking (if-then), predominantly among political sophisticates. Due to the increased complexity of the decision

¹⁴ <http://www.theage.com.au/federal-politics/federal-election-2013/metre-long-ballot-paper-means-voters-will-need-to-read-the-fine-print-20130817-2s3yw.html>

environment, we should expect voters to experience greater uncertainty, leading to the use of simplifying heuristic strategies (e.g. ‘*satisficing*’, ‘*take the best*’, partisanship). As such, non-USA elections are a rich and fertile ground for decision science research.

Lau et al. (2013) measured CV in 33 democracies by using Comparative Study of Electoral Systems (CSES) data to calculate ‘utility scores’ for party candidates, considering a correct vote as one for the candidate with the highest utility, and comparing with survey respondents’ reported vote choice. Rates of CV were higher in the USA (88% in 2004; 82% in 1996) than in the UK (79% in 1997; 78% in 2005). Across the entire analysis of thirty-three democracies, ten factors were found to be associated with CV, some of which we described previously. Lau et al. (2013) reported that across all 69 elections considered, that the probability of casting a correct vote dropped from 79 percent to 57 percent when the number of parties increases from two to nine. Additionally, in a lab-based study, Lau and Redlawsk (2001) found increasing candidate numbers was negatively associated with correct voting. Exactly why rates of CV decrease so dramatically as the number of candidates/parties increases is explored in the next section (Section 1.5).

Several questions arise out of examining the cultural differences between the UK and the USA: what, if any, is the effect of additional parties on voter decision-making? What role does partisanship play outside of the USA, when there are more than two political ‘tribes’ that may have shared and diverging policy positions? Finally, how do these differences impact on voters’ ability to vote correctly in the UK, compared to the USA?

1.5. The cognitive psychology of additional options

Cognitive psychology has much to offer on the question of how additional options affects decision-making. In modern society people are beset by an ever-increasing abundance of options to choose from: potential mates (as exemplified by online dating applications such as ‘Tinder’); career options; and consumer products, to name a few. The proliferation of choice arising from market democracies has been recently discussed as a source of decline in personal well-being (Lane, 2000). In the case of dating applications like Tinder, increasing search options have been shown to trigger excessive searching, poorer choices, and less selectivity (Wu & Chiou, 2009; Finkel et al., 2012)¹⁵; and greater errors in memory for those options presented (Lenton, Fasolo, & Todd,

¹⁵ And Tinder’s use has recently been linked to lower evaluations of self-esteem, especially among men (Strubel & Petrie, 2016; *under review*).

2008). These findings would seem to violate the *regularity principle*, a cornerstone of classical choice theory (Arrow, 1963; Rieskamp, Busemeyer, & Mellers, 2006), which holds that expanding a choice set cannot make decision makers worse off, as the probability of an option that best matches their preferences increases.

The idea that increasing the number of options ('alternatives') in a choice set leads to increasing choice difficulty and adverse consequences (e.g. inability to choose; decrease in choice satisfaction) is well documented (Chernev, 2003b; Iyengar, Huberman, & Jiang, 2004; Iyengar & Lepper, 2000). This phenomenon has been alternatively referred to as the "*the problem of too much choice*" (Fasolo, McClelland, & Todd, 2007), "*too-much-choice effect*" (Scheibehenne, Greifeneder, & Todd, 2009), and "*choice overload*" (Poynor & Diehl, 2007; Iyengar & Lepper, 2000; Mogilner, Rudnick, & Iyengar, 2008). For consistency, we use the term 'choice overload' henceforth.

There have been a number of arguments proposed in favour of 'choice overload'. For example, as options within a category increases, information about those options increases, and differences between attractive options decreases (Fasolo et al., 2008; Timmermans, 1993), with justification of any choice becoming more difficult (Sela, Berger, & Liu, 2009). Alternatively, an exhaustive comparison of options increasing choice set sizes is cognitively effortful and time-consuming; and decision-makers with non-defined preferences may face more (un)attractive options, requiring additional time and cognitive resources in their evaluation (Kahn & Lehmann, 1991). Indeed, choice overload increases if decision-makers are unfamiliar with, or have unclear prior preferences for, items in a choice set (Iyengar & Lepper, 2000; Mogilner et al., 2008). Those with clear preferences prefer larger assortments, with choice probability and satisfaction increasing with choice set size (Chernev 2003a; 2003b). Notably, choice overload can only occur if there is no obviously dominant option (best on all attributes considered) in the choice set, otherwise, the decision will be relatively easy regardless of set size (Dhar, 1997).

Scheibehenne, Greifeneder, and Todd (2010) find in a meta-analysis of sixty-three conditions across fifty experiments, that the overall mean effect size for choice overload to be near-zero ($D = .02$). Scheibehenne et al. (2010) identify three potential moderators of choice overload: *assortment structure* ([lack of] categorisation, difficult trade-offs, information overload, & time pressure); *decision strategies* (relative vs absolute evaluations, maximizing, choice justification, & heuristics); and *perception of the distribution* of attributes.

‘Assortment structure’ and ‘decision strategies’ are of particular interest. We save discussions around categorization in a political context (e.g. by party, or ideology), and difficult trade-offs, for Chapter 2.

Below, we further consider the effect of additional options on decision-making. Firstly, how it adds to the complexity of the decision environment through information overload, and use of decision strategies (e.g. *heuristics*). And secondly, how the addition of alternatives leads to perceived changes in the decision environment, and violations of voter preference, via *context effects*.

1.5.1. Information Processing & Heuristics

The information overload hypothesis predicts that if the total amount of information about a choice set grows too large, a negative impact on decision making will result (Jacoby, Speller, & Kohn, 1974; Jacoby, Speller, & Kohn-Berning, 1974). Decision-makers confronted with more information make less informed choices (Lee & Lee, 2004; Lurie, 2004), and Greifeneder et al. (2010) find choice satisfaction decreases as choice set size increases when options described on increasing number of attributes.

Information overload occurs as cognitive limits prevent the processing of relevant information to the appropriate degree. The human cognitive system suffers from issues of ‘computational constraint’: we are limited cognitive processors due to limitations of attention and memory, with neither motivation nor ability to make the largely intractable calculations dictated by *rational choice theory* (RCT; Anderson, 1983; Gilovich & Griffin, 2010; Hastie & Dawes, 2001; Simon, 1979). The standard RCT approach views humans as “*omniscient calculators*”, who can perform the expected complex computation tasks to reach a decision (e.g. calculating the *subjective expected utility* of all possible outcomes) given adequate motivation and information. This view of *homo economicus* has been critiqued from a variety of viewpoints, not least because people have a poor ability understanding problems involving probability (Tversky & Kahneman, 1973; 1983; for a review, Kahneman, 2011).

Gigerenzer and Goldstein (1996) point out that people do not need to calculate their optimal behaviour functions, they need only use ‘successful’ algorithms to *approximate* the most optimal behaviour; and term these ‘fast & frugal’ cognitive algorithms ‘*heuristics*’. (for a review, see Gigerenzer & Gaissmaier, 2011). Gigerenzer & Gaissmaier (2011) define a heuristic as “*a strategy that ignores part of the information, with the goal of making decisions more quickly, frugally, and/or accurately than more complex methods*” (p.454).

Heuristics make judgments faster and less effortful through frugality, by: (i) examining fewer cues, (ii) reducing the effort of retrieving cue values, (iii) simplifying the weighting of cues, (iv) integrating less information, and (v) examining fewer alternatives (Shah & Oppenheimer, 2008). Kahneman and Frederick (2002) add to this, proposing that a heuristic assesses a target attribute by another property (*attribute substitution*) that is more easily accessible.

Information-processing approaches to examining voter decision-making have become popular in recent years (Lau & Redlawsk, 2001, 2006), examining the selection of an alternative (or ‘candidate’) from a finite number of alternatives contained in a choice set, based on its attributes (e.g. policies, candidate personal information, campaign details). Heuristics may help voters choose between varying numbers of alternatives, all of which may have differing number of attributes. For example, by: *editing* or eliminating unfamiliar candidates from the choice set (*familiarity heuristic*), or choosing that option that is most familiar (*recognition heuristic*; Gigerenzer & Gaissmeier, 2011); or choosing the alternative best on a key attribute (*‘Take-The-Best’*); or not computing weights for each attribute (i.e. use a simple -1/0/+1 score *‘tallying’* method). The alternative being calculating overall values (*utilities*), for each alternative, weighted by their perceived importance, and again by the probability of an outcome occurring given the choice (i.e. a calculation of risk given uncertainty).

Lau and Redlawsk (2001; 2006) provide some of the most prominent heuristics voters seem to utilize in vote-tasks (i.e. *candidate party affiliation, candidate ideology, endorsements, polls, & candidate appearance*). Of all of these, candidate appearance has been studied the most, with prominent work by Todorov and Uleman (2002; 2003) on trait judgments of likeability, competence, trustworthiness, and aggressiveness, from single glances or 100ms exposure to a face (Willis & Todorov, 2006; Todorov et al., 2008). Trait judgments of competency predict the winning candidate in a variety of real-life and lab-based elections in the US with only 100ms exposure; 66-72% of time in the 2000, 2002, 2004 US Senate elections (Todorov et al., 2005), 68.5% of the time for state-governor elections from 1996-2006 (Ballew & Todorov, 2007); and in 2006, 72.4% of the Senate elections and 68.6% of the gubernatorial elections (Ballew & Todorov, 2007).

The other ‘political heuristics’ have received less experimental attention, with other authors positing that candidate partisan identity (e.g. being a Labour or Conservative politician) acts as a heuristic in voter decision-

tasks (e.g. Rahn, 1993). Partisan identities are stereotypic schemata with which voters can infer a large amount about those with a partisan label (e.g. ‘liberals are for high taxes’, ‘Republicans are anti-government’, ‘Tea-Partiers are crazy’). Acceptance and application of these partisan stereotypes result in a schemata-based affective response, though this is mediated by how consistent with the stereotype the target seems to be (Collange, Fiske, & Sanitioso, 2009). Gaissmaier & Marewski (2011) investigated party label as a *recognition heuristic*, with results from four major German elections showing that mere recognition of party names forecast parties’ electoral success fairly well.

Political heuristics may be used in isolation as appropriate, or operate in tandem to produce some form of compound decision. In keeping with general views on heuristics, Lau and Redlawsk (2006) find that heuristic use depends on a person’s overall cognitive style, and are increasingly utilized in low-information environments, or where the DM has limited time or cognitive capacity; and that heuristic use varies as a function of political sophistication. Lau and Redlawsk (2006) found that heuristic use among sophisticates improved correct voting, while it decreased correct voting among non-sophisticates, however, this effect *reverses* when sophisticates were presented with non-stereotypic candidates. This seems intuitive- heuristics only approximate optional decisions if they are correctly applied given the informational environment.

In prior studies by Lau and Redlawsk, partisan cues needed to be learned in bi-party elections of 2-6 candidates through intentional access of informational items; yet this is not reflective of reality, where partisan cues (e.g. party brands) are ubiquitous and salient. In electoral contexts outside of the US, which are predominantly multi-party electoral contexts, heuristics (such as partisanship) should narrow information search down to a few alternatives, and voters may engage in a more effortful comparative depth of search within them. Decreasing correct voting rates may reflect the fact that voters never get the opportunity to learn about potentially more congruent candidates, as they are biased from the outset. If heuristics bias our decision-strategies in such a way as to decrease correct voting, then we should be able to observe bias where partisanship is a global cue rather than a learned one. Results in Lau and Redlawsk (2006) seem to support such a rationale, and as such we explore this in Chapters 2 and 3.

1.5.2. Preference violations & ‘context effects’

‘Contextual preference reversals’ are the observation that people’s preference between options can be reversed by the presence of ‘decoy options’ added to a choice set, are extensively documented in the cognitive psychology and consumer psychology literature (Huber, Payne, & Puto, 1982; 2014; Tsestos, Usher, & Chater, 2010). To illustrate this with a classic example: Imagine Ms. X sitting in a restaurant oscillating between menu options A and B, and eventually opting for A, at which point the waiter informs her of a hitherto unknown option C (e.g. a daily special). This in mind, Ms. X gratefully orders option B instead. Why would the information about a non-preferred option (D, a ‘decoy’) cause Ms. X to switch to the originally lesser-preferred competing option B? This is a classic example of a ‘contextual preference reversal’, which has been found to occur in human decision-making between alternatives that vary on several dimensions or, *attributes* (e.g., price and quality).

Context effects raise challenges for rational choice theories, which presume that people should always prefer options that are highest on preferred values dimensions. Underlying these *option-based accounts of choice* is the assumption that value is assigned independently to the considered option and choice is determined by comparison of values; thus whether A is chosen over B depends on the relative values of A and B. No additional option (e.g. C) should affect the relative values of A and B. Such value-based choice accounts include: *expected utility theory* (Debreu, 1960; Von Neumann & Morgenstern, 1947); theories that allow noise either in the assignment of, or decision between, goodness values (e.g., *stochastic expected utility*; Blavatsky, 2007); and psychological theories of choice like *prospect theory* (Kahneman & Tversky, 1979).

Four such reversal effects have been reported so far in the literature, the: *attraction effect* (Huber, Payne, & Puto, 1982); *similarity effect* (Tversky, 1972); *compromise effect* (Simonson, 1989); and the *phantom effect* (Choplin & Hummel, 2005; Pettibone & Wedell, 2000; 2007).

In the *attraction effect*, an ‘irrelevant’ option D (a decoy) is added to the choice set of A and B; similar to but of less value than A (inferior, or ‘dominated’, on one or more attribute dimensions), which creates a bias in favor of A (the ‘targeted’ option). This violates the principle of regularity, which holds that preference for option A should not increase when more irrelevant options are added to the choice set.

In the *similarity effect*, the introduction of a new option S, which is very similar to B (and of equal value), shifts the *relative* choice between A and B in favor of the dissimilar option (the ‘competitor), A. The similarity effect demonstrates a violation of the *independence from irrelevant alternatives* principle.

In the *compromise effect*, option C is of approximately equal value to A and B, and is placed either in the middle within the two-dimensional attribute space, making *it* a compromise between AB. Or, it is positioned as to make either A or B the compromise option in the choice set (sitting the target along the ‘*line of indifference*’; Berkowitsch, Scheibehenne, & Rieskamp, 2014).

Finally, the most recently discovered reversal effect, the *phantom decoy effect*, occurs following the introduction of an unavailable but dominant option P (i.e. better on one or more attributes), biasing choice share toward the dominated target (e.g. option A). Phantom decoy effects raise an additional challenge to the theory of choice (Pettibone & Wedell, 2007), as decision-makers should not be influenced by unavailable options, but only by those options available for choosing and can provide utility. The relative positions of options for each effect are illustrated in Figure 1.

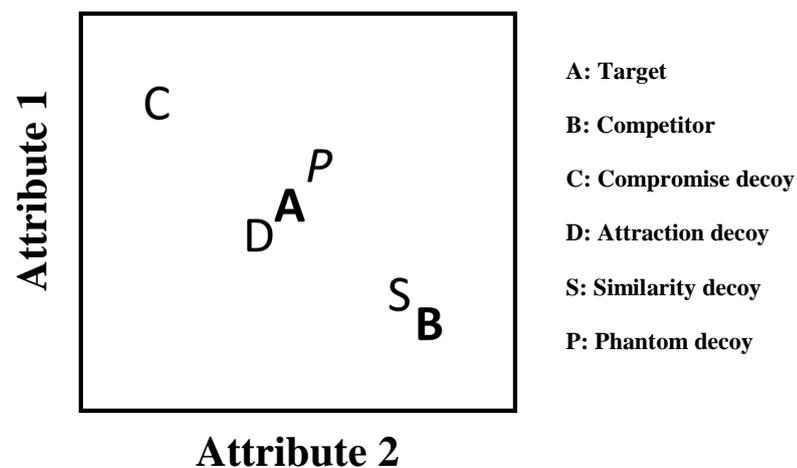


Figure 1.1: Illustration of alternative placement for each context effect. In each instance, A will increase choice share over B. Letters represent the decoy location for each context effect.

Various theoretical accounts to explain the mechanisms behind context effects have been mooted, such as: *decision-field theory* (DFT; Roe, Busmeyer, & Townsend, 2001); *leaky competing accumulators* (LCA; Usher & McClelland, 2004), *decision-by-sampling* (DBS; Stewart, Chater, & Brown, 2006); and *reason-based choice* (Shafir, Simonson, & Tversky, 1993). These accounts are based on either: *attentional switching* between different choice aspects; *relational evaluation* of properties and loss aversion; and *value shifts or contrast*

effects; although “no single mechanism accounts for all three decoy effects” (Tsetsos et al., 2010, p. 1276). Other mechanisms, such as dimensional weight change, stretching or shrinking of the choice space, ranking, grouping, etc., have been proposed (Guo & Holyoak, 2002; Pettibone & Wedel, 2007; Stewart et al., 2006).

Attention to choice aspects and temporal correlations are put forward as explanations for the similarity effect. Imagine at any given time Ms. X is influenced by the imagined taste of dish A, while other times it is the healthiness of dish B that sways her. For Mrs. X, the criterion of her choice is continually shifting. This is a stochastic criteria shifting mechanism (Roe et al., 2001; Usher & McClelland, 2004; Usher & Zakay, 1993), resembling the stochastic examination of choice attributes proposed by *elimination by aspects* (EBA; Tversky, 1972).

Suppose Mrs. X’s probability of choosing dish A was .50 (the tasty option), and the waiter introduces dish C- which is almost exactly the same as, and no better or worse than, dish A- Mrs X will resume her oscillation between taste and health; but she has a further choice: between A and C. If she makes this choice between A and C randomly, then the probability of choosing the tasty dish is now .25, less than the .50 probability of choosing dish B. Yet before C was added, the probability of choosing A was greater than the probability of choosing B. In this example. Mrs. X’s preferences fluctuate and the preferences for A and C are positively correlated. The general principle is that when temporal correlations between momentary preferences exist, the correlated options (A, C) split their winning choice share, and hence lose share *relative* to the uncorrelated options (B).

The impact of relational (vs. independent), evaluation of options is exemplified by the attraction effect. If option D is added to the menu, which is just like option A, but marginally inferior in on at least attribute (and no better on any other), no matter how one weighs the attributes (taste, health) it is clear that A is better than D. According to *reason-based decision making* (Pennington & Hastie, 1993; Shafir, Simonson, & Tversky, 1993; Simonson, 1989), people choose by searching for a justification for their choice. Choosing A is justified by its clear superiority to D, but choosing D has no clear justification, being difficult to compare with either A or B. However, decoy effects have been found in other, non-human species (Hurly & Oseen, 1999; Shafir, Waite, & Smith, 2002), suggesting that justification is not crucial for such effects to occur (at least, to the point we are able to claim non-humans do not justify their actions to themselves/others).

The compromise effect and the attraction effect can be accounted for by assuming that values are computed via pairwise comparisons. If we assume each option is compared with every other option and considerations are transformed into utilities via some value function characterized by *loss aversion* (a steeper utility slope in the losses domain vs that in the gain domain, such that losses loom larger than gains; Tversky & Kahneman, 1991; Tversky & Simonson, 1993). Under the attraction effect, as D confers an advantage to B on one attribute and a disadvantage on the other, this disadvantage looms larger than the advantage- and the *overall* value contributed by D relative to B is negative. As the compromise option has no great disadvantages relative to other options in the set, the overall relative evaluations to the alternative options are positive.

Local contrast enhancement could also account for the attraction effect, as observed through work in visual perception. Massaro and Anderson (1971) showed that a circle appears larger when surrounded by smaller circles, with such effects possibly occurring through a process of lateral inhibition between similar items, in that only alternatives that are similar inhibit each other. Enhancement of the dominating option A occurs as inferior option D has negative values, while superior A, has positive values; thus, D causes a relative evaluation enhancement in the attribute value of A, since passing negative activation via an inhibitory link results in excitation (Roe et al., 2001).

However, choices are not independent of temporal processes, and a number of dynamical theories of value-based decision making have been proposed, accounting for the choice outcome and also for the dynamics of the decision process as it unfolds over time. DFT for multi-attribute choice (Roe et al., 2001), which considers attentional shifting and value shifts; and LCA (Usher & McClelland, 2004), which considers attentional switching and relational evaluation via elements of EBA (Tversky, 1972) and the context-dependent advantage model (Tversky & Simonson, 1993). Both of which account for the attraction, similarity, and compromise effects (for a comparative review, see Tsetsos et al., 2010). LCA can account for the phantom decoy effect by assuming that people use the superior unavailable decoy as a reference point; while the DFT could account for phantom decoys if the valence of the superior decoy is negative due to its unavailability (see a detailed discussion, including limitations of the LCA/DFT accounts, in: Pettibone & Wedell, 2007).

DFT and LCA are not the only two theories that account for the similarity, attraction, and compromise effects simultaneously. Other multi-alternative, multi-attribute, theories have been proposed, in particular, *decision*

by *sampling* (Stewart et al., 2006). In decision by sampling, no underlying psycho-economic scales are assumed, instead, the subjective value of an attribute is its rank in the decision sample, which consists of attribute values both present in the decision context and drawn from memory¹⁶. Decision by sampling and its mechanisms (ranking and ordinal comparisons) appear to be promising for the case of preference reversal effects, accounting for a large set of decision phenomena such as loss aversion, temporal discounting, and overestimation of small probabilities (Tsetsos et al., 2010); and was recently integrated with LCA in a dynamical model for decisions under risk (Stewart & Simpson, 2008).

We have given a taste for some of the theories that account for these context effects, we will not be evaluating them further. Context effects have potential to exert influence in political decision-making, which is inherently based on voter's choosing options that differ on multiple attributes, just as they do in cognitive psychology or consumer decision-making. Of relevance to this thesis, context effects have implications for correct voting: if a voter prefers party A over B, or B over A, these preferences should not be affected by the presence of additional options in the choice set. In other words, if party B is a voter's correct choice this choice should not be affected by the addition of an inferior option party D (attraction effect), such that the voter now chooses party A, an incorrect option.

While there has been a recent upsurge of interest in the robustness of context effects, in particular, the attraction effect, in more realistic decision-domains (Frederick, Lee, & Baskin, 2014; Huber et al., 2014; Yang & Ling, 2014), there has been a surprising surfeit of research examining whether context effects occur in political decision-making (cf. Pan, O' Curry, & Pitts, 1995). Considering the prevalence of context effects in other domains of multi-attribute multi-alternative choices, we examine context effects in political decision-making in depth in Chapter 4.

¹⁶ This is not dissimilar to models of evaluation developed in political psychology, such as: the *on-line model*, which posits that individuals' attitudes are formed in real time at the moment of information exposure, updating an 'affective integrator' (i.e. an *on-line tally*) as new information is encountered (Hastie & Park 1986; Lodge et al. 1989; McGraw et al. 1990); or, the *memory-based model* which states that individuals form their preferences at the time of judgment, retrieving relevant information from long-term memory (Kelley and Mirer 1974; Zaller 1992; Zaller and Feldman 1992). On-line and memory-based processes may act jointly in shaping evaluative judgments (Redlawsk 2001; McGraw et al. 2003; Lau and Redlawsk 2006), with a 'hybrid model' proposed; in line with the view of people as "*flexible processors*" (Uleman et al., 1996) with 'dual processing' systems (Chaiken and Trope, 1999). McGraw (2003) muses, "*There is good reason to suspect that a hybrid approach, incorporating both time-of-exposure and time-of-judgment information effects on evaluative judgments may provide a more psychologically realistic model*". (p. 408). For a review, see Kim and Garrett (2011).

1.6. Summary and Overview of Empirical Chapters

The structure of the remainder of the thesis is as follows.

In Chapter Two, we examine the conceptual and practical aspects of ‘correct voting’, carrying out a number of lab-based experimental studies among the UK electorate. We investigate the effect increasing the number of alternatives (candidates) has on voters’ ability to correctly choose the alternative that best matches them on their self-reported preferences. We also examine in a first-pass, if the presence of political heuristics (e.g. partisanship) affect voters’ ability to vote correctly.

In Chapter Three, we delve further into the results from Chapter Two, examining voters’ information processing at the cognitive level, and the effects of increasing choice set size. We also examine at the information processing level if there is any effect of the partisan heuristic on voters’ information processing; and overall, how voters’ information processing relates to correct voting. We develop novel measures of comparing preference for the chosen alternative relative to the choice set, based on the amount of informational search, and the average duration of search, that voters’ engage in.

In Chapter Four, we explore if context effects can occur when making decisions in political domains. We conduct a number of experimental studies, using realistic and fictional political scenarios, and examining issues such as ‘desirability’ in eliciting political context effects. We also report results from a two-cohort study, one field and one online, carried out during the 2015 UK General Election. It explores if asymmetric preference structures approximating those seen in ‘context effects’ exist naturally among the UK electorate and their relationship to their intended vote choice in the General Election.

Finally, we conclude with a general discussion in Chapter 5. We summarise our findings, and their implications for further research on voter decision-making, the field of political psychology, and democracy at large.

Chapter 2: Correct Voting in dynamic voting environments

2.1. Background

Information-processing approaches to examining voter decision-making have become popular in recent years (Lau & Redlawsk, 2001, 2006). Information processing accounts include Multi-Attribute Decision Making (MADM), that is: the selection of an alternative (or ‘candidate’) from a finite number of alternatives contained in a choice set, based on its attributes (e.g. policies, candidate personal information, campaign details). Such attributes may be exclusive to one alternative or shared by alternatives in the choice set. While much of political science and political psychology research is concerned with *how* and *why* voters make their decisions (e.g. voting on partisan lines, policy issues), some researchers (e.g., Lau & Redlawsk, 1997) have been concerned with *how well* voters make decisions, and consequent implications for democracy and governments.

Democracy relies on the assumption that voters vote in line with their preferences and/or best interests; in order to empower a relatively small number of people to reflect and design society in line with those presumed preferences. If people are not accurate in their vote-decisions, the quality of democratic representation provided by the electoral system, and the legitimacy of elected governments and any decisions they make, are in question (see also, Lau, Patel, Fahmy, & Kaufman, 2013). In majoritarian democracies where marginal vote differences determine one party’s overall control of the government (e.g., UK, USA), inaccurate voting can lead to governments that aren’t just unrepresentative but opposed to the preferences of broad swathes (or even the majority) of the public.

Voting is the primary way that citizens influence their government, yet even freely chosen decisions can be misguided. The accuracy of voter decision-making can be considered in terms of the degree to which voters choose the candidate whose policies best represent their preferences – a ‘*correct vote*’ (Lau & Redlawsk, 1997). Therefore, the rate of electors voting correctly is a higher normative standard than turnout or voter accessibility by which to judge the health of democracies (Lau et al., 2013).

As discussed in Chapter 1 (section 1.4), Lau and Redlawsk (2001) found increasing candidate numbers was negatively associated with correct voting. In a comparative study, Lau et al. (2013) reported a negative

relationship between rates of CV and number of parties. One possible explanation for this dramatic decrease in CV rates as the number of alternatives increase might be in terms of ‘chance levels’. The chance of a voter choosing a party who matches her own interests simply is higher when there are two parties (as any voters choosing randomly will be correct 50% of the time) than when there are nine. Lau and Redlawsk (1997) find voters choose correctly better than chance when there are two candidates, and Lau et al. (2013) show above chance levels of CV across 69 elections where chance levels range between 27% and 37%. Another explanation is *task complexity* (Timmermans, 1993), or task difficulty, that increases the cognitive complexity of the decision and results in poor outcomes.

Decision-makers often simplify choice-tasks through the use of various ‘*heuristics*’ (‘cognitive shortcuts’; Gigerenzer & Gaissmaier, 2011). A seminal definition of the aim of heuristics is to reduce complex tasks to simpler judgmental operations (Tversky & Kahneman, 1974). Some researchers have suggested that heuristics can approximate, and even outperform, optimal decision-making strategies (e.g., Todd & Gigerenzer, 2011). While heuristics are usually effective, “*sometimes they lead to severe and systematic errors*” (p.1, Tversky & Kahneman, 1974). Heuristic success is dependent on applying the appropriate heuristic given the environmental structure (or decision context), with misapplication leading to errors in accuracy (Todd & Gigerenzer, 2011).

Increasing the number of alternatives (herein, candidates) should increase the complexity of the task, and increase the reliance on heuristics (Bettman, Luce & Payne, 1998). Political decision-making is no exception, as Lau and Redlawsk (2001, 2006) find increasing numbers of candidates increased the use of ‘political’ heuristics, specifically *differing types* of political heuristics. In two candidate scenarios, for example, voters use the *viability* or likelihood of a candidate being elected; and *candidate ideology* in four candidate scenarios (Lau & Redlawsk, 2001).

We examine the possible effects of an increase in choice set size (*number of candidates*), and use of political heuristics, on correct voting, using Lau and Redlawsk’s (2006) methodology of *dynamic (information) process tracing environments* (DPTE).

2.1.1. Dynamic Processing Tracing

Lau and Redlawsk (1997; 2001a,b; 2006; 2009) study voter decision-making using *dynamic process-tracing* (DPT); adapting the traditional static information board used in psychology studies of decision-making (e.g. Jacoby, Speller, & Kohn, 1974; Jacoby, Speller, & Kohn-Berning, 1974; Payne, 1980), and studies on decision-making and information search in political environments (Riggle & Johnson, 1996; Huang, 2000; Huang & Price, 2001). Information boards typically display a static list of attributes belonging to options in a choice set in a matrix, with decision-makers able to select an attribute to learn more detailed information about that item. DPT is a dynamic version of the information board, “*uniquely suited for studying decision-making in complex social situations*” (Lau & Redlawsk, 2009, p.1), in particular it is useful to simulate the ebb & flow of information during actual election campaigns, and examine how voters obtain, process, and evaluate the information they encounter about candidates.

Traditional information boards suffer from the problem of being *static*, allowing constant access to all attributes for all alternatives. Considered in the context of elections, this presumes a voter is able to access any information about a candidate at any point in time, and allows for ease of comparison between them all. While the internet¹⁷ and ‘comparison tools’^{18,19} certainly make such scenarios more plausible, in real elections information is often chaotic, sometimes unavailable, candidates can obscure stances on issues, and learning is time-limited; you only have until ‘Election Day’. Additionally, in standard information boards the decision-making is an active learner, yet in elections (and reality more generally) information exposure occurs without any active effort (e.g. advertisements, social networks endorsements), and may result in ‘information overload’ (Einhorn & Hogarth, 1981). Put simply, traditionally static information boards represent an ‘ideal’ world-while we are interested in approximating decision-making in *the* real world. For a review of information board studies, see Payne, Bettman, and Johnson (1993); and process tracing methods in decision-making more generally, see Schulte-Mecklenbeck, Kühberger, and Ranyard (2010; 2011).

Lau and Redlawsk (2006; 2009) operationalize DPT by presenting information in the form of ‘attribute labels’, which flow down a computer screen (over time, at a specified rate) rather than remaining fixed on

¹⁷ Manifesto watch: Where parties stand on key issues. BBC. 25 Feb, 2015

¹⁸ CompareTheParties: “*Political Comparison Made Easy*”. <http://www.comparetheparties.co.uk/>

¹⁹ Pocket Politics. <http://www.pocketpolitics.co.uk/>

screen, allowing for a limited number of attributes to be available on screen for access at any given time. Labels include a candidate's name, a brief description of the attribute and/or the information contained within, and can include images (e.g. candidate image, party label, other). Participants access the information by clicking on the attribute label, which 'opens' showing the information contained within. Importantly, attribute labels continue scrolling in the background, creating a 'cost' to accessing the information and dwelling on it, in terms of missed information. As the scrolling format allows only a subset of the total available information available at any one time, it makes the overall task of processing the election information less manageable for a subject (and more akin to real-world elections). The total number of attributes and the number of times each appears can all be pre-determined by the experimenter(s).



Figure 2.1: Example of the DPTE flow stage screen.

Other functionalities exist, such as: 'campaign-ad pop-ups', poll result announcements, and even social network information (e.g. a real or fictional confederate shares information on the election in real time). Where necessary, we provide additional details in the Methods section of each experimental section.

2.1.2. Partisanship

Partisanship remains the central factor in explaining not just how people vote, but also how they see the political world (Bartels, 2000), and is historically defined as "*the individual's affective orientation to an important group-object in his environment*" (Campbell et al., 1960, p. 121). Miller and Shanks (1996) reason that party identification is analogous to religious affiliation, as psychological attachments to groups; i.e. "I am Catholic" or "We are Jewish," is much like "I am a Democrat" or "We are Republicans" (Green, Palmquist,

& Schickler, 2002; Miller & Shanks, 1996).

Partisanship not only acts as an internal reference point for use in voters' judgment model, but perceived candidate partisanship and the degree of alignment of the two also act as cues during evaluation and preference formation for a candidate. Longitudinal studies in America and Europe (for a review, see: Sears, 1975) has shown that by adolescence, most children have a partisan identification connected to political preferences like adults, and nearly all share it with their parents (Jennings & Niemi, 1981). Achen (2002) wryly queries this, stating: "*parents are rarely able to influence their teenage children's hairdos, clothing styles, tastes in popular music, or even more important decisions such as the choice of a life partner... Why should party identification be any different?*" (p. 152). Achen (2002) constructs a compellingly simple dynamic model of Bayesian retrospective voting by partisan identification across multiple elections to explain this phenomenon, explaining (in plain terms) that the initial priors a young voter has when they go to vote is a regressed form of the partisan identity of their parents.

Partisanship can bias our evaluation and interpretation of common events (Bartels, 2002; Gerber & Huber, 2010; Zaller, 1992), and determine our preferences for biased political information (Lau & Redlawsk, 2001; Redlawsk, 2002), and therefore might play a causal role in attitude formation rather than just filtering information. Gerber, Huber and Washington (2010) corroborate this, finding that people reminded that they needed to identify with a party (by way of registering for a party in a primary) exhibited heightened partisan identities, were increasingly partisan in their voting choices and evaluations of partisan figures and institutions. Thus, partisan information about candidates may lead voters to engage in confirmatory decision-making and could affect voters' ability to vote correctly by directing them away from potentially useful information about other alternatives.

Various authors have posited that partisan identity (*'party label'*) acts as a heuristic in voter decision-tasks (e.g., Lau & Redlawsk, 2001; Rahn, 1993). Party labels are stereotypic schema with which voters can infer a large amount about those with a partisan label (e.g. Liberals are for high taxes, Republicans are anti-government). Party labels act as 'top-level' affective proxies; a pre-computed summary of affective reactions to all the schema's attributes (Lau & Sears, 1986). Application of party labels to candidates can easily lead to errors if the default attributes do not apply (e.g., if a pro-EU candidate runs for an anti-EU party). In the UK,

political parties tend to run ‘national’ campaigns focusing on party brand and nationwide policies, rather than ‘local’ campaigns; the latter being where candidate policies might differ from the party nationally to appeal to a local base, as is common in other democracies where ‘politics is more local’ (e.g. Ireland; Weeks & Quinlivan, 2009). As such, candidate policies may not reflect national party policies as indicated by partisan identifiers (and *vice versa*), and voters may not identify these differences when opting to vote by brand.

Despite participants choosing to access information informing them of the party to which a candidate belonged (to a greater extent than any other information), Lau and Redlawsk (2001) could not assess the importance of party label as a heuristic due to the uni-party design of their study. Lau and Redlawsk (2006) found differing results in a primary campaign for their party heuristic, with it decreasing the probability of correct voting in 2-candidate scenarios but increasing correct vote probability in 4-candidate scenarios. Whether this reached significance is unclear (p. 251), but more importantly, there is no reason for party label to have *any* effect given all the candidates in a primary campaign belong to the same party (p. 94).

Thus, the party label heuristic is best studied in multi-party scenarios. Further, as Lau and Redlawsk (2001) relied on voters to directly access partisan affiliation during information search, we are interested in how party label as a *global* cue (i.e. visible from the onset & throughout) impacts voter decision-making strategies. In particular, how it impacts the ability of voters to vote correctly.

2.1.3. Directional vs. Proximal Models (of Correct Voting):

In order to assess the rate of correct voting (CV) among an electorate, we first must consider how to measure CV as pertains to voter preferences for attributes (e.g. policies). To do this, we ask voters for their preferences on a variety of policy issues, and match those with the positions of the political alternatives on offer- much as voters (should) do when voting. Arguments over the two dominant ‘spatial’ models of voting, ‘*proximity*’ (Davis & Hinich, 1966; Downs, 1957) and ‘*directional*’ (MacDonald, Listhuag, & Rabinowitz, 1991; Rabinowitz & MacDonald, 1989), abound in political science and public policy (Blais et al., 2001; Cho & Endersby, 2003; Lewis & King, 1999), with attempts at unifying the two under a common framework (Merril & Grofman, 1999; Weber, 2015).

Proximal Model: The ‘*proximity spatial*’ model is the most prominent spatial theory of electoral choice (Downs, 1957), positing electoral choice is best understood by examining the proximity between

candidate/party attributes and voters' preferences; simply, voters will choose candidates whose preferred policies are 'closer' to theirs. The proximity model has a lot of appeal, and similarities to decision-science: individuals (voters) make decisions (choosing candidates) according to their preferences (proximity between policy positions). It presents a “*simple and intuitive link between formal representation of voters' issue-based information processing and their observable candidate-based electoral choice*” (Ye, Li, & Leiker, 2011, p. 497).

Within the proximity model, we define a multi-dimensional policy space ('Davis-Hinich space'; Davis & Hinich, 1966) where a voter's most preferred policy bundle, and their perception of candidates' issue positions, are represented by points in the space; their respective 'ideal points'. The spatial distance between these ideal points corresponds to preference proximity: smaller distance, the more proximate the preferences. Preference proximity helps explain individual voters' comparison of candidates: a voter ranks candidates in accordance with the distance from their respective ideal points, such that the most proximate is the most preferred and so forth.

Proximal CV Method: Our 'proximal' of correct voting arises from the standard Euclidian distance formula for calculating the distance between 2-points in an n -dimensional space, and is standard in the '*proximal model*' of voter decision-making used by the political sciences (Hinich & Enelow, 1984). The resulting output is a utility score for each candidate, relative to the voter's stated preferences, and is illustrated in Equation 1; where q is a candidate's score on a given issue and p is a voter's self-placement on the issue, over N policy issue dimensions. Decision-weights (dw) are derived from participants' explicit ratings of a policy issue's importance to them, obtained via a questionnaire post-experiment, and rescaled to range between '0' and '1'.

Equation 1: Proximal Correct voting, using a Euclidian distance equation (with decision weights).

$$d(q, p) = \sqrt{(q_1 - p_1)^2(dw_1) + (q_2 - p_2)^2(dw_2) \dots + (q_n - p_n)^2(dw_n)} = \sqrt{\sum_{i=1}^n (q_i - p_i)^2(dw_i)}$$

Where participants indicated a decision-weight of '0', or answer 'Don't Know' on a policy issue questionnaire, this dimension is removed from the equation, as if we multiply any dimension by a dw of 0,

then this will be incorrectly scored as being perfectly aligned with a candidate on that policy issue, and will result in a biased score.

We prefer the proximal model and methods of operationalizing correct voting, as lab and survey experiments by Claassen (2007), Tomz and Van Houweling (2008) and Lacy and Paolino (2010) find that proximity theory offers the best model of voting behavior. We outline additional reasons for our use of the proximity model below. First, we review the directional model, as favoured by Lau and Redlawsk (1999; 2006).

Directional Model: The Rabinowitz and MacDonald (1989) ‘*directional spatial*’ model states that the distance between a voter and a candidate on any given dimension (e.g. policy issue) matters less than whether or not they are on the same ‘side’ on an issue (i.e. on the same side, relative to the ‘neutral point’ of an issue). Rabinowitz and MacDonald (1989) argue this captures the ‘affective intensity’ of spatial issue voting, which is missed from the proximity model. The authors state that, if a candidate and voter are on the ‘same side’ the affect associated with the issue will be positive (regardless of distance); whereas if they are on ‘opposite sides’ of an issue, affect will always be negative (regardless of distance). Thus the utility of a candidate on a given dimension for a voter can be expressed formally in Equation 2, where $U(Q_j)$ is the utility of candidate Q over all ideal vector points in the dimension j , for a voter with a vector of ideal points P_i , where P_0 is the neutral point.

Equation 2: Directional spatial model of voting.

$$U(Q_j) = (Q_j - P_0)'(P_i - P_0)$$

Simply stated; the utility for any given candidate is the product of the distance of a candidate from the neutral point and the distance of a voter from the neutral point, on a given dimension.

Directional CV Method: Determining a ‘standard’ operationalisation of Lau and Redlawsk’s ‘directional’ measure of correct voting is mildly difficult, as they use differing methodologies when examining CV in laboratory settings (Lau & Redlawsk, 1997; 2006), or determining CV from national election panel surveys like the American National Election Survey (ANES; Lau, Andersen, & Redlawsk, 2008). Despite this, at the core of their directional measure(s), is the Rabinowitz and MacDonald (1989) directional spatial model.

Using the directional model of voting, Lau and Redlawsk (1999; 2006) aim to capture a voter's 'agreement' with (or 'favourability' toward) a candidate on a given dimension. They further rescale the resulting utility score to range between +/- 1 for a given candidate on a given dimension, based on the maximum range possible from the neutral-point. For example, for a 7-point scale where '4' is the midpoint (or 'neutral-point'), the maximum range from the neutral point is -3 and +3, whose absolute product is '9'. A scenario where a voter and candidate occupy the extreme ends on an issue scale would result in a utility of -1 for that issue (i.e. $[(7-4) * (4-4)]/9 = -1$). Lau and Redlawsk (2006) average this utility over the number of items accessed for a given candidate.

It is also important to look at what dimensions are included in constructing the measure(s) as per Lau and Redlawsk (2006; Lau et al., 2008). In calculating their directional measure of correct voting, Lau et al. (2008) include "*the interests and concerns of each voter*" (p. 408) by including some, but not always all, of the following: a measure of *party identification* (strength); trait judgments of *candidate personality*; thermometer ratings of *candidate-group links*; *candidate performance evaluations* (if examining existing datasets from the ANES); and *issue stands* (where voters line on certain policy issues). All these dimensions are rescaled to range between -/+ 1.

Secondly, Lau et al. (1997; 2008) state they include the degree a voter 'cares' about each of these dimensions of judgment: by obtaining *explicit* weights (e.g. a participant reporting their partisan identification); or calculating *implicit* weights (e.g. the proportion of questions answered for a judgment dimension, a proxy for how much a participant 'cares' about that dimension). They calculated policy issue weights either by asking for participants' perceived importance of that issue to them (Lau & Redlawsk 1997), or by calculating a scaled importance weight for each issue based on how many candidates in the choice set they attributed a perceived position to; '0' if unanswered, '0.5' if answered at all, and increasing the weight proportionately towards '1' with each additional candidate the voter attributed a position to on that policy issue.

Lau et.al (2008) calculated 4 different versions of their directional measure; by using (un)weighted versions of either an additive or averaged utility model for each candidate, noting that these measures are highly correlated and "*there were absolutely no differences between the additive and averaging algorithms for*

combining the information”, and “*while it is certainly possible to create situations where these two procedures produce very different results, in practice those situations apparently do not occur very often*” (Lau et al., 2008, p.401).

We construct our own version of Lau and Redlawsk’s (2006; 2008) directional (utility) measure, in order to check if using a ‘directional spatial model’ vs. a ‘proximal spatial model’ approach leads to different conclusions around ‘correct voting’ in our *own* experiments. As Lau et al. (Note 37, 2013) state that empirically the results arising from the two are usually indistinguishable, we do not expect to observe any. Additionally, Weber (2015) notes the high collinearity of both model predictions, stating that while the models are theoretically distinct, they make identical predictions in most real-world situations. Further details on the measure can be found in Appendix B.

2.1.4. Decision difficulty, confidence, and alternative similarity

The literature on ‘choice overload’ resulting from increases in choice set size has been summarized in Chapter One (Section 1.5). Put simply, choice overload occurs when the complexity of the decision task exceeds an individual’s cognitive resources (Simon, 1955; Toffler, 1990), caused in the main by the number of alternatives available (Iyengar & Lepper, 2000). As choice overload is a subjective state of the decision-maker (DM), we can only observe it through a series of objective indicators: *process-based* indicators, that describe the subjective state of the DM (e.g. decision confidence, regret); and *outcome-based* indicators, that describe the DM’s observable behavior (likelihood of reversing choice, nature of chosen option).

In general, those experiencing choice overload are less likely to be satisfied with their decisions (Botti & Iyengar, 2004), less confident that they have chosen the best option (Haynes, 2009), and prone to more post-decision regret (Inbar, Botti, & Hanko, 2011). While we are not directly addressing the central choice overload phenomenon here, we are interested in how task complexity can be observed. It stands to reason that we should observe changes as mentioned previously in voters’ internal states, and behavioural outcomes, in our studies. We assess this by asking participants how *confident they are in their vote choice*, how *confident they would not change their vote* if given additional time, and how *difficult was their choice*.

Various theories, including choice overload, predict task complexity will increase as alternatives become more similar, becoming more difficult to justify the choice of an option (Sela, Berger, & Liu 2009).

Scheibehenne et al. (2010) note the similarity between available options “*have often not been precisely controlled in studies on choice overload ... even though they potentially affect choice satisfaction, regret, and motivation*” (p. 419). The use of the proximity model provides a solution to this problem, as we can compute the distance between the alternative most proximal to a voter (i.e. closest to their ideal point in n -dimension policy space), and the next-most-proximal (and so forth) as a proxy for similarity; investigating any correlations of alternative similarity with voter’s internal and behavioural outcomes.

2.2. Experiment 1

Lau and Redlawsk (2001) find increasing candidate numbers increases heuristic use, and decreases the probability of a correct vote (Lau & Redlawsk, 2001, 2006), but in a uni-party scenario. We test this further in a UK setting with multi-party candidates. We test the potential influence of the party label heuristic on ‘correct voting’ by manipulating the presence of the party label. Our hypotheses are:

H₁: *That rates of ‘correct voting’ will decrease when the number of candidates (alternatives) increases from 2 to 3.*

H₂: *That ‘correct voting’ will decrease when Party Label (party identity) information is available.*

H₃: *That H1 and H2 will have multiplicative effects, such that the effect of excluding Party Label will be greater in the 3-candidate condition, due to the enhanced task complexity.*

Methods

2.2.1. Participants

Participants were native English speakers and eligible to vote in the UK local or parliamentary elections before enrolment in the study. 136 participants (78 female), aged 18-73 ($\mu= 27.72$ years), were recruited. Participants were mostly single (71%); students (76%); self-identifying as ‘White-British’ (55%); and with an income under £10,000 per annum (53%). Participants were paid £4 for participating. Ethical approval was granted from UCL (CPB/2010/10).

2.2.2. Design

A 2x2 ('Number of Candidates' x 'Party Label') between-participants design was employed. Participants were randomly assigned to a 'Party Label Present' (PL^P) or a 'Party Label Absent' (PL^A) condition by the experimenter, and randomly assigned further by the software to either a 2 or 3 candidate condition within that block. The latter randomisation led to some imbalance in cell sizes (2Can- PL^A: 35; 3Can- PL^A: 34; 2Can- PL^P: 41, 3Can- PL^P: 28)

The 2-candidate condition consisted of simulated candidates representing the UK's main political parties, the Labour Party and the Conservative Party [Lab/Con]. The '3-Candidate' (3-Can) condition also included the Liberal Democrats [Lib]. Each candidate had 21 policies that could be accessed during the campaign stage. The party association of the candidates was either explicitly presented (PL^P) or not (PL^A). 'Party Label' and 'Number of Candidates' were the only variables manipulated in this study.²⁰

Participants indicated their vote choice at the end of the trial by choosing one of the candidates, or opting for 'None of the Above' or 'Abstain/Spoil'.

2.2.3. Materials

Dynamic Process Tracing Environment (DPTE): The experiment was carried out using the Dynamic Process Tracing Environment software (Lau & Redlawsk, 2009). Stimulus items (i.e., candidate policies) are presented during '*flow stages*'. Participants are told that item boxes will appear with summary 'headlines' along with the candidate's name, and they have to click on an item to read and learn more about that item if they wish. Participants are also informed that information continues to 'flow' in the background, even while reading an open item, as to mimic the flow (and opportunity cost) of information over time in a real campaign.

²⁰ There were, however, a number of additional scales included (e.g., 'Need for Cognition', UK Civics Test questionnaire). These are not the focus of the current discussion and will not be discussed further.



Figure 2.2: Example of DPTE ‘flow’ screen in PL^P condition.

The order of items was randomised, with each item appearing twice during the experiment. The time between an item appearing at the top of the 'flow screen' and exiting at the bottom was 15 seconds. Participants could click on any item currently visible in the 'flow screen'. The ‘flow stage’ automatically terminated after the disappearance of the last stimulus item.

Candidate Party Label: Party-identifying information for candidates in PL^P conditions was imparted by putting party logos and party-branded colour theme (i.e. Red= Lab, Blue=Con, Yellow= Lib) on stimulus items (e.g. a red rose and red border for Labour candidates), and explained before the voting task. A separate printed sheet with the candidate names, the party they belonged to, and the relevant party logo, were made available to the participant in the PL^P conditions. In PL^A conditions logos were absent, and all stimulus item borders were grey, and no additional printed materials were provided.

Constructing the Candidates: Male-only names were used to control for effects of candidate gender on vote-choice. Names were chosen from the 3 most common UK first and surnames on the 2007 UK Electoral Roll, and randomly allocated. This was then checked against the list of MPs in the House of Commons to

check that such politicians did not already exist²¹. See Table 2.1 for the candidates. Other information, such as age, occupation etc. were created from the 2010 Smith Institute report on MP demographics²².

Table 2.1: Candidate Names, Party Affiliation, and Party Label.

<u>Surname, Forename</u>	<u>Party Affiliation</u>	<u>Party Label</u>
Williams, James	<i>Conservative Party</i>	
Smith, Robert	<i>Labour Party</i>	
Jones, Michael	<i>Liberal Democrats</i>	

Candidate Policies (Attribute Items): Candidate policies were taken from the relevant party manifesto from the 2010 UK General Election (Manifesto Project, 2013; BBC News, 2010), and prioritized based on public attitude polls asking voters to rank the importance of policy categories just prior to the time of the experiment (e.g., when asked “Which of the following do you think are the most important issues facing the country at this time?”, 77% of the public reported [the] ‘Economy’)²³.

21 stimulus items for each candidate were constructed based on these policy categories (e.g. for ‘Economy’, policies on ‘Jobs’ were used, e.g., “[Labour] will guarantee people aged 18-24 a job, work experience or training place if they are unemployed for more than six months”), and controlled to be similar in word length, complexity and informational content. Each policy was assigned a value between 1-7, based on its position in a political ‘left-right’ continuum, with up to 7 possible options for that policy (e.g. on Deficit: Lab, Lib, and Con received 2, 4 or 5 respectively; for higher education fees, 1= 100% Government Funded, and 7= 100% Tuition Fees). Candidate policies were scored blind by the experimenter, with no knowledge of participants’ experimental data. For the full text of materials used, see Appendix A.3.

²¹ 6 ‘Jones’s, 6 ‘Williams’s, and 10 ‘Smith’s, were MPs in the 2010 House of Commons. [List of MPs elected in the United Kingdom general election, 2010.](#)

²² *Who Governs Britain?* - [Smith Institute, 2010.](#)

²³ YouGov (2013a). *Issue Tracker (2)*. <https://goo.gl/1L7Iog>

Table 2.2: Attribute Text, and scores for candidates on 7-point Left-Right scale [in parentheses].

Attribute	Candidate	Williams, James (Con)	Smith, Robert (Lab)	Jones, Michael (Lib)
<i>Age</i>		47	51	52
<i>Occupation</i>		"...works for a financial services firm in the private sector."	"...is a full-time public representative for local government."	"...is self-employed, and owns a small-medium business."
<i>Marital Status</i>		"is married to his wife Jane."	"lives with his partner, Fiona."	"is unmarried, and single."
<i>Education</i>		"said his days at public school were his best."	"said he was proud to have gone to a state school."	"visited his old private school while campaigning."
<i>Political Experience</i>		"has not had any political experience yet."	"is currently a local councilor for the area."	"has previously been an MP in parliament"
Academies		"continue the roll out of academies, and expand the programme to allow every existing school - including primaries - to seek Academy status." [6]	"will continue roll-out of Academies, and leave them independent of local authority control." [5]	"hopes to replace Academies with "Sponsor Managed Schools", to be run by educational charities and private providers, but under local authority control" [3]
Council Tax		"would provide funding for a two-year council tax freeze, and allow local residents to block "high" council tax rises." [3]	"ruled out Council Tax revaluation in the next Parliament, and would continue selective capping of "excessive" rises in council tax." [2]	"would replace the Council Tax with a Local Income Tax set by Local Councils, and it would not be capped by the Government." [5]
Child Tax Credits		"will end tax credits for families earning over £50,000." [3]	"Give parents of one- and two-year-olds an extra £4 a week in Child Tax Credit per child." [5]	"will make the payments of tax credits for six months at a time so that payments are stable and predictable; and restrict credits to those that need them most" [2]
National Deficit		"aims to eliminate "the bulk" of the UK's structural deficit within five years, with 6 billion pounds in cuts... spending cuts would happen in all areas, apart from health and foreign aid." [5]	"would target an increase in public spending over the next year, before cutting the deficit by more than 50% by 2014 and reducing the structural deficit by at least two-thirds over the next parliament." [2]	"plans to cut £15 billion per year of lower priority spending to protect front-line services, while reducing structural deficit by at least two-thirds over the next parliament." [4]
Elderly Care		"wants to enable retirees to prevent their homes from being sold to fund residential care costs by paying a one-off premium of 8,000 pounds at retirement. [He] also says that they would reject any proposals to fund care by levying charge on elderly peoples' estates after death." [5]	"would ensure government would cover people's care costs after they have spent two years in residential care from 2014. [He] also wants to establish a "National Care Service" free at the point of use for all adults with an "eligible care need", with funding arrangements decided by a Commission by 2015." [2]	"wants to establish an independent commission, with cross-party support, to develop proposals for long-term care of the elderly." [4]

EU Membership	“would pass a law to require a referendum on any future treaty that transfers power from Britain to the EU.” [4]	“strongly supports continued EU membership for the UK.” [2]	“would strongly support continued EU membership, and would opt into pan-European justice policies.” [1]
Euro Currency	“would rule out joining the Euro currency if in government.” [5]	“would support joining the Euro in principle, if approved in a referendum, but has no current plans to enter.” [3]	“would support Euro membership in principle, but has no current plans to enter.” [2]
Greenhouse Gas Emissions	“wants an 80% reduction in greenhouse gas emissions by 2050.” [2]	“would cut greenhouse gas emissions by over 34% by 2020 and 80% by 2050.” [3]	“a 40% reduction in greenhouse gasses emissions by 2020, rising to 100% by 2050.” [4]
Health Spending/NHS	“cut the cost of NHS administration by a third, while increasing health spending in real terms every year up to 2015.” [2]	“to protect frontline NHS from spending cuts, saying the NHS was a vital part of British life.” [1]	“more cost-effective purchasing of drugs, including greater use of generic drugs, would be carried out to make savings in the NHS.” [2]
3rd Heathrow Runway	“would block the third runway at Heathrow and would also oppose second runways at Stansted and Gatwick Airports.” [3]	“would support a third runway at Heathrow, but would oppose any extra runways at any other UK airport in the next Parliament.” [6]	“wants to block a third runway at Heathrow, and any expansion of other airports in the South East.” [3]
High Speed Rail 2 (HS2)	“develop a high speed rail network connecting cities across England, Scotland and Wales, with the construction of the first stage to begin in 2015.” [5]	“to build a new high-speed rail line, initially linking London to Birmingham, Manchester, the East Midlands, Sheffield and Leeds, and eventually extending to the North and Scotland.” [5]	“supports Crossrail and North-South high-speed rail, but would prefer more private sector funding for the plans.” [4]
Immigration (Levels of)	“would bring down net immigration to 1990s levels, and ensure only economic migrants who will “bring the most value to the economy” are admitted, but also would establish an annual limit for non-EU economic migrants... wants to apply controls on migrants from new countries joining the EU.” [5]	“wanted to break the automatic link between staying in the UK for a set period and being able to settle or gain citizenship, and continue to force employers to advertise skilled vacancies in job centres four weeks before appointing a skilled immigrant from outside the EU... would expand the Migration Impacts Fund to channel money to parts of the country which take in the most migrants.” [3]	“wanted to increase the cost to business of work permits for immigrant employees to pay for training British workers... would create an “earned route” to citizenship for illegal migrants who have been in the UK for 10 years, who have no criminal record and speak English.” [4]
Jobs/Unemployment	“will replace current employment schemes with a single Work Programme via private and voluntary sector providers.” [5]	“will guarantee people aged 18-24 a job, work experience or training place if they are unemployed for more than six months.” [3]	“will introducing a new ‘90-day promise’, instead of the current 10 months, to make available a place in work, training, education or an internship.” [2]
‘Mansion Tax’	“said calls for a “mansion tax” are ridiculous, and is opposed to the idea.” [5]	“a “mansion tax” of 1% on properties worth more than 2 million pounds will be introduced.” [2]	“supported a mansion tax in principle, they would enact a 7% stamp duty on those whose properties are worth above 2 million pounds.” [3]

Nursery Care	“supports free nursery care for pre-school children, offered a range of private and public providers.” [4]	“promises to provide nursery places for 20,000 two-year-olds in the most deprived areas by 2015, and increase free nursery hours to 15 hours a week for three- and four-year-olds.” [2]	“would be protected as it is, but when possible, wants to introduce free, universal childcare provision for children aged 18 months-five years for 20 hours a week.” [1]
Nuclear Power	“wants to speed up the planning process for new nuclear power plants, so new plants can be built faster.” [4]	“said they supported changes to the planning system to encourage a new generation of nuclear power stations to cater for energy demand, and supports things remaining the same for now.” [3]	“opposes any new nuclear power plants being built.” [2]
Pension Age	“would bring forward the rise in the state pension age to 66; although no sooner than 2016 for men and 2020 for women.” [3]	“would increase pension age for women to 65 in 2020, and to 68 for both men and women between 2024 and 2046.” [2]	“says it should remain at current levels.” [1]
Police	“wants Police Crime Commissioners to have responsibility for strategy and budgets at an area specific level.” [6]	“wants to protect “frontline” police from budget cuts in the next parliament.” [3]	“would increase overall police numbers by 3,000 over five years.” [2]
Prisons	“would increase prison capacity 15,000 places, in order to scrap the early release scheme.” [4]	“would add 15,000 prison places by 2014.” [3]	“need to reduce the use of short sentences and encourage use of community sentencing, as the way to reduce prison overcrowding.” [2]
3rd Level Tuition Fees	“retain the current level of tuition fees for university, and give bonuses for early repayment of student loans.” [3]	“will lower Tuition Fees for universities etc. to 6,000 pounds.” [2]	“would retain the current level of tuition fees, and provide more support for graduates around debt repayment.” [3]
Trident (Nuclear Defence)	“is committed to replacing Trident to maintain the UK's independent nuclear deterrent.” [4]	“is committed to replacing Trident to maintain the UK's independent nuclear deterrent.” [4]	“would rule out the like-for-like replacement of the Trident nuclear weapons system, and halve the UKs stockpile of nuclear warheads as a prelude to kick-starting multilateral disarmament.” [3]

Post-Ballot/Decision Questionnaire: Following their vote choice, participants were asked the questions contained in Table 2.3, and also how realistic they found the campaign and candidates, and if there were ways to improve it to make it more reflective of a typical UK election campaign.

Table 2.3: Post-Ballot Box Questionnaire; text and scale points.

Question	Scale End-Point ‘Text Anchor’
<i>“How ‘believable’ or realistic were the candidates you experienced?”</i>	0 ‘Not at all Believable’ – 100 ‘Completely Believable’
<i>“If you had more time to learn about the candidates running in this election, how confident are you that you would still vote for the same person?”</i>	0 ‘Not at all Confident’ – 100 ‘Completely Confident’
<i>How confident are you that the person you chose best reflects the type of person you want representing you?</i>	0 ‘Not at all Confident’ – 100 ‘Completely Confident’
<i>How difficult was it for you to decide how to vote for your choice?</i>	0 ‘Not at all Difficult’ – 100 ‘Extremely Difficult’
<i>Briefly, what was the most important reason you decided to vote for the candidate you supported in the election?</i>	Free Text Answer

2.2.4. Procedure

The study was conducted in individual lab cubicles at UCL, with the experimenter in a separate adjoining room. Participants were given a brief overview of the experiment, whereupon they were invited to sign a consent form and begin.

Participants first read an introductory message on screen consisting of an overview of the study’s main stages, and requirements for each one. Upon continuing, participants completed three questionnaires measuring their ‘*political sophistication*’, ‘*rate of civic involvement*’ and other political behaviours (i.e. ‘*media viewing habits*’) – these are not the focus of the current discussion.

After completion of the questionnaires, participants were presented with instructions on the software’s operation, and the experimental voting task, before proceeding to engage in a practice trial featuring two candidates (Ken Livingstone & Boris Johnston, 2012 London Mayoral candidates), with four stimulus items (none relating to main experimental stimuli) per candidate. After completion of the practice experiment,

participants proceeded to the main experiment. Upon making their vote choice, participants completed a further 2 questionnaires ('Need for Cognition 5Q', 'Need to Evaluate 16Q')²⁴ as well as completing a policy attitude survey relating to the 21 policy attributes that appeared for each candidate (21 questions), before being debriefed as to the purpose of the experiment and paid.

2.2.4.1. Calculating Correct Voting

Correct-Voting Measure: Participants' policy preferences are compared with each candidate's policies using their responses to the policy attitude survey. The overall distance between their preferences and the policies offered by candidates are calculated using the Euclidian calculations for the distance (d) between two points in (n) dimensions:

$$d(qp) = \sqrt{(q_{x1} - p_{x1})^2 + (q_{x2} - p_{x2})^2 \dots + (q_{xn} - p_{xn})^2} = \sqrt{\sum_{i=1}^n (x_{qi} - x_{pi})^2}$$

$d(qp)$ is the distance between the participant p and the candidate (alternative) q over the values for each policy issue X_i . These positions are given by participants' responses to the 21 question policy attitude survey and the candidates' values for each policy on the 'left-right' continuum²⁵. An end-product value of '0' between a candidate and a voter indicates a perfectly proximal (overlapping) preference-distance, with an increasingly positive (due to the squared difference) value reflecting relative distance away from each other. For example: if a person scores '1' for Candidate A, and '2' for Candidate B, and '6' for Candidate C, we can say A is closer to B, and B is closer to A than C.

Determining the Correct Choice: From the above calculations, we already have a ranked objective measure of whom a participant should have voted for (e.g. A, as $A < B < C$). If a participant voted for the most proximal candidate available to them in the 'election', it was deemed a 'correct' vote, otherwise, they voted 'incorrectly'. In the event of a participant being equally close to two or more of the candidates, a vote for either of them was treated as voting 'correctly'.

²⁴ We do not address the use of these measures any further in our results or discussion.

²⁵ We do not capture participant's decision-weights for inclusion in the distance calculation here, as equal-weight models have been shown to approximate the performance of optimally weighted decision models (Dawes, 1979). However, we do so in subsequent experiments (Experiments 3 & 4), finding no meaningful differences in the pattern of results following on their inclusion.

Alternative Distance (Similarity): Using the Euclidian scores of candidate distance relative to the voter (who lies at the origin in N -dimension space), we computed the ‘distance’ (or difference) from the ‘best’ alternative in the choice set (based on proximity) to the ‘next best’ in the choice set. Where the resulting values trend towards ‘0’, distances between the two ‘best’ alternatives will be small; the converse also being true. For brevity, we refer to this as ‘*distance BNB*’.

2.2.5. Results

2.2.5.1. Vote Choice

The Labour candidate was the most popular in our experiment (60% of votes), followed by Conservative (21%), Liberal Democrat (8%), None of those on ballot (8%) and Abstain/Spoil (3%).

We examined the relationship between Vote Choice and *Number of Candidates*. The moderate relationship between these variables was significant, $\chi^2(4, N= 136) = 15.72, p = .003, \phi_c = .338$. This is as expected: a lack of a 3rd (LibDem) candidate in 2-Candidate conditions will create a significant effect, as there will be no LibDem votes. There was no relationship between Vote Choice and *Party Label*, $\chi^2(4, N= 136) = 2.75, p = .601, \phi_c = .141$.

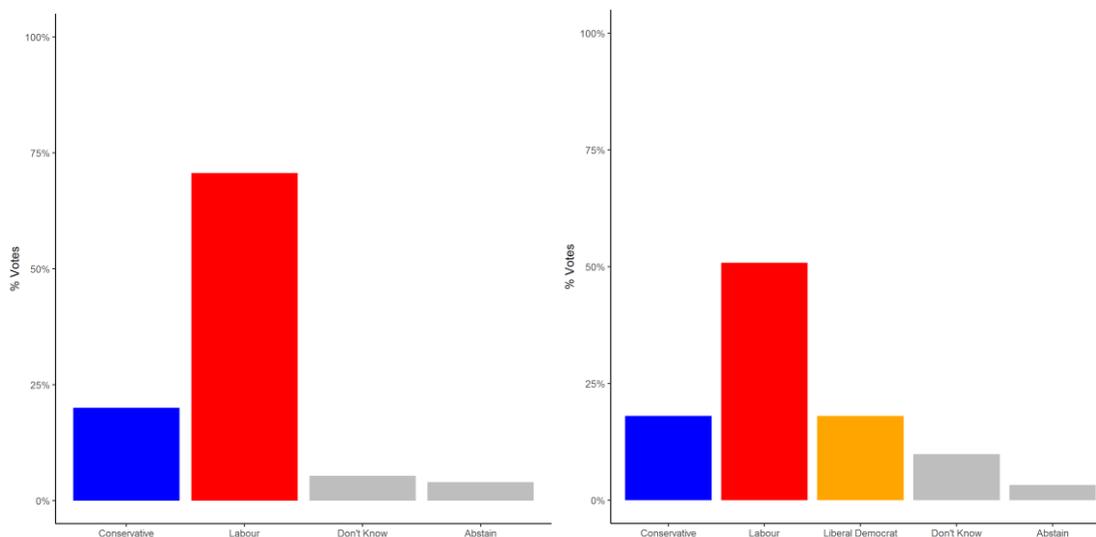


Figure 2.3: % Vote Choice per candidate condition

2.2.5.2. Correct Voting

We removed all participants who responded ‘Abstain’ or ‘Don’t Know’ from our analyses (N=16), leaving 120 participants in our sample. This led to unequal cell sizes in our data, therefore we also compare our results to a bootstrapped sample ($r = 10,000$). There are no meaningful deviations from the reported results unless we

mention them in footnotes where appropriate. As outlined in Section 2.1.3, we also calculated correct voting (CV) using the directional method. There are no meaningful differences in our results using either the directional or proximity model of CV in our results, unless mentioned in footnotes. For supporting analyses, see Appendix A.2.

Using binary logistic regression, we regressed CV (0 = Incorrect, 1= Correct) on our main condition variables, with Party Label (PL: Absent, Present) and Number of Candidates (NOC: 2CAN, 3CAN) entered in Block 1, and their interaction term in Block 2. The regression model containing PL and No. of Candidates was significant, $\chi^2(2)= 14.93$, $p= .001$, $R^2= 16.8\%$, and predicted 68.3% of the overall cases correctly. Adding the interaction term did significantly improve the model ($p= .036$). We report the full model in Table 2.4, $\chi^2(3)= 19.34$, $p< .001$, $R^2= 21.4\%$.

Table 2.4: Logistic Regression results of Party Label and Number of Candidates on CV rates. (N=120).

Predictor	β	SE	χ	e^β
Party Label (PL^A)	1.77**	.83	4.52	5.91
NOC (2^{CAN})	-.77	.56	1.88	.464
PL*NOC	-1.98**	1.00	3.92	.137
Constant	1.05**	.41	6.62	2.87

* $p< .1$. ** $p< .05$. *** $p< .01$. † $p< .001$. (Reference categories in parentheses).

The main effect of PL did not significantly predict CV, $\beta= .50$, $p= .24$, with participants 1.6 times more likely to vote correctly when party label is present. The main effect of NOC did significantly predict CV, $\beta= -1.53$, $p= .001$, with participants being 78% less likely to vote correctly when the number of candidates in the choice set increases from 2 to 3. 85.1% of participants voted correctly when the choice set contained 2 candidates, whereas 54.7% of participants voted correctly when choice set contained 3 candidates (see Figure 2.4).

The interaction term was significant, $\beta= -1.98$ $p= .048$, therefore we analysed the effect of PL^{P/A} for 2 vs. 3 candidates separately. In the 2CAN condition, participants voted correctly 74.2% of the time when PL^A, and 94.4% of the time when PL^P; which is significant, $\chi(1, 67)= 5.38$, $p= .02$. In the 3CAN condition, participants

vote correctly 57.1% of the time when PL^A, and 52.0% of the time when PL^P, the difference between conditions being non-significant, $\chi(1, 53) = .14, p = .70$ (see Figure 2.4).

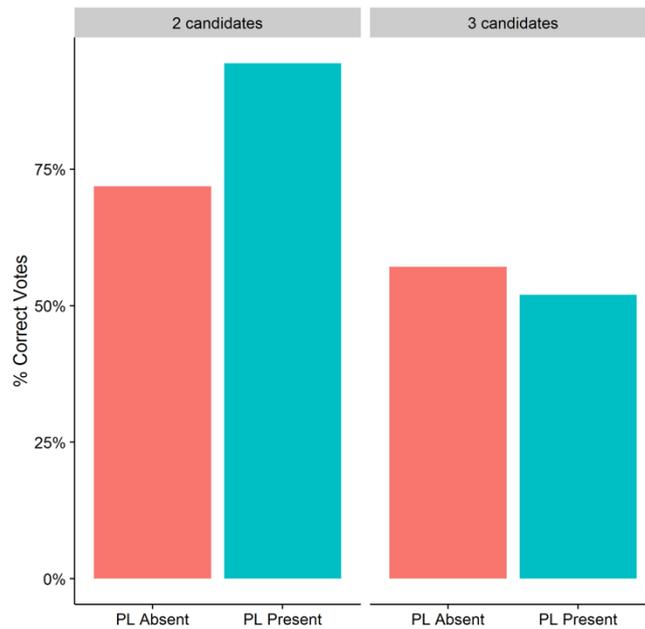


Figure 2.4: % Correct Voting by condition

Chance Level Analysis: The significant effect of number of candidates would of course be expected even if participants were choosing candidates at random, due to the fewer options available in the 2-Candidate condition. We therefore compared rates of CV to chance levels in these conditions, collapsing across party label conditions. 85.1% of participants voted correctly in the *2-candidate condition* (greater than the 50% expected by chance, $p < .001$), whilst the 54.7% of participants voting correctly in the *3-candidate condition* did not differ significantly from chance levels (33%; $p = .67$). Thus, the influence of increasing the number of candidates on levels of CV cannot be explained solely on the basis of a difference in chance levels. Note that we are not claiming that participants *are* choosing randomly in the 3-Can condition; simply that based on their own reported policy preferences they choose the correct candidate no better than if by chance.

2.2.5.3. Post-Ballot Box

Overall participants found the candidates in the experiment believable ($\mu = 67.23, SD = 18.90$), had confidence in their vote choice ($\mu = 55.18, SD = 20.17$), were confident they would not change their vote ($\mu = 65.34, SD = 19.34$), and felt making their vote choice was not especially difficult ($\mu = 42.48, SD = 24.44$).

We carried out a multi-variate ANOVA on all four measures, finding only number of candidates had a significant effect averaged across all the dependent variables, Pillai's Trace $V = .09$, $F(4, 112) = 2.77$, $p = .03$, $\eta^2 = .09$. Follow-up univariate analyses revealed that this effect was only significant for how confident participants were in their vote choice, $F(1, 119) = 6.26$, $p = .014$, $\eta^2 = .054$. Participants' confidence in their choice is lower in the 2-candidate condition ($\mu = 50.91$, $SD = 20.69$) than in the 3-candidate condition ($\mu = 60.51$, $SD = 18.34$), suggesting participants are more confident in their choice as the choice set size increases. See Figure 2.5 for all variables by PL and NOC.

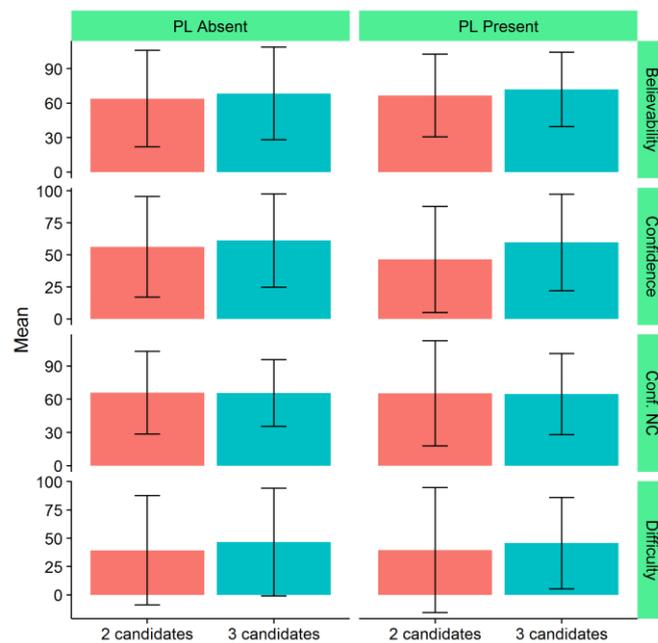


Figure 2.5: Post-Ballot Measures by Condition. Bars are +/- SD.

2.2.5.4. Post-Ballot Box and Correct Voting

Vote confidence appears to increase significantly when the numbers of candidates in the choice set increases, which itself negatively predictive of correct voting rates. We test if increasing confidence may be mediating the effect of NOC on CV²⁶. While NOC is predictive of levels of vote confidence, $\beta = .23$, $p = .013$, vote confidence is not predictive of CV, $\beta = -.01$, $p = .35$.

²⁶ As a check, CV was also regressed on all the post-ballot variables, noting none significantly predicted CV; though 'perceived difficulty' was marginally significant ($p = .052$) and bootstrapping improves this to $p = .038$. NOC remains negatively predictive ($p = .005$).

2.2.5.5. Distance and Correct Voting

We regressed ‘distance BNB’ (centered on its mean) as a predictor variable on CV, finding it was negatively associated with the likelihood of voting correctly but not significantly, $\beta = -.15$, $p = .93$. Thus, the similarity of the proximal candidate and the second-most proximal candidate does not predict rates of correct voting, suggesting conflict arising from their similarity does not affect the ability to vote correctly.

Correlations of ‘best-next-best’ distance: Distance from the ‘Best’ to the ‘Next Best’ option in the choice set was not significantly correlated with vote-choice difficulty ($r = .002$, $p = .98$); nor was it significantly correlated with how confident participants were they would not change their vote given more time ($r = -.05$, $p = .55$). This suggests that increasing similarity between the two most similar alternatives (presumably the most ‘attractive’ options in the choice set) does not relate to how difficult participants found the vote choice. Likewise, alternative similarity is unrelated to how confident participants would not switch their vote choice; though the negative relationship is in line with the idea that decreasing distance (increasing similarity) would lead greater uncertainty in the decision.

However, distance was significantly negatively correlated with how confident people were in their vote choice, $r = -.24$, $p = .01$, suggesting that as the two candidates most proximal to a voter’s ideal point become closer or ‘more similar’, participants become more confident in their vote. This may be as a result of participants feeling that ‘they can’t go wrong’ in their choice, given the relatively small size of the choice sets used (2 and 3 alternatives) compared to other studies (e.g. 24 alternatives).

2.2.5.6. Summary

We find that PL is not significantly predictive of correct voting, whereas NOC does significantly predict CV, with participants more likely to vote incorrectly as the choice set size increases. Rates of CV do differ significantly from chance in the 2-candidate condition, whereas they do not in the 3-candidate condition. We find an interaction between PL and NOC, such that highest rates of correct voting occur when there are 2 candidates and PL is present (94%), but lowest when there are 3 candidates and PL is present (52.0%).

There is a difference in how confident participants are about their vote, with participants feeling significantly more confident in their vote choice when there are 3 candidates compared to 2 candidates, with no significant differences in perceived choice difficulty.

Similarity (as measured by the distance between the two most proximal alternatives) of alternatives in the choice set to the participant is not predictive of CV and is not correlated with how difficult participants found their choice, or how confident they were in sticking with their choice. Similarity was correlated with how confident participants were in their vote, with increasing similarity between the two most proximal candidates correlating with greater levels of vote confidence.

2.2.6. Discussion

In discussing our findings, we refer back to our original hypotheses:

H₁: *That rates of ‘correct voting’ will decrease when the number of candidates (alternatives) increases from 2 to 3.*

Our analysis showed a strong relationship between CV and Number of Candidates. Indeed, we showed that in 3-Candidate conditions, voters chose the candidate who best represented their policy levels at a level no better than chance. Rational theories of choice would predict CV will remain unchanged with larger numbers of vote-choice alternatives, with increasing alternatives to choose from increasing the probability of an option appealing that best matches a voters’ preferences.

However, we know from findings in decision-making research that increasing the numbers of alternatives in a choice set increases the difficulty of the choice task (Johnson & Payne, 1985), due to increased information search requirements. This subsequently leads to the use of different decision-making strategies, which can result in different choices being made. It nonetheless seems striking that such a small increase to three alternatives leads to such a large effect on voters’ ability to vote correctly (85.1% to 54.7%), given in real-world elections increases from two to *nine* alternatives decrease correct voting from 79% to 57% respectively (Lau et al., 2013). Contrary to Lau et al.’s (2013) results from real-world elections, we find participants *do not* do better than chance in a controlled laboratory-based study when there are 3 alternatives in the choice set.

H₂: *That ‘correct voting’ will decrease when Party Label (party identity) information is available.*

H₃: *That H1 and H2 will have multiplicative effects, such that the effect of excluding Party Label will be greater in the 3-candidate condition, due to the enhanced task complexity.*

We observed no support for H2. This was a simplified laboratory version of a real-world voting task, potentially reducing the need to rely on cognitive shortcuts such as the party label heuristic. We predict that such effects might be stronger in more complex scenarios, where task demands are greater. The lack of an effect, however, given the weight to it in the literature, suggests the importance of investigating this issue further.

It is also the case that in the present study, the candidate attributes were highly stereotypic, reinforced through the addition of candidates' 'personal information' (e.g. their school education and occupation). This should have made the candidates' party affiliation readily apparent even in the absence of a party label. This might account for the lack of a significant overall effect of Party Label but does not explain the interaction effect (H3) with Number of Candidates.

Contrary to H3, we find that there is no significant difference between the 3-candidate conditions whether party label is absent or present (57% vs 52%, respectively), but rather that correct voting is significantly higher (94%) when there are 2 candidates and party label is present, compared to when it is absent (74%). This is contrary to H2 and H3. This suggests any effect of party label may be strongest when choice sets are smaller. Our results suggest that party label exerts a positive effect on correct voting rates, in that CV rates are higher when it is present than when it is absent.

Given the nature of the candidates used in the 2-candidate condition, this may not be unsurprising. The Labour and Conservative candidates are generally divergent on many issues, and it may be that this becomes apparent to participants as they learn about them during the flow stage, decreasing the perceived complexity of the task. The addition of party labels may encourage participants to engage in a matching-strategy with their own preferences, and may reduce the need for participants to engage in effortful learning about the alternatives.

Of those in the 2-Can/PL^P condition 30.6% self-identified as closest to Labour and 8.3% Conservative, 19.4% as Liberal Democrat, 27.8% as Green Party, 5.6% 'None of the Above', and 8.3% 'Don't Know'. Given the low amount of participants unsure of which party they may be closest to, the high rates of CV in this condition may be resulting from the task being too easy- in that is obvious whom they are (or are not) closest to in terms of policy. However, this does not explain why the combined 82% of participants in the 3-Can/PL^P who felt closest to either Labour, Conservative, or Liberal Democrats does not align with the correct voting

rate (52%). There are two possibilities besides increased task complexity; the first being that participants' policy preferences may not align with their preferred party's stances, leading to incorrect voting. Party label can be a useful cue, but only if it aligns well with a candidate's policies, and the voter's. In our case, party label does match the candidates' policies as they are derived from the real-world policies of each. The second is that the addition of the Liberal Democrats may result in preference violations (i.e. context effects) as discussed in Chapter 1. We explore this possibility in Chapter 4.

We also find that participants' confidence in their vote choice is higher as choice set size increases and that participants are more confident as the 'best' and 'next-best' candidates become closer in n -dimensional policy space. Under rational models of decision-making, such a finding makes sense; as choice set size increases, the likelihood of an alternative (candidate) that better approximates a voter's preferences also increases. Further, as two options come closer together and are more similar, the more likely choosing either will satisfy a voter's preferences; in a 2-candidate choice set the choice becomes arbitrary, and in the 3-candidate set a choice even at random will satisfy preferences 2/3rds of the time. While both of our measures of confidence are negatively correlated with perceived choice difficulty, difficulty did not seem significantly affected by either of our condition manipulations nor by how similar options are. One might expect perceived difficulty to increase following an increase in choice set size (as per Johnson & Payne, 1985), and they did differ, with perceived difficulty higher in the 3-candidate condition ($\mu= 46.21$, $SD=21.97$; vs. $\mu= 36.48$, $SD= 26.03$), albeit non-significantly. Among those pursuing a '*satisficing*' strategy (Bearden & Connolly, 2008; Simon, 1978), difficulty should not increase from the increasing similarity of alternative, as any choice becomes increasingly as 'good' (or correct) as another, unless the motivation to discriminate among options is high. We do not ask participants directly to vote 'correctly', or motivate them in any overt way to discriminate between options beyond choosing a candidate to vote for. Therefore, it is possible that participants are following a satisficing strategy when choosing a candidate.

In real-world voting with multiple parties and candidates, strategic voting concerns (e.g. electability; Blais & Gschwend, 2011) complicate things further. This is highly unlikely to have been a concern in the present study, as our election scenarios stressed candidates were equally 'tied in the polls', thus reflecting equal likelihood of election at the time. We discuss these further in the chapter, and in the general discussion (Chapter 5).

Given the contradictory nature of our results in comparisons to what was expected given much of the literature on partisanship and choice overload, we decided to attempt to replicate these results in a further experiment.

2.3. Experiment 2

In Experiment 1 we found support for our first hypothesis that the number of candidates in the choice set would affect correct voting, with participants voting less correctly when the number of candidates increased from 2 to 3. Therefore, we conduct an additional experiment to test if the results replicate.

Methods

2.3.1. Participants

Participants were native English speakers and eligible to vote in the UK local or parliamentary elections before enrolment in the study. 105 participants (70 female), aged 18-52 ($\mu = 20.54$ years), were recruited. Participants were mostly single (74.3%); students (96.2%); self-identifying as ‘White-British’ (40%) or ‘White-Other’ (14.3%); and with an income under £10,000 per annum (78.1%). Participants were paid £4 for participating. Ethical approval was granted from UCL (CPB/2010/10).

Randomisation led to some imbalance in cell sizes (2Can- PL_A: 25; 3Can-PL_A: 29; 2Can- PL_P: 24, 3Can- PL_P: 32).

2.3.2. Design, Materials, and Procedure

The design, procedure, and materials, used were the same as those in Experiment 1, with the exception that we removed the candidate-specific personal attribute items (e.g. candidate’s education history, marital status, age, etc.) from the presentation in the flow stage. These items are not included in how we calculate CV and were originally included to increase candidate ‘believability’ to participants. Also, personal information about candidates might lead to participants forming stereotypical views of candidates, which may undermine the effect of party label, and/or be used as cues in candidate evaluation. As the alternative is to include these items

and capture participants' appraisals/preferences for each, we elect to be consistent with our conception of correct voting as being based on policy preferences only²⁷.

2.3.3. Results

2.3.3.1. Vote Choice

The Labour candidate was the most popular in our experiment (48.6% of votes), followed by Conservative (25.7%), Liberal Democrat (14.3%), None of those on the ballot (3.8%) and Abstain/Spoil (7.6%). This is shown in Figure 2.6.

We examined the relationship between Vote Choice and *Number of Candidates*. The strong relationship between these variables was significant, $\chi^2(4, N= 105) = 17.98, p = .001, \phi_c = .414$. This is as expected: a lack of a 3rd (LibDem) candidate in 2-Candidate conditions will create a significant effect, as there will be no LibDem votes. There was no relationship between Vote Choice and *Party Label*, $\chi^2(4, N= 105) = 3.78, p = .436, \phi_c = .19$.

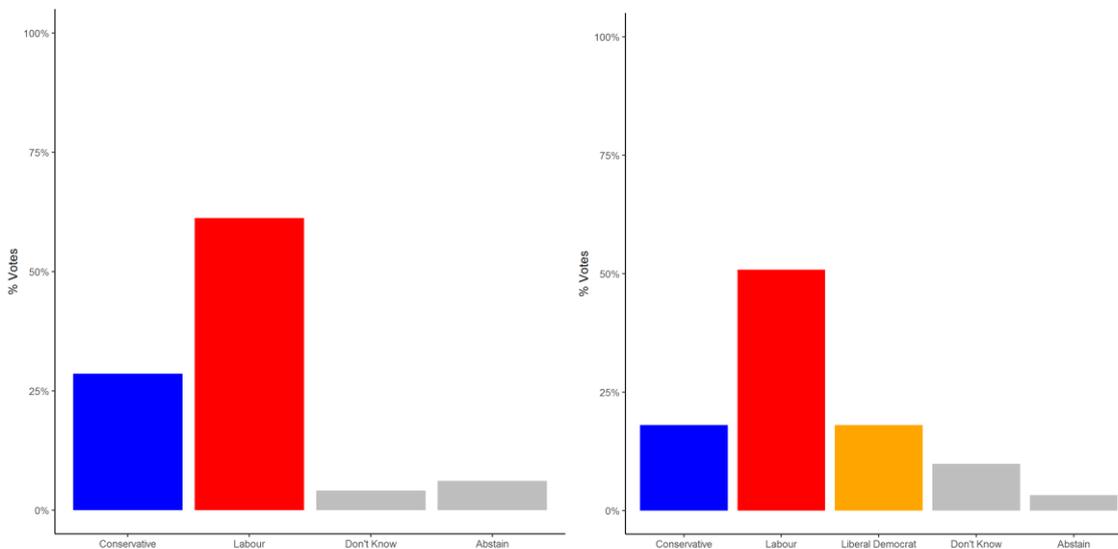


Figure 2.6: % Vote Choice by candidate condition

²⁷ It is worth stating that voters only fall back on "demographic cues" (Popkin, 1991, 63); such as their similarity to a candidate's age, gender, race, cultural membership, and educational background; in order to estimate candidates' ideological positions when such information is not available, or voters do not have opinions on the issues, or don't have strongly held partisanship priors. None of which are an issue in our studies. While gender (McDermott, 1997; Fulton & Ondercin, 2012), and a combination of race and gender (Philpot and Walton, 2007), has a significant impact on voting decisions, we control for all of these, as all our candidates are male and White British.

2.3.3.2. Correct Voting

We removed all participants who responded ‘Abstain’ or ‘Don’t Know’ from our analyses (N=16), leaving 94 participants in our sample. This led to unequal cell sizes in our data, therefore for we also compare our results (where possible) to a bootstrapped sample ($n=10,000$). Where there are meaningful deviations from the reported results, we note them in footnotes.

We regressed CV (0 = Incorrect, 1= Correct) on the group variables Party Label (PL) and Number of Candidates (NOC), entering these in Block 1, and their interaction term in Block 2. The regression model containing PL & No. of Candidates was significant, $p=.009$, $R^2=12.8\%$, and predicted 64.5% of the overall cases correctly. The addition of the PL & NOC interaction term did not significantly improve the model ($p=.28$), which was significant overall, $p=.015$, $R^2=14.2\%$, and predicted 64.5% of the overall cases correctly. We report the overall model in Table 2.5.

Table 2.5: Logistic Regression results of Party Label and Number of Candidates on CV rates. N= 93.

Predictor	β	SE	χ	e^β
Party Label (PL ^A)	.40	.65	.39	1.5
NOC (2 ^{CAN})	-1.60**	.66	5.78	.20
PL*NOC	.96	.90	1.13	2.62
Constant	.442	.43	1.07	1.55

* $p < .1$. ** $p < .05$. *** $p < .01$. † $p < .001$. (Reference categories in parentheses).

Looking at our main-effects, NOC significantly predicted CV, $\beta = -1.10$, $p = .015$, with participants being 77% less likely to vote correctly when the number of candidates in the choice set increases from 2 to 3. When there are 2 candidates in the choice set, participants vote correctly 65.1% of the time, and 42% of the time when there are 3 candidates. Additionally, in this experiment, PL significantly predicted CV, $\beta = .92$, $p = .041$, with participants 2.5 times more likely to vote correctly when PL is present (differing from Experiment 1). When PL^A, participants vote correctly 43.2% of the time, and 61.2% of the time when PL^P.

Despite the non-significant interaction term, in light of H3, we analysed the effect of PL^{P/A} for 2 vs. 3 candidates separately. In contrast to Experiment 1, in the 2-Can condition there was no effect of Party Label on CV, $\chi^2(1, 43) = .39$, $p = .53$, $\phi_c = .09$, where CV is 60.9% when PL^A and 70% when PL^P. Again differing from

Experiment 1, there was a significant effect of PL on CV in the *3-Can* condition, $\chi^2(1, 49) = 4.92, p = .027, \phi_c = .131$, where CV increases from 23.8% when PL is absent to 55.2% when PL is present. The pattern of results is shown in Figure 2.7.

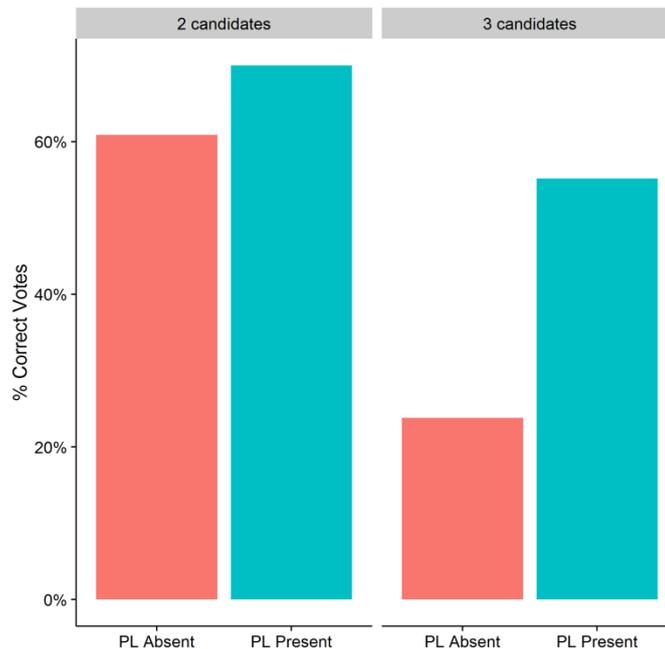


Figure 2.7: % CV rates by condition

Chance Level Analysis: The significant effect of number of candidates would, of course, be expected even if participants were choosing candidates at random, due to the fewer options available in the 2-Candidate condition. We compared rates of CV to chance levels in these conditions, collapsing across party label conditions. 65.1% of participants voted correctly in the *2-candidate* condition at rates non-significantly different from chance (50%), $p = .15$. This is in contrast to Experiment 1, where CV rates were greater than chance levels in the *2-candidate* condition.

The 42% of participants voting correctly in the *3-candidate* condition did not differ significantly from chance levels (33%; $p = .47$). Thus, the influence of the number of candidates on levels of CV could be explained on the basis of choosing at chance levels. Again, we are not claiming that participants *are* choosing randomly; simply that based on their own reported policy preferences they choose the correct candidate no better than if by chance.

2.3.3.3. Post-Ballot-Box

Overall participants found the candidates in the experiment believable ($\mu= 66.27$, $SD= 16.85$), had confidence in their vote choice ($\mu= 53.15$, $SD= 17.52$), had confidence they would not change their vote ($\mu= 58.36$, $SD= 20.11$), and felt making their vote choice was of medium difficulty ($\mu= 48.02$, $SD= 25.02$).

We carried out a multi-variate ANOVA on all four measures, finding neither Party Label (PL), number of candidates (NOC), nor their interaction term, had a significant effect averaged across all the dependent variables. NOC was significant for how confident participants were that they would not change their vote choice given more time, $F(1, 90)= 4.28$, $p= .041$, $\eta^2= .045$. Participants' confidence they wouldn't change is higher in the 2-candidate condition ($\mu= 63.07$, $SD= 18.19$) than in the 3-candidate condition ($\mu= 54.23$, $SD= 19.12$). The means and standard deviations are similar across all groups and are shown graphically in Figure 2.8.

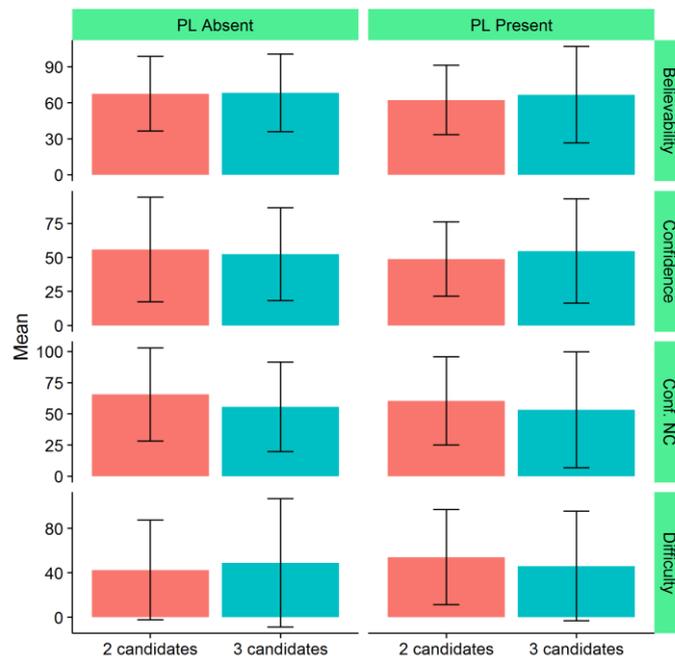


Figure 2.8: Post-Ballot Measures by condition. Bars are +/- SD.

2.3.3.4. Post-Ballot Box and Correct Voting

While we found no significant differences between our conditions for any of our post-ballot box measures, in keeping with our discussion around confidence and difficult in Experiment 1, we regressed the post-ballot measures of vote confidence, believability, and difficulty, on CV. The model was not significant, $\chi^2(7) = 9.41$, $p= .22$, explaining 13% of the variance in CV, and correctly classifying 64.5% of the cases We found no

significant effect of any of the variables on CV, and note in passing that PL and NOC remain significant ($\beta = .94, p = .04; \beta = -.53, p = .021$) after controlling for all these post-ballot measures.

2.3.3.5. Distance and Correct Voting

We regressed ‘distance BNB’ (centered on its mean) as a predictor variable on CV, finding it was positively associated with the likelihood of voting correctly, $\beta = .36, p = .039$, indicating participants were 1.43 times more likely to vote correctly as the distance between the two most proximal alternatives increases. We re-ran the previous regression model, including ‘distance BNB’ (centered on its mean) as a predictor variable with PL and NOC in Block 2, their 2-way interaction terms in Block 3, and their 3-way interaction term in Block 4.

Our regression model for Block 2 was significant, $\chi^2(3) = 12.21, p = .007, R^2 = 16.4%$, and correctly classifying 66.7% of the cases. Increasing distance between the ‘best’ and ‘next-best’ alternatives was non-significantly associated with the likelihood of voting correctly, $\beta = .29, p = .09$; indicating the effect was non-significant when controlling for the main effects of NOC and PL. PL was marginally significant, $\beta = .86, p = .06^{28}$, with participants 2.35 times more likely to vote correctly when PL is present after controlling for distance; NOC was significant, $\beta = -1.02, p = .026$, with participants 65% less likely to vote correctly when there are 3 candidates.

Adding the interactions between our condition variables and the distance between alternatives in Block 3 did not significantly improve our model ($p = .16$), nor did the addition of a three-way interaction in Block 4 ($p = .38$). The overall model was significant, $\chi^2(7) = 18.21, p = .012, R^2 = 23.5%$, which we report in Table 2.6.

Table 2.6: Logistic Regression results of ‘distance’ between ‘best’ and ‘next best’ options on CV rates. (N= 93)

Predictor	β	SE	χ	e^β
Distance	.80*	.45	3.19	2.24
Party Label (PL ^A)	.38	.80	.23	1.47
NOC (2 ^{CAN})	-1.91**	.76	6.22	.26
PL*NOC	1.08	1.04	1.08	2.96
Dist*PL	-1.11*	.63	3.05	.330

²⁸ Bootstrapped sample ($r=10,000$) estimates $p = .051$.

Dist*NOC	-0.21	.63	.11	.81
Dist*PL*NOC	.73	.84	.75	2.08
Constant	1.01	.48	4.44	2.74

* $p < .1$. ** $p < .05$. *** $p < .01$. † $p < .001$. (Reference categories in parentheses).

Distance & Post-Ballot Box: Increasing distance was not significantly correlated with ‘candidate believability’ ($r = -.06, p = .56$); nor with ‘vote confidence’ ($r = .06, p = .57$); nor with ‘confident wouldn’t change’ ($r = .11, p = .27$); nor with ‘perceived choice difficulty’ ($r = -.06, p = .59$).

2.3.3.6. Summary

In contrast with results from Experiment 1, we find that PL is significantly predictive of correct voting with participants more likely to vote correctly when PL is present. NOC significantly predicts CV, with participants more likely to vote incorrectly as the choice set size increases, however, rates of CV do not differ significantly from chance in either the 2-candidate condition (differing from Experiment 1) or 3-candidate condition (similar to Experiment 1). We find no significant interaction between PL and NOC. The highest rates of correct voting occur when PL is present and there are 2 candidates (70%), but least when PL is absent and there are 3 candidates (23.8%).

Unlike Experiment 1, distance (or similarity) between the two ‘best’ candidates based on participants’ self-reported preferences was positively predictive of correct voting, in that the more similar alternatives became the more likely participants were to correctly vote. In addition, the main effects of PL and NOC remain after controlling for distance/similarity between the 2 ‘best’ alternatives.

We find no difference in vote confidence, candidate believability, or perceived difficulty, across our conditions and none were predictive of correct voting.

2.3.4. Discussion

H₁: *That rates of ‘correct voting’ will decrease when the number of candidates (alternatives) increases from 2 to 3.*

As per Experiment 1, we find rates of correct voting decrease when the number of candidates increases from 2 to 3 in our replication study (65.1% to 42%). In contrast to Experiment 1, we find that CV rates were

no better than chance in the *2-candidate* condition (65.1% vs. 50%) where originally they were greater than chance levels. The only major changes between Experiments 1 and 2 were the participants themselves and the removal of the candidates' personal information. Overall, the demographics of our participants are highly similar, as were their prior party preferences and their vote choices at our 'ballot box', therefore we do not see this as a plausible explanation.

We removed items containing 'personal information' of the candidates, 15 items in total (10 in the 2-candidate condition with an additional 5 from the 3-candidate condition). On a purely information-processing level, we would not expect this to affect results, as we scale the time spent in the flow stage to the number of items presented, therefore allowing participants comparable amounts of time to process the information. However, they could have been providing additional information that was somehow diagnostic to a candidate's policy stands (though efforts were taken for them to be as non-stereotypic as possible).

One would suspect that the removal of attribute information from each candidate would decrease the task complexity, especially in the *2-candidate* condition, and thus should not affect the previously high CV rates in the smaller choice set. However, it may be participants were utilizing candidates' personal information in Experiment 1 to discern either candidate ideology/partisanship, or as cues in their own right, in aiding them in making a correct vote for a candidate. Without this information, participants may be engaging in more effortful decision-strategies, and experiencing greater task demands- leading to decreases in correct voting. While do not know the nature of participant's information search or processing, we address this point in Chapter 3.

H₂: *That 'correct voting' will decrease when Party Label (party identity) information is available.*

We obtained the opposite to predicted findings for H₂ in this experiment, with party label exerting a positive effect such that when it is present correct voting increases (61%), compared to when it is absent (43%). We mused on the possibility of party label aiding participants in making a correct vote in the Discussion section of Experiment 1 due to the correct voting pattern, finding direct evidence of such in Experiment 2.

Given that candidate information (age, gender, race, cultural membership, and educational background) can be used to estimate candidates' ideological positions when such information is not available (Popkin, 1991), our removal of such for Experiment 2 may have resulted in party label having a much greater effect, serving its purpose as a stereotypic schema or 'proxy' for candidates' beliefs, values, and policies. One would think as

our correct voting measure is only based on values for our experimental candidates and participants' self-reports, the addition of party labels could not provide any additionally useful information to participants in making their decision. However, party label may still act as a heuristic by guiding participants to explore those options that they are most likely to agree with in greater depth, perhaps by a form of confirmatory search.

H₃: *That H1 and H2 will have multiplicative effects, such that the effect of excluding Party Label will be greater in the 3-candidate condition, due to the enhanced task complexity.*

We found no support for H3 in this study, with trends in the opposite direction. Participants vote correctly at the highest rates when party label is present and there are 2 candidates in the choice set (70%), and lowest when there are 3-candidates and party label is absent (23.8%). This is similar to Experiment 1, where the highest rates of correct voting were when party label was present and there were 2 candidates; while CV rates were lowest in Experiment 1 when there were 3-candidates and party label was present. Comparing across all conditions between Experiments 1 and 2, we do see an overall drop in correct voting rates; PL^A-2CAN (74.2% -> 60%); PL^A-3CAN (57.1% -> 23.8%); PL^P-2CAN (94.4% -> 70%); with the exception of 3CAN-PL^P (52% -> 55.2%). There are some possible explanations, the most obvious being the removal of candidates' 'personal information' items (age, marital status, education, political experience, & occupation), which may have been decreasing reliance on party label. More complex tasks where there is less diagnostic information should increase reliance on party label as a heuristic. We can observe this in the pattern of our results, with candidate conditions with party label present having higher CV rates than those with party label absent.

An alternative view may be that the addition of candidates' personal information items in Experiment 1 made the overall decision-process more difficult and effortful, by including extra information that required participants (if they wished) to compare between alternatives. If so we would expect perceived difficulty to be lower in Experiment 2 following their removal, whereas in fact perceived difficulty is slightly higher in Experiment 1 ($\mu=48.02$ vs. $\mu=42.48$). While the results are not significant, when party label is *absent*, perceived difficulty increases as number of candidates increases, as one would expect due to the expected complexity of increasing choice set size, with resulting decreases in correct voting (PL^A-2CAN: 60% vs. PL^A-3CAN: 23.8%). However, when party label is *present* participants perceive their vote choice as *more difficult* when there are 2 candidates ($\mu= 54.10$) compared to 3 candidates ($\mu= 46.07$; $p > .05$), while correct voting rates

are higher in the PL^P-2CAN (70%) versus PL^P-3CAN (55.2%). That said, *perceived* choice difficulty is a subjective measure, not an objective measure, and simply reporting something was difficult does not necessarily translate to poor performance. We note that participants are also more confident in their vote choice when there are 3 candidates and party label is present (vs. 2 candidates); it may be that in enlarged choice sets party label is a reassurance for voters in the choice they made- decreasing perceived difficulty and raising confidence in their choice. No consistent pattern that may relate to correct voting emerges at the descriptive level for any of our post-ballot measures, and none of the variables were predictive of correct voting.

Our measure of alternative similarity, the distance between the two most proximal alternatives, was positively predictive of CV, unlike in Experiment 1. In other words, as the two alternatives that were closest to participants converged, or became ‘more similar’, participants were less likely to vote correctly. Others have predicted task complexity will increase following an increase in the similarity between attractive alternatives (e.g. Scheibehenne et al. 2010; Sela, Berger, & Liu, 2009), leading to negative outcomes. Our results support this conclusion when correct voting is our outcome measure. However, as we do not ask participants for their appraisal of the alternatives, it is hard to tell if participants see this convergence as ‘all options are equally good’ (attractive), ‘all options are equally bad’ (unattractive), or otherwise.

Importantly, our main effect of number of candidates holds after controlling for alternative distance/similarity, with party label nearing significance at $\alpha = .05$ (bootstrapped sample); suggesting the negative effects of expanding choice sets, and the positive effects of party label, occur despite similarity/proximity between the two best alternatives. There are two views of how party label may operate in a scenario where both ‘most proximal’ alternatives are increasingly similar (e.g. in a 2-candidate race); firstly, if similar in *every* aspect, party label should not matter- as choosing either alternative is functionally equivalent. However, if alternatives are similar in *nearly*, but not all, aspects party label may be the only obvious individuating cue between them, reducing decision errors (e.g. by attending to some, but not all information that may prove diagnostic).

Considering our aim to make our experiments as ‘real’ as possible, removing personal information for candidates may seem counter to this. In real world voting tasks, it is arguable either way that a voter takes into account a candidate’s age, marital status, education, and employment history (and so on). Undoubtedly for

differing kinds of voters these will be weighted more heavily than others, acting perhaps as simpler proxies for more complex policy stances (e.g. ‘if X worked in the NHS, I can presume he is supportive of retaining the NHS, which I agree with’). Indeed, it is also plausible that voters care, or ‘weight’ issues (attributes), differently. For example, one might care more about the NHS than about education. We address the issue of attribute weighting in the next section, where we discuss refining correct voting.

Refining Correct Voting: A more fundamental question is around the accuracy of our correct voting (CV) measure in establishing a ‘correct vote’ based on a voter’s preferences. CV is a complex concept, and measurable in multiple ways (Lau & Redlawsk, 1997). The conclusions presented here reflect the measure that we chose, and we have outlined our rationale for that previously (section 2.1.3, this chapter). The degree to which these conclusions are robust across different potential measures is yet to be seen, and worthy of investigation. For example, one issue not considered in the previous two experiments was the relative importance (weighting) of each policy item to voters, an issue that we address in Experiment Three. While this is potentially a limitation of Experiments 1 and 2, within judgment analysis research equal-weight models have been shown to approximate the performance of optimally weighted decision models (Dawes, 1979). It may, nevertheless, be the case that a single issue dominates a participants’ preference, and we were unable to assess that in the current study. It is also debatable whether weights should be created from participants judging policy importance independently (Lau & Redlawsk, 2006), or in relation to each other, or generating importance weights implicitly.

2.4. Experiment 3

The main change in this experiment compared to the previous two experiments is the capturing and inclusion of participants’ decision-weights in the calculation of participants’ ‘correct vote’. In all other respects we keep the same methods and materials as those for Experiments 1 & 2.

Our initial hypothesis remains the same, namely:

H₁: *That rates of ‘correct voting’ will decrease when candidates (alternatives) increase from 2 to 3.*

Given our findings that correct voting tends to *increase* in the presence of party label (Experiments 1 & 2), we revise our second and third hypotheses:

H₂: *That ‘correct voting’ will increase when Party Label (party identity) information is available.*

H₃: *That H₁ and H₂ will be multiplicative effects, such that the effect of including Party Label will be greater in the 3-candidate condition, due to the enhanced task complexity.*

Methods

2.4.1. Participants

Participants were native English speakers and eligible to vote in the UK local or parliamentary elections before enrolment in the study. 149 participants (99 female), aged 18-56 ($\mu = 25.10$ years), were recruited. Participants were mostly single (63.8%); students (71.1%); self-identifying as ‘White-British’ (42.3%) or ‘White- Other’ (16.1%); and with an income under £10,000 per annum (51%) or between £10-20,000 per annum (28.6%). Participants were paid £4 for participating. Ethical approval was granted from UCL (CPB/2010/10).

Randomisation led to some imbalance in cell sizes (2Can- PL_A: 42; 3Can-PL_A: 28; 2Can- PL_P: 37, 3Can- PL_P: 42)

2.4.2. Design, Materials, & Procedure

The design, procedure, and materials, used were the same as those in Experiment 2, with the following exceptions.

Importance Ratings: In contrast to the previous two experiments, we obtained participants’ ratings of how important each policy issue was [to them]. We obtained the participants’ decision-weights at the end of the experiment. Upon completing the policy questionnaire, participants were automatically forwarded to a participant-ID-linked online Qualtrics questionnaire. Participants were presented with all the policy items on a single screen, in a randomized order, and were instructed to insert a numerical rating between ‘0’ (‘Not at all important’) and ‘10’ (‘Extremely Important’) for how important *they personally* felt each item was. Each policy item also had an accompanying version of the explanatory text presented in the political questionnaire, in case participants were unable to recall what the issue related to. We divided the results by ‘10’ to rescale them to lie between 0-1.

Upon completion, participants were debriefed as to the nature of the experiment and paid.

Issue decision-weights in Correct Voting: We used the importance rating to weight the distance between the candidate and the voter on each policy issue in our proximal model of correct voting. We can redefine the model as,

$$d(qp) = \sqrt{(q_1 - p_1)^2(dw_1) + (q_2 - p_2)^2(dw_2) \dots + (q_n - p_n)^2(dw_n)} = \sqrt{\sum_{i=1}^n (x_{qi} - x_{pi})^2(dw_i)}$$

Where $D(qp)$ is the distance between the participant p and the candidate (alternative) q over the values for each policy issue (variable) X_i . In addition, dw_i is the decision weight on issue i for all N of i . We follow the same procedure as previous; obtaining the relative distance(s) from the voter to the candidate, and identifying their ‘best’ option from the choice set, and classifying it as a ‘correct’ or incorrect vote if they chose that option at the ‘Ballot Box’ stage.

2.4.3. Results

We compare the results using the weighted and unweighted versions of our proximity measures²⁹, and find no meaningful differences in the results; nor do they affect the pattern of results in our analyses (see Appendix A.1.3 for details). These results support points made by Dawes (1979) that unweighted models approximate the performance of optimally weighted decision models. This gives us additional confidence in the results we have obtained previously in Experiments 1 & 2, namely that including decision-weights would not have led to differing outcomes. Results here use the weighted proximity measure.

If there are any meaningful points to the contrary, they are noted in footnotes where appropriate.

2.4.3.1. Vote Choice

The Labour candidate was the most popular in our experiment (48.3% of votes), followed by Conservative (26.2%), Liberal Democrat (9.4%), ‘None of those on ballot’ (7.4%) and Abstain/Spoil (8.7%). See Figure 2.9.

We examined the relationship between Vote Choice and *Number of Candidates*. The strong relationship between these variables was significant, $\chi^2(4, 149) = 18.42, p = .001, \phi_c = .35$. This is as expected: a lack of a

²⁹ We also compare weighted & unweighted ‘directional’ measures, also finding no meaningful differences. See Appendix A.1.3.

3rd (LibDem) candidate in 2-Candidate conditions will create a significant effect, as there will be no LibDem votes. There was no relationship between Vote Choice and *Party Label*, $\chi^2(4, 149) = 2.27, p = .68, \phi_c = .12$.

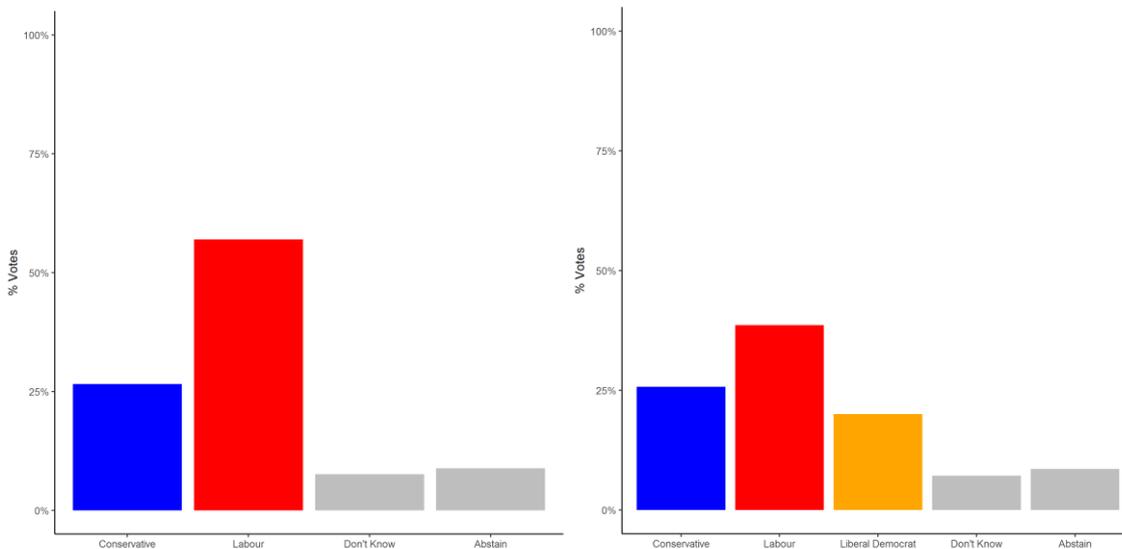


Figure 2.9: % Vote choice by candidate condition

2.4.3.2. Correct Voting

We removed all participants who responded ‘Abstain’ or ‘Don’t Know’ from our analyses (N= 25), leaving 124 participants in our sample. This led to unequal cell sizes in our data, therefore for we also compare our results (where possible) to a bootstrapped sample (r= 10,000). Where there are meaningful deviations from the reported results, we note them in footnotes.

We regressed CV on the group variables Party Label (PL) and Number of Candidates (NOC), entering these in Block 1, and their interaction term in Block 2. The regression model containing PL & No. of Candidates was significant, $\chi^2(2) = 21.28, p < .001, R^2 = 21.2%$, and predicted 70.4% of the overall cases correctly. PL did not significantly predict CV, $\beta = .15, p = .70$ (in line with Exp.1, but not Exp. 2); while NOC did, $\beta = -.177, p < .001$, with participants being 83% less likely to vote correctly when the number of candidates in the choice set increases from 2 to 3 (as per Exp. 1 & 2).

The addition of the PL & NOC interaction term did not significantly improve the model ($p = .86$), though the overall model remained significant, $p < .001, R^2 = 21.2%$, and predicted 70.4% of the overall cases correctly. The overall model results are shown in Table 2.7. The PL & NOC interaction term trended in the predicted direction, but was non-significant, $\beta = .14, p = .86$.

Table 2.7: Logistic Regression results of Party Label and Number of Candidates on CV rates.

Predictor	β	SE	χ	e^β
Party Label (PL^P)	.08	.60	.02	1.08
NOC (2^{CAN})	-1.84***	.60	9.58	.16
PL*NOC	.14	.81	.03	1.15
Constant	1.27‡	.428	8.86	3.57

* $p < .1$. ** $p < .05$. *** $p < .01$. ‡ $p < .001$. (Reference categories in parentheses).

In the *2-Can* condition CV is 78.1% when PL^A and 79.4% when PL^P. In the *3-Can* condition, CV increases from 36.0% when PL is absent to 41.2% when PL is present. We note that the results trend in the predicted direction, and are similar to those in Experiments 1 and 2. Pattern of results are shown in Figure 2.10.

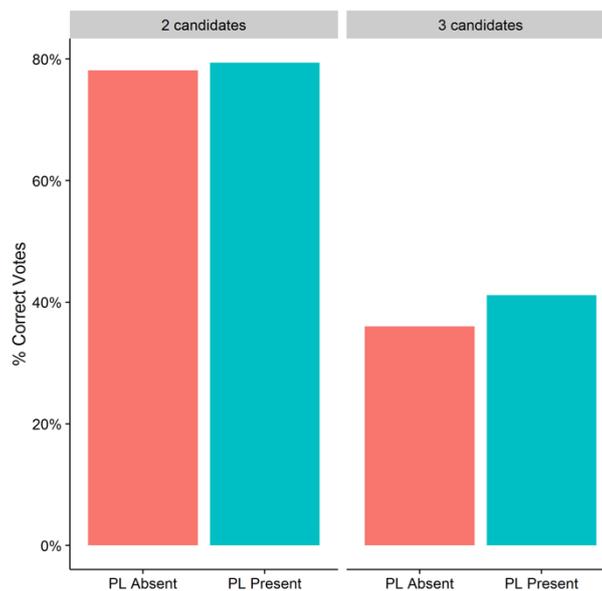


Figure 2.10: % CV rates by condition

Chance Level Analysis: The significant effect of number of candidates would of course be expected even if participants were choosing candidates at random, due to the fewer options available in the 2-Candidate condition. We therefore compared rates of CV to chance levels in these conditions, collapsing across party label conditions. 78.5% of participants voted correctly in the *2-candidate condition* (greater than 50%, $p < .001$), whilst the 39% of participants voting correctly in the *3-candidate condition* did not differ significantly from chance levels (33%; $p = .21$). Thus, the influence of increasing the number of candidates on levels of CV cannot be explained solely on the basis of a difference in chance levels. These results are in line with those

obtained in Experiment 1, but differ in that CV rates did not differ from chance in the *2-candidate condition* in Experiment 2.

2.4.3.3. Post-Ballot-Box

Overall participants found the candidates in the experiment believable ($\mu= 61.28$, $SD= 18.56$), had confidence in their vote choice ($\mu= 61.11$, $SD= 19.69$), had confidence they would not change their vote ($\mu= 59.15$, $SD= 18.51$), and felt making their vote choice was of medium difficulty ($\mu= 49.34$, $SD= 26.89$).

We carried out a multi-variate ANOVA on all four measures, using Party Label (PL), number of candidates (NOC), and their interaction term (PL*NOC) as predictor variables. We found PL*NOC had a significant effect averaged across all the dependant variables, Pillai's Trace $V=.08$, $F(4, 117)= 2.68$, $p= .035$, $\eta^2= .08$. Levene's Test was non-significant for all the variables (all $p > .12$). Follow-up univariate analyses showed significant effects.

PL*NOC had a significant effect on participants' confidence they would not change in their vote choice, $F(1, 120)= 3.92$, $p= .049$, $\eta^2= .03$, with participants' most confident in their vote when party label was absent and there were 2 candidates ($\mu= 63.48$, $SD= 17.92$), and least when absent and 3 candidates ($\mu= 50.93$, $SD= 22.44$). PL*NOC had a significant effect on participants' perceived vote choice difficulty, $F(1, 120)= 9.32$, $p= .003$, $\eta^2= .07$, with participants' feeling their vote was least difficult when party label was absent and 2 candidates ($\mu= 41.24$, $SD= 25.98$), present and three candidates ($\mu= 43.26$, $SD= 27.09$), and hardest when PL was absent and there were 3 candidates ($\mu= 61.00$, $SD= 27.07$).

These results differ from Experiments 1 and 2. In Exp.1, only vote confidence was affected by NOC, such that participants were more confident as choice set size increases; while this experiment suggests the opposite is true when PL is absent. Looking at the trends in Figure 2.11, confidence seems to be greater in the *3-candidate condition* when PL is present (vs. absent), which can also be observed in Figure 2.8 (Exp. 2) and somewhat in Figure 2.5 (Exp. 1). Similarly, the trends for perceived difficulty in Figure 2.11 are in line with those in Figure 2.8 (and somewhat Figure 2.5), namely that difficulty increases as choice set increases, but the presence of party label in the *3-candidate condition* leads to participants as perceiving the choice as easier than when it is absent.

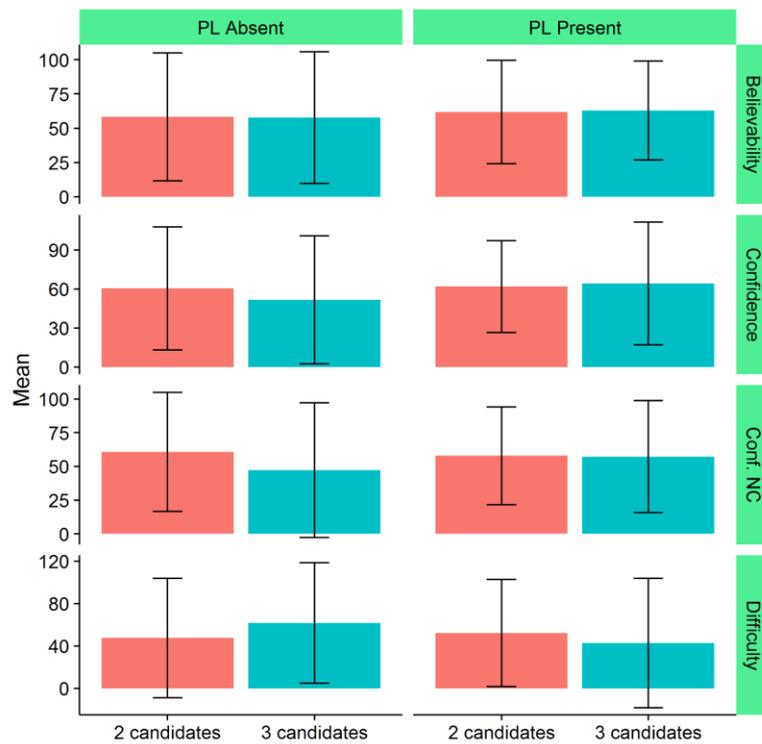


Figure 2.11: Post-Ballot Measures by condition. Bars +/- SD.

2.4.3.4. Post-Ballot Box and Correct Voting

We regressed all of our post-ballot measures of vote confidence, believability, and difficulty, on CV in Block 1, adding our main predictors (PL, NOC) and their interaction term in Blocks 2 and 3. The regression model containing our post-ballot variables was marginally significant, $\chi^2(4) = 8.86, p = .065, R^2 = 9.2\%$, and predicted 62.1% of the overall cases correctly. Only believability, controlling for all other variables, significantly predicted CV, $\beta = .03, p = .005$, with participants being 1.03 times more likely to vote correctly when candidates are perceived as being more believable.

Adding the main predictors in Block 2 improved the model, with NOC remaining significant ($p < .001$), while adding the interaction term in Block 3 did not further improve the model ($p = .17$). Believability remained significantly predictive of CV in Blocks 2 & 3 ($p < .003$).

2.4.3.5. Distance and Correct Voting

Correct Voting, Distance & Difficulty: We regressed ‘distance BNB’ (centered on its mean) as a predictor variable on CV in Block 1, finding it was positively associated with the likelihood of voting correctly, $\beta = .62, p < .001$, indicating participants were 1.86 times more likely to vote correctly as distance between the two most

proximal alternatives increases. We including ‘distance BNB’ (centred on its mean) as a predictor variable with PL and NOC in Block 2, their 2-way interaction terms in Block 3, and their 3-way interaction term in Block 4.

Our regression model for Block 1 was significant, $\chi^2(3) = 24.68, p < .001, R^2 = 24.2%$, and correctly classifying 72.0% of the cases. Increasing distance between the ‘best’ and ‘next-best’ alternatives was non-significantly associated with the likelihood of voting correctly, $\beta = .35, p = .07^{30}$. PL was non-significant, $\beta = .18, p = .66$; NOC was significant, $\beta = -1.19, p = .016$, with participants 70% less likely to vote correctly when there are 3 candidates after controlling for the effect of distance.

Adding the interactions between our condition variables and the distance between alternatives in Block 2 did not significantly improve our model ($p = .90$), nor did the addition of a three-way interaction in Block 3 ($p = .29$). The overall model was significant, $\chi^2(5) = 25.80, p < .001, R^2 = 25.2%$, which we report in Table 2.9.

Table 2.8: Logistic Regression results of ‘distance’ between ‘best’ and ‘next best’ options on CV rates.

Predictor	β	SE	χ	e^β
Distance	.33	.27	1.49	1.39
Party Label (PL^P)	.17	.65	.07	1.18
NOC (2^{CAN})	-.98	.81	1.45	.37
PL*NOC	-.02	1.01	.00	.97
Dist*PL	.32	.51	.38	1.37
Dist*NOC	1.01	.46	4.86	2.76
Dist*PL*NOC	.33	.27	1.49	1.39
Constant	.17	.65	.070	1.18

* $p < .1$. ** $p < .05$. *** $p < .01$. † $p < .001$. (Reference categories in parentheses).

Distance & Difficulty: Increasing distance was not significantly correlated with any of the measures of choice confidence or believability of the candidates collected after participants choose a candidate at the ‘Ballot Box’ stage (all $p > .25$). Distance between the ‘best’ and ‘next best’ options was negatively correlated with vote

³⁰ Bootstrapped sample ($n=10,000$) estimates $p = .039$, indicating distance may still be a significant factor, controlling for PL and NOC.

choice difficulty (difficulty increases as alternatives becomes ‘more similar’, but not significantly, $r = -.10$, $p = .25$).

2.4.3.6. Summary

We found no effect of PL on correct voting rates, with voting rates comparable in both conditions (59.6% vs 60.3%). We found NOC had a significant effect on CV, such that participants vote correctly 78.8% of the time when there are 2 candidates, and 39% of the time when there are 3 candidates (which does not differ significantly from chance levels). There was no significant interaction between PL and NOC, though the trends observed are in line with previous results, such that CV rates are lowest when party label is absent and there are 3 candidates (36%), with an increase when PL is present and 3 candidates (41.21%), and highest when PL is present and there are 2 candidates (79.4%).

The distance between the two most ‘proximal’ candidates on our correct voting measure was positively correlated with CV, such that increasing distance between the two increased the likelihood of correctly voting.

All our post-ballot measures are significantly correlated in the directions one would expect, with believability and vote confidence (& confidence wouldn’t change) positively correlated, and vote confidence and perceived difficulty negatively correlated. Participants are most confident in vote choice when PL is absent and there are 2 candidates, and least confident when PL is absent and there are 3 candidates’. Perceived difficulty was lowest in the PL absent 2-Can condition, and highest in the PL absent 3-Can condition, with participants perceiving their choice as easier when there are 3 candidates and PL is present, compared to when there are 2 candidates and PL is present.

2.4.4. Discussion

H₁: *That rates of ‘correct voting’ will decrease when candidates (alternatives) increase from 2 to 3.*

Again in this experiment we find that correct voting is affected by the size of the choice set, with participants far less likely to vote correctly when just increasing the choice set size from 2 to 3 candidates. Participants vote correctly 78.8% of the time when there are 2 candidates, and 39% of the time when there are 3 candidates, with rates not different from what would be expected by chance in the 3-candidate condition. That we have observed this in three separate studies indicates that the number of alternatives in a choice set, even in political

decision-making, seems to be exerting a strong effect on participant's ability to correctly vote. Whether this effect is linear, or otherwise, in nature is not able to be determined from the current studies, and requires subsequent testing with larger choice sets.

H₂: *That 'correct voting' will increase when Party Label (party identity) information is available.*

In contrast to the results of Experiment 2, we do not find any differences in correct voting rates between when party label is absent or present. Participants vote effectively at the same rates in either condition (59.6% vs 60.3%). It is difficult to pinpoint an exact explanation for this, given the materials are the same as those in Experiment 1 (interaction) and Experiment 2 (main effect), though the significant effect of candidate believability, where increasing believability is predicative of correctly voting, leads one to consider a possible explanation by way of the candidate materials.

Experiment 1 was carried out in 2013, and based on the 2011 General Election Manifesto of the UK political parties; whereas Experiment 3 took place at the end of 2014 and ran through until the start of 2015, a new General Election year in the UK. It is entirely possible that the candidate materials no longer reflected what participants perceived to be relevant as relates to the party. Simply, party label may have been irrelevant as the policy items for each candidate did not reflect the policy they were supposedly stereotypic of in the real world; as such, party label would not be an appropriate (or useful) heuristic for participants' to employ.

If so, this is heartening in some regards. Our original hypothesis was that party label would be used inappropriately as a heuristic, such that it would lead to greater rates of incorrect voting. Our results do not support this (in any experiment). A question remains whether participants are actively ignoring party label, or if participants are not aware of it, or if there is some cognitive awareness but the effects are not such that they affect correct voting. While testing such ideas is difficult in the current experimental paradigm, we note Lau and Redlawsk (2000) operationalize party label as its own information item for access in the flow stage. However, had we done the same, even one access would not allow us to say participants are effectively ignoring it; it seems highly likely participants are paying party label *some* degree of attention at a cognitive level during the experimental flow stage, so a possibility exists to investigate party label's effects on participants' information processing to provide better insight (see Chapter 3).

H₃: *That H1 and H2 will have multiplicative effects, such that the effect of including Party Label will be greater in the 3-candidate condition, due to the enhanced task complexity.*

We find no support for H3 in this study, though we note the consistency of the worst voting rates being when there are 3 candidates and party label is absent (36%), and the slight bump in correct voting rates in the 3-candidate condition when party label is present (41.2%). Participants are least confident they would not switch their vote in the party label absent 2-Can condition, and perceived their vote as the most difficult when party label was absent and 3 candidates.

Participants perceived their vote was most difficult when there were 3 candidates and party label was absent (36% CV). Participants found their choices similarly difficult, when there were 2 candidates and party label was absent/present (78.1% & 79.1% CV, respectively). However, participants found the 3-candidate condition where party label was present even *easier* than when party label was present and there were just 2 candidates (despite lower CV rates; 41% vs 79% respectively). Participants find the choice harder when party label is absent and the choice set size increases (with lower CV rates), but party label's presence seems to mitigate this somewhat, with participants finding the decision less difficult and are more confident in it; this finding seems consistent across the 3 experiments thus far.

As per Experiment 2, in this experiment we find that the distance (similarity) between the two alternatives closest to the participant's 'ideal' (sic: 'correct') choice, and by definition each other, is significantly predictive of correct voting. When the distance between the two alternatives increases in n -dimensional policy space, participants are more likely to vote correctly. This is understandable; when alternatives are close together as to be near indistinguishable (though still technically different by even a margin), voting for either might seem as a 'either is as good' model of decision-making. Participants, who not perfectly rational beings with unlimited cognitive capacity and time, should be happy to settle for either, as the costs of being 'incorrect' are somewhat negligible. However, our correct voting measure does not allow for this; while it is mathematically possible for two alternatives to exactly occupy the same point in n -dimension space, it does not occur in our experiments; only one option, no matter how close they are, is the *correct* option for the voter given the available alternatives in the choice set.

As an aside, while it is tempting to attribute the results around ‘alternative distance’ to the use of the importance (i.e. ‘decision’) weights in this experiment, we did analyse the results without the use of decision-weights, finding they make no difference to the results, and distance is still predictive of correct voting even excluding weights in the correct voting calculation. Similarly, the lack of an effect for party label does not differ if we use differing correct voting metrics (weighted, unweighted; proximal, directional). In fact, we find few changes in classifications (correct, incorrect) between measures, and that statistically all are highly correlated with each other. In that, our results chime with those of Lau and Redlawsk (Table 1, 2008), who find that all their 4 possible measures are significantly correlated with each other (equal weights: additive utility/averaged utility; implicit importance weights: additive utility/averaged utility), with the implicit weighting “*barely better than a simple equal weights*” version ($p .401$; $r = .45$ vs. $r = .46$), and no difference between additive or averaging methods. In our analyses, we find the weighted and unweighted versions, using participants own self-reported importance of policy items, in operationalising correct voting to be functionally the same. This is in line with Dawes (1979), and is another demonstration that equal-weight models approximate the performance of optimally weighted decision models. For those with a penchant for such detail, see Appendix A.1.2.

In conclusion, we find that there is no effect of party label on correct voting, with a possible explanation being the age/relevancy of the materials used. Given the inconsistency of the results for party label across Experiments 1-3, we can address this issue by updating the materials used to be more believable and reflective of the real-world parties and electoral realities. We find in this experiment, and in Experiments 1 and 2, that the size of the choice set of candidate does negatively affect voters’ ability to correctly vote. Given that we only look at a maximum of 3 alternatives, the effect of larger choice set sizes should be examined, as it is unclear if this effect is linearly related to increasing choice set size, or follows a non-linear function. While there was no interaction of choice set size and party label, the trends remain consistent with those previously, namely that party label seems to mitigate some of the negative effects of increasing choice set size, such that correct voting rates improve.

We address these issues in Experiment 4, increasing the choice set sizes examined, and updating the experimental materials in line with the UK General Election 2015.

2.5. Experiment 4

The results and discussion of Experiments 1-3 raise some important aspects that warrant further examination. While we have observed a consistent effect of increasing choice set size leading to decreased correct voting, we do not know if this will extend to even larger choice set sizes. This is pertinent given the historical trend towards increasing political plurality (Peterson, 1979), and in countries such as India the number of parties have grown from 53 to 1687 since 1952³¹. Appropriately, the UK political landscape is not limited to 3 political parties, but also include additional parties with 2 parties in particular that roughly map onto the ‘further ends’ of the left-right political spectrum: the Green Party (left), and the UK Independence Party (right). At the time of data collection for the experiment (March, 2015), the Conservative Party was averaging 35% daily in national polls; the Labour Party, 35%, the Liberal Democrats, 8%; UKIP, 12%, and the Green Party, 6%³². These polling figures make excluding UKIP, and to a degree the Green Party, from analysis fairly unrepresentative of the electoral realities that we are trying to reflect.

Considering the inclusion of these additional parties raises some issues. Experimentally, the ideal scenario for a study design would be to have: a baseline 2-candidate condition, a 3-candidate condition, two 4-candidate conditions (‘Main 3’ + Green/UKIP), and an omnibus 5-candidate conditions (total: 5 conditions), but we err against this for practical and theoretical reasons.

We aim to keep in line with the principle strength of the previous studies, namely that they reflected scenarios that are inherently realistic and thus ecologically valid. There exists no parliamentary seat (and arguably no council seat) in the UK, where there is a believable scenario that includes either UKIP or the Green Party, and excludes the other. Indeed, on multiple occasions, instances of the Green Party polling higher than the Liberal Democrats have made national news coverage³³. In addition, it is likely that including one raises the saliency of the absence of the other, thus limiting the effect of our manipulations. Indeed, the most common scenarios are a Labour-Conservative ‘two horse race’³⁴, a ‘three-way’ with Labour-Conservative-Liberal Democrat, or a ‘5-way battle royale’ between all 5 parties. Utilizing such a design would allow us to plot a trend of correct voting by choice set size, and while a worthwhile endeavour, this seems more useful where

³¹ NDTV (2014) *Number of Political Parties Increased Over 30 Times Since Independence*. <https://goo.gl/SGkQaP>

³² YouGov (May 7th, 2015): Voting Intention 2010 to 2015. Available here: <https://goo.gl/wmOhvx>

³³ “Greens ahead of Liberal Democrats in YouGov poll.” *The Guardian* (Oct, 2014). <https://goo.gl/ANv6mY>

³⁴ There are instances of Labour-Lib, Conservative-Lib marginals, but they are few: 8 out of 650 in 2015 GE.

political choice sets naturally range into higher numbers; such as in countries with proportional (non-majoritarian) democracies (e.g. Ireland, Spain, Finland, most of South America³⁵).

We are interested primarily if the principles we are interested in still hold; namely, does choice set size continue to lead to higher rates of correct voting compared to a smaller set, removing the need for ‘stepped’ comparisons. As we have studied differences in 2-/3-candidate choice sets at length in Experiments 1-3, here we opt to compare a 3-candidate condition, consisting of Labour/Conservatives/Liberal democrats, with an expanded choice set that includes the Green Party and UKIP (5-candidates).

In keeping with Experiments 1-3, our first hypothesis is:

H₁: *That rates of ‘correct voting’ will decrease when candidates (alternatives) increase from 3 to 5.*

While we found no support for an effect of party label in Experiment 3, a main concern was that the materials were outdated, thus limiting any usefulness of the party label to act as a beneficial heuristic in aiding correct voting (i.e., the materials used were inconsistent with those signaled by partisan labels). We have accounted for this in this experiment, updating the materials in line with those produced by the 5 main parties (wherever possible), and including the party labels for the new additional parties. Thus one would expect that where party label is present, it should be a far more useful heuristic, and that reliance on it should increase. Thus our second hypothesis is:

H₂: *That ‘correct voting’ will increase when Party Label (party identity) information is available.*

Finally, we hypothesize that:

H₃: *That H1 and H2 will be multiplicative effects, such that the effect of including Party Label will be greater in the 5-candidate condition, due to the enhanced task complexity.*

Due to the addition of the 2 additional parties, we include the same amount of policy items in the flow stage for participants to access for each candidate, increasing the amount of information by 66% in the 5-candidate condition. The 5-candidate condition should be the most informationally complex, with the lowest rates of

³⁵ The Ace Project; <http://aceproject.org/epic-en/CDTable?view=country&question=ES005>

correct voting when party label is absent and there are 5 candidates, with rates of correct voting improving when party label is present.

Methods

2.5.1. Participants

Participants were native English speakers and eligible to vote in the UK local or parliamentary elections before enrolment in the study. 154 participants (89 female), aged 18-56 ($\mu = 26.88$ years), were recruited. Participants were mostly single (69.5%); students (72.1%); self-identifying as 'White-British' (39.3%), 'White- Other' (8.4%) or Chinese (17.5%); and with an income under £10,000 per annum (56.5%) or between £10-20,000 per annum (27.9%). Participants were paid £4 for participating. Ethical approval was granted from UCL (CPB/2010/10).

Randomisation led to some imbalance in cell sizes (3Can- PL_A: 43; 5Can-PL_A: 45; 3Can- PL_P: 33, 5Can- PL_P: 33)

2.5.2. Design, Materials, Procedure

Unless otherwise mentioned, all methods, materials, and procedures are the same as per Experiments 1-3. We include importance ratings in our calculation of correct voting.

Candidate Party Label: Party-identifying information for candidates in PL^P conditions was imparted by putting party logos (e.g. a red rose and red border for Labour candidates) and party-branded colour theme (i.e. red= Labour, blue=Conservative, yellow= Liberal Democrat, green= Green Party, purple= UKIP) on stimulus items, and were also identified and explained (if PL^P) before the voting task. A separate printed sheet with the candidate names, the party they belonged to, and the relevant party logo, were placed by the participant in the PL^P conditions. In PL^A conditions logos were absent, and all stimulus item borders were grey, parties were not referred to in the task instructions, and no additional printed materials were provided.

Constructing the Candidates: Male-only names were used to control for effects of candidate gender on vote-choice. Names were chosen from the 5 most common UK first and surnames on the 2015 UK Electoral Roll, and randomly allocated. This was then checked against the list of MPs in the House of Commons to check that such politicians did not already exist.

Table 2.8: Candidate Names, Party Affiliation, and Party Label.

Surname, Forename	Party Affiliation	Party Label
Williams, James	<i>Conservative Party</i>	
Smith, Robert	<i>Labour Party</i>	
Jones, Michael	<i>Liberal Democrats</i>	
Taylor, Harry	<i>UK Independence Party</i>	
Davies, John	<i>Green Party</i>	

Candidate Policies (Attribute Items): Candidate policies were taken from the relevant party manifesto from the 2015 UK General Election (Manifesto Project, 2015; BBC News, 2015), and prioritized based on public attitude polls asking voters to rank the importance of policy-categories just prior to the time of the experiment³⁶ (e.g., when asked “Which of the following do you think are the most important issues facing the country at this time?”, 50% of the public reported [level of] ‘Immigration; YouGov, 2015).

17 stimulus items for each candidate were constructed based on these policy categories (e.g. for ‘Economy’, policies on ‘Jobs’ were used, e.g., “[Labour will] *guarantee a job for under 25s unemployed for over a year, and adults unemployed for more than two years, and create 1 million new high technology, green jobs by 2025*”), and controlled to be similar in word length, complexity and informational content. Each policy was assigned a value between 1-7, based on its position in a political ‘left-right’ continuum, with up to 7 possible options for that policy (e.g. on Deficit: Lab, Lib, and Con received 2, 4 or 5 respectively; for higher education fees, 1= 100% Government Funded, and 7= 100% Tuition Fees). For full copies of materials used, see Appendix A.4.

³⁶ YouGov Political Tracker (March 2nd, 2015). Located here: <https://goo.gl/WvMXUR>

Table 2.9: Attribute Text, and scores for candidates [attribute score in parentheses].

Attribute	Candidate	Williams, James (Con)	Smith, Robert (Lab)	Jones, Michael (Lib)	Taylor, Harry (UKIP)	Davies, John (Green)
Academies		“continue the roll out of academies, and convert up to 3,500 more schools that "require improvement" into academies... wants primary schools in England that repeatedly fail tests be forced to become academies, or have sponsorship replaced if already an academy.” [7]	“wants to allow good and outstanding schools to convert to academy status if they wish, but would not give converting schools subsidies. [He] also believes that control of academies should be under the Local Authority and Parent Groups.” [5]	“to support the idea of academies, but wants to limit academies in hiring unqualified teachers. [He] has given a 'parental guarantee', promising parents their child will be taught a core curriculum by a properly qualified teacher.” [6]	“wants to keep existing Grammar Schools and encourage the creation of new Grammar Schools [He] wants to allow charitable associations, parental co-operatives, profit-making private companies or individuals to run schools.” [7]	“is against Free Schools and academies due to lack of local democratic accountability and oversight, and is opposed to creating more Free Schools & Academies, and will integrate them into the Local Authority school system.” [2]
		“aims to eliminate "the bulk" of the UK's structural deficit within five years, with 6 billion pounds in cuts. [He] has said these spending cuts would happen in all areas, apart from health and foreign aid.” [6]	“will introduce a variety of 'wealth' taxes on 'mansions' and bankers houses, and pledged a 5% pay cut for every government minister. [He] wants to also blacklist tax-avoiding companies from operating in the UK.” [2]	“promises strict new fiscal rules to ensure the deficit is gone by April 2018, with the wealthy contributing the most. [He] plans to increase capital gains from 28% to 35%., and impose an additional 8% rate of corporation tax on UK banks to raise an extra 1billionn pounds a year.” [4]	“will eradicate the deficit by 2018 and secure an overall budget surplus by 2019-20. Achieve this by approx. 25billionpounds in spending cuts, not tax rises” [6]	“aims to more than halve the deficit with taxation and spending by: raising the proportion of taxation from 36% of GDP, and 'efficiency savings' of 23billion pounds (or 0.25% over the entire public service each year).” [1]
Elderly Care		“said elderly benefits including free bus passes, TV licences, prescriptions, eye tests and the Winter Fuel Allowance would not be means-tested if [he] won the general election.” [5]	“ensure government would cover people's care costs after they have spent two years in residential care from 2014... also wants to establish a "National Care Service" free at the point of use for all adults with an "eligible care need", with funding arrangements decided by a Commission by 2015. [2]	“... has pledged to increase National Healthcare spending, which includes elderly care, by 8 billion a year by 2020/21, in three stages.” [4]	“would increase dementia funding by 130 million pounds per year over the next parliament and would increase social care funding for older people by 1 billion pounds each year...stated that [he] will merge health and social care under the NHS.” [4]	“said that personal and nursing care for all older people will be provided free, and house owners would not be required to sell their home to pay for such care if elected.” [4]

EU Membership	<p>“would pass a law to require a referendum on any future treaty that transfers power from Britain to the EU, and also create a UK Sovereignty Bill to ensure ultimate authority stays in Parliament.” [4]</p>	<p>“strongly supports continued EU membership for the UK, and will not support an in/out referendum on Britains membership in the EU... will push for reform of European Union instead.” [3]</p>	<p>“would support continued EU membership, and does not want an in-out referendum on Britain’s membership of the EU. [He] wants instead to achieve EU reform to make it more competitive, efficient and accountable.” [3]</p>	<p>“strongly believes in leaving the EU, and would seek to do as soon as possible if elected.” [5]</p>	<p>“wants a UK referendum on the EU; calling for radical reform of the EU to increase transparency and give Member States more control over their economies.” [3]</p>
Greenhouse Gas Emissions	<p>“wants to reduce all UK greenhouse gas emissions by 80% by 2050.” [4]</p>	<p>“would cut greenhouse gas emissions by over 34% by 2020 and 80% by 2050.” [4]</p>	<p>“aims for a 40% reduction in greenhouse gases emissions by 2020, rising to 100% by 2050.” [5]</p>	<p>is critical of EU targets on Greenhouse gas emission reductions. [He] is a climate change skeptic, of "apocalyptic claims" by climate research. [1]</p>	<p>“wants to reduce all UK greenhouse gas emissions to 10% of their 1990 levels by 2030.” [6]</p>
Health Spending/NHS	<p>“vowed to cut the cost of the National Health Service (NHS) administration by a third, but increase health spending in real terms every year to 2015.” [2]</p>	<p>“promised to keep the National Health Service (NHS) ring-fenced and spend an extra 2.5billion pounds a year starting 2017/18. This is in addition to plans to spend 2billion pounds a year starting in 2015/2016.” [2]</p>	<p>“has pledged 8billion pounds of extra spending on the NHS if [he] is elected to government in the coming election.” [1]</p>	<p>“committed to investing 3 billion pounds per year extra in the National Health Service (NHS) front-line services... wants to integrate health and social care funding under an NHS-controlled 'social care fund'.” [2]</p>	<p>“says health spending should be "maintained at around the average in the European union", and suggests directly funding the National Health Service (NHS) with an 'NHS tax' as part of general income and other taxation.” [2]</p>

Immigration (Levels of)	<p>“wants to bring net immigration down to below 100,000 people a year (it currently stands at 243,000), and promised to make reform of EU free movement rules part of renegotiations of Britain's relationship with the EU.</p> <p>[He] would make migrants wait four years before they can claim certain benefits, such as tax credits, Universal Credit, or get access to social housing.</p> <p>[He] wants to stop migrants from claiming child benefit for dependents living outside the UK, and remove those that have failed to find work after six months from the Welfare system.” [5]</p>	<p>“wants to make it easier to deport foreign criminals, and to tackle illegal immigration with "proper" entry and exit checks to count people moving in and out of the country, and introduce a 'smarter system' of controls to get the top talent and investment the UK needs, whilst controlling low skilled migration. [He] also said we need to further support the Border Agency in guarding ports and airports.</p> <p>[He] wants people coming here not to be able to claim benefits for at least two years, and for people working in public services in public facing roles to be required to speak English.” [4]</p>	<p>“wants to introduce exit checks, so the Government can keep track of who is leaving the country and identify people who are overstaying their visa... wants all new claimants for Jobseekers Allowance (JSA) to have their English language skills assessed, with JSA then being conditional on attending language courses for those whose English is poor. [He] will also ensure that EU migrants have to "earn" their entitlement to benefits.” [4]</p>	<p>“wants to reduce net immigration to 50,000 people a year... wants to use a 'points policy' to select migrants with the skills and attributes needed in the UK, for people inside and outside the EU, and time-limited work permits. [He] said proof of private health insurance will be a precondition for immigrants and tourists to enter the UK... will require immigrants to financially support themselves and any dependents for 5 years, and wants tougher English language tests for migrants seeking permanent residence. [4]</p>	<p>“wants to progressively reduce UK immigration controls, and says illegal immigrants living in the UK for over five years will be allowed to remain, unless they pose a serious danger to public safety.</p> <p>[He] wants access to benefits, the right to vote, and tax obligations to apply to everyone living on British soil- regardless of passport type.” [4]</p>
Income Tax	<p>“promised an income tax cut for 30 million people by 2020. Income Tax would start to kick in at 12,500pounds a year, instead of 10,500pounds. The higher tax rate, 40%, would start at 50,000pounds a year instead of 41,900, again by 2020.” [6]</p>	<p>wants to reintroduce the 50% top rate of income tax for earnings over 150,000 pounds per year. [He] also wants to cut income tax for 24 million people by bringing back the 10% rate on lower incomes.” [2]</p>	<p>“wants to raise the 'personal allowance' - the amount you can earn before you have to start paying income tax - to 11,000pounds in April 2016 and then to 12,500pounds by 2020.” [4]</p>	<p>“wants to increase the personal allowance - the amount you can earn before you have to start paying income tax - to the level of full-time minimum wage earnings (about 13,500pounds) by 2020.” [7]</p>	<p>“said people earning more than 100,000 pounds a year would pay 50% income tax if [he] was elected to government.” [2]</p>

Jobs/Unemployment	“wants to create three million apprenticeships in the UK, which will be paid for by welfare benefit cuts.” [4]	“will guarantee a job for under 25s unemployed for over a year, and adults unemployed for more than two years, and create 1 million new high-tech green jobs by 2025. [He] wants to get as many young people to go on an apprenticeship, as currently go to university, by 2025, and also ban "exploitative" zero hour contracts. [4]	“wants to give an extra 1pound an hour for the lowest paid apprentices, and has vowed to campaign to create a million more jobs.” [4]	“says firms should be allowed to offer jobs to British workers first "without the fear of being sued for discrimination". [4]	“is proposing a national energy conservation scheme to create thousands of new jobs. [He] wants to create "sustainable jobs" and promote more local production of food and goods.” [4]
‘Mansion Tax’	“vowed to oppose any possible mansion tax on high-value properties if [he] is elected to government.” [5]	“will bring in a ‘progressive mansion tax on properties worth over 2million pounds, that will rise in line with property prices; which will raise 1.2billion pounds.” [1]	“supported a mansion tax in principle, [he] would prefer to create additional banded levys on top of council tax for high value properties worth over 2 million pounds.” [2]	"is critical of a 'mansion tax' on high-value properties, claiming it is a "policy of vengeance against the wealthy". [5]	“against a mansion tax, but in favour of a 'Land Valuation Tax' (LVT) - a tax payable on the annual value of land, levied by the local community at rates to be agreed amongst Districts and Regions.” [2]
Nursery Care	“has no plans to change the number of free hours for childcare entitlement, and pointed out his scheme to allow working parents to get a 20% rebate on the costs of childcare.” [3]	“promises to extend the current free childcare for working parents with 3 and 4 year olds from 15 to 25 hours per week, saying it would be worth 1,500pounds per child. [He] would double the number of childcare places at Sure Start centres and guarantee childcare from 08:00am to 18:00pm for parents of primary school children.” [2]	“would extend the existing entitlement of 15 hours a week free childcare to all extend the existing entitlement of 15 hours a week for 3 & 4 year olds to, all children of working parents aged between nine months and three years.” [1]	“has yet to announce detailed childcare policies ahead of the election.” [3]	“would extend the hours of nursery/children’s centre entitlement for children aged 3 and 4... wants nursery staff to be given adequate training, including training in nutrition.” [2]

Nuclear Power	<p>“is committed to retaining nuclear power plants, and the long term expansion of nuclear power generation in the UK.” [5]</p>	<p>“believes that nuclear power must remain part of the UKs energy mix, but would be reluctant to provide public subsidies for building nuclear power plants.” [4]</p>	<p>“supported nuclear power in 'limited' circumstances, and backs the continued operations at existing nuclear power stations until the end of their working lives.” [4]</p>	<p>“thinks we should abandon renewables and instead base our energy strategy on gas, nuclear and coal. [He] believes that nuclear power is a vital part of energy generation.” [5]</p>	<p>“opposes all nuclear power generation, and has said [he] will cancel construction of new nuclear stations, and nuclear power will not be eligible for government subsidy. Money earmarked for new nuclear plant research, development and construction will be reallocated to energy efficiency measures and renewable energy infrastructure.” [1]</p>
Pensions	<p>“would retain the Triple Lock on the Basic State Pension, guaranteeing it rises yearly by whichever is the highest: inflation, wages, a minimum of 2.5%. This would see the state pension increase by 3 pounds year on year from 113pounds currently.” [3]</p>	<p>“will honour the 'triple lock' on pensions, which guarantees the state pension will rise by whichever is highest amount: inflation, average earnings, or by 2.5% minimum. This would see the state pension increase by 3 pounds year on year from 113pounds currently.” [3]</p>	<p>“plans to raise the state pension from 107pounds to around 144pounds per week, and will protect future pensioners with a fair, single tier pension.” [1]</p>	<p>“has yet to announce any pension policy for this election. Previously promised [he] would roll all existing State pensions, Pensions Credit, the Winter Fuel Allowance into a flat-rate non-means tested, non-contributory and non-taxable 'Citizens Pension' of 130pounds per week for all pensioners aged 65 and over.” [2]</p>	<p>“wants to replace state pensions with an unconditional 'Citizens Pension'; set at the rate of the official poverty line (currently 170pounds per week for someone living alone, or 300pounds per week for couples), and would be linked to average earnings. [He] said pensioners would be allowed work, and earners would be taxed at normal rates.” [1]</p>
Police	<p>“has not outlined any specific cuts to the police force, other than a general 25 billion cut in the public sector.” [6]</p>	<p>“wants to protect frontline police from budget cuts in the next parliament, and -scrap Police and Crime Commissioners, which would save 50million pounds.” [2]</p>	<p>“has no plans to cut police numbers, but would replace Police & Crime Commissioners with 'Police Boards' made up of local councilors.” [3]</p>	<p>“promises to stop the scrapping of front-line police jobs.” [4]</p>	<p>“vowed to defend local neighbourhood policing from cuts, arguing for a better use of the policing budget to boost frontline capacity.” [4]</p>

Prisons

<p>“would build new prisons to increase capacity by 5,000 and break the cycle of repeat offenders though education & rehabilitation, and increased monitoring upon release by the probation service.” [4]</p>	<p>“has pledged to reduce prison overcrowding, but as yet have not announced specific policies to do so. In the previous election [he] promised if elected [he] would add 15,000 prison places.” [2]</p>	<p>“believes that we need to reduce the use of short sentences for personal drugs possession.” [3]</p>	<p>“will double the number of prison places through better use of existing prisons.” [6]</p>	<p>“committed to significantly reducing the prison population; by decriminalising cannabis, axing prison sentences for possession of other drugs, and decriminalising prostitution. [He] promised that courts will have a duty to reduce use of custodial sentencing in favour of community sentencing, and Young People under the age of 18 would no longer be kept in custody.” [1]</p>
---	--	--	--	---

3rd Level Tuition Fees

<p>“wanted to retain the current level of tuition fees for university, and give bonuses for early repayment of student loans.” [3]</p>	<p>“has pledged to scrap the current 9,000pounds-a-year tuition fees and may replace it with a maximum of 6,000pounds, if elected to government.” [2]</p>	<p>“will not change the current level of tuition fees of 9,000pounds per student, and will block any cuts in tuition fees if in government.” [3]</p>	<p>“would remove tuition fees for students taking approved degrees in science, medicine, technology, engineering, maths on the condition that they live, work and pay tax in the UK for five years after the completion of their degrees... wants students from the European Union (EU) to pay the same student fee rates as International students, whom pay a higher amount than EU students.” [5]</p>	<p>“will scrap tuition fees if elected to government.” [1]</p>
--	---	--	--	--

Trident (Nuclear Defense)

“was committed to replacing Trident to maintain the UK's independent nuclear deterrent. [He] is committed to maintaining constant nuclear patrols, and has indicated that 4 new submarines will be required.” [4]

“has not committed to renewing or replacing Trident, Britain’s nuclear weapons program; but have indicated [he] might consider the prospect of Britain’s nuclear fleet being replaced with a cheaper system, or downgraded in some way.” [3]

“has promised to replace a number of Trident nuclear submarines, but not all four currently in the Trident program.” [3]

“will cancel Britain’s nuclear weapons program, Trident, or its replacement, and [he] accepts that Britain will not have an independent nuclear deterrent.” [1]

“will scrap Britain's nuclear weapons program, aka. Trident if elected to government.” [1]

After completion of the practice experiment, participants proceeded to the main experiment. Upon making their vote choice, participants completed a policy attitude survey relating to the 17 policy attributes that appeared for each candidate (17 questions; see Appendix B). Upon completing the policy questionnaire, participants completed an online Qualtrics questionnaire where they were presented with all the policy items on a single screen, in a randomized order, and were instructed to insert a numerical rating between ‘0’ (‘Not at all important’) and ‘10’ (‘Extremely Important’) for how *they personally* felt about each item.

Upon completion, participants were debriefed as to the nature of the experiment before being debriefed as to the purpose of the experiment and paid.

2.5.3. Results

2.5.3.1. Vote Choice

The Labour candidate was the most popular in our experiment (35.7% of votes), followed by Liberal Democrats (20.1%), Conservatives (18.2%), Green Party (10.4%), ‘None of those on ballot’ (11.0%) and Abstain/Spoil (4.5%). No participant chose the ‘UKIP’ candidate.

We examined the relationship between Vote Choice and *Number of Candidates*. The strong relationship between these variables was significant, $\chi^2(5, N=154) = 28.08, p < .001, \phi_c = .42$. This is as expected: a lack of the two additional candidate in 3-Candidate conditions will create a significant effect, as there will be no Green or UKIP votes. There was no relationship between Vote Choice and *Party Label*, $\chi^2(5, N=154) = 8.43, p = .13, \phi_c = .23$.

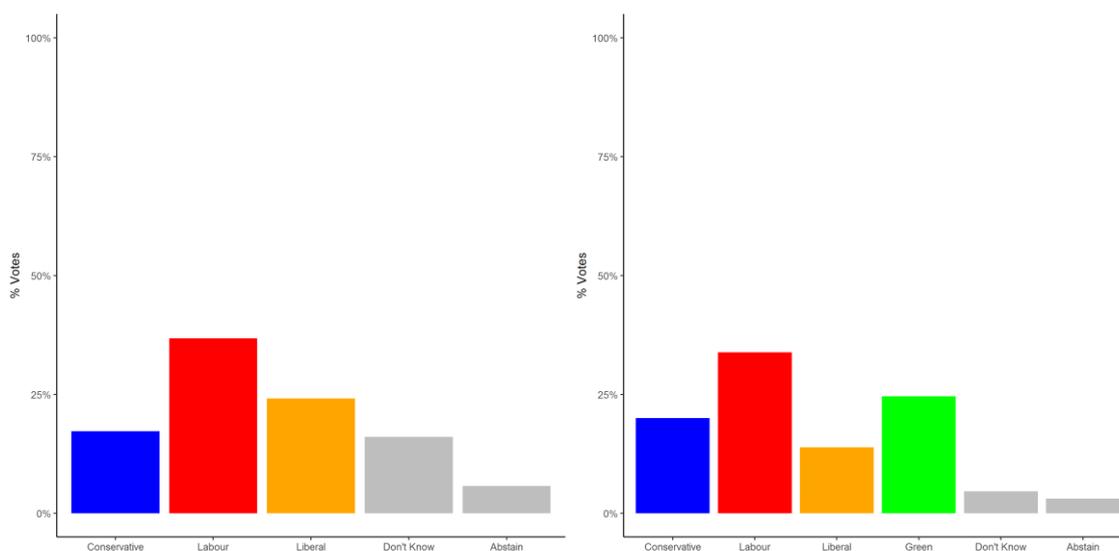


Figure 2.12: % Vote Choice by candidate condition

2.5.3.2. Correct Voting

We removed all participants who responded ‘Abstain’ or ‘Don’t Know’ from our analyses (N= 24), leaving N=130 participants in our sample. This lead to unequal cell sizes in our data, therefore for we also compare our results (where possible) to a bootstrapped sample ($r= 10,000$). Where there are meaningful deviations from the reported results, we note them in footnotes.

We regressed CV on the group variables Party Label (PL) and Number of Candidates (NOC), entering these in Block 1, and their interaction term in Block 2. The regression model containing PL & No. of Candidates was not significant, $p= .47$, $R^2= 1.6\%$, and predicted 60.0% of the overall cases correctly. The addition of the PL & NOC interaction term did not significantly improve the model ($p= .14$), and was non-significant, $p= .26$, $R^2= 4.1\%$, and predicted 60.8% of the overall cases correctly. We report the full model in Table 13.

Table 2.10: Logistic Regression results of Party Label and Number of Candidates on CV rates.

Predictor	β	SE	χ	e^β
Party Label (PL^A)	-.47	.49	.93	.62
NOC (2^{CAN})	-1.08*	.55	3.78	0.34
PL*NOC	1.16	.74	2.47	3.19
Constant	.07	.37	.034	1.07

* $p < .1$. ** $p < .05$. *** $p < .01$. † $p < .001$. (Reference categories in parentheses).

The main effect of PL did not significantly predict CV, $\beta= -.47$, $p= .82$; and neither did the main effect of NOC, $\beta= -.437$, $p= .23$, with participants being 36% less likely to vote correctly when the number of candidates in the choice set increases from 3 to 5. We note that using the directional method of CV (CV^{DR}) that while the model containing all three terms is significant ($p= .012$), none of the predictors are significant ($p > .196$); bootstrapping ($r= 10,000$) does not improve the significance levels ($p > .18$).

CV (layered by PL): We were curious about the non-significance of the NOC term for CV in light of our previous results. We followed up using a layered chi-square test, looking at the differences in correct voting between the 3 and 5 candidate conditions in the presence or absence of Party Label separately. We found a significant *decrease* in the rates of correct voting when choice set increases from 3 to 5 candidates (51.7% vs.

26.7%) when PL^A, $\chi^2(1, 130) = 3.90, p = .049, \phi_c = .26$, but not when PL^P, $\chi^2(1, 130) = .027, p = .86, \phi_c = .02$ ³⁷. CV rates are 51.7% when PL^A-3Can; PL^A-5Can, 26.7%; PL^P-3Can, 40%; PL^P-5Can, 41.9% (see Figure 2.13). Similar to Experiments 1-3, we see a rise in CV rates in the larger choice set (5-candidates) when PL is present, compared to when it is absent.

Chance Level Analysis: The significant effect of Number of candidates when PL^A would, of course, be expected even if participants were choosing candidates at random, due to the fewer options available in the 3-Candidate condition. We therefore compared rates of CV to chance levels in these conditions, first collapsing across party label conditions. 44.9% of participants voted correctly in the 3-candidate condition (no greater than the 33% expected by chance, $p = .59$), whilst the 34.4% of participants voting correctly in the 5-candidate condition did not differ significantly from chance levels (20%; $p = .41$). Additionally, considering only those for whom party label was *absent*, CV rates in both 3-candidate and 5-candidate conditions did not differ significantly from chance levels ($p = .90; p = .19$). Thus, any influence of increasing the number of candidates on levels of CV cannot be explained solely on the basis of a difference in chance levels.

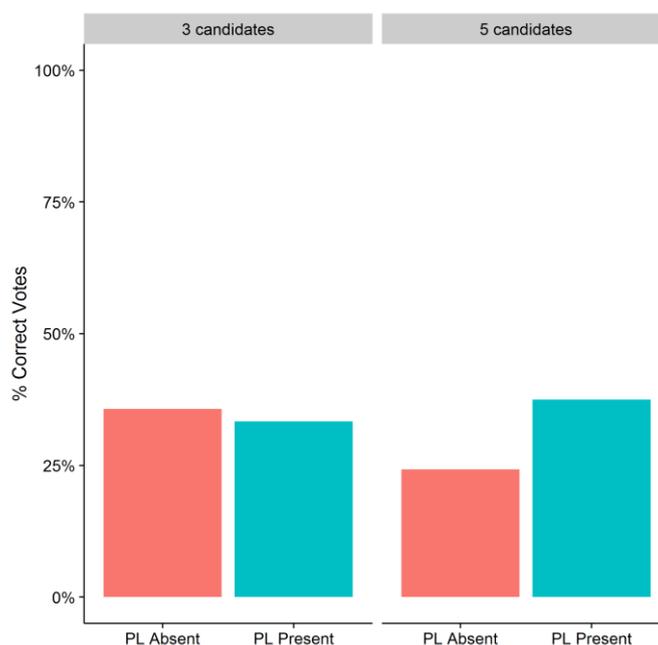


Figure 2.13: % CV by condition

³⁷ We did the same for CV^{DR}, finding the opposite that rates of correct voting significantly increase from 3 to 5 candidates (15% vs. 45%) when PL^P, $\chi^2(1, 130) = 7.85, p = .005, \phi_c = .33$, but no significant change in correct voting between conditions when PL^A, $\chi^2(1, 130) = 1.70, p = .19, \phi_c = .17$. We discuss this in Appendix A.1.4.

2.5.3.3. Post-Ballot-Box

Overall participants found the candidates in the experiment believable ($\mu= 64.38$, $SD= 18.32$), had confidence in their vote choice ($\mu= 58.45$, $SD= 18.01$), had confidence they would not change their vote ($\mu= 57.65$, $SD= 20.76$), and felt making their vote choice was of medium difficulty ($\mu= 46.44$, $SD= 24.54$).

We carried out a multivariate ANOVA on all four measures, using Party Label (PL), number of candidates (NOC), and their interaction term (PL*NOC) as predictor variables. Levene’s Test was not significant for any of the variables (all $p> .41$). We found no factor had a significant effect when averaged across all the dependent variables. However follow-up univariate analysis showed that Party Label had a significant effect on perceived vote choice difficulty, $F(1, 126)= 5.79$, $p= .01$, $\eta p^2= .044$. When party label was absent ($\mu= 51.86$, $SD= 23.56$), participants found their vote choice more difficult than when party label was present ($\mu= 41.93$, $SD= 24.58$).

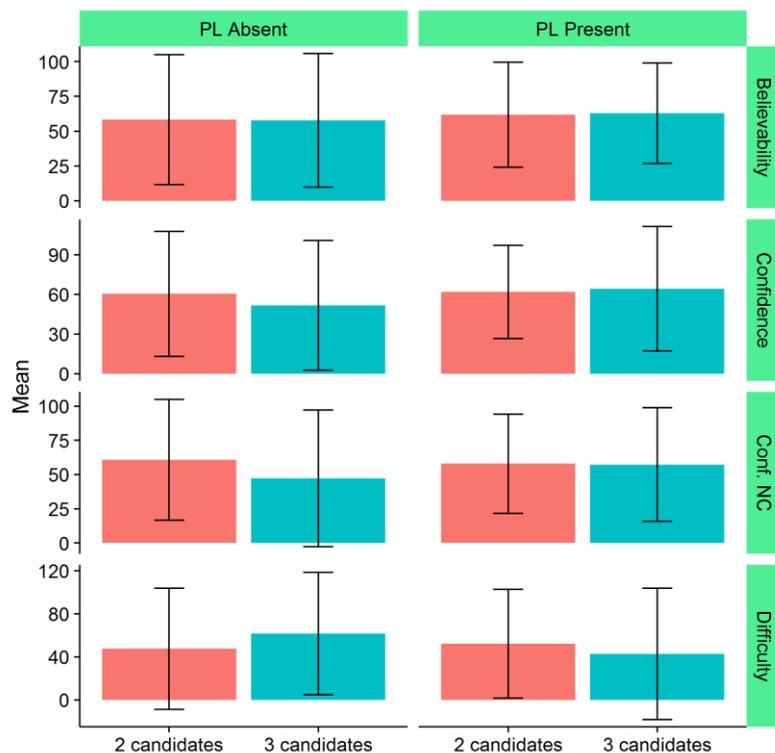


Figure 2.14: Post Ballot Measures by Condition. Bars are +/- SD.

2.5.3.4. Post-Ballot Box and Correct Voting

We regressed all of our post-ballot measures of vote confidence, believability, and difficulty, on CV in Block 1, adding our main predictors (PL, NOC) and their interaction term in Blocks 2 and 3. The regression model containing our post-ballot variables was not significant, $\chi^2(4) = .78$, $p= .94$, $R^2= 0.8\%$, and predicted

58.5% of the overall cases correctly. None of the post-ballot measures were significantly predictive of correct voting (all $p > .50$). Adding the main predictors in Block 2 did not improve the model, and adding the interaction term in Block 3 did not further improve the model ($p = .09$).

2.5.3.5. Distance and Correct Voting

We regressed ‘distance BNB’ (centered on its mean) as a predictor variable on CV, finding it was positively associated with the likelihood of voting correctly but non-significantly, $\beta = .45$, $p = .18$, indicating participants were 1.57 times more likely to vote correctly as distance between the two most proximal alternatives increases (in line with per Experiments 2 & 3). We included ‘distance BNB’ (centered on its mean) as a predictor variable with PL and NOC in Block 2, their 2-way interaction terms in Block 3, and their 3-way interaction term in Block 4.

Only the regression model containing Block 3 approached significance, $\chi^2(6) = 9.28$, $p = .07$, $R^2 = 11.4\%$, correctly classifying 63.8% of the cases; significantly improving over Block 2 ($p = .044$). The interaction of ‘Distance’ and PL was significantly associated with the likelihood of voting correctly, $\beta = 1.55$, $p = .046$, such that when party label is present and distance between alternatives increases participants are 4.7 times more likely to vote correctly.

Adding the 3-way interactions between our condition variables and the distance between alternatives in Block 3 did not significantly improve our model ($p = .91$). The overall model was non-significant, $\chi^2(7) = 9.31$, $p = .121$, $R^2 = 11.4\%$, which we report in Table 2.15.

Table 2.11: Logistic Regression results of ‘distance’ between ‘best’ and ‘next best’ options on CV rates. (N= 130)

Predictor	β	SE	χ	e^β
Distance	-1.03	.87	1.40	.35
Party Label (PL^P)	-.55	.51	1.17	.57
NOC (2^{CAN})	-1.194**	.574	4.322	.30
PL*NOC	1.12	.773	2.101	3.07
Dist*PL	1.46	1.14	1.65	4.31
Dist*NOC	.93	1.16	.64	2.55

Dist*PL*NOC	.17	1.56	.01	1.18
Constant	.17	.39	.19	1.19

* $p < .1$. ** $p < .05$. *** $p < .01$. † $p < .001$. (Reference categories in parentheses).

It seems worthwhile to point out the large exponentiated betas (the Odds Ratios) in our model (Block 4). While none of the terms reach significance after controlling the 3-way interaction term, participants are still 4.3 times more likely to vote correctly when PL is present and distance between alternatives increases. Additionally, participants seem 3 times more likely to vote correctly in choice sets where the number of candidates increases when PL is present. Also, participants seem 2.5 times more likely to vote correctly in the 5-candidate choice set when Distance between the two proximal alternatives increases. As these do not reach significance, we discuss them no further.

Distance & Difficulty: Increasing distance was not significantly correlated with any of the measures of choice confidence or believability of the candidates collected after participants choose a candidate at the ‘Ballot Box’ stage. While it was negatively correlated with vote choice difficulty, this was not significant, $r = -.06$, $p = .50$.

2.5.3.6. Summary

We found no main effects of party label (PL), nor of number of candidates (NOC). However, when examining differences between the 3 and 5 candidate choice sets, there is a significant difference when party label is *absent* such that CV rates decrease from 51.7% to 26.7% as the choice set size increases to 5 candidates. Distance followed the predicted trend, being positively associated with correct voting, but was not significant. The interaction between party label and increasing distance was significant, with increasing distance when party label is present increasing likelihood to correctly vote by an odds ratio of 4.7.

There was an effect of party label on perceived difficulty of vote choice, such that collapsing across choice set conditions, participants found choosing a candidate easier when party label was present, compared to when it was absent. None of the post ballot measures were predictive of correct voting, nor did controlling for differences in confidence, perceived difficulty etc., improve the regression models or the predictive power of our main effects (i.e. PL and NOC).

2.5.4. Discussion

Generally, the rates of correct voting are lower in this experiment than in Experiments 1-3, with an averaged CV rate of 40.07% across conditions. We found no overall support for our initial hypotheses:

H₁: *That rates of ‘correct voting’ will decrease when candidates (alternatives) increase from 3 to 5.*

44.9% of participants voted correctly in the 3-candidate and 34.4% of participants voted correctly in the 5-candidate condition, the differences being non-significant. The trend in CV rates is in the predicted direction, and the rates of correct voting in the 3-candidate condition seem fairly consistent with those observed Experiments 1-3 (51%; 42%; 39%; respectively), suggesting our results are broadly in line with those obtained previously. That there is not a large drop-off following the addition of 2 additional candidates would suggest that there is a plateauing of the effect of increasing choice set size above 3 candidates, and the rates of correct voting here do not differ significantly from what is expected by chance.

Lau et al. (2013) in their analysis of correct voting across 33 democracies find that the number of alternatives (‘political parties’) is negatively correlated with correct voting ($\beta = -.12$), with “*only two alternatives on the ballot the model predicts almost 79 percent correct voting, but when there are nine alternatives ... the probability of a correct vote drops precipitously to under 57 percent ... by far the largest effect present in our data*” (p. 16). We observe similar or lower rates using a more ecologically valid approach, with a smaller set size. Lau et al. (2013) go further to comment that “*voters are nonetheless doing considerably better than chance*” (p. 16). This is a beguiling statement, and a histogram of CV rates against chance rates are sadly not provided by the authors, for if there is a plateauing of the effect of increasing the choice set size, then at a certain point statistically people *must* be seen to vote correctly, as the chance rate drops to the floor ($P = 1/N$).

H₂: *That ‘correct voting’ will increase when Party Label (party identity) information is available.*

We observe no support for H₂, with no main effect of party label observable in the data. Party label does have a significant effect on perceived difficulty, with participants finding the vote decision more difficult across the 3 and 5-candidate conditions when party label was absent than when it was present. This suggests that party label is not ignored, or not exerting *some* effect on participants, and is simplifying the decision for

participants somewhat as would be expected of a beneficial heuristic, but this is not affecting or aiding participants in making a correct vote.

While there were concerns that the believability of materials may be the cause of a lack of an effect of party label overall in Experiment 3, believability has no relationship with correct voting in this experiment. One possible consideration might be the ‘*ideological distinctiveness*’ of the party candidates, that is, the clarity of party choices arising from how distinct or ‘polarised’ they are from each other³⁸ on a ‘Left-Right’ scale. Ideological distinctiveness is measured by Dalton’s (2008) party polarization index³⁹ (PPI); the greater the index the greater the variance of party ideologies, and the easier it should be to distinguish between alternatives on ideological grounds. Lau et al. (2013) find that “*the ideological distinctiveness of alternatives ... helps mitigate against the pernicious effect of too many alternatives in the choice set, increasing the probability of a correct vote by almost 8 percent when the parties are, on average, most distinct*” (p. 16). As our experiments use real-world materials to construct our stimuli, we do not control for the ideological distinctiveness, or the *perceived* ideological distinctiveness, of the candidates in our experiments. It may well be that on this occasion certain parties are less ideologically distinct based on their manifestos, or as perceived by voters⁴⁰.

Conveniently, we do have an alternative way of testing the same principle, our ‘distance’ or ‘similarity’ measure of the two alternatives that are closest (‘best’) to a participant (based on their weighted policy preferences). An alternative way of viewing the measure is the ‘distinctiveness’ between the 2 alternatives closest to a voter in an n -dimensional policy space. We observe the trend for participants to be more likely to vote correctly as the instance between the two most-proximal alternatives increases (i.e. they become more distinct, or dissimilar), but unlike Experiments 2 & 3, the effect is not significant in this experiment. We find a significant interaction with Distance and party label, such that participants are 4.7 times more likely to vote correctly when alternatives are distinct from each other, and party label is present. Similarly, participants are more likely (2.8 times) to vote correctly the more distinct the candidates are as choice set size increases.

³⁸ ‘Party polarisation’ is a concept fraught with terminological difficulties. See Dalton (2008) for a discussion.

³⁹ Essentially the standard deviation of the distribution of parties along the ‘Left-Right’ ideological dimension. See Dalton (2008, p.906) for the equation.

⁴⁰ Not included in this PhD thesis, we actually ran a study in March 2015 testing how the addition of each party in the UK to a group made of 1-5 of the others affected the perception of each on Left-Right, and Libertarian-Authoritation axes. We found no significant effects, but not it does change how the ‘scale range’ is used when adding in certain candidates.

In fact, our measure, might be more accurate (for our goals) than the method of calculating ideological distinctiveness than of Lau et al. (2013) whose “*survey researchers provided expert judgements about where the political parties stand on the left-right scale*” (p. 3) and combined them with “*respondents’ own ideological self-placement [on an 11-point scale] to construct ideological closeness scores*” (p. 10). There is no shortage of debate over the use of a simple ‘left-right’ scale to collapse n -dimensions of policy preferences (e.g. Castles & Mair, 1997). In our experiments, we are able to directly capture participants’ policy preferences, and their relative weights to construct and place alternatives in n -dimensional space. Unlike Dalton (2008) and Lau et al. (2013), our measure considers only the variation (distinctiveness) between the two parties that should matter most- those closest to a voter’s preferences. In the absence of intentionally creating a measure *a priori*, it is a worthwhile proxy for voters’ perceptions of ideological distinctiveness.

H₃: *That H1 and H2 will have multiplicative effects, such that the effect of including Party Label will be greater in the 5-candidate condition, due to the enhanced task complexity.*

We find a lack evidence for H₃, with the integration term being non-significant. However, closer analyses suggest a less clear-cut conclusion. Correct voting rates are 51.7% when PL^A-3Can; PL^A-5Can, 26.7%; PL^P-3Can, 40%; PL^P-5Can, 41.9%; with the difference between the 3- and 5-candidate conditions significant when party label is absent. This result is in line with Experiments 1-3, which found that CV rates decreased when party label was absent and choice set size increased. However, unlike the trends Experiments 2-3, we do not see a beneficial effect of party label in the 3-candidates condition (albeit, the difference did not reach significance in previous Exps.); this difference may simply be a result of the imbalance in cell sizes between the party label conditions (33% less in the party label present conditions). We do see a positive increase in CV rates in the larger 5-candidate condition when party label is present, which is line with our predictions and previous results in Experiments 2-3.

One aspect of our study that is surprising is the lack of any participant choosing the UKIP option, despite its availability. Of those who actually chose a candidate in our study, 10% felt the party they were closest to was UKIP (6.3% said the British Nationalist Party), and ‘UKIP-ers’ made up 6.5% of the *5-candidate party-label present* condition (with half voting correctly). Expecting UKIPers to vote in a partisan fashion presumes that these participants should engage in a simple matching strategy in this condition, which they clearly do not.

An obvious explanation is that their affective appraisal of whom they *feel* closest to is not whom they are closest to in our experiment; or, given the real-world materials used, even in reality. This demonstrates why conceptions of ‘correct voting’ should never be about simply whether voter’s match their partisanship to that of a candidate available- they may not align (well) in reality. Despite the low prevalence of UKIPs in the sample, it is worth noting that it is broadly reflective of the 12% of the British electorate who supported UKIP at the time of testing.

2.6. General Discussion

We have investigated correct voting in a multi-party electoral context outside of the USA, using four in-lab experiments and participants’ own self-reported policy preferences. We have examined correct voting using both proximal and directional approaches, weighted and unweighted, finding no real difference in using either.

Worryingly, we find when the increase in the available candidates in the choice set is minimal (2 alternatives to 3 alternatives), voters seem unable to correctly identify the candidate that overall best matches their own reported preferences. When we increase the choice set size to 5 alternatives, correct voting rates can go as low as 26%, but seems to plateau; indicating that either: a) there is some limit to the effect of choice set size on decision-complexity, or b) participants are utilizing some strategies to deal with increasing choice set size (e.g. by reducing the set to a smaller subset).

In that light, we find mixed evidence for the idea that partisan labels act as a heuristic; with party label seemingly acting to aid participants in correctly voting as the choice set size increases, contrary to our initial hypotheses that it would act to bias participants to choose incorrectly. We find the effect mildly elusive, likely hampered by issues of low statistical power and unbalanced cell sizes. However, there is a consistent observation in all experiments that participants vote correctly at the lowest rates when the choice set size increases and there is an absence of partisan labels, and better when party label is present as choice set size increases. This finding is a positive contribution to both the political and psychological literature, identifying some initial evidence for an oft-mooted political heuristic that may aid decision-making in real world tasks, and contributes to the debate as to whether relying on partisan cues result in biased decision-making (and if that results in positive outcomes).

A possibility may be that party label acting as providing a memory aid to participants and reducing cognitive load, as having a proxy summary of positions reduces the need to hold all the learned attributes in working memory for recall, comparison, and evaluation. Additionally, party label may be acting to narrow the consideration of alternatives down to a smaller set of alternatives (i.e. by excluding those least preferred), effectively rendering the decision between larger sets of alternatives comparable to a smaller choice set. We examine these possibilities in Chapter 3.

Our results also point towards the role of *ideological* (or inter-alternative) *distinctiveness* in playing a role in voters' ability to correctly vote, such that greater distinctiveness (or decreasing similarity) of alternatives leads to greater rates of correct voting. This is in line with Scheibehenne et al. (2010), whom posited that greater alternative similarity in choice sets would lead to adverse outcomes by increasing task complexity- a similar concept mooted by Downs (1957) via the spatial voting model, positing that if two or more parties are equidistant (similar), this produces voter indifference and increases the likelihood of nonvoting (a negative outcome). While we are unable to tell if perceived similarity led to indifference in our study, it is a possible avenue for further investigation.

There are some limitations to our own research, namely tension between the concepts of 'sincere' voting and 'correct' voting (Austen-Smith, 1989; Lau et al., 2013). 'Sincere' voting presumes that voters vote for the candidate whose 'electoral platform' is the most preferred, and is agnostic to other considerations such as barriers to voting for such a candidate, or indeed if the most preferred candidate is capable of winning (perceived or real). 'Insincere' voting is voting for a candidate who is disliked, such as tactically voting against a candidate to keep the 'least preferred' from being elected (and other strategic concerns). Like Lau et al. (2013), we do not incorporate these concerns into our CV framework, though aspects such as 'electability' can be as legitimate as any other attribute for consideration and weighting in a decision-theoretic model, and their exclusion may lead to over-estimation of incorrect voting. We do not believe it was a concern in our studies here, as participants were informed that all candidates were equally tied in 'the polls' (thus signaling equal electability), therefore participants had no reason to vote insincerely. Further, Lau et al. (2013) provide *a posteriori* analyses to support their claim that strategic voting was not a concern in their analysis of correct voting in 33 democracies. That said, an objective measure of whether voters vote 'correctly' should take into considerations that they may not be able to, which we do in our studies by assigning a correct vote to the

proximal alternative that is available, even if they are not ‘the most preferred’ in a wider sense of all possibilities. Identifying the best methods of measuring strategic voting concerns, and incorporating them into a correct voting framework, is a fruitful line of further research.

Given the prevailing trend in non-USA countries towards increasing the number of parties on offer (Pederson, 1979), and the UK’s comparatively high party tribalism (YouGov, 2013b), our findings are concerning for a fundamental of modern democracy; political pluralism may negatively impact the health of democracy. While the UK political parties’ use of party branding is ubiquitous, and party labels exist on the ballot paper next to candidate names in every election, our results would suggest that even among voters that are given the opportunity (and arguably motivation) to access information for political candidates and make a decision, voters may only choose correctly as low as 41.2% of the time; and as low as ~24% of time if party label is missing.

We have investigated choice set size and a suspected political heuristic, and their effects on correct voting as an outcome measure. In order to better understand how these may exert their effects on voters’ decision-making during the formation of their vote choice at the cognitive level, we explore our data at in greater detail and more sensitive measures via an *information processing* approach in Chapter 3.

Chapter 3: Information processing in vote choices

3.1. Introduction

In Chapter 2, we explored how the *size of the choice set* of candidates, and the presence of ‘*party label*’ impacts on voters’ ability to vote correctly; that is, choose the candidate in the available choice set that best matches their political preferences. Specifically, we hypothesised that increasing numbers of alternatives would increase task complexity (Sela, Berger, & Liu 2009) leading to decreased rates of correct voting; that party label would act as a partisan heuristic (Lau & Redlawsk, 2001), leading to decreased rates of voting; and that these effects would be multiplicative, so that the lowest rates of correct voting would be where party label was absent and choice set size increases.

We find across our four experiments that when the increase in the available candidates in the choice set is minimal (2 alternatives to 3 alternatives), the rate of correct voting decreases. When we increase the choice set size to 5 alternatives, correct voting rates can go as low as 26%, but seems to plateau; indicating that either: a) there is some limit to the effect of choice set size on decision-complexity; or b) participants are utilizing some strategies to deal with increasing choice set size and reducing cognitive load (e.g. by reducing the set to a smaller subset).

We find mixed evidence for the idea that partisan labels act as a heuristic; with party label seemingly acting to aid participants in voting correctly as the choice set size increases, contrary to our initial hypotheses. While not reaching statistical significance in three of our four experiments, we consistently observe that participants vote correctly at the lowest rates when the choice set size increases and there is an absence of partisan labels, and better when party label is present as choice set size increases. We conjectured that party label may act as a memory aid to participants and reduce cognitive load, as having a proxy summary of positions reduces the need to hold all information in working memory. Additionally, party label may be acting to narrow the consideration of alternatives down to a smaller set of alternatives (i.e. by excluding certain alternatives), effectively rendering the decision between larger sets of alternatives comparable to a smaller choice set. While it may have no overall effect on our outcome measure of correct voting, we do observe some support that is exerting some effect, as participants in Experiments 3 and 4 that find the perceived difficulty of making a vote choice greater when party label was absent than present.

Fundamentally, we do not know why choice set size has this effect on participants' (in)ability to vote correctly. While we can conjecture based upon Chapter 2 that participants are finding the decision-task far more complex due to the additional information load, and alternatives to compare between, this is no guarantee that participants are accessing more information in the expanded choice sets, or simply succumbing to fatigue during the experiments (Danzigera, Levav, & Avnaim-Pesso, 2011). Similarly, it is unclear what, if any, heuristic effect party label has at the cognitive level; either to reduce the levels of information processing required, or by directing participants to a smaller subset of alternatives.

As the results from Chapter 2 were unclear, this chapter also provides more sensitive measures of the direct effects of choice set size, and party label. We can explore the cognitive effects of both choice set size and party label by looking at how our 'voters' (i.e. participants) process the information they encounter during the experimental 'flow stage'. For example, how much information they access, the duration of how long it is accessed, and if they engage in preferential search amongst alternatives. With this in mind, we examine participants' processing-level data from our previous four experiments in Chapter 2. We adapt some of the approaches used by Lau and Redlawsk (2006) to examine the information processing of voters during the experimental flow stage; namely, looking at the amount of search participants engage in during the flow stage, and the average duration that participants spend on items; and we develop our own measures of preferential processing between alternatives.

3.1.1. Heuristics & Processing

We provide a basic introduction to cognitive processing and heuristics in Chapter 1 (Section 1.5.1). Simon (1990), argues heuristics are "*methods for arriving at satisfactory solutions with modest amounts of computation*" (p. 11), used to reduce the effort associated with decision processes. In judgment and decision making, the *weighted additive rule* (Payne, Bettman, & Johnson, 1993) is "*the traditional gold standard for rational preferences*" (Gigerenzer, Todd, & the ABC Research Group, 1999, p. 26) for arriving at optimal decisions and accurate judgments, where decision makers consider all of the available alternatives and cues for each alternative, determine a weight for each cue in some manner (e.g. relative importance), assign weights to each cue, and calculate each alternative's value by multiplying each cue by its weight and summing the products. By contrast, heuristics can make judgments faster and less effortful through frugality, by examining

fewer cues, reducing the effort of retrieving cue values, simplifying the weighting of cues, integrating less information, and examining fewer alternatives (Shah & Oppenheimer, 2008).

Of particular relevance is the role of heuristics in reducing cognitive effort, for example, in **processing fewer cues** (i.e. informational items).

Decision makers may focus on the cues they deem most important, or what cues most validly predict judgments about alternatives. The *lexicographic heuristic* (Fishburn, 1967; 1974) operates by selecting the alternative with the best value on the most important cue; and if alternatives tie decision makers search again according to the second most important cue, and so on until a single alternative is chosen. The *priority heuristic* (Brandstätter, Gigerenzer, & Hertwig, 2006), and the *Take-the-Best heuristic* (Gigerenzer et al., 1999) are variants of the lexicographic heuristic. While decision makers may search multiple cues because the first cue does not discriminate between alternatives, they are still reducing effort as only one cue is considered at a time, reducing the amount of information to be kept in working memory. Under the *elimination by aspects heuristic* (EBA) (Tversky, 1972), decision makers select and establish a cut-off value for the most important cue, eliminating any alternatives that do not satisfy the criterion value on this cue and continue to choose cues in this manner until only one alternative remains. Again, while decision makers may still have to consider many cues before finally narrowing the set to one alternative, by consulting fewer cues during each comparison of alternatives, the decision task becomes significantly easier. Similarly, a heuristic might reduce the number of cues used, but use more than one cue (i.e. the *CONF heuristic*, Karelaia, 2006).

Decision makers may **reduce effort in retrieving/storing cues** by computing them quickly or substituting other attributes in their place (*'attribute substitution theory'*, Kahneman & Frederick, 2002), by using heuristics like the *representativeness heuristic* to judge using easy-to-access information about whether a target resembles a prototypical instance of the class (e.g. if a candidate with a Labour party label is a typical example of a Labour politician). Similarly, affect associated with an alternative can act as a prominent cue or *affective heuristic* (Monin & Oppenheimer, 2005; Slovic, Finucane, Peters, & MacGregor, 2002)

In order to reduce decision effort, decision makers can reduce effort by **integrating less information** across multiple attributes or even by not integrating information at all., using non-compensatory heuristics (i.e., heuristics that do not make trade-offs between cues). The *satisficing heuristic* (Simon, 1955, 1956, 1990) uses

numerous cues, setting cut-off levels for each cue, and selecting the first alternative in their search that surpasses their cut-off for each cue. Information from all of these cues are not integrated to gain an alternative's total utility, therefore the chosen alternative is simply 'good enough'. Payne et al., (1993) warn that decision makers utilizing such heuristics often do not form an overall impression of an alternative, and thus their overall utility, leading to poor decisions – a possible source of incorrect voting. The *domran heuristic* (Hogarth & Karelaia, 2005b) eliminates alternatives that are dominated on a cue by at least one other alternative, removing the need to integrate information across cues or to form an overall impression of an alternative before it is eliminated.

Finally, decision makers can reduce effort in decision-making by utilizing heuristics that **examine fewer alternatives**. EBA and other lexicographic heuristics progressively rule out alternatives that fall below cue threshold levels during evaluation. Heuristics might also reduce effort by immediate elimination of some alternatives from the choice set (Shah & Oppenheimer, 2008). An example analogous to the political domain is the *do-no-harm heuristic* for policy reform (Baron, 1993, 1994), where decision makers rule out any policy change that would infringe upon the rights of a group, and then continues using cues, such as 'fairness', to decide on policy changes.

Four 'models' of voters were proposed by Lau and Redlawsk (2006). Their voter models consist of Model 1 (classic 'rational decision-makers who seek out all information), Model 2 (confirming prior beliefs through partisan voting), 'Model 3' ('fast & frugal' by seeking out few but highly valid informational cues), and with 'Model 4' types (utilize heuristics and other shortcuts, i.e. stereotypes, schemes, etc.). Model 3 voters are those most likely to utilize variants of the lexicographic heuristic, while Model 4 voters could use a wide range of heuristic strategies. By further exploring party label and choice set size in depth, we can examine the type of heuristic processing voters engage in, and relate our findings back to Lau and Redlawsk's (2006) voter models.

In all of our experiments in Chapter 2, we observe the trend that participants report their decision as more difficult when choice set size increases, particularly when party label is absent, while in Experiments 2-4 participants' perceived decision difficulty actually decreases (i.e. the choice seems easier) in larger choice sets when party label is present than when absent. This suggests that increasing choice set size does increase perceived effort of the decision in our experiments, while party label may act to reduce effort (e.g. through

heuristic processing). Lau and Redlawsk (2006, p.246) also note this trend to utilize ‘political heuristics’ when choice set size increases but do not find the use of their party heuristic significantly differs, which is based on the rate of access for that item.

In the next section, we discuss how we can assess the use of heuristics and effort reduction under each of these principles. Primarily, we consider the role of information processing approaches, and a ‘Dynamic Process Tracing Environment’ (DPTE) methodology outlined in Chapter 2.

3.1.2. Assessing heuristics & information processing via process tracing

Generally, there are three types of ways to study heuristics in judgment and decision making (Shah & Oppenheimer, 2008); computer simulations to investigate the effort and expected accuracy of heuristics; what information is searched for and used over time to arrive at a decision; and how people’s behavioural outcomes match patterns that are indicative of certain strategies. The latter we investigated in Chapter 2.

Shah & Oppenheimer (2008) state while “*computer simulations are useful, they cannot prove whether people actually use a given heuristic*” (p. 218) whereas *process tracing* and *outcome analysis* are strong empirical tests of effort-reduction. Process tracing observes how people search for information prior to making a judgment or decision, allowing determination of which types of decision processes are being used (Payne et al., 1993; Schulte-Mecklenbeck et al., 2010). It is especially useful for studying whether decision makers are examining fewer cues or alternatives (Shah & Oppenheimer, 2008), for instance, by examining the relative number of cues accessed for alternatives, or the average duration spent on them. Lau and Redlawsk (2006, p.233) inferred ‘heuristic’ use by participants in their experiments (e.g. party label, candidate images) by comparing the mean (or relative) amount of times the information items (or all items in a related category) for each proposed ‘political heuristic’ were accessed by participants; comparing them between studies mimicking USA primary and general election campaigns. This approach is problematic. Access of information items *itself* can be part of a heuristic strategy (i.e. seeking out highly valid cues, like party label), but doesn’t show if, or how, such information may subsequently result in heuristic processing (e.g. by eliminating alternatives).

The Dynamic Process Tracing Environment (DPTE) software used in our methodology allows for a degree of exploratory analysis into participants’ information processing during our experiments. The DPTE is designed to capture participants’ access of informational stimuli as they appear on screen during a simulated

election campaign (the ‘flow stage’); recording when an item is opened, for how long it remains open on a participant’s screen, and which alternative the informational item belongs to (and more; see Lau & Redlawsk, 2006). As such, we decided to investigate how participants’ *amount of information search* and the *average duration* on items searched (as proxy measures of information processing), differed with choice set size and party label’s presence, in line with research on heuristic processing and effort reduction.

Amount of Information Access (IA): Lau and Redlawsk (2006, p.109) explore the various ways one might assess a voter’s depth of information search in a study, namely looking at the total *amount of access* (i.e. total number of informational items searched) for each candidate. The amount of information accessed overall will be influenced by the number of candidates in the choice set (i.e., there is more to access in expanded choice sets), therefore we need an additional measure that takes into account the differing number of items accessed.

Average Duration (AD): considering the general use of reaction times and duration data assess processing patterns, including in static information boards (Jacoby, Kohn, & Speller, 1974; Jacoby, Speller, & Berning, 1974; Payne, 1980), it is somewhat surprising that Lau and Redlawsk (2001; 2006) do not include analysis on how party affiliation, number of candidates, or campaign effects, impact on the duration participants access items for. The duration spent on information searched is a useful way of assessing information processing, as one could expect that larger choice sets would result in less time spent on items or alternatives as participants attempt to search, and compare, information within/between more alternatives. We average duration across the number of items accessed to control for differences between participants who access differing amounts of information. Similarly, if party label’s presence does result in more heuristic processing, reducing the need for more information search and comparison, participants may spend a shorter average duration on items.

Equality of Search (ES): The standard indicator of search equality is the variance in the amount of information gathered across alternatives; if the variance is low, then search is relatively equal; if it is high, then search across alternatives is unequal. However, this does not tell us in which direction (i.e. for which alternative) search is unequal (i.e. preferential for an alternative). Therefore, we construct our own measures of information search equality amongst alternatives in the choice set, using the amount of information accessed and average duration, and the chosen candidate as the reference point. We do this in two ways, as discussed below.

'Suppressing' Alternatives: First, we compare whether the equality of search between the chosen alternative (candidate) and the alternatives in the smaller choice set (e.g. 2 candidates) is the same as that in the expanded choice set (e.g. 3 candidates). This is in order to assess if unequal search (i.e. preferential search) patterns for the chosen alternative differ by choice set size. If the amount and average duration of search between the alternatives in both conditions (chosen +1 alternative, vs. chosen +2 alternatives) are not meaningfully different (i.e. equal), then it may be that participants are *'suppressing'* the presence of additional alternatives by considering a smaller subset of alternatives in the larger choice sets. For example, an alternative pair comprised of the chosen alternative and whichever other alternative is next-most-accessed by the participant. Equality of search between choice sets would correspond to heuristic strategies that utilize pairwise comparisons (Russo & Doshier, 1983), which reduce the number of alternatives that must be kept in working memory at once and demand on cognitive resources. We can also see if party label has any effect across choice sets. However an effect using this measure may correspond to participants suppressing additional alternatives, or focusing on a preferred pair, therefore we construct an additional metric to test for these differences.

'Focussing [on]' Alternatives: We test this idea more directly by *'removing'* the additional *'least-considered'* candidates from our calculating our suppressing measures in larger choice sets (e.g. comparing 2 the two most accessed alternatives in both the 2-/3-candidate conditions). This allows us to see if participants are *'focussing'* on their chosen candidate relative to another candidate. In the smaller 2-candidate conditions, there is no choice but to focus on the chosen candidate and the remaining alternative (either Labour or Conservative), but in expanded choice sets the focussed pair of the chosen candidate and *'next-most-considered'*⁴¹ could be any of a number of alternatives (Labour, Conservative, Liberal, Green, or UKIP). Therefore, we remove the alternative(s) that are the least considered when calculating our measures for the larger 3-/5- candidate conditions and re-calculate the score *as if* there were only that many alternatives in the choice set. This allows us to test if equality of information search between the chosen and next-preferred candidate differs based on choice set size, and if party label has any effect.

⁴¹ We use the word *'considered'* as to not become confused with *'preference'*. We have no way of knowing if an alternative is accessed heavily indicates participants' preference (though it seems likely), and we only assume preference for the chosen candidate as participants' vote choice has made that explicit *a posteriori*.

The method of calculating of our ‘suppressing’ and ‘focussing’ preference measures are detailed in ‘Procedure’ (Section 3.3.5, this chapter).

Timebin: Considering that heuristics like EBA and other lexicographic heuristics initially include all alternatives and reduce effort by gradually paring down the number of alternatives in the set that fall below a minimum threshold for a particular cue, it is logical to analyse our IA, AD, and ES measures over the duration of the experimental flow stage. We follow Lau and Redlawsk (2006) in dividing up the flow stage into three equal time-bins. Looking at the pattern of our ES measures over time will allow us to examine how a preference for the chosen candidate relative to the alternatives emerge over time, per condition.

Information Processing, Heuristics, & Correct Voting: Ultimately, we wish to investigate how participants’ information processing may relate to whether or not they vote correctly. In line with rational assumptions, it seems uncontroversial to state that the more information participants access should lead to more informed decisions, and thus be more likely to vote correctly. The alternative view is that ‘information overload’ arising from excess information results in lower quality decisions (Bargh & Thein, 1985, Kerstholt, 1992). In such a case, Gigerenzer and Gaissmaier (2011) argue that using less information (e.g. by utilizing heuristics) can actually increase performance and accuracy in decision-tasks under certain conditions. For example, Take-the-Best can predict more accurately than linear multiple regression models (Czerlinski et al.1999), provided cues are searched through in the order of their validity, and there is high cue redundancy and high variability in cue weights (Gigerenzer & Gaissmaier, 2011). Famously, Ortmann, Gigerenzer, Borges, and Goldstein (2008) reported in a study on financial portfolio success, that general members of the public utilizing the recognition heuristic outperformed (on average) managed funds, the Dow/Dax markets, and stock experts.

In political information processing, Lau and Redlawsk (2006) put forward a theoretical voter model of decision-making (*Model 4*, p.8) that is ‘rational bounded’ and ‘intuitive’ in decision-making; utilizing heavily on heuristic strategies (i.e. satisficing) and ‘political heuristics’. They find evidence that cognitive limits are indeed a problem for voters and that non-compensatory strategies corresponding to those for Model 4 voters are positively related to correct voting in certain scenarios, often outperforming ‘rational’ models corresponding to effortful decision-making strategies (e.g. weighted additive; *Model 1* voters). Both of these

bodies of research suggest that in certain cases, voters following heuristic strategies may lead to positive outcomes, improving correct voting rates.

Similarly, if participants are spending longer on items, rather than quickly skimming information, this should lead to better evaluations of the cues and alternatives overall, and thus better decisions on their utility (i.e. more correct voting). Alternatively, average duration on items may not matter, as individual differences in reading and processing speed may lead to participants spending only as long as is needed.

One would expect that greater preference for the chosen candidate on our constructed measures should be related to rates of correct voting, in that, when participants show greater preference for a chosen candidate and they are the (in)correct choice, this should be related to (in)correct voting rates. Yet, greater amount of search for one specific candidate, and the longer spent on one candidate reduces evaluation of other candidates (as there is limited time); and may be negatively related to correct voting (if the participant is dwelling on the incorrect choice).

3.2. Research Questions

As this chapter is exploratory in nature, analysing data already collected, we make no strong *a priori* predictions as to what the expected patterns of information processing may be. As party label is probably the most informative cue about candidates in elections (containing stereotypic information, and acting as a proxy for policy stances), its absence should make vote choice more difficult, and result in more effortful processing. Therefore, our first research question (RQ) is:

RQ1. *What effect does party label have on information search, and average duration, when it is absent versus when it is present?*

In Chapter 2 we observe that the *number of candidates* in the choice set exerts the most consistent effect throughout our 4 experiments on correct voting rates, with increasing choice set size negatively associated with the ability to vote correctly. Increasing the choice set from 2 (Labour Party, Conservative Party) to 3 candidates (adding in Liberal Democrats) may seem like a minor increase, but it increases the number of items present in the flow stage from an average of 40 (when there are 2 candidates) to 60 (3 candidates); increasing the number of intra-/inter-alternative comparisons possible for participants to carry out. In Experiment 4, we

also increased the choice set size from 3 candidates to 5 (again increasing information items), including the two more relatively ‘extreme’ parties (albeit still ‘mainstream’) in the UK: the UK Independence Party, and the Green Party. These parties’ policies are less well known to the general UK electorate (relative to the Labour Party, Conservative Party, and the Liberal Democrats), and less covered by the wider media as a result of their small electoral share in the UK. While we give 33% more time in the flow stage with the addition of each candidate (alternative) to participants to access this information (as to be comparable with small choice set conditions), this does not necessarily mean participants will find the tasks any less demanding or complex, and may attempt to access as much information as possible in the shortest time to reduce the ‘cost’ of missing information as items continue in the background of the flow stage (see Chapter 2, section 2.1.1). Therefore, we expect task complexity arising from increasing choice set size to increase effortful processing and heuristic use (Timmermans, 1993; Gigerenzer & Gaissmaier, 2011).

However, given the increased informational content and proportional duration, we would expect significant differences between our choice sets in the raw amount of information accessed- an uninformative result as it just confirms that more information is accessed when available and there is more time. Average duration, however, will provide us with more information on participants’ information processing. We expect increasing task complexity to result in more effortful processing, and therefore longer duration on average in accessing and integrating information to arrive at a judgment. In addition, we should expect any heuristic effect party label may exert should be greater as task complexity increases, in order to reduce decision effort. Therefore, our RQ is:

RQ2. *What effect does choice set size have on information search and average duration, and does this differ when party label is absent/present?*

In relation to equality of search, or ‘preferential search’, due to the more effortful processing required to choose a candidate when party label is absent (access more information, more cue retrieval, examining across more alternatives.), our RQs are:

RQ3. *What effect do choice set size and party label have on the equality of search and duration?*

In relation to correct voting, greater search and average duration could lead to better or worse correct voting rates, depending on voters’ decision strategies. We opt for the rationalist assumption that participants who

learn more about the alternatives, and spend longer considering them, gain a better overall impression of alternative utility, and thus vote more correctly. Therefore, our final RQ is:

RQ4. *How do our information processing, and equality, measures relate to correct voting rates?*

3.3. Methods

3.3.1. Meta-Analysis

We originally analysed Experiments 1-4 from Chapter 2 separately. An overall picture of the pattern of results was difficult to obtain, owing to changing patterns of significance across experiments. Possible explanations include differences in statistical power owing from differing sample sizes, temporal factors, etc. As the chapter is exploratory in nature, we opted to conduct a meta-analysis across our experiments to estimate the overall effect of our manipulations on our variables.

Meta- analysis allows the combining of numerical results from a few or many studies, the accurate estimate of descriptive statistics (Hedges 1987, Rosenthal 1978) and “*the explanation of inconsistencies as well as the discovery of moderators and mediators in bodies of research findings*” (Rosenthal & DiMatteo, 2001, p.61). Meta-analysis reduces the reliance on significance testing of any single finding as a measure of its value. In that, repeated results in the same direction across multiple studies can provide more powerful evidence than a single significant result, even if none of them are significant. Rosenthal and DiMatteo (2001) give an example as follows: “*two results at $p = .06$ are much stronger evidence ($p = 0.014$) against the null hypothesis than is one 0.05 result; and ten results at $p = 0.10$ are stronger evidence ($p = 0.000025$) against the null than are five at $p = 0.05$ ($p = 0.00012$)*” (p. 63). Meta-analysis can allow small and non-significant effects to contribute to understanding the overall picture of a research area. By conducting a meta-analysis on our studies we hope to provide more accurate and credible conclusions as to the patterns of results that emerge from our data.

Random Effects Meta-Analysis: We use the random-effects model approach to meta-analysis. There are two ways to conceptualize meta-analysis: fixed- and random-effects models (Hedges, 1992; Hedges & Vevea, 1998; Hunter & Schmidt, 2000). We opt to follow the random effects model of meta-analysis used by Hunter and Schmidt (2004), based on observations by Field and Gillet (2010) that real-world data in the social sciences are likely to have variable population parameters (Field, 2003; Hunter & Schmidt, 2000, 2004; National

Research Council, 1992; Osburn & Callender, 1992)⁴², and average effect sizes will vary randomly across studies depending on the sample population. Field and Gillet (2010) argue that “*the consequences of applying random-effects models to fixed-effects data are much less severe than the other way around*” (p. 674). Specifically, the Hunter and Schmidt (2004) random-effects method produces less biased estimates of the population values than Hedges & Piggot’s (2001) random-effects method (Field, 2005), which is what we follow here.

Fixed-effect models assume that studies in the meta-analysis are sampled from a population in which the average effect size is *fixed* or can be predicted from a few predictors (Hunter & Schmidt, 2000). Thus, sample effect sizes should be *homogeneous* because they come from the same population with a fixed average effect. Alternatively, one may assume that the average effect size in the population varies randomly from study to study, or that studies in a meta-analysis come from populations that have different average effect sizes, so population effect sizes can be thought of as being sampled from a ‘super-population’ (Hedges, 1992). Therefore, effect sizes should be *heterogeneous* as they come from populations with varying average effect sizes. Essentially fixed effects models have one error term, whereas random effects models have two error terms; which has implications for computing mean effect sizes (Field & Gillet, 2010). When heterogeneity exists in fixed models, it results in over-weighting large studies, narrow confidence intervals, and smaller *p*-values (compared to random effects models). Conversely, when homogeneity exists, fixed effects models have correct pooled estimates, correct confidence intervals, and correct *p*-values (compared to random effects, where confidence intervals are too wide, and *p*-values are larger). Random effects modeling allows us to assess, and adjust for, hetero-/homogeneity.

Additionally, random-effects models allow inferences that generalize beyond the studies included in the meta-analysis (i.e. unconditional inferences). We outline our method below.

⁴² Field (2005) calculated the standard deviations of effect sizes for all meta-analytic studies (using *r*) published in Psychological Bulletin in 1997–2002 and found that they ranged from 0 to 0.3, and were most frequently in the region of 0.10–0.16; Barrick and Mount (1991) similarly found that the standard deviation of effect sizes (*rs*) in published data sets was around 0.16. These studies suggest that a random-effects approach should be the norm in social science data, and we take this as further reason to use a random-effects approach to our meta-analysis here.

3.3.2. Participants

All details of the participants included in our analyses in Experiments 1-3 can be found in Chapter 2 under the appropriate sections.

We include all participants from each of our studies: N= 120 in Experiment One, N= 93 in Experiment Two, N= 124 in Experiment Three, and N=153 from Experiment Four.

3.3.3. Design

Experiments 1-3 followed the same 2x2 between-subjects design, Party Label (Present, Absent) and Number of Candidates (2, 3), as outlined in Chapter 2. Experiment 4 utilized a 2x2 between-subjects design, Party Label (Present, Absent) and Number of Candidates (3, 5). Our dependent variables are the total number of items accessed (IA), the average duration of item access (AD); our metrics of preferential search; IA(S)upressing, IA(F)ocussing, AD(S), and AD(F); and the rate of correct voting (CV).

Additionally, we follow Lau and Redlawsk (2006) in dividing the flow stage into 3 equal segments, taken as the time from when the first item appears on screen to when the last item disappears off the screen. This gives us T1 (Start), T2 (Middle), and T3 (End). We include Time-bin (T1, T2, T3) as a within-subjects factor in our analyses.

We conduct the random-effects meta-analysis for Experiments 1-3, and analyse Experiment 4 separately as it differs from Experiments 1-3.

3.3.4. Materials

All details of the materials used in Experiments 1-3 are in Chapter 2, and/or contained in Appendix B, under the appropriate sections.

3.3.5. Procedure

DPTE Flow Stage: To help the reader, we repeat here how the flow stage works in our experiments. All items appear in random order over the course of the flow stage, entering from the top of the screen, and exiting at the bottom. A total of 6 items are available on screen for access at any one time, and items are on screen for a total of 15 seconds in duration before becoming inaccessible. All items are repeated once, for a total of 2

possible accesses over the flow stage. Participants cannot terminate the campaign to ‘vote early’, so all information possible is presented over the maximum time.

3.3.5.1. Constructing information processing variables

To calculate the amount of search for each candidate, we use the summed total number of items accessed (IA) for each candidate over the course of the flow stage. To calculate the average duration (AD) of item access, we calculate the duration each item accessed was ‘open’ on screen for, sum the total for each candidate, and divide the total duration for each candidate by the total number of items accessed for that candidate.

Constructing our Equality Measures: When considering how best to calculate equality of search between alternatives in the choice set, we examined the decision-making and consumer psychology literature for best practice examples and found none that suited our purpose (to date). We are particularly interested in how to measure preference for one option over the alternatives in a choice set. One could calculate the *variance* in the amount of (unique) information/duration across alternatives (Payne et al.,1993), with smaller variance indicating equality across the choice set. However, this does not inform us towards what alternatives higher variance (i.e. unequal search) may be skewed. Alternatively, Lau and Redlawsk (2004, 2006) calculate equality of search (‘comparability’, 2006, p. 111) as the percentage of all *unique* attributes accessed for any one alternative compared to the total considered for all alternatives. For example, if a participant accessed ‘Education’ and ‘Healthcare’ for Candidate A and B, comparability would be 100%; but if the participants only accessed one of the two (e.g. Education) for Candidate B, comparability would be 50%. As such, Lau and Redlawsk’s (2004, 2006) measure relies on knowing the attributes accessed, which is not our aim and again does not clearly indicate any preferential strategies towards any one candidate.

Therefore, we examined a range of possible methods of calculating preference for one option over other alternatives, noting each have their own unique characteristics, strengths, and weaknesses. Our primary aim is to calculate a measure that assesses whether search is equal amongst alternatives, or unequal for/against the candidate chosen at the ‘Ballot Box’.

One could calculate the percentage (%) of IA or AD for each alternative relative to total IA or AD across alternatives. However, this is not without problems. Imagine a scenario where there are 10 items accessed in the flow stage, and 5 items are accessed for the chosen candidate. When there are 2 candidates the scores will

be 50%:50%, indicating equal search (non-preferential search) between the options; however, when there are more than 2 candidates, the ‘50%’ score for the chosen candidate (%CC) is harder to interpret alone as being indicative of equal search. For example, the spread of scores could be 50%:49%:1% (CC: ALT1: ALT2)-essentially equal between 2 alternatives- or 50%: 25%: 25% (clear preference for chosen candidate), while truly ‘equal’ search in a 3-candidate condition would result in a score of 33%:33%:33%. Therefore, we need a single metric that is singularly diagnostic for the degree of preference shown for the *chosen candidate* that is comparable across choice-sets.

Differing Metric Calculations: We attempted to create such a metric in a variety of ways. First we attempted either (i) dividing the %CC by the mean percentage of the remaining alternatives in the choice set (e.g. $\%CC/[25\% + 25\%]/2$), or (ii) subtracting the mean percentage of the remaining alternatives from the %CC (e.g. $\%CC - [25\% + 25\%]/2$). The former (i) aims to provide a proportional metric of the CC share relative to the other alternatives; however, this results in unintelligible results. For example, where participants sample only from one alternative (e.g. 100%:0:0), this will result in division by zero, despite a clear skew for the chosen candidate. Similarly, if the spread is 50%:50%:0%, the resulting product is either ‘1’ or ‘2’ depending on whether there are 2 or 3 alternatives and renders comparison between choice sets difficult. Another example, if the spread is 41.6%:58.4%:0%, the resulting product is either .71 or 1.42, despite the %CC being lower in both conditions.

Version (ii) produces a metric of residual share for the CC relative to the alternatives. This solves the problem of division by zero, and provides a directionality in that +/- values indicate %CC is greater/less than the relative share than the remaining alternatives. However, it still suffers from the same issue as (i) where the presence of a 3rd alternative scoring 0 will artificially inflate the result for the CC. We attempted to solve this by computing the difference between the observed %CC share and the expected %CC, but finding it was too immune to absolute numbers. For example, if total items accessed for Candidates A:B:C are 5:3:2, this results in 50%:30%:40%, and a score of ‘.16.’ If items for A *only* increase to 30 the score will be ‘.52’, and if 100, ‘.62’- despite the latter being a threefold increase.

Our Chosen Metric: Ultimately, we find that calculating the difference between the observed values for the chosen candidate (OV), relative to what the expected values (EV) would have been *if* there were equal search

amongst alternatives in the choice set, is the best method. We calculate the expected values (EV) by dividing the total values for IA or AD by the number of alternatives in the choice set (2, 3, or 5). There are a few ways to construct a score based on OV and EV.

One could divide OV/EV (e.g. (CC: 5)/[(Total:10)/(Alternatives: 3)]= 1.5); this results in a proportional measure that ranges from 0 to positive integers, and is only informative as to whether sampling for the CC is greater or less than what would be expected by chance, not whether is unequal in favour of other alternatives. To illustrate, if values were 0:0:10 or 0:10 (CC:ATL1:ALT2) the resulting score is '0'. Therefore, OV/EV does not provide useful information as to the skew of sampling in favour, or away, from the CC.

Alternatively, subtracting the OV from EV (OV-EV) results in a valenced measure that has centrality around 0, such that values approaching 0 indicate more equal search amongst alternatives, and those further away from 0 in positive/negative directions indicate more preferential search for the chosen candidate or other alternatives. It also preserves the units of the original measure (e.g. 'items' or 'seconds').

Using the previous 0:0:10 and three alternatives, the score will be -3.3 items for the CC (unequal sampling preference away from CC). If 0:10:10, -6.6 (stronger away from CC); if 10:10:0, +3.3 (in favour of CC overall); if 10:0:0, +6.6 (strongly in favour of CC overall). If only two alternatives: 0:10, -5 (away from CC in favour of remaining alternative); 10:0, +5 (in favour of CC against alternative).

As per previous calculations, EV will be affected by the size of the choice set, even if no items are accessed for any one candidate. If ten items are accessed in a 2-candidate condition, then $EV = 5$, however even if the access pattern in the 3-candidate condition is the exact same between the 2 candidates (no access for third candidate), the $EV = 3.33$. We address this in the next section.

While it could be suggested this should be normalised by the total amount (i.e. $[OV-EV]/N$), doing so constrains the measure to lie between $-/+ 1$, losing the intuitive nature of the simpler measure version that preserves the original units it is derived from, and the relative degree of preference by being unconstrained to range outside of $-/+ 1$.

Comparing between Choice Sets: When comparing these scores between the 2-, 3-, 5-candidate conditions, we are investigating whether the patterns of search/duration in the larger choice sets are similar to those in the

smaller choice sets. If they are, this indicates that participants may be ‘suppressing’ the additional alternatives or participants may be processing information *as if* it were a smaller choice set of alternatives, that is ‘focussing’ on a smaller alternative subset. Using our main information processing variables IA & AD, we used the above calculation method to create two metrics to test for suppression; $IA(S)_{upressing}$ and $AD(S)_{upressing}$.

We can test if participants are focussing on a smaller subset, by removing the lesser-considered options in the 3 and 5-candidate conditions, and lowering the EV denominator (e.g. from 3 to 2). This results in a measure that compares the chosen candidate with the next-preferred alternative in the 2-, 3-, and 5-candidate choice sets (making them more comparable), and allows us to examine if there are any differences between conditions (if any) when participants are just ‘focussing’ on just the chosen and the next-most-considered alternative. Using our processing variables and the above calculations, we construct the two related metrics: **$IA(F)_{ocussing}$, and $AD(F)_{ocussing}$.**

In Experiment 4, where we compare 3 vs 5 alternatives, we follow a similar method. We calculate a suppressing measures (3v5), and two focussing measures (3v3, 2v2), by progressively removing the least-considered alternatives at each step from the previous choice set.

3.3.5.2. Meta-Analysis Procedure

Calculating Effect Sizes: An effect size is usually a standardized measure of the magnitude of an observed effect, such as the r family (Pearson’s r , phi , r^2 , η^2 etc.) and the d family (Cohen’s d , Hedge’s g , and Glass’s Δ). We follow Rosenthal and DiMatteo’s (2001) recommendation to convert all effect sizes to r , as unlike d and the Odds Ratio, r is constrained to lie between 0 (no effect) and ± 1 (a perfect effect).

Meta-Analysis, Hunter–Schmidt Method: The population effect (‘population correlation coefficient’) \bar{r} is estimated using a simple mean in which each effect size estimate, r , is weighted⁴³ by the sample size (n) on which it is based:

⁴³ There is an argument to be made for weighting each of the studies by the quality of the methodology (i.e. the degree of confidence in the reliability of the experimental procedure and/or results) of each study, or some other factor, as a moderator of the effect size. Rosenthal (1995) recommends a weighting studies by their overall methodological quality (e.g. on a 5-point scale from ‘*poor*’ to ‘*excellent*’). We report all results here unweighted, and note the discussion about the subjectivity issues arising from this approach in Hunter and Schmidt (2004).

$$\bar{r} = \frac{\sum_{i=1}^k n_i r_i}{\sum_{i=1}^k n_i}$$

For each study, i in k number of studies included for meta-analysis.

We estimate the generalizability of the population effect value, or whether other variables moderate the population effect, using ‘credibility intervals’ (Hunter & Schmidt, 2004). Credibility intervals provide information about if one can generalize validity, or if the population of effect sizes should be broken down into subpopulations (Whitener, 1990). The credibility intervals are based on taking the population effect estimate \bar{r} , and adding to or subtracting from it the square root of the estimated population variance $\hat{\sigma}_p^2$ (for full calculations, see Appendix B.1), multiplied by $Z\alpha_{/2}$ in which α is the desired probability (e.g., for a 95% interval, $Z\alpha_{/2} = 1.96$):

$$95\% \text{ credibility interval}_{upper} = \bar{r} + 1.96 \sqrt{\hat{\sigma}_p^2}$$

$$95\% \text{ credibility interval}_{lower} = \bar{r} - 1.96 \sqrt{\hat{\sigma}_p^2}$$

If the 95% credibility interval (95% CrI) includes zero (heterogeneous populations), then the mean corrected effect size is probably the mean of several subpopulations identified by the operation of moderators; if the interval does not include zero (homogeneous populations), then the mean corrected effect size is likely the estimate of a single population parameter, and we can assume the absence of moderators (Whitener, 1990).

Dealing with (in)credible studies: While, whimsically, we consider all our studies to be ‘incredible’, we follow a series of stepwise recommendations (where practicable) outlined by Whitener (1990) in the event of the 95% CrI including zero and indicating the presence of moderators. Namely that:

- 1) *if* moderators can be identified, this can be used to subgroup the data into subpopulations (and re-analysed to see if they can be sub-grouped further)
- 2) having identified one or more sub-populations as *homogenous*, a 95% confidence interval (95% CI), using the standard error (SE) for the mean effect size, can be generated around \bar{r} :

$$SE = \sqrt{\frac{(1 - \bar{r}^2)^2}{(N - K)}}$$

3) for heterogeneous *subpopulations*, one can generate a 95% CI using the SE formula provided by Hunter & Schmidt (1990):

$$SE = \sqrt{\frac{(1 - \bar{r}^2)^2}{(N - K) + \left(\frac{\hat{\sigma}_p^2}{K}\right)}}$$

where N is the population size and K is the number of studies included in the sample. The resulting 95% CI formula is the standard $\bar{r} \pm 1.96(SE)$.

3.4. Results

We divide our results section into two main parts: a meta-analysis of the processing data results from Experiments 1-3, and analysis of the results from Experiment 4. We summarise the results jointly at the end.

In the analysis of each experiment we remove any participant that did not open at least 1 information item during the flow stage⁴⁴. While it is a legitimate action to take to not access any information, there is little benefit to be gained from keeping these participants in the sample. We removed N=6 from Experiment 1, N=5 from Experiment 2, N= 17 from Experiment 3, and N= 13 from Experiment 4.

3.4.1. Experiments 1-3: Meta-Analysis

We carried out a series of repeated measures multi-variate ANOVAs on our dependent variables Items Accessed (IA) and Average Duration (AD) using their ‘Total’ amounts, and the derived ‘Suppressing’ (S) and ‘Focussing’ (F) measures of both. For cogency and due to space constraints, we include all our analytic work and results in Appendix B.2 for reference, and only report the main findings here. All the tables containing the 95% Credibility Intervals, sampling variances, etc. can be found in Appendix B.2.

Many of the Credibility Intervals contained zero, indicating the presence of heterogeneous subpopulations, no one experiment stood out consistently as different from all the others, nor is it clear what any such moderator

⁴⁴ Lau & Redlawsk (2006) also note some participants do not access at least one item for any candidate, though they account for approx. .01% of their total sample

may be given the similar set up of the experiments. We note that in the majority of our results we report the heterogeneous adjusted 95% confidence intervals (95% CIs) for the population effect size. Where the Hetro 95% CIs include zero ($p > .05$), the homogenous versions often do not include zero (i.e. significant at $p < .05$). The reverse case never occurs. Therefore, it is possible our results are overly conservative in favour of the null hypothesis.

The overall trends for each of our Total Items accessed variables, weighted and averaged across Experiments 1-3 are shown in Figures 3.1 and 3.2.

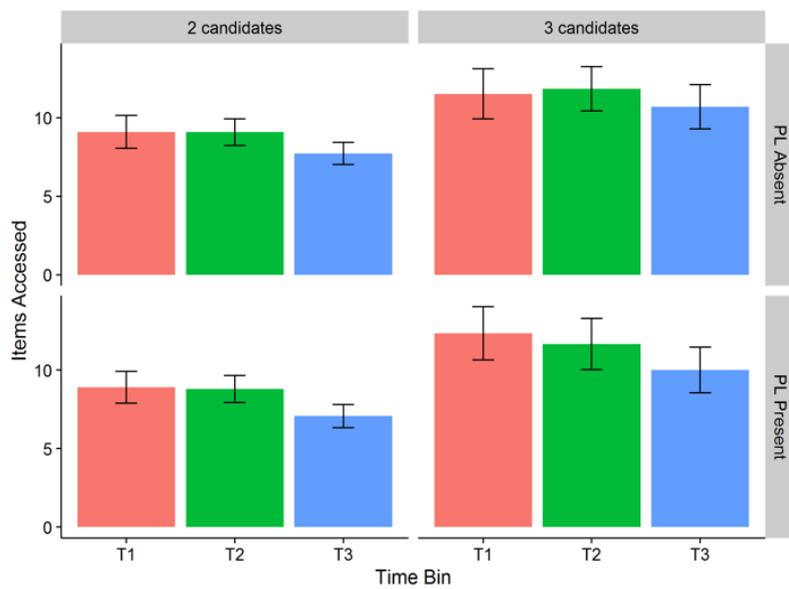


Figure 3.1: Items Accessed by condition. N= 308

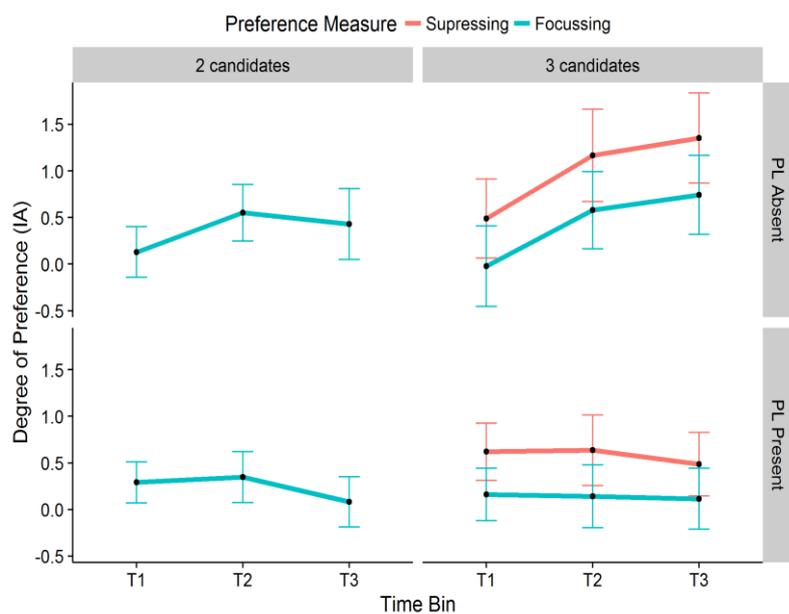


Figure 3.2: Preferences for Chosen using IA. N=308

The overall trends for each of our Averaged Duration variables weighted and averaged across Experiments 1-3 are shown in Figures 3 and 4.

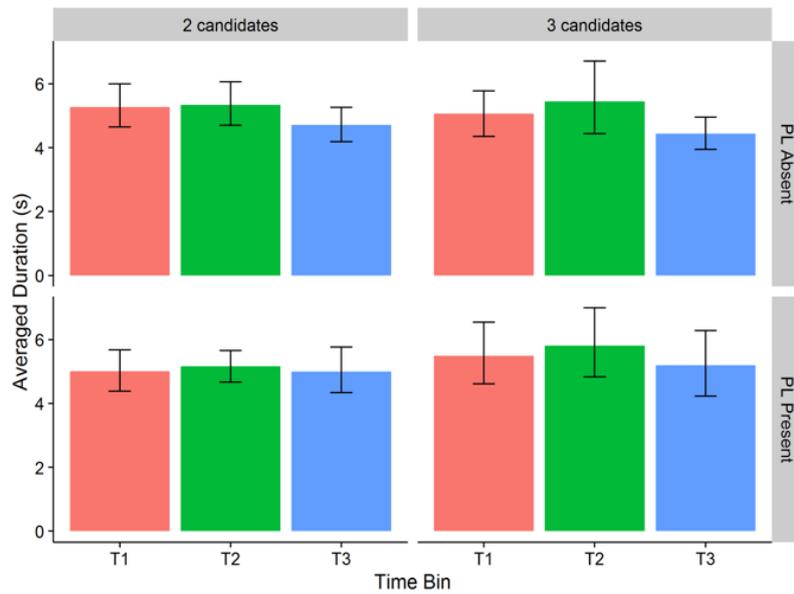


Figure 3.3: Average Duration (seconds) by TB

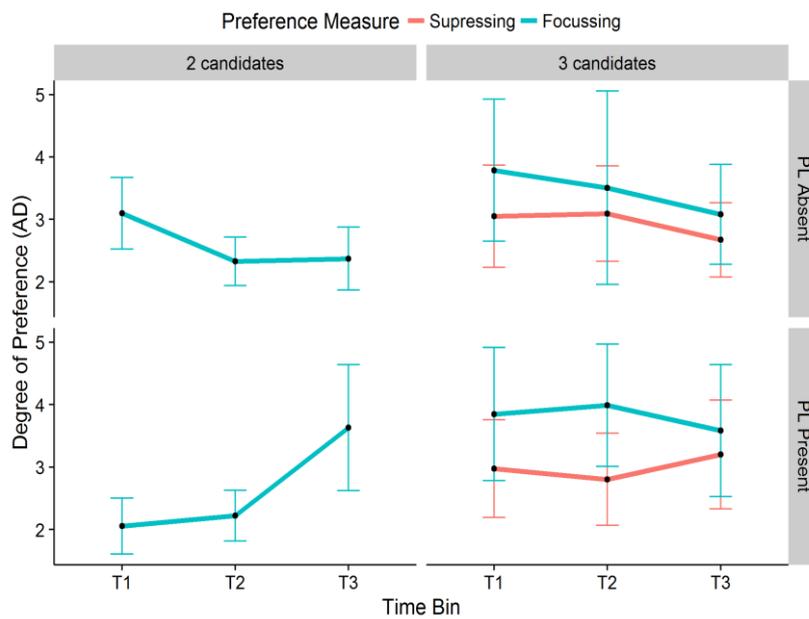


Figure 3.3: Preference for chosen using AD. N=308.

3.4.1.1. Number of Candidates

IA: The effect of NOC on IA was significant at the $\alpha = .05$ level, $\bar{r} = .26$ (95% CI: .15, .36). This is a somewhat unsurprising result, given that there are more items to access and increased time in which to do so in the 3-candidate condition.

AD: The effect of NOC on AD was not significant at the $\alpha = .05$ level, $\bar{r} = .03$ (95% CI: $-.07, .18$). Participants spent an average duration of $\mu = 5.08$ s (SD= 2.44) on items in the 2-*Can* condition, and $\mu = 5.25$ s (SD= 3.54) in the 3-*Can* condition, which suggests the increasing the choice set from 2 to 3 alternatives does not affect the average duration participants spend on items.

Effect of NOC on Equality: The effect of NOC on *IA(S)* was significant at the $\alpha = .05$ level, $\bar{r} = .28$ (95% CI: $.18, .38$). Participants search was more equal in 2-*Can* condition ($\mu = .91$, SD= 2.22), compared to the 3-*Can* condition ($\mu = 2.34$, SD= 2.65). The effect of NOC on *IA(F)* was significant at the $\alpha = .05$ level, $\bar{r} = .15$ (95% CI: $.03, .25$). Participants accessed more items for their chosen candidate relative to the next most considered alternative in 2-*Can* condition ($\mu = .91$, SD= 2.22), compared to the 3-*Can* condition ($\mu = .83$, SD= 2.05).

The effect of NOC on *AD(S)* was not significant at the $\alpha = .05$ level, $\bar{r} = .20$ (95% CI: $.09, .30$). Participants spent more equal duration in 2-*Can* condition ($\mu = 2.61$, SD= 1.69), compared to in the 3-*Can* condition ($\mu = 2.96$, SD= 2.61). The effect of NOC on *AD(F)* was significant at the $\alpha = .05$ level, $\bar{r} = .31$ (95% CI: $.21, .41$). Participants spend more equal duration on the chosen and next-considered pair in 2-*Can* condition ($\mu = 2.61$, SD= 1.69), compared to in the 3-*Can* condition ($\mu = 3.64$, SD= 3.77).

3.4.1.2. Party Label

IA: The effect of PL on IA was not significant at the $\alpha = .05$ level, $\bar{r} = .03$ (95% CI: $-.09, .13$). Participants accessed $\mu = 29.84$ items (SD= 14.34) when PL^A, and $\mu = 29.28$ items (SD=16.36) when PL^P.

AD: The effect of PL on AD was not significant at the $\alpha = .05$ level, $\bar{r} = .07$ (95% CI: $-.03, .18$). Participants spent an average duration of $\mu = 5.05$ (SD= 2.61) on items when PL^A, and $\mu = 5.26$ s (SD=3.34) when PL^P.

Effect of PL on Equality: The effect of PL on *IA(S)* was significant at the $\alpha = .05$ level, $\bar{r} = .20$ (95% CI: $.09, .29$). Participants accessed more items for their chosen candidate relative to the alternatives in the choice set when PL^A ($\mu = 2.03$, SD= 2.17), compared to when PL^P ($\mu = 1.21$, SD= 2.30). The effect of PL on *IA(F)* was significant at the $\alpha = .05$ level, $\bar{r} = .17$ (95% CI: $.06, .28$). Participants accessed more items for their chosen candidate compared to the most considered alternative when PL^A ($\mu = 1.21$, SD= 2.18), compared to when PL^P ($\mu = .58$, SD= 2.06).

The effect of PL on $AD(S)$ was significant at the $\alpha = .05$ level, $\bar{r} = .11$ (95% CI: .004, .21). Participants spent less time on average on their chosen candidate compared to the alternatives in the choice set when PL^A ($\mu = 2.76$, $SD = 1.98$), compared to when PL^P ($\mu = 2.80$, $SD = 2.36$). The effect of PL on $AD(F)$ was significant at the $\alpha = .05$ level, $\bar{r} = .17$ (95% CI: .06, .28). Participants spent less time on average on their chosen candidate compared to the most considered alternative when PL^A ($\mu = 3.00$, $SD = 2.94$), compared to when PL^P ($\mu = 3.19$, $SD = 2.91$).

3.4.1.1. Party Label & Number of Candidates

IA: The effect of PL & NOC on IA was not significant at the $\alpha = .05$ level, $\bar{r} = .03$ (95% CI: -.07, .15).

AD: The effect of PL & NOC on AD was not significant at the $\alpha = .05$ level, $\bar{r} = .05$ (95% CI: -.06, .16).

Effect of PL & NOC on Equality: The effect of PL & NOC on $IA(S)$ was significant at the $\alpha = .05$ level, $\bar{r} = .14$ (95% CI: .03, .25). Participants access the most items for their chosen candidates when PL^A and there are 3 candidates ($\mu = 3.00$, $SD = 2.01$), and least when PL^P and there are 2-candidates ($\mu = .72$, $SD = 2.28$; see Figure 3.4). The effect of PL & NOC on $IA(F)$ was significant at the $\alpha = .05$ level, $\bar{r} = .14$ (95% CI: .03, .25). Participants access the most items for their chosen candidates when PL^A and there are 3 candidates ($\mu = 1.30$, $SD = 2.25$), compared to when PL^P and there are 3-candidates ($\mu = .41$, $SD = 1.77$; see Figure 3.5).

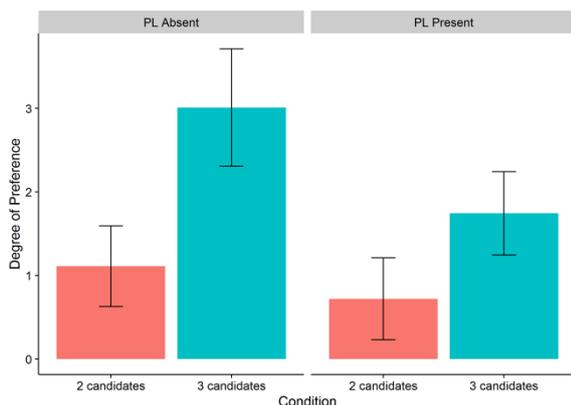


Figure 3.4: $IA(S)$ by PL and NOC. $N = 308$.

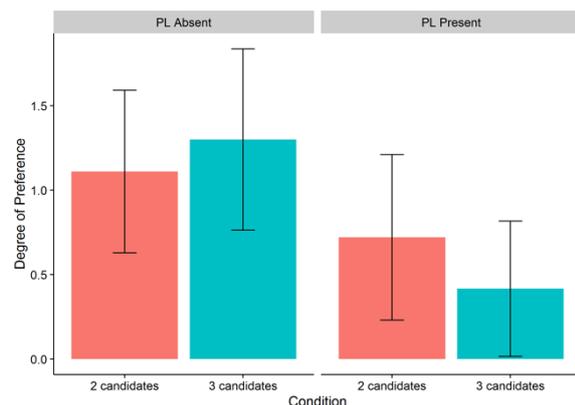


Figure 3.5: $IA(F)$ by PL and NOC. $N = 308$

The effect of PL & NOC on $AD(S)$ was not significant at the $\alpha = .05$ level, $\bar{r} = .06$ (95% CI: -.08, .14). The effect of PL & NOC on $AD(F)$ was significant at the $\alpha = .05$ level, $\bar{r} = .31$ (95% CI: .21, .41). Participants spend the longest on their chosen candidate relative to the next-considered alternative when PL^P and there are 3-

candidates ($\mu = 3.81$, $SD = 3.65$), and the least time when PL^A and there are 2-candidates ($\mu = 2.38$, $SD = 2.37$).

Results are shown in Figure 3.7.

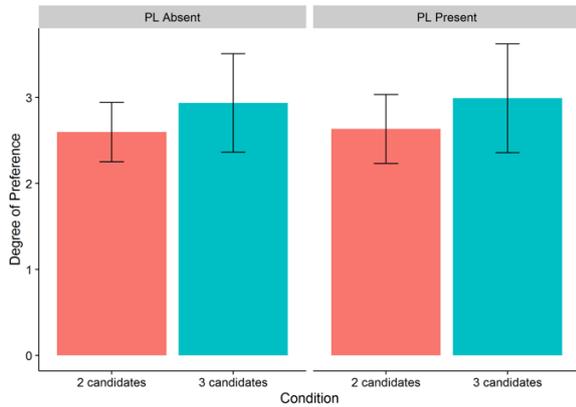


Figure 3.6: AD(S) by PL and NOC

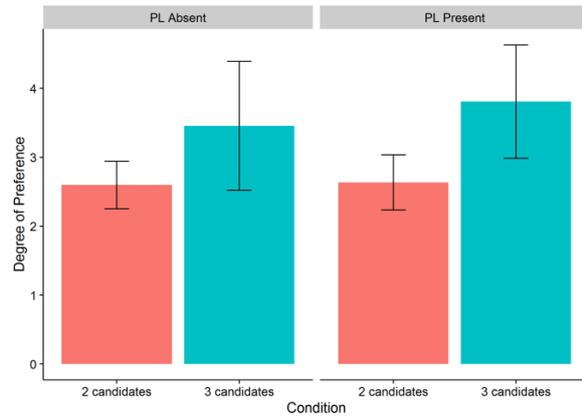


Figure 3.7: AD(F) by PL and NOC

3.4.1.2. Time-bin

IA: The effect of TB on IA was significant at the $\alpha = .05$ level, $\bar{r} = .29$ (95% CI: .19, .39). There were significant linear trends for IA, $F(1, 305) = 39.84$, $p < .001$, $r = .33$; and quadratic trends, $F(1, 305) = 18.34$, $p < .001$, $r = .24$. Participants access fewer items as the flow stage progresses: $\mu = 10.44$ items ($SD = 6.12$) in T1, $\mu = 10.29$ items ($SD = 5.54$) in T3, and $\mu = 8.80$ items ($SD = 5.10$) in T3.

AD: The effect of TB on AD was significant at the $\alpha = .05$ level, $\bar{r} = .12$ (95% CI: .04, .26). There were significant linear trends for IA, $F(1, 305) = 4.21$, $p = .04$, $r = .12$; and quadratic trends, $F(1, 305) = 5.01$, $p = .026$, $r = .13$. Participants' average duration spent on each item increases from T1 ($\mu = 5.21$, $SD = 3.48$) to T2 ($\mu = 5.43$, $SD = 4.06$), and decreases overall at T3 ($\mu = 4.85$, $SD = 3.27$).

Effect of TB on Equality: The effect of TB on $IA(S)$ was significant at the $\alpha = .05$ level, $\bar{r} = .13$ (95% CI: .02, .25). Participants access increasingly more items for their chosen candidate as the flow stage progresses (see Figure 2) from T1 to T2, with a slight decrease in T3. The credibility intervals for the effect of TB on $IA(F)$ indicated the population variances were not homogenous (-.09, .34), and the effect of TB on $IA(F)$ was significant at the $\alpha = .05$ level, $\bar{r} = .12$ (95% CI: .01, .23). The same trend for participants to increasingly access more items for their chosen candidate as the flow stage progresses from T1 to T2, with a slight decrease at T3, is observed.

The effect of TB on $AD(S)$ was not significant at the $\alpha = .05$ level, $\bar{r} = .07$ (95% CI: -.04, .18). The effect of TB on $AD(F)$ was not significant at the $\alpha = .05$ level, $\bar{r} = .06$ (95% CI: -.04, .19).

3.4.1.3. Time-bin & Party Label

IA: The effect of TB & PL on IA was significant at the $\alpha = .05$ level, $\bar{r} = .13$ (95% CI: .02, .24). There was a significant linear trend for IA, $F(1, 305) = 3.91$, $p = .049$, $r = .11$. When PL^A , participants access $\mu = 10.26$ items in T1 (SD= 5.82), $\mu = 10.42$ in T2 (SD= 5.07), and $\mu = 9.15$ items (SD= 4.88) in T3. When PL^P participants access $\mu = 10.60$ items in T1 (SD= 6.38), $\mu = 10.17$ in T2 (SD= 5.94), and $\mu = 8.80$ items in T3 (see Figure 1).

AD: The effect of TB & PL on AD was not significant at the $\alpha = .05$ level, $\bar{r} = .06$ (95% CI: -.05, .17).

Effect of PL & TB on Equality: The effect of TB & PL on $IA(S)$ was significant at the $\alpha = .05$ level, $\bar{r} = .14$ (95% CI: .03, .24). There was a significant linear trend of $IA(S)$, $F(1, 305) = 21.57$, $p = .004$, $r = .16$. When PL^A , participants access more items for their chosen candidate relative to the others in the choice as the flow stage progresses from T1 ($\mu = .30$, SD= 1.51) to T2 ($\mu = .85$, SD= 1.75), and remains at the same level at T3 ($\mu = .87$, SD= 1.90). When PL^P , participants' preference for their chosen candidate is relatively the same at T1 ($\mu = .45$, SD= 1.20) and T2 ($\mu = .48$, SD= 1.48), but decreases at T3 ($\mu = .27$, SD= 1.39) (see Figure 2).

The effect of TB & PL on $IA(F)$ was significant at the $\alpha = .05$ level, $\bar{r} = .13$ (95% CI: .01, .23). There was a significant linear trend for $IA(F)$, $F(1, 305) = 6.44$, $p = .01$, $r = .14$. When PL^A , participants access almost equally between their chosen candidate and the next most considered alternative in T1 ($\mu = .06$, SD= 1.52), accessing more items for their chosen candidate in T2 ($\mu = .56$, SD= 1.54), and continuing to access for the chosen candidate in T3 ($\mu = .58$, SD= 1.73). When PL^P , participants access more items for their chosen candidate than the next most considered alternative at T1 ($\mu = .23$, SD= 1.14) and T2 ($\mu = .24$, SD= 1.39), but have more equal access between the chosen and the next most considered candidate at T3 ($\mu = .10$ SD= 1.55).

The effect of TB & PL on $AD(S)$ was significant at the $\alpha = .05$ level, $\bar{r} = .15$ (95% CI: .04, .26). There was a significant linear trend of $AD(S)$, $F(1, 305) = 9.73$, $p = .002$, $r = .17$. When PL^A , participants spend progressively less time on their chosen candidate relative to others in the choice set. When PL^P , participants spend

progressively *more* time on items access for their chosen candidate relative to others in the choice set. See Figure 4 for visualisation of trends.

The effect of TB & PL on $AD(F)$ was significant at the $\alpha = .05$ level, $\bar{r} = .13$ (95% CI: .02, .24). There was a significant linear trend for $AD(F)$, $F(1, 305) = 7.28$, $p = .007$, $r = .15$. When PL^A , participants spend progressively less time on their chosen candidate relative to the next most considered alternative. When PL^P , participants spend progressively *more* time on items access for their chosen candidate relative to the next most considered alternative. See Figure 4 for trends.

3.4.1.4. Time-bin & Number of Candidates

TIA: The effect of TB & NOC on TIA was not significant at the $\alpha = .05$ level, $\bar{r} = .06$ (95% CI: -.05, .17).

AD: The effect of TB & NOC on AD was not significant at the $\alpha = .05$ level, $\bar{r} = .09$ (95% CI: -.01, .21).

Effect of NOC & TB on Equality: The effect of TB & NOC on $IA(S)$ was significant at the $\alpha = .05$ level, $\bar{r} = .12$ (95% CI: .005, .22). When there are 2-candidates, participants access $\mu = .22$ items (SD= 1.11) for their chosen candidate at T1, $\mu = .45$, (SD= 1.31) at T2, and $\mu = .25$ (SD= 1.48) at T3. When there are 3-candidates, participants show increasing rate of item access for their chosen candidate as the flow stage progresses, accessing $\mu = .56$ items (SD= 1.56) at T1, $\mu = .85$ (SD= 1.89) at T2, and $\mu = .90$ (SD= 3.48) at T3.

The effect of TB & NOC on $IA(F)$ was significant at the $\alpha = .05$ level, $\bar{r} = .12$ (95% CI: .01, .24). Similar trends are observed; when there are 3-candidates, participants access more items for their chosen candidate relative to the next-considered alternative as the flow stages progresses: $\mu = .07$ items (SD= 1.53) at T1, $\mu = .35$ (SD= 1.62) at T2, and $\mu = .41$ (SD= 1.63) at T3.

The effect of TB & NOC on $AD(S)$ was not significant at the $\alpha = .05$ level, $\bar{r} = .07$ (95% CI: -.04, .18). The effect of TB & NOC on $AD(F)$ was not significant at the $\alpha = .05$ level, $\bar{r} = .09$ (95% CI: -.02, .22).

3.4.1.5. Time-bin & Party Label & Number of Candidates:

TIA: The effect of TB & PL & NOC on TIA was not significant at the $\alpha = .05$ level, $\bar{r} = .07$ (95% CI: -.04, .18).

AD: The effect of TB & PL & NOC on AD was not significant at the $\alpha = .05$ level, $\bar{r} = .11$ (95% CI: -.001, .21).

Effect of PL & NOC & TB on Equality: The effect of TB & PL & NOC on $IA(S)$ was not significant at the $\alpha = .05$ level, $\bar{r} = .07$ (95% CI: -.04, .18). The effect of TB & PL & NOC on $IA(F)$ was not significant at the $\alpha = .05$ level, $\bar{r} = .07$ (95% CI: -.04, .18).

The effect of TB & PL & NOC on $AD(S)$ was not significant at the $\alpha = .05$ level, $\bar{r} = .08$ (95% CI: -.02, .19). The effect of TB & PL & NOC on $AD(F)$ was not significant at the $\alpha = .05$ level, $\bar{r} = .10$ (95% CI: -.006, .22).

3.4.1.6. Relationship with Correct Voting

We carried out logistic regressions on CV with our processing variables included, in order to check if the effects of NOC or PL are mediated by any variable.

IA & AD: Using binary logistic regression we regressed CV (0 = Incorrect, 1 = Correct) on our processing variables (total IA, AD) entered in Block 1, adding their interaction term in Block 2, our condition variables (PL, NOC) in Block 3, and the condition interaction term in Block 4. The regression models for Block 1 was non-significant ($p = .92$), and neither total IA or AD were significantly predictive of increasing levels of CV ($p > .72$). The addition of their interaction term did not significantly improve the model ($p = .81$). The regression model containing Block 3 was significant, $\chi^2(5) = 35.70$, $p < .001$, $R^2 = 14.6\%$, and predicted 67.9% of the overall cases correctly.

After controlling for the Total Items Accessed (IA), and the Average Duration (AD) spent on each item, the main effect of PL predicted CV at marginal significance, $\beta = .45$, $p = .052$, with participants 1.5 times more likely to vote correctly when party label is present. The main effect of NOC significantly predicted CV, $\beta = -1.61$, $p < .001$, with participants being 80% less likely to vote correctly when the number of candidates in the choice set increases from 2 to 3. Adding the condition interaction term (PL*NOC) did not significantly improve the model ($p = .47$), and the interaction term PL*NOC was not significant, $\beta = .35$, $p = .47$. We report the full model in Table 3.1, $\chi^2(6) = 36.20$, $p < .001$, $R^2 = 14.8\%$ ⁴⁵.

⁴⁵ We perform bootstrapped logistic regressions for each of our reported regression models ($n = 10,000$), finding the pattern of results do not meaningfully differ from those reported here.

Table 3.1: Logistic Regression results of main effects, controlling for IA and AD, on CV rates. (N=308).

Predictor	β	SE	χ	e^β
IA	.007	.014	.236	1.007
AD	-.027	.069	.155	.973
IA*AD	.001	.003	.150	1.001
Party Label (PL^A)	.275	.346	.629	1.316
NOC (2^{CAN})	-1.605‡	.365	19.31	.201
PL*NOC	.349	.490	.506	1.417
Constant	.526	.451	1.365	1.693

* $p < .1$. ** $p < .05$. *** $p < .01$. ‡ $p < .001$. (Reference categories in parentheses).

Suppressing Measures: Using binary logistic regression we regressed CV (0 = Incorrect, 1= Correct) on *IA(S)* & *AD(S)* in Block 1, adding their interaction term in Block 2, and PL/NOC in Block 3, and PL*NOC in Block 4. Blocks 1 & 2 were non-significant ($p = .25$; $p = .19$). The regression model containing Block 3 was significant, $\chi^2(5) = 35.60$, $p < .001$, $R^2 = 14.6\%$, and predicted 66.9% of the overall cases correctly. After controlling for the equality of search shown towards the chosen candidates, PL was marginally non-significant ($\beta = .442$, $p = .074$), and NOC was significantly predictive of correct voting ($\beta = -1.34$, $p < .001$),

Table 3.2: Logistic Regression model including main effects, IA(S), and AD(s), for CV rates. (N=308).

Predictor	β	SE	χ	e^β
IA(S)	.108	.091	1.390	1.114
AD(S)	.094	.074	1.647	1.099
IA(S)*AD(S)	-.035	.028	1.544	.966
Party Label (PL^A)	.284	.348	.666	1.328
NOC (2^{CAN})	-1.512‡	.371	16.644	.221
PL*NOC	.320	.493	.422	1.377
Constant	.453	.313	2.097	1.573

* $p < .1$. ** $p < .05$. *** $p < .01$. ‡ $p < .001$. (Reference categories in parentheses).

Adding the condition interaction term (PL*NOC) did not significantly improve the model ($p = .51$). We report the full model in Table 2, $\chi^2(6) = 36.01$, $p < .001$, $R^2 = 14.8\%$.

Focussing Measures: Using binary logistic regression we regressed CV (0 = Incorrect, 1= Correct) on *IA(F)* & *AD(F)* in Block 1, adding their interaction term in Block 2, and PL/NOC in Block 3, and PL*NOC in Block 4. The regression model containing Block 3 was significant, $\chi^2(5) = 35.52$, $p < .001$, $R^2 = 15.0\%$, and predicted

66.6% of the overall cases correctly. Adding the condition interaction term (PL*NOC) did not significantly improve the model ($p = .53$). We report the full model in Table 3, $\chi^2(6) = 36.91$, $p < .001$, $R^2 = 15.1\%$.

Table 3.3: Logistic Regression results of main effects, controlling for IA(F) and AD(F), on CV rates. (N=308).

Predictor	β	SE	χ	e^β
IA(F)	.100	.109	.846	1.106
AD(F)	.083	.052	2.524	1.087
IA(F)*AD(F)	-.024	.028	.745	.976
Party Label (PL^A)	.287	.348	.678	1.332
NOC (2^{CAN})	-1.549 †	.363	18.236	.213
PL*NOC	.310	.494	.393	1.363
Constant	.459	.290	2.515	1.583

* $p < .1$. ** $p < .05$. *** $p < .01$. † $p < .001$. (Reference categories in parentheses).

When comparing the equality of search for the chosen candidate with the 3rd (least considered) alternative removed, *IA(F)* was not significantly predictive of CV, $\beta = .10$, $p = .35$. *AD(F)* was not significantly predictive of CV, $\beta = .083$, $p = .11$. The main effect of NOC significantly predicted CV, $\beta = -1.38$, $p < .001$, with participants being 75% less likely to vote correctly when the number of candidates in the choice set increases from 2 to 3.

3.4.1.7. Summary: Experiments 1-3

There were some significant patterns observed across *Time-bins*. Participants' item access decreased linearly over time, while average duration initially increased during the flow stage, but decreased by the end. Participants show increasing item access for the chosen candidate over the flow stage, both overall and in comparison to the next-considered alternative.

Party Label (PL) did not significantly affect IA or AD. At the level of time-bin, participants rate of item access increased initially when PL^A, but decreases linearly when PL^P. PL did have an effect on IA(S), IA(F), AD(S) and AD(F). Participants had more unequal search in favour of the chosen candidate when PL^A versus when PL^P, even when considering just the chosen and next-considered alternative. Participants spent less average duration on their chosen candidate when PL^A versus PL^P, and this holds for when looking at the chosen and next-considered alternative. At the level of time-bin: when PL^A, access between alternatives begins equal and increases over time; when PL^P, access is greatest for the chosen candidate and becomes more equal between alternatives over time.

Number of candidates (NOC) had a significant effect on IA and AD. NOC did have an effect on IA(S) and IA(F), such that greater information was accessed for the chosen candidate relative to the alternatives as choice set size increased (unequal search in favour of candidate). NOC had a significant effect on AD(F) but not AD(S), such that average duration was more equal between alternatives in the *2-candidate* condition, but greater for the chosen candidate in the *3-candidate* condition relative to the next-considered alternative. At the time-bin level: in the *2-candidate condition*, access for the chosen candidate increases initially, then decreases; in the *3-candidate condition*, access for the chosen candidate increases linearly over time.

The *interaction of NOC and PL* had a significant effect IA(S), IA(F) and AD(F). Participants search for their chosen candidate was greatest when PL^A and 3 candidates, and least when PL^P and 2 candidates. When compared to the next-considered candidate, participants show more equality of search when PL^P in the 3-candidate condition than when PL^A (see Figure 3.6).

Correct Voting: None of our total, ‘suppressing’, or ‘focussing’, measures of processing were predictive of correct voting rates. Party Label was significant after controlling for IA, AD, and their interaction, positively predicting correct voting; but did not reach significance after controlling for our ‘suppressing’ or ‘focussing’ measures. We note party label’s positive beta coefficients across all analyses. Only choice set size (number of candidates) was significantly predictive of CV rates after controlling for our measures, with CV decreasing as the choice set size increases from 2 to 3 candidates. We note the positive beta coefficients and Odd Ratios (e^{β}) for the interaction of party label and choice set size after controlling for our measures, though the term does not reach significance.

3.4.2. Discussion: Experiments 1-3

We made no predictions as to the pattern of information search or average duration over the flow stage. Participants appear to access less information as the flow stage progresses, while the average duration spent on information increases initially, only to decrease by the end. This could be due to participants engaging in more deliberative processing, constructing preferences for candidates. As the flow stage progresses, items are most likely to be repeated, and participants are more likely to have reached a conclusion- decreasing the need for effortful search and deliberation amongst alternatives. Alternatively, this could be as a result of task fatigue; or boredom, as information is repeated and participants have already accessed items according to some cue

validity. However, these explanations seem unlikely, given participants access more information (i.e. engage in more unequal search) for their chosen candidate as the flow stage progresses relative to alternatives in the choice set. Thus it seems participants are engaging in *confirmatory processing* (Bruner et al., 1956; Fischer, Fischer, Weisweiler, & Frey, 2010), checking previously accessed information, or accessing new information about the chosen candidate, to confirm their evaluations. Confirmatory processing strategies have been argued to be a heuristic strategy, in particular the CONF heuristic (Karelaia, 2006), which differs from TTB in that it allows for multiple pieces of confirming evidence to be accumulated before reaching a decision. This heuristic pattern relates to Lau & Redlawsk's (2006) Model 4 voter type, more so than Model 3 ('fast and frugal') or Model 2 ('partisan-matching'), as they are conceptualized as needing only one piece of confirming evidence in order to make a decision.

To recap, our initial research question was:

RQ1. What effect does party label have on information search, and average duration, when it is absent versus when it is present?

We observed no significant differences for the overall amount of search, or the average duration spent on information, as a result of party label's presence or absence. Party label does not seem to cause less information search when it is present, or cause less time to be spent on the items accessed, even if they have party stereotypic information attached to them.

We do note some significant differences in the patterns of information search when looking across time-bins; when PL^A, information search increases initially from T1, and decrease towards T3; when PL^P, search decreases linearly over time from T1 (-T3). This suggest that party label does exert an effect on information search, such that when party label is available it reduces information search over time by participants. This might be as a result of more focussed search between alternatives; or that it provides a memory aid for participants, reducing the need to re-access information. When party label is absent, participants may need to learn and develop a sense of candidate's positions in the general ideological space, requiring initially greater search rates until such a point is reached. A possible way of testing for this may be to potentially ask participants to recall candidate's stances on policies, recording errors, and analysing the differences; with the

expectation that those exposed to party label will be able to rely more on stereotypic information to recall (or infer) policy stances.

RQ2. What effect does choice set size have on information search and average duration, and does this differ when party label is absent/present?

We find no significant effect of choice set size on the amount of information search, or average duration spent on items accessed, with no interaction effects observed on the depth of information processing or the average duration spent on items accessed. There were no differences over the flow stage. While the average duration participants spend on information accessed does increase from *2-candidates* to *3-candidates*, it is not significant; suggesting if there is any effect of choice set size on task complexity and/or effortful processing, it is not reflected in the average duration participants spend on the information they access. We provide additional thoughts on this at the end of the chapter in our General Discussion.

RQ3. What effect do choice set size and party label have on the equality of search and duration?

We find that participants search more equally between alternatives, and the average duration spent on items for alternatives is more equal, when there are two candidates compared to when there are three candidates. Equality of search differs comparing our ‘suppressing’ and ‘focussing’ measures. When comparing the chosen candidate to all other alternatives (2v3), equality of search decreases in favour of the chosen candidate in the 3-candidate set; whereas if we compare just the chosen and next-considered, search between the two becomes *more* equal in the 3-candidate set. This is in line with people eliminating the least preferred candidate (suppressing), rather than focusing on the most preferred candidate. In addition, this greater equality of search as the choice set size increases, reflect heuristic strategies that utilize pairwise comparisons (Russo & Doshier, 1983).

We found participants spend longer on their chosen candidate when party label is *present*. There are differences at the descriptive level between our suppressing and focussing measures. The mean increase for the chosen candidate in party label’s presence is 0.4s when compared to the entire alternative set (suppressing), while it increases to .19s when compared only to the next-most-considered alternative (focussing). We find these patterns also emerge over the flow stage, such that when party label is absent duration spent between alternatives becomes more equal; while it gradually increases in favour of the chosen candidate when present.

We do find greater search for the chosen candidate relative to all the other alternatives in the choice set and the next-considered alternative when party label is absent. Furthermore, over the flow stage we see preferential search for chosen candidate begins at a level closer to 0 (more equal search between alternatives) and increases linearly over time when party label is absent (on both measures), while preferential access decreases (becomes more equal) later in the flow stage when party label is present (on both measures). This suggests that when party label is present, participants are utilising less information in order to arrive at a judgment about their chosen candidate, compared to when it is absent. This is in line with the hypothesis that party label may be acting to reduce informational search requirements, and information/cue storage, retrieval, and integration.

Taken together it seems that when party label is absent participants access more information for their chosen candidate (more unequal), but spends less average duration on the chosen candidate (becoming more equal). This suggests, in the absence of partisan cues or heuristics, participants are continually seeking out more information to aid in their judgment, but that the time spent evaluating and integrating the information accessed becomes less- possibly due to decreasing cue validity decreasing the need for effortful processing and integration. Participants may be engaging in a simple confirmatory processing strategy (as per the CONF heuristic), with time spent on each subsequent evaluation and judgment of each cue decreasing in line with cue validity.

What of those participants accessing less information, but spending more time on their chosen candidate when party label is present? Taking Shah & Oppenheimer (2008)'s view that heuristics can make judgments faster and less effortful through frugality via; examining fewer cues, integrating less information, and examining fewer alternatives; we see no conflict with this and the fact participants spend longer on the target of their judgment. In fact, if participants are focussing their informational search, the most intuitive way to express a reduction in effort is to simply 'take your time'. That we see these patterns emerge from the onset lends credence to such an idea- why frantically search between alternatives once you've narrowed them down? Alternatively, it could be a mathematical artifact from how average duration is calculated, as all else being equal, average duration decreases as the number of items increases ($AD = \text{Duration} / N \text{ accessed items}$).

Participants' information search for their chosen candidate was greatest (most unequal between alternatives) when PL^A and 3 candidates, and search was least (most equal between alternatives) when PL^P and 2 candidates.

It is hard to ignore how these conditions also reflect the general trends in the experiments for correct voting rates, where each condition usually reflects the worst and best rates of correct voting respectively; suggesting a relationship between equality of search and CV. The difference in our suppressing and focussing measures is also worth highlighting. Using our focussing measure, participants show more equality of search, and spend the longest average duration on their chosen candidate, in the 3-candidate condition when PL^P (vs. PL^A); the condition where we often see a trend for CV rates to improve in the larger choice set.

Taken together, this would suggest that participants in the larger choice set when party label is absent (worst CV rates) are engaging in more exclusive information access for an inappropriate candidate, possibly resulting in an incorrect choice. This stands to reason: if the focus of search is predominantly within one candidate, then should that candidate be the incorrect one, participants cannot encounter information that may be indicative of a better alternative. That we see more equal search in both the 2 and 3 candidate conditions when party label is present, where CV rates improve on when it is absent in the same conditions, seems overly coincidental. This supports the argument that party level is acting as an aid in participants' decision making- particularly by initially narrowing options down to the most appropriate alternatives to consider.

It may be that the lack of diagnostic partisan labels, and the increased complexity of the choice set size, may be causing participants to choose inappropriate alternatives to focus on at the outset. Looking at the level of time-bin (see Figure 3.2) we see over the flow stage that for equality of search remains relatively flat and close to '0' (equal search) when party label is present (on both measures); whereas when it is absent, participants access more information for their chosen candidate, particularly in the 3-candidate condition (on both measures). Similarly, for duration of access we see a tendency for more equal duration to be spent on the remaining alternatives over time (both measures) in those conditions where CV rates are lowest (i.e. party label absent, 3-candidates), whereas we see average duration become more in favour of the chosen candidate in those conditions where CV is highest or improves (i.e. when party label is present). In short, participants may well be considering the two best pair of alternatives as the flow stage progresses, but CV rates would indicate they ultimately build a preference for the incorrect candidate more often than not when party label is absent and choice sets are larger.

Specifically, in relation to correct voting, our RQ was:

RQ4. How do our information processing, and equality, measures relate to correct voting rates?

We found that the trends for information search were positively associated with increasing rates of correct voting, but non-significantly so. Average duration of item access was negatively associated with correct voting. While the rationalist assumption is that greater duration spend on information will lead to better quality decisions, this result makes sense as the longer you spend on items on average, the less time you have overall to access and processes additional information (limiting intake of potentially diagnostic information) in our limited time frame. To take an example to *ad absurdum* if you access 1 item for the entirety of the study duration, it doesn't seem likely you'll gain much (more) useful information about the alternatives, and you are more likely to make poor decisions.

Participants were more likely to vote correctly as they search and dwell preferentially for their chosen candidate relative to their choice set, or their next-considered alternative; but non-significantly so. Party label is positively associated with correct voting at marginal significance ($p = .052$). After controlling for the amount of information accessed; average duration, and the main effect of choice set size; participants are 1.22 times more likely to vote correctly when it is present. Party label remains positively predicted of correct voting when controlling for our two measures of search and duration equality, but non-significantly (at $\alpha = .05$), suggesting a positive role for party label in aiding correct voting even when search and average duration are equal amongst alternatives. However, such a result may mean that while party label's presence may lead to greater equality of search (and to a lesser degree, average duration) and is relatively flat over time, party label may not confer a benefit beyond the narrowing of alternatives and comparing equally between them on correct voting.

Consistently choice set size is negatively and significantly predictive of correct voting rates. After controlling for depth of search, average item search duration, and the main effects of party label (and their interaction term), increasing the choice set size from 2 to 3 candidates results in an 80% decrease in likelihood to correctly vote; and exerts a negative effect even after controlling for equality of search and duration amongst alternatives. This means the effect of additional candidates to the choice set on correct voting holds despite equal search or duration spent between alternatives, or the two most considered alternatives. As we do not observe significant differences (overall) in our measures of perceived difficulty (etc.) of vote choice between

choice sets in Chapter 2, taken together this suggest task complexity and/or effortful processing is not the main cause of incorrect voting.

We note the interaction term (NOC*PL) is positively associated with rates of correct voting after controlling for our differing information processing variables, although non-significantly; and that addition of the interaction term does not significantly improve our model(s). This points to unique effects of each of our main variables, independent of the level of the other. That is, after equality of search/average duration are controlled for, the effect of party label is not conditional on the size of the choice set (and *vice-versa*).

We deal further with these points in the General Discussion (this chapter) but proceed with the results of Experiment 4, where we increased the alternatives in the choice set from three to five.

3.4.3. Experiment 4

117 participants were included in the analysis, 35 were excluded for either choosing to ‘Abstain’, not knowing who to pick, or not accessing at least 1 item during the flow stage. We also excluded N=1 participant who accessed 1 item for a duration of 405s, under the assumption they did not take the experiment seriously.

We carried out a series of repeated measures MANOVAs including our IA and AD variables, and our ‘Suppressing’ and ‘Focussing’ measures. We have two ‘suppressing’ measures here, ‘3v5 alternatives’, and ‘3v3 alternatives’, in order to see if people are suppressing the two least-preferred alternatives relative to the smaller subset of the three alternatives. Our focusing measure, 2v2, is the same conceptually as previously (testing if participants are focusing on the most preferred pair of alternatives).

We report the results by effect, as to be in line with previous sections. Where Mauchley’s *W* is significant, we report Greenhouse-Geisser corrected values. The trends for each of our Items Accessed (IA) variables can be seen in Figures 3.9 and 3.10, and for average duration (AD) in Figures 3.11 and 3.12.

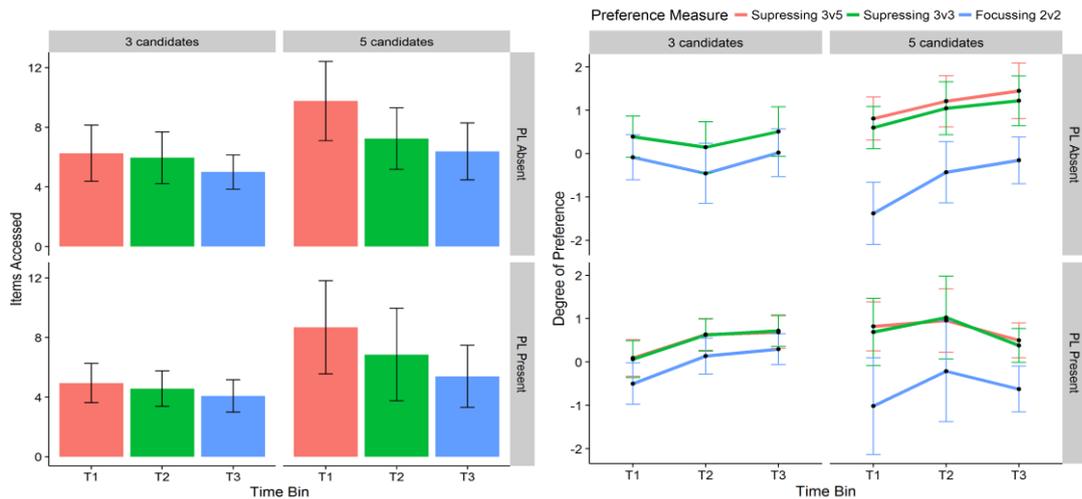


Figure 3.8: Items Accessed over TB (by PL & NOC) **Figure 3.9: Preference Measures (IA) over TB**

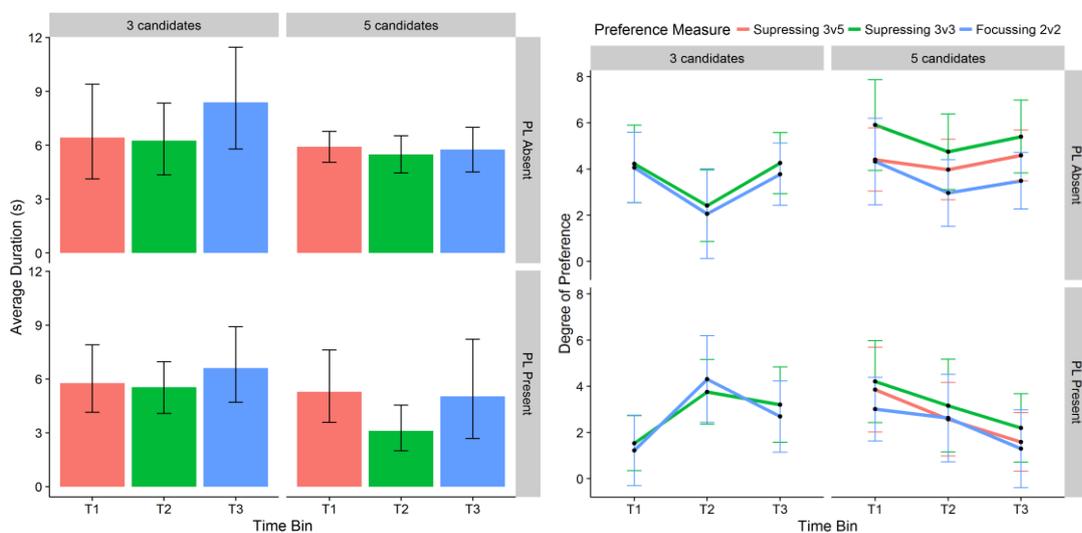


Figure 3.10: Average Duration over TB (by PL & NOC) **Figure 3.11: Preference Measures (AD) over TB**

3.4.3.1. Party Label

IA: There was a non-significant effect of Party Label (PL) on total Items Accessed (IA), $F(1, 113) = 1.35$, $p = .247$, $r = .11$.

AD: There was a non-significant effect of Party Label (PL) on Average Duration of Access (AD), $F(1, 113) = 3.03$, $p = .085$, $r = .16$.

Effect of PL on Equality: There was a non-significant effect of PL comparing search between the chosen candidate and the rest of the choice set, between the 3-Can and 5-Can conditions on Items Accessed, IA(3v5), $F(1, 113) = .857$, $p = .356$, $r = .06$; similarly, no significant effect on IA(3v3), $F(1, 113) = .12$, $p = .72$, $r = .04$; or on IA(2v2), $F(1, 113) = .14$, $p = .70$, $r = .04$.

There was a significant effect of PL on AD(3v5), $F(1, 113)= 8.73, p= .004, r= .26$. Participants spend a longer average duration on their chosen candidate when PL^A ($\mu= 4.01, SD= 1.96$) compared to when PL^P ($\mu= 2.76, SD= 2.69$). There was a significant effect of PL on AD(3v3), $F(1, 113)= 7.53, p= .007, r= .25$; participants spend a longer average duration on their chosen candidate when PL^A ($\mu= 4.59, SD= 2.94$) compared to when PL^P ($\mu= 2.98, SD= 2.89$) The effect of PL on AD(2v2) trended towards significance, $F(1, 113)= 3.16, p= .07, r= .16$, PL^A ($\mu= 3.46, SD= 2.56$) compared to when PL^P ($\mu= 2.55, SD= 2.87$).

3.4.3.2. Number of Candidates

IA: There was a significant effect of Number of Candidates (NOC) on total Items Accessed (IA), $F(1, 113)= 6.25, p= .01, r= .23$. This is expected as there are more items in the expanded choice set condition and longer duration in which to access them. As such, we discuss this no further.

AD: There was no significant effect NOC on Average Duration of Access (AD), $F(1, 113)= 3.06, p= .083, r= .16$.

Effect of NOC on Equality: There was a significant effect of NOC on IA(3v5), $F(1, 113)= 6.73, p= .003, r= .27$. Participants access more items for their chosen candidate, relative to the others in the choice set, in the *5-Can* condition ($\mu= 2.87, SD= 3.32$) compared to the *3-Can* condition ($\mu= 1.27, SD= 2.34$). There was a significant effect of NOC on IA(3v3), $F(1, 113)= 4.81, p= .03, r= .21$; participants access more items for their chosen candidate, relative to the two considered alternative pair, in the *5-Can* condition ($\mu= 2.48, SD= 3.61$) compared to the *3-Can* condition ($\mu= 1.27, SD= 2.34$) There was a significant effect of NOC on IA(2v2), $F(1, 113)= 4.81, p= .03, r= .20$; participants engage in more equal search next-considered alternative, in the *3-Can* condition ($\mu= -.24, SD= 2.60$); and participants engage in greater search in favour of the next-considered alternative in the *5-Can* condition ($\mu= -1.91, SD= 4.92$).

The effect of NOC on AD(3v5) was non-significant, $F(1, 113)= .34, p= .55, r= .05$. There was a marginally significant effect of NOC on AD(3v3), $F(1, 113)= 3.69, p= .056, r= .18$; participants longer on average on items for their chosen candidate, relative to the others in the choice set, in the *5-Can* condition ($\mu= 4.28, SD= 3.32$) compared to the *3-Can* condition ($\mu= 3.13, SD= 2.59$). There was a non- significant effect of NOC on AD(2v2), $F(1, 113)= 3.69, p= .056, r= .18$.

3.4.3.3. Party Label & Number of Candidates

IA: There was a non-significant effect of the interaction between PL & NOC on IA, $F(1, 113) = .037, p = .847, r = .02$.

AD: There was a non-significant effect of PL & NOC on AD(3v5), $F(1, 113) = .26, p = .605, r = .05$.

Effect of PL & NOC on Equality: There were no significant effects arising from the interaction of PL & NOC observed, for any of our measures.

3.4.3.4. Time-bin

IA: Mauchley's W was significant, $W = .82, p < .001$. There was a significant effect of Time-bin (TB) on Total Items Accessed (TIA), $F(1.69, 191.43) = 16.68, p < .001, r = .36$. There was a significant linear trend observed for IA across time-bins, $F(1, 113) = 25.29, p < .001, r = .42$. Participants access fewer items during the flow stage as it progresses (see Figure 3.8).

AD: Mauchley's W was not significant, $W = .99, p = .61$. There was a significant effect of TB on AD, $F(2, 226) = 3.12, p = .046, r = .19$. There was a significant quadratic trend of AD across time-bins, $F(1, 113) = 7.51, p = .005, r = .26$. The trend follows a U-shape, with participants spending less time in T2 on items compared to T1, whereas the duration spent increases at T3 (see Figure 3.10).

Effect of Time-bin on Equality: There was no significant effect of Time-bin on IA(3v5), $F(2, 226) = 1.62, p = .19, r = .11$; nor on IA(3v3), $F(2, 226) = 1.66, p = .19, r = .12$. There was a significant effect of TB on IA(2v2), $F(2, 226) = 5.95, p = .003, r = .22$. There was a significant linear trend in the data observed for IA(2v2), $F(1, 113) = 10.75, p = .001, r = .29$. Participants initially access more items for the next-considered alternative at T1 ($\mu = -.76, SD = 1.98$), but access linearly increases to become more equal between the chosen candidate and the next-considered alternative across the flow stage (at T3: $\mu = -.08, SD = 1.30$). See Figure 3.9.

There was no significant effect of TB on AD(3v5), $F(2, 226) = .43, p = .64, r = .02$; nor on AD(3v3), $F(2, 226) = .38, p = .68, r = .05$; nor on AD(2v2), $F(2, 226) = 1.62, p = .19, r = .11$. See Figure 3.11.

3.4.3.5. Time-bin & Party Label

IA: There was a non-significant effect of the interaction of TB & PL on TIA, $F(1.69, 191.43) = .05$, $p = .95$, $r = .01$.

AD: There was a non-significant effect of the interaction of TB & PL on AD, $F(2, 226) = 1.31$, $p = .272$, $r = .10$.

Effect of TB & PL on Equality: There was no significant effect of TB & PL on IA(3v5), $F(2, 226) = 1.05$, $p = .19$, $r = .08$; nor on IA(3v3), $F(2, 226) = 1.25$, $p = .28$, $r = .10$; nor on IA(2v2), $F(2, 226) = 1.62$, $p = .19$, $r = .11$.

Nor was there a significant effect of TB & PL on AD(3v5), $F(2, 226) = 2.03$, $p = .13$, $r = .13$; the effect on AD(3v3) trended toward significance, $F(2, 226) = 2.63$, $p = .07$, $r = .15$; while the effect on AD(2v2) was significant, $F(2, 226) = 4.44$, $p = .01$, $r = .19$. There was a significant quadratic trend observed in the data, $F(1, 113) = 7.77$, $p = .006$, $r = .25$. When PL^A, duration spent on items for the chosen candidate relative to the next-considered alternative follows a U-shape (initially unequal in favour of chosen candidate, becomes more equal, and increases for chosen candidate at the end), while search when PL^P is inverted, following a \cap -shape, over the flow stage (equal initially, becomes less equal in favour of the chosen candidate, then returning towards equal duration).

3.4.3.6. Time-bin & Number of Candidates

IA: There was a significant effect of TB & NOC on IA, $F(1.69, 191.43) = 5.59$, $p = .01$, $r = .20$. There was a significant linear trend of IA, $F(1, 113) = 7.22$, $p = .008$, $r = .06$. Participants access more items in each time-bin in the 5-Can condition compared to the same time-bin in the 3-Can condition, with negative linear trends observed in both conditions. Simple effects tests show that this difference is only significant at T1 with participants accessing more items in the 5-candidate condition (3-Can: $\mu = 5.45$, $SD = 4.11$; 5-Can: $\mu = 9.22$, $SD = 7.4$; $p = .003$, Sidak adjusted), with non-significant differences at T2 and T3 (both $p > .08$, Sidak adjusted).

AD: There was a non-significant effect of TB & NOC on AD, $F(2, 226) = 1.56$, $p = .21$, $r = .12$.

Effect of TB & NOC on Equality: There was no significant interaction of TB & NOC on IA(3v5), $F(2, 226) = .53, p = .58, r = .02$; nor on IA(3v3), $F(2, 226) = 1.54, p = .40, r = .09$; nor on IA(2v2), $F(2, 226) = 1.84, p = .16, r = .12$.

There was no significant interaction of TB & NOC on AD(3v5), $F(2, 226) = 1.86, p = .16, r = .07$; nor on AD(3v3), $F(2, 226) = 2.13, p = .12, r = .13$; nor on AD(2v2), $F(2, 226) = 1.56, p = .21, r = .12$.

3.4.3.7. Time-bin & Party Label & Number of Candidates

IA: There was a non-significant effect of TB & PL & NOC on TIA, $F(1.69, 191.43) = .33, p = .68, r = .09$.

AD: There was a non-significant effect of TB & PL & NOC on AD, $F(2, 226) = 2.03, p = .133, r = .12$.

Effect of TB & NOC & PL on Equality: There was a marginally significant effect of on IA(3v5), $F(2, 226) = 2.77, p = .06, r = .15$. There was a significant linear trend observed, $F(1, 113) = 4.81, p = .03, r = .20$. Follow-up simple effects tests show that when PL^A, there is no significant difference in search equality between the 3-Can and 5-Can conditions at T1, whereas there are at T2 and T3 (both $p < .012$, Sidak adjusted). When PL^P the opposite is true, with a significant difference at T1 between 3-/5-Can and no significant difference at T2 or T3. When PL^A, search for the chosen candidate in the 3-Can follows a U shape, while it increases linearly in the PL^A 5-Can condition. When PL^P search increases linearly for the chosen candidate in the 3-Can condition, while in the 5-Can condition it follows a \cap -shape; increasing at T2 only to decrease at T3.

There was no significant effect on IA(3v3), $F(2, 226) = 2.09, p = .10, r = .14$; nor on IA(2v2), $F(2, 226) = 1.62, p = .19, r = .11$.

There was a significant effect on AD(3v5), $F(2, 226) = 3.56, p = .01, r = .19$. There was a significant linear trend observed, $F(1, 113) = 4.10, p = .045, r = .20$. Follow-up simple effects tests show there are no significant differences in the average duration participants spend on items for their chosen candidate, relative to the rest of the choice set, between the 3-Can and 5-Can conditions, except at T1 when PL^P; participants access items for their chosen candidate longer in the 5-Can condition. We note that the reverse is true at T3 (participants access items for longer at T3 in the 3-Can condition when PL^P), but this does not reach significance ($p = .08$, Sidak adjusted)

There was no significant effect on AD(3v3), $F(2, 226)= 2.04, p= .13, r= .13$; nor was there a significant effect on AD(2v2), $F(2, 226)= 1.79, p= .17, r= .12$.

3.4.3.8. Relationship with Correct Voting

IA & AD: Using binary logistic regression we regressed CV (0 = Incorrect, 1= Correct) on our processing variables (total IA, AD) entered in Block 1, adding their interaction term in Block 2, our condition variables (PL, NOC) in Block 3, and the condition interaction term in Block 4. The regression model(s) containing Blocks 1-4 were not significant. We report the full model in Table 3.4, $\chi^2(6)= 4.06, p= .66, R^2= 4.7\%$.⁴⁶

Table 3.4: Logistic Regression results of main effects, IA, and AD, on CV rates. (N=117).

Predictor	β	SE	χ	e^β
IA	.010	.034	.078	1.010
AD	.083	.090	.845	1.086
IA*AD	-.003	.007	.141	.997
NOC (3^{CAN})	-.762	.625	1.490	.467
Party Label (PL^A)	-.309	.553	.311	.734
PL*NOC	1.034	.811	1.623	2.811
Constant	-.713	.652	1.196	.490

* $p < .1$. ** $p < .05$. *** $p < .01$. † $p < .001$. (Reference categories in parentheses).

None of our raw processing measures, or condition variables, were significantly predictive of levels of CV.

Suppressing Measures (1 & 2): Using binary logistic regression we regressed CV (0 = Incorrect, 1= Correct) on IA(S1) & AD(S1) in Block 1, adding their interaction term in Block 2, and PL/NOC in Block 3, and PL*NOC in Block 4. The regression model(s) for IA(S1) & AD(S1) were not significant (3-Can vs 5-Can), and we do not report it here. The regression model containing Block 1 for IA(S2) & AD(S2) was marginally significant (3-Can vs 3-Can), $\chi^2(2)= 5.41, p= .063, R^2= 6.2\%$, and adding further variables do not significantly improve the model. IA(S2) is positively predictive of CV, $\beta= .15, p= .035$, with participants 1.16 times more likely to vote correctly when accessing items for their chosen candidate relative to the other two next-considered alternatives in the choice set.

⁴⁶ We perform bootstrapped logistic regressions for each of our reported regression models ($n= 10,000$), finding the pattern of results do not meaningfully differ from those reported here.

We report the full model in Table 3.5, $\chi^2(6)= 10.29, p=.11, R^2= 11.6\%$.

Table 3.5: Logistic Regression results of main effects, IA(S2), and AD(S2), on CV rates. (N=117).

Predictor	β	SE	χ	e^β
IA(S2)	.102	.100	1.035	1.107
AD(S2)	-.101	.100	1.016	.904
IA(S2)*AD(S2)	.027	.025	1.103	1.027
NOC (3 ^{CAN})	-1.336**	.679	3.875	.263
Party Label (PL ^A)	-.523	.568	.846	.593
PL*NOC	1.395	.851	2.687	4.033
Constant	-.113	.548	.043	.893

* $p < .1$. ** $p < .05$. *** $p < .01$. † $p < .001$. (Reference categories in parentheses).

In our full model, NOC is negatively predictive of CV rates, $\beta = -1.33, p = .035$, with participants 74% less likely to vote correctly when there are 5-candidates in the choice set, compared to when there are 3-candidates. We note that when controlling for all other variables, participants are 4 times more likely to vote correctly when party label is present and there are 5 candidates, though this does not reach significance ($\beta = 1.39, p = .10; p = .072$ using $r=10,000$ bootstrapped sample)

Focussing Measures: Using binary logistic regression we regressed CV (0 = Incorrect, 1 = Correct) on IA(F) & AD(F) in Block 1, adding their interaction term in Block 2, and PL/NOC in Block 3, and PL*NOC in Block 4. The regression model containing Block 1 was marginally significant, $\chi^2(2) = 5.64, p = .059, R^2 = 6.5\%$, and predicted 66.7% of the overall cases correctly. IA(FI) is positively predictive of CV, $\beta = .12, p = .029$, with participants 1.13 times more likely to vote correctly when accessing items for their chosen candidate relative to the next-considered alternative in the choice set.

Adding Blocks 2-4 did not significantly improve the model ($p > .05$). We report the full model in Table 3.6, $\chi^2(6) = 8.44, p = .21, R^2 = 9.6\%$.

Table 3.6: Logistic Regression results of main effects, IA(F) and AD(F), on CV rates. (N=117).

Predictor	β	SE	χ	e^β
IA(F)	.064	.088	.533	1.066
AD(F)	.001	.074	.000	1.001
IA(F)*AD(F)	.024	.028	.755	1.024

NOC (3^{CAN})	-.643	.628	1.048	.526
Party Label (PL^A)	-.436	.555	.618	.646
PL*NOC	1.029	.821	1.571	2.798
Constant	-.198	.490	.162	.821

* $p < .1$. ** $p < .05$. *** $p < .01$. † $p < .001$. (Reference categories in parentheses).

None of our variables were significantly predictive of CV rates. We note as previous that the interaction of PL & NOC is still the most positively predictive of CV rates, $\beta = 1.02$, with participants 2.79 times more likely to vote correctly when PL^P and choice set is 5-candidates, though this is non-significant ($p = .21$).

3.4.3.9. Summary

Time-bin: As per Experiments 1-3, participants' information access decreases linearly over the flow stage, while average duration spent on items decreases initially and increases again towards the end of the flow stage. Equality of search between the two most-considered alternatives is initially skewed away from the chosen candidate, becoming approximately equal by the end of the flow stage (similar to Exps. 1-3).

Party Label (PL): There was no effect of PL on information access, or average duration spend on information. There were significant effects on our equality measures, such that when PL was absent participants spent more time on their chosen candidate relative to the other alternatives (opposite to Exps. 1-3). When absent, duration between alternatives becomes more equal over time, and more in favour of the chosen candidate by the end (U-shape). When present, duration becomes less equal between alternatives over time, returning to equal duration by the end (a \cap -shape). These patterns over time are broadly in line with the aggregated trends, and individual results, in Experiments 1-3.

Number of Candidates (NOC): There was no effect of NOC on average duration of information access. There were significant effects on our equality of search measures, such that equality of search skewed more in favour of the chosen candidate when choice set size increased (as per Exps. 1-3). There were no significant patterns of results for any measure over time-bins (broadly in line with Exps. 1-3).

Interaction of PL and NOC: There were no overall effects of the interaction on any of our measures. We find some significant differences at the level of time-bin between our groups on our *3v5 suppressing* measure only. When party label is *absent*, equality of search differs only at the middle and end of the flow stage between

choice sets. Search becomes more equal at T2 in the *3-Can* condition (more for chosen candidate in *5-Can*) and more in favour of the chosen alternative at T3 (search his more equal in *5-Can*,). In general, when PL is absent equality of search follows a U-shape in the *3-Can* condition, while search equality becomes linearly more equal over time in the *5-Can* condition. When party label is *present*, search increases linearly for the chosen candidate in the *3-Can* condition, while in the *5-Can* condition it follows a \cap -shape; with the only significant difference at T1 where search in the *5-Can condition* is more in favour of the alternative(s).

Comparisons of equality measures: It is worth noting the effect removing alternatives has on our equality measures in Figures 3.10 and Figure 3.12. When looking at equality of information search (IA-) among alternatives, there are not large descriptive differences for 3v5 ‘suppressing’ ($\mu= 2.04$, $SD= 3.07$) and 3v3 ‘suppressing’ ($\mu= 1.85$, $SD= 2.95$; $p= .03$), and are highly correlated ($r= .95$; $p< .001$). By contrast, the 2v2 ‘focussing’ measure mean lowers noticeably into the negative ($\mu= -1.04$, $SD= 3.96$), and is less strongly correlated ($r= .48$, $r= .60$; $p< .001$). We can see in Figure 3.10 that in all conditions, the 2v2 measure is generally <0 at the beginning at the flow stage, and comes closer to 0 over time. This suggests that when looking at the chosen and the next considered alternative pair, search is far more in favour of the *non-chosen* alternative but equalises over time- and that this is masked by the inclusion of the other alternatives in the *3/5-candidate* choice sets, that artificially inflate the skew of search on the 3v3/5 metrics in favour of the chosen candidate. For reference, we do not see this in Experiments 1-3; removing alternatives does move the mean of our 2v2 focussing measure closer to ‘0’, but always remains in the chosen candidate’s favour across all conditions (>0).

3.4.4. Discussion: Experiment 4

We had the same research questions (RQs) for Experiment 4 as for Experiments 1-3, namely:

RQ1. What effect does party label have on information search, and average duration, when it is absent versus when it is present?

Party label did not affect the depth of search participants engaged in overall or the average duration they spent on items. Nor did we see any meaningful differences for either of these, between party label absent/present. This is the same as our findings in Experiments 1-3. We did not find any differences for party label on our information processing variables across the flow-stage (whereas we did in Experiments 1-3).

Comparing the graphs in Figures 3.1 and 3.9 we note that in general the tendency in all conditions is a linear decrease in informational access over time, and do not seem to differ visually by party label condition. We find this the most plausible conclusion. As we do not include a 2-candidate condition in our experiment, we are unable to test if the differences are unique to Experiments 1-3's design.

RQ2. What effect does choice set size have on information search and average duration, and does this differ when party label is absent/present?

We find no significant effect of choice set size on the amount of information search, or average duration spent on items accessed, with no interaction effects observed on the depth of information processing or the average duration spent on items accessed. There were no meaningful differences over the flow stage. This is the same as our findings in Experiments 1-3.

RQ3. What effect does choice set size and party label have on the equality of search and duration?

Party label seemingly has no effect on equality of information search across any of our preference measures (unlike Exps. 1-3). We do note that there is a trend for increasing search linearly over the flow stage for the chosen candidate relative to other alternatives across all measures (as in Experiments 1-3) with a possible exception of when party label is present and the choice set includes 5 candidates (see Figure 3.10).

Party label had significant effects on all our measures of average duration equality, such that participants spend a longer average duration on their chosen candidate when party label is absent compared to when party label is present. This is the reverse of Experiments 1-3 where we observed participants spend less time (more equal duration) when party label was absent than present. Our finding here is more in line with the thinking that party label's presence should reduce the need for effortful processing by encouraging heuristic processing (as per Model 4; Lau & Redlawsk, 2006) by reducing the effort of retrieving cue values, simplifying the weighting of cues, or integrating less information. All of which would decrease time spent on information evaluation and integration into a judgment model about the alternatives. This may arise from differences in complexity between the experimental tasks: while we collapse across 2-/3-candidate sets in Experiments 1-3, we collapse 3-/5-candidate sets here. While we do not see differences at the aggregate level of participants' perceived choice difficulty or confidence between Experiments 1-3 and 4, as noted in Chapter 4, perceived difficulty does not necessarily reflect difference in cognitive effort expended. Particularly, we ask participants

how the *choice* was, not necessarily the *task*, and as such participants may be positively evaluating their choice (Brehm, 1916; Lieberman, Oschner, Gilbert, & Schacter, 2001) and misattributing how they feel about their choice for how they viewed the decision task.

We find an effect of choice set size on our equality measures (as in Exps. 1-3). Participants engage in more equal informational search in the smaller 3-candidate choice set, compared to the 5-candidate choice set on our '3v5' and '3v3' measures (as per Exps. 1-3). However, when we remove the two-least considered alternatives (our '2v2' measure), we see unequal sampling in favour of the next-preferred candidate ($\mu = -.21$) in the 3-candidate set which increases in the 5-candidate set ($\mu = -1.91$). While there were no significant interactions with time-bin, looking at Figure 3.10, we see that generally over the flow stage participants' sampling becomes more equal between their chosen candidate and next-alternative, approaching equality by the end of the flow stage. This does not differ by party label and seems consistent with participants engaging in confirmatory decision-strategy as they learn about alternatives, form preferences, and sample more from those they like in order to confirm those emerging preferences. Also, this increasing equality of search between the two alternative pairs correspond to heuristic strategies that utilize pairwise comparisons (Russo & Doshier, 1983), and evolve over the flow stage.

A key question is why is there a clear tendency for participants to sample from their next-considered candidate so heavy from the outset? Party label could initially bias participants to certain initial options, but we do not observe that here. A possible answer may be that participants simply base their preferences around the first alternatives they sample and/or like, and use those as comparators as they sample the informational environment and build preferences for the inevitably chosen candidate. While this could be a form of primacy effect or 'anchoring bias' (Tversky & Kahneman, 1975), various research shows that the order of information items participants see for one alternative has a substantial effect on their choices (Carlson et al., 2006; DeKay et al., 2011; DeKay et al., 2012; Miller et al., 2013; Russo & Chaxel, 2010). DeKay (2015) work on '*pre-decisional information distortion*' details how decision makers' initial preference shifts the evaluation of subsequent information in a manner that benefits the early leader.

RQ4. How do our information processing, and equality, measures relate to correct voting rates?

Only our regression models of CV that included our equality measures for ‘3v3’ and ‘2v2’ were significant, with no other variable improving the models. The trends we observe are in line with those observed in Experiments 1-3, namely that greater search (and duration) in favour of the chosen candidate is positively associated with correct voting, but only is significant when comparing the chosen and ‘next-two’ (3v3) alternatives. Excepting this, none of the equality measures reach significance in our regression models, and have small effect sizes (as measured by the Odds Ratio or e^{β}). Trends for choice set size (NOC) and the interaction with party label and choice set size are in line with Experiments 1-3, with choice set size negatively predictive of correct voting. In our 3v3 model, choice set size was significant when search and duration equality was equal between the chosen candidate and the ‘next-two’ alternatives (3v3), resulting in a 73.7% decrease in the likelihood of voting correctly. Our 3v3 measure assumes that participants are suppressing, ignoring, or removing, the two-least-preferred options in the 5-candidate choice set; this result suggests that participants those least-preferred options are ones that would have led them to vote correctly. In the 5-candidate condition, we introduce the Green Party and UKIP. While we cannot distinguish between the choices participants could have made if in both conditions (as it was a between-subjects design), this result can only arise if a) participants who should have voted Green/UKIP did not when opportunity arose, or b) switched to Green/UKIP inappropriately from either Labour/Conservative/Green. Additionally, we should take the above in light of the large Odds Ratio observed for the party label and choice set size interaction term (OR=4.04), which was consistently positively predictive of correct voting, but non-significantly ($p = .10$). This suggests that all other variables held equal, participants were 4.04 times more likely to vote correctly when party label was present and choice set size was increased to 5 candidates. We are wary of over-interpreting our non-significant results in favour of rejecting the null hypothesis and suggest that these results should be taken in the broader observation that so far party label seems to possibly have a) some effects and b) some positive effect on correct voting as choice set expands.

3.5. General Discussion

As this chapter was inherently exploratory, we aimed to see if patterns in the data might shed light on the results we observed in Chapter 2. In Chapter 2, we posited party label would act as a heuristic and increase decision-error via voting incorrectly for candidates. We did not consistently observe a significant effect on participants’ correct voting and found party label had a positive relationship with correct voting. We suspected

party label may still be exerting an effect upon participants' information processing, but whether it acted as a heuristic was unclear. We also wished to see if we could observe any patterns in the data between choice set sizes, as to explain the consistently negative effect increasing choice set size has on correct voting in all four of our experiments.

Overall, we can say that **party label** does seem to exert some effect on information processing, not at the aggregate level, but in the equality of information search, and duration on items, participants engage in for their chosen candidate relative to other alternatives in the choice set. Namely, when party label is absent participants preferentially sample information on the chosen candidate at increasing rates over time when choice sets are greater than 2 candidates. When label is present, participants tend to compare information for the chosen and another highly considered alternative equally at an earlier rate, staying consistent between them across the flow stage; that is, there is immediate elimination of some alternatives from the choice set (Shah & Oppenheimer, 2008), a heuristic strategy.

There are conflicting results of the effect of party label on the equality of average duration spent on information accessed. For example, in Experiments 1-3 participants spend more time on information for their chosen candidate vs. alternatives when party label is present (unequal); while in Experiment 4 participants spend less time relatively on information for their candidate (more equal). However, these differing results are not incompatible with each other.

That party label could focus participants to search and dwell preferentially on their chosen candidate when the choice sets are relatively small (2-3 alternatives; Exps. 1-3) is understandable, as smaller choice sets make it easier to eliminate alternatives earlier and focus on preferred candidates. Why look at alternatives you don't like? In larger choice sets (i.e. 5; Exp. 4), party label would be more useful in narrowing alternatives into subsets that include the chosen candidate and encouraging more equal duration between them. We see this in Experiment 4, where average duration is more equal between alternatives on all our measures when party label is present (vs. absent), with little change at the descriptive level as we remove lesser-considered alternatives (e.g. 5-3-2). We also see that average duration gradually becomes more equal over time when party label is present in the 5-candidate condition, suggesting this narrowing may occur over time. We can see this clearly

in the differences between the 3-candidate and 5-candidate choice sets when party label is present in Figures 3.4 and 3.12.

We highlight an issue looking at the descriptive statistics for average duration in the *3-candidate* condition (our only common condition) across experiments. In Experiments 1-3 that average duration on items increases when party label is present, but in Experiment 4 duration decreases when it is present. All things being equal, we should observe the same pattern of results in this conditions across all our experiments. We do not observe such differing patterns for information search. There are a number of possible explanations. In Experiment 4 we use differing candidate materials that were more current and reflective of the real-world party policies in 2014/2015 (Experiments 1-3 were based on 2010, and run 2013-2014), decreasing perhaps the average duration needed to appraise them; particularly when party label is present, as participants are simply confirming current knowledge against information presented experimentally. A possible solution would be to run an experiment with the most current policies using a condition comparing multiple choice set sizes in tandem (i.e. choice set: 2, 3, 4, 5, etc.); however, we highlight the points made in Chapter 2 (section 2.5), and at the end of this chapter, that such an experiment has methodological and practical restraints, but is still worth pursuing. It is also worth noting that Lau and Redlawsk (2006) also follow a similar strategy, comparing 2-candidate sets with 4-candidate sets, so our approach is not without precedent.

A final note on party label's inability to affect information search and average duration overall. There is a methodological explanation for why we might not be able to observe this here; we do not account for the time during *non-access* of information. We are only able to measure the duration participants spend with items open, however, this presumes that this accurately captures the time frame in which participants spend processing the information and evaluating it. Clearly, this would not be the case but is the best approximation we have of measuring time spent processing information, but point out its limitation. There is also a more inherent issue resulting from the nature of information boards; because participants can easily lookup cues in a process tracing environment, they need not always retrieve cues from memory (Shah & Oppenheimer, 2008), reducing reliance on heuristics that aid in memory consolidation/retrieval. As one of the roles we hypothesized party label would play is as a decision-aid, reducing reliance on memory, it seems using process tracing methodology might actually decrease reliance on party label- rendering testing for any effect difficult. The interaction of memory and partisan heuristics does not seem examined by Lau and Redlawsk (2006) in their original work, who found

simply that there was a weak ($r = .25$) correlation between party affiliation access (their measure of heuristic use), and the memory for “*relevant*” (p. 239) information (presumably if participants remembered candidate-party affiliations). This seems a fruitful avenue for potential research, though it may require a differing methodological approach.

We do see a consistent effect of **choice set size**. Increasing the choice set size has absolutely no effect on the average duration participants spend on each item, spending approximately the same time on items whether there are 2, 3 or 5 candidates to search between and consider. However, as choice set sizes increase from 2 to 3 to 5 candidates, there is greater preferential search for the chosen candidate (unequal) when we use our ‘suppressing’ measures. When we compare search equality for the chosen candidate and the next-preferred candidate only (our ‘focusing’ measure), we see that search is less equal between the pair in smaller sets than in the larger sets. In other words, in larger choice sets participants engage in more equal search between the two most preferred candidates, than in smaller choice sets. This is in line with confirmatory heuristic strategies that utilize pairwise comparisons (Russo & Doshier, 1983), such as *elimination-by-aspects* and other lexicographic heuristic, in particular *choice by most attractive aspect* heuristic, which retains the alternative with the highest overall cue value (Svenson, 1979), which we expect to be engaged more as choice set size increases and task complexity increases.

In relation to **correct voting**, we observed that none of our information search, duration, or equality measures were predictive of correct voting. The exception being that when participants are searching between a candidate and the two-next-considered alternatives (Exp. 4, ‘3v3’ measure), or between their chosen and ‘next-preferred’, preferential search for the candidate positively predicts correct voting. It seems that as participants remove the ‘worst’ alternatives out of the set of 5, and are more likely to identify a ‘correct’ alternative out of the remaining two/three and confirm this through preferential sampling; leading to correct voting.

Only choice set size was significantly predictive of correct voting, even after controlling for all our information measures and equality measures, and any interaction with party label, such that choice set size seems to have a unique effect on participant’s ability to vote correctly beyond explanations of influencing information search, equality of search, etc. However, choice set size was not significantly predictive of correct voting in Experiment 4, except for the ‘3v3’ measure comparison, such that increasing the choice set size to 5

alternatives and focusing only on the chosen and other ‘top 2’ made it more likely to vote incorrectly, even when sampling and duration were equal between them. This points to a potential incorrect consideration of alternatives, in other words, participants choose the ‘wrong’ three alternatives to consider between in the larger 5-candidate set. This may explain why in Experiments 1-3 we see choice set size as negatively predictive of correct voting on both measures (looking at all three alternatives, or just the ‘top 2’); participants choose the wrong alternatives to focus on in the expanded choice set. If this is an accurate assumption, we would expect choice set size to be negatively signed in our ‘focussing measure’ in Experiment 4, which it is, albeit non-significantly. Despite this, we feel this is strong evidence for why increasing choice set size seems to have such consistent negative impact on correct voting rates.

What does help participants identify the ‘best’ alternatives in a choice set to narrow their options down? Perhaps, party label. Interestingly, across all experiments is the positive interaction term of PL and NOC that consistently appears in all of our regression models, and nearly always has the greatest effect (looking at Odds Ratio) on correct voting, but is non-significant in each case after controlling for our information search/equality measures. We draw attention to the notes in our results sections that every logistic regression is compared with a 10,000 sample bootstrapped model. In Experiment 4, the interaction term in the models looking at our equality measures neared significance at $\alpha = .05$ on each occasion. Post-hoc power analyses for the logistic regression models revealed power to be $\sim .75$, meaning the study was underpowered in order to avoid Type II errors (accepting the null hypotheses incorrectly). It is possible, at least when we consider larger choice sets of candidates, that party label’s effects might be more beneficial in aiding a correct vote, but we do not have the power to detect it.

It seems therefore that choice set size might encourage heuristic processing into the narrowing of alternatives to smaller subsets, with participants incorrectly choosing the alternatives to compare between. However, party label’s effect may be to attenuate such misselection, by guiding participants to consider alternatives that may result in a greater likelihood of correct voting.

An obvious criticism is the fact we do not conduct a study that has scaled choice sets (i.e. a condition with 2, 3, 4, 5, 6 etc., alternatives), as to test for these effects in one controlled study. In many regards we were constrained by recruitment difficulties and time, due to the lab-based nature of the experiments; a study with

4 choice set conditions and party label manipulation would require approximately 1,721 participants⁴⁷, based on the relatively small-medium effect sizes observed. An online-based study is possible using the DPTE software, however, this loses the control of the lab setting, and may lead to even greater noise in the data at the processing level.

An omission in our analyses may be that party label might affect the *type* of information accessed between conditions (i.e. attributes), such that participants might access different attributes for alternatives when party label is absent compared to when it is present. If party label contains stereotypic information, then it is cognitively inefficient to search information items that would be highly consistent with this stereotypic information, since that information is already implicitly given. For instance, they may substitute such information for cues as per ‘attribute substitution theory’ (Kahneman & Frederick, 2002), or they may infer information about candidates and/or their policies reducing the motivation to access non-valid (less important) cues. Lau and Redlawsk (2006) found that participants who accessed partisan information were more likely to be accurate in their inferences about candidate’s policy stances that they did not access; whether this access would differ based on the global presence of partisan cues (party label), is an open question, and if it is related to correct voting.

To return to Lau and Redlawsk (2006) finally; in their analyses of political heuristic use, they found that party affiliation was utilized by ‘Model 4’ voters more so than their hypothesized ‘Model 2’ voters (decision based on matching candidates with voter’s own partisan identify) in general election campaigns. Model 4 voters were assumed to use heuristics (i.e. satisficing), restricting information search in order to reduce decision-effort, with unequal comparability across alternatives. We find support for the idea that party label encourages heuristic strategies among voters as per Model 4 voters, however, this seems to exert its effect by restricting information search via reducing the number of alternatives considered, to engage in *more equal* search between those being considered during formation of their vote choice. This is the first work of its kind, which we are aware of, in exploring the effect of ‘political heuristics’ on voter decision-making at the cognitive level.

⁴⁷ Estimated using G*Power 3.1.7, at .95 power and .10 effect size.

The effect of increasing choice set size on the ability to vote correctly after controlling for information search is still somewhat harder to explain, and while task complexity (Kerstholt, 1992) is a strong explanation, and results through our outcome measures support this, there are other explanations as to why the introduction of alternatives into choice sets may result in decisions that are not in line with voters' preferences. We explore one of these in Chapter 4.

Before concluding with correct voting using Lau and Redlawk's (2006) DPTE approach, it is useful to summarise our findings across Chapters 2 and 3. We have investigated correct voting in a multi-party electoral context outside of the USA, using both proximal and directional approaches, weighted and unweighted, finding no real difference in using either, which is a useful contribution to the ongoing debate between the use of these models.

We find when choice set size increases voters seem unable to correctly identify the candidate that overall best matches their own reported preferences, going as low as 26%. We investigate this finding at the information processing level, finding as choice sets get larger, participants engage in more equal search between the two most preferred candidates, than in smaller choice sets. Participants information processing seem to correspond to confirmatory heuristic strategies that utilize pairwise comparisons, choosing subsets of alternatives which may lead to incorrect selection of the 'best' alternatives for consideration- explaining the decrease in correct voting rates.

We find mixed evidence partisan labels acting as a heuristic in Chapter 2, with evidence for party label aiding participants in correctly voting as the choice-set size increases, contrary to our initial hypotheses that it would act to bias participants to choose incorrectly. From our analyses in Chapter 3, party label seems exerts an effect such that it helps narrow choice sets down into smaller subsets of alternatives, and with more equal duration on information between those alternatives. This may result in a greater likelihood of including alternatives that are the 'best' choice for the voter, increasing the probability of a 'correct vote'.

That we are aware of, this research is the first to explore the underlying cognitive mechanisms for choice set size's well documented negative effect on correct voting (Lau & Redlawsk, 2006; Lau et al., 2013). Additionally, we are also the first to directly test partisan information as a global cue via party labels, and their effect on voters' information processing, and the subsequent relationship with correct voting.

Chapter 4: Context Effects in Political Domains

4.1. Introduction

In Chapter 2 we observed strong evidence that increasing the number of alternatives (candidates) in a choice set leads to adverse outcomes, namely decreasing rates of correct voting. A likely explanation is the increasing complexity of the decision-task (Scheibehenne et al., 2010), with the effect of increasing alternatives seeming strongest when increasing the choice set size from 2 to 3 alternatives, rather than from 3 to 5 alternatives. In Chapter 3 we explored this idea more deeply, looking at how increasing choice set size impacts voters' information processing, and use of decision strategies in order to reduce task effort arising from increased complexity. We found, even after controlling for the amount of information, duration spend on the information, and how people sampled between preferred options, increasing choice set size still had effects on the ability to vote correctly. Reflecting on how we set up the decision-task, namely between a choice set of two diverging options (Labour, Conservative) or an expanded choice set that includes a third option (Liberal Democrats), it is hard to ignore parallels with another research area in psychology that uses a similar paradigm: *contextual preference reversals*, or 'context effects'.

Context effects arise from changes in preference for options that vary on differing attribute dimensions (e.g. the price and quality of beer), following the addition of a new irrelevant option. That is, the preference for Beer A (over Beer B) should not change simply by adding additional options to the choice set (Beer C). These 'context effects' violate rational theories of choice (e.g. rational choice theory; Anderson, 1983), which assumes the entry of additional alternatives in a choice set will only reduce the choice share of the existing alternatives (Luce, 1977). Yet, the phenomenon of contextual preference reversal has been well documented in decision-making research (Huber, Payne & Puto, 1982; Tsetos, Usher & Chater, 2010). We have given a thorough background to these effects (Chapter 1.5.2), and limit our discussion here.

A number of context effects have been observed to date, such as the '*attraction effect*' (Huber, Payne, & Puto, 1982) and the '*compromise effect*' (Simonson, 1989); both of which violate the principle of regularity. For the attraction effect, the irrelevant option (D) is a decoy (an inferior or 'dominated' option), similar to but of less value than A, which creates a bias in favour of A. For the compromise situation, option C is of approximately equal value to A and B, but it is placed in the middle within the two-dimensional attribute space,

making it a compromise. A third is the ‘*similarity effect*’ (Tversky, 1972), which violates the independence from irrelevant alternatives principle. Here the new option S is very similar to B (and of equal value), shifts the relative choice between A and B in favour of the dissimilar option A. The ‘*phantom effect*’ (Choplin & Hummel, 2005; Dhar & Glazer, 1996; Pettibone & Wedell, 2000, 2007; Pratkanis & Farquhar, 1992), occurs following the introduction of an unavailable but dominant option P, which biases the decision toward the similar dominated option (A).

Various theoretical accounts to explain the mechanisms behind context effects have been mooted, based on either: *attentional switching* between different choice aspects; *relational evaluation* of properties and loss aversion; and *value shifts or contrast effects*; although “*no single mechanism accounts for all three decoy effects*” (Tsetsos et al., 2010, p. 1276). Other mechanisms, such as dimensional weight change, stretching or shrinking of the choice space, ranking, grouping, etc., have been proposed (Guo & Holyoak, 2002; Pettibone & Wedel, 2007; Stewart, Chater, & Brown, 2006). A number of models have been proposed to account for some, but not all of, context effects based on the differing mechanisms previously mentioned, for example, *decision-field theory* (DTF; Roe et al., 2001) and *leaky competing accumulators* (LCA; Usher & McClelland, 2004). We do not propose to distinguish which best account for these effects here but note them for reference.

In our previous studies (Chapter 2), we provided participants with over 17 attribute dimensions on which to evaluate candidates, and we did not control how participants perceived each of the alternatives in relation to each other, or provide numerical values on some common scale (e.g. Candidate A is ‘5’ on Healthcare, Candidate B is ‘4’, etc.). Regardless, it is plausible that the addition of a third alternative resulted in violations of preference for one of the alternatives in the smaller choice set, leading to incorrect voting. Therefore, we investigate in this chapter if context effects can occur in political domains, limiting the number of dimensional attributes to two, and controlling the position of alternatives in the dimensional space in line with previous research in order to elicit each differing context effect.

4.1.1. Context Effects in Politics

Much like in consumer choice modeling, political models also assume regularity and independence from irrelevant alternatives (Shapiro, 1969). Context effects (to the best of our knowledge via an extensive literature search) have not been investigated meaningfully in the political decision-making domain, with the exception

of Pan, O' Curry, and Pitts (1995) who studied the attraction effect in political scenarios. Pan et al., (1995) noted that in the US Presidential Election 1992, the Bush campaign hoped that the entry of a third candidate (Perot) would pull more votes from Clinton while others speculated that the opposite effect would occur, with no political experts predicting that Perot's re-entry would increase the votes for either Clinton or Bush⁴⁸. Yet, at the time, literature on the attraction effect abounded (Lehmann & Pan, 1994; Payne, Bettman, & Johnson, 1992; Simonson & Tversky, 1992).

Pan et al. (1995) conducted two studies to examine the attraction effect in two elections: the 1994 Illinois Primary election (Burris, Netsch, & Phelan), using fake poll approval ratings on 'tax' and 'crime'; and the 1992 U.S. Presidential election (Bush, Clinton, & Perot), using participants' own perceptual values on a 7-point desirability scale for 'defence' and 'healthcare'. The authors find the attraction effect in their first study, and that voters have naturally occurring asymmetric dominance patterns (in line with the attraction effect) that predict their vote choice. We address this study in further detail in Experiment 8 (Section 4.5, this chapter).

Since Pan et al. (1995), three large-scale reviews of the extant literature on the attraction effect (Huber et al., 2014) exploring the factors and situations determining when the attraction effect may (not) hold, some involving over 49 additional studies/replications and hundreds of choice scenarios (Frederick et al., 2014; Yang & Lynn, 2014), have been published; *none* involved context effects in political scenarios. This is surprising given the nature of politics and the multi-dimensional nature of the spatial model of voting; and we note we are not the only ones to ruminate over the possibility of their existence in how voters make decisions for candidates (in popular media: Vedantam, 2007).

Political parties often compete on a few key attributes (or 'policies') such as healthcare and education spending, and taxation levels etc., and there is well-documented evidence that parties 'position' themselves along the spectrum of issues as to be seen as a 'compromise' option (Warwick, 2009), or (dis)similar to other parties in the political space as to maximise vote share (Buckler & Dolowitz, 2012). Presuming that preferences for policies range along a spectrum of positions (or values) for each issue, and that voters perceive party positions along at least one of these issues spectrums, it stands to reason that voters who may trade-off between party options may be susceptible to context effects elicited by party positioning. For example, a voter preferring

⁴⁸ Kramer, H. (1992, October 12). Why Bush welcomes Perot. *Time*, p. 48.

increased healthcare spending while decreasing immigration may try to decide between Labour (increased healthcare spending, no change in immigration) and Conservatives (decreased healthcare spending, decreased immigration). The addition of a third party, for example the Green Party, who promise even greater healthcare spending and greater immigration (an ‘extreme’ option), may cause the Labour Party to appear as a ‘compromise’, increasing the Labour Party’s vote share.

Investigating these effects is especially of interest to majoritarian democracies where there are 2 or 3 main political parties to choose from, such as the UK and the USA; or in democracies where newer parties are emerging that seek to compete on a very limited policy platform with established parties. Context effects may provide an insight into what (if any) effect the Liberal Democrats, UKIP, or the Green Party may have on the decisions of voters determining between Labour and Conservatives in the UK. This is a timely question, as the Liberal Democrats (often see as a compromise between the two parties) are in electoral decline, whereas UKIP are seen as a similar party to the Conservatives (but more ‘right-wing’ on issues such as immigration, and more ‘left’ on healthcare^{49,50}) were the main alternative to Labour (national polling: 34%) and the Conservatives (34%) in the UK General Election 2015 (UKIP 12% vs. Lib Dem, 10%)^{51,52}. These are not idle questions. Figure 4.1 (replicated from YouGov, Footnote 3) shows the placement of the four main parties in December 2014 by the UK population on a Left-Right ideological scale, clearly showing spatial positions with potential for contextual preference reversals. Additionally, the self-placement of UK voting population on a simple Left-Right ideological spectrum (Figure 4.2) shows main parties own voters perceive themselves, with similar patterns.

⁴⁹ 71% of UKIP voters agreed with five leftwing ideological statements, far above the Conservatives (43%) or even the Liberal Democrats (65%). They are only a little behind Labour (81%). [British Election Study Internet Panel, 2014-15](#)

⁵⁰ “UKIP voters now put themselves to the left of Tories”, *YouGov*, December 2014.

⁵¹ [Pre-May 7th ‘Great Britain Final Call’ GE 2015 Poll](#), *YouGov*, May 6th.

⁵² Actual vote for UKIP was higher than forecast: UKIP (13%), Lib Dems (8%).

Where voters put the parties – and themselves – on a left-right scale

First, a representative sample of all GB adults was asked to place the political parties on a left right scale (darker coloured bar) Then, the individual parties' supporters were asked to place themselves on the same scale (lighter coloured bar).

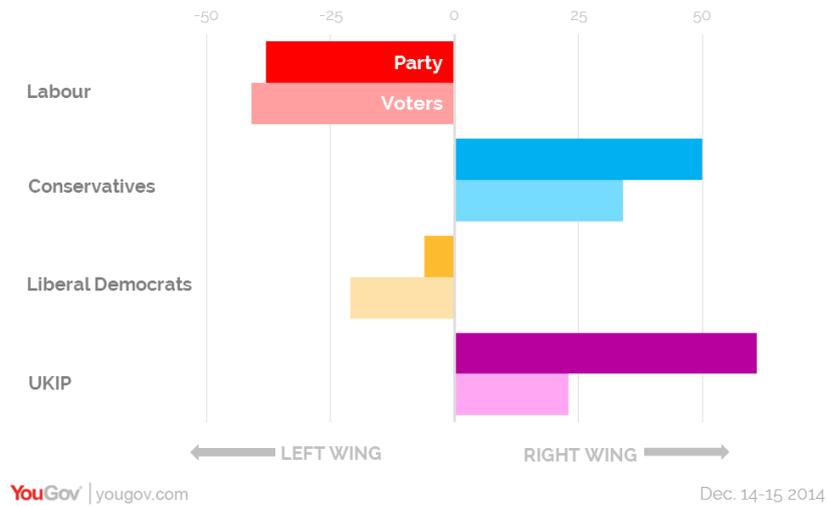


Figure 4.1: Placement of UK parties on Left-Right scale by GB population (darker bar).

The shifting composition of the parties

Respondents were asked to place themselves on a left-right scale ranging from "very left-wing" to "very right-wing". Average placements are shown.

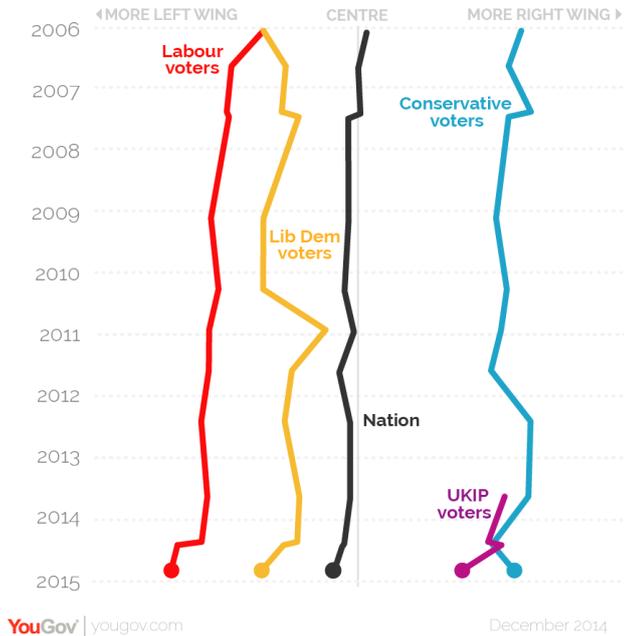


Figure 4.2: Average Lab/Con/Lib Dem/UKIP voter self-rating on Left-Right scale

In this chapter we seek to investigate if such ‘context effects’ can be replicated in the political domain. Experiment 5 examines all four of the (so-far) discovered context effects using realistic political scenarios and political materials; Experiment 6 explores all context effects in hypothetical political scenarios; Experiment 7 uses attribute ‘desirability’ to enable a more first-person approach to eliciting context effects; and Experiment

8 tests whether or not asymmetric preference structures, mirroring those of context effects, exist in the UK population, and whether they predict real-life voters' political vote preferences.

4.2. Experiment 5: Third-Person Context Effects in Political Scenarios

In this experiment we investigate if context effects occur when using realistic political attribute dimensions (e.g. education/healthcare spending) that members of the public would be familiar with. We adopted a similar method to Huber et al. (1982), which required participants to choose one option out of the presented choice set (options A, B, D/C/S) at an initial time-point, and then again out of a choice set containing just the target (e.g. option A) and the competitor (e.g. option B) two weeks later. In our experiment however, there is no 2-week delay, and participants choose again in the same experiment. We limit carry-over effects arising from participants realising the task is the same as previous by asking participants to predict the best choice between the options presented for two different hypothetical voters (different per context effect, for a total of eight scenarios). We ask participants to choose an option in the third-person, predicting what a hypothetical voter would choose, to limit participants' using their personal preferences for the realistic attributes. Participants are told what voters' preferences for the attributes are, that they were equally important to the voter, and to choose only on this information.

A note on the similarity effect is useful here. The similarity effect predicts a relative increase in the choice share for the non-targeted option (e.g. A), resulting from the targeting the other option (B) by a decoy (S), and can manifest in two ways. Suppose choice share for A & B is 50%:50%: A can increase choice share by gaining directly from B's loss (e.g. 70%:30%) when targeted by S_B , or A can increase share *relatively* by having B's share split between B and S_B (e.g. 50%:25%:25%). A choice for the decoy in the similarity condition is not an irrelevant choice, as it is better on one attribute dimension than B, and less on the other (unlike the decoy in the attraction effect).

We follow work by Noguchi & Stewart (2014), among others, in alternating which of the 'core' options in the choice set would be the target for the decoy (i.e. for half of participants A would be targeted by D_A , the other half B would be the target of D_B). Additionally, we follow Malkoc, Hedgcock, and Hoeffler (2013) in analysing our results in two ways: firstly, by comparing the choice proportions of the core set (A, B) to each expanded set (A, B, D_A/D_B) (as per Huber et al., 1982); and then by directly comparing the choice proportions

of the choice sets where the decoys target different options (e.g. A, B, D_A vs. A, B, D_B). This is a stronger test the hypothesis, as it takes the difference between the two conditions with decoy, making it harder to find a non-significant difference (Malkoc et al., 2013).

Our hypotheses are that we would observe each of the four ‘context effects’ following the addition of the appropriate ‘decoy’ option, namely:

H1: An *increase* in preference share for the targeted option in the ‘attraction effect’ condition.

H2: A *decrease* in preference share for the targeted option in the ‘similarity effect’ condition

H3: An *increase* in preference share for the targeted option in the ‘compromise effect’ condition.

H4: An *increase* in preference share for the targeted option in the ‘phantom effect’, despite the unavailability of a decoy option.

Methods

4.2.1. Participants

300 participants took part in an online study using Qualtrics, and recruited via the Prolific Academic⁵³ subject pool, in return for £0.80. All reported being born in the UK, resident in the UK at the time of the study, and with English as their primary language. Participants were aged 18-60 ($\mu= 30.14$, $SD= 9.34$), 63.3% of whom were female. 86.7% of participants identified as ‘White-British’. 28% of participants identified as working in the private sector, 27.7% were students, 17.3% in the public sector, 13.3% were self-employed, and 9.7% were unemployed; with the remained stating ‘None of the Above’.

4.2.2. Design

We utilized a mixed 2x3 (Decoy x Choice Set) between-within subjects design. The between subjects Decoy condition determined whether the decoy targeted either option A or option B respectively (i.e. D_A or D_B) in the expanded choice set. The within-subjects condition consisted of the ‘core’ set of options (A, B), or the expanded set (A, B, D_{1A}/D_{2B}), with the expanded set presented first (AB options are the same for all

⁵³ Prolific Academic. URL: <https://prolific.ac/>

conditions). Participants were then randomly presented with all 4 context effect scenarios (attraction, compromise, similarity, phantom) for each choice set, which are analysed separately.

4.2.3. Materials

Stimuli: For each ‘context effect’, we created 2 attributes on which participants would attempt to distinguish between 2 or 3 options, on behalf of the hypothetical ‘voters’. We used differing policies for the differing context effects to allow for effective within-subjects manipulation. All attributes and associated figures were chosen as to be as realistic as possible, based on current information in current affairs, and the top issues from political polling trackers⁵⁴. Our materials and stimuli are displayed in Table 1.

Table 4.1: Option stimuli for each attribute, per task (Experiment 1).

‘Voter’	Context Effect	Attribute(s)	A	B	D _A	D _B
Grace/Emily	<i>Attraction</i>	Healthcare Spend (£bns)	3	7	2.5	6.5
		Education Spend (£bns)	7	3	6.5	2.5
Olivia/Sophie	<i>Similarity</i>	Social Welfare Spend (£bns)	2	4	1.5	4.5
		Defence Spend (£bns)	4	2	4.5	1.5
Lily/Ella	<i>Compromise</i>	Greenhouse Gases Reduction (%)	50	30	70	10
		Top-Rate Income Tax (%)	30	50	10	70
Lucy/Laura	<i>Phantom</i>	Immigration Levels Reduction (%)	20	50	20	50
		Crime Level Reduction (%)	50	20	55	25

For convenience, we have shown the spatial positions of each of these options, per context effect, in Figures 4.3-4.7.

Scenarios: Participants were presented with scenarios containing 8 hypothetical voters (2 differing sets of 4 for each choice set), and a set of alternatives that varied on two attribute dimensions that the hypothetical voter had preferences on (‘issues’, e.g. healthcare, education). Participants were told the hypothetical voter(s) preferred higher levels of each attribute, except for the phantom effect scenarios where they were told that they *lower* levels of each (unlikely any ‘normal’ voter would want higher levels of crime).

Participants were told that the voter cared about each issue equally, had no preference for any one party, and were asked to predict the party the *voter* would choose given the voter’s stated preferences *only*. For example:

⁵⁴ “Issues 2 (Most important now + Most important your family) 2010 to 2015”. *YouGov*, 2015.

“[Grace/Emily] cares about spending on Healthcare (i.e. the NHS) and Education (i.e. schools, universities), and wants to support a party that will fund these areas as much as possible. Below are the stances of the three parties Grace is considering supporting... Which party do you think Grace will choose?” In the case of the phantom effect where the dominating alternative is unavailable, participants were told: “[Lucy/Laura] would also vote for Party [O], but they are not in her electoral area. Party O want to...” and given the choice out of the two available options presented.

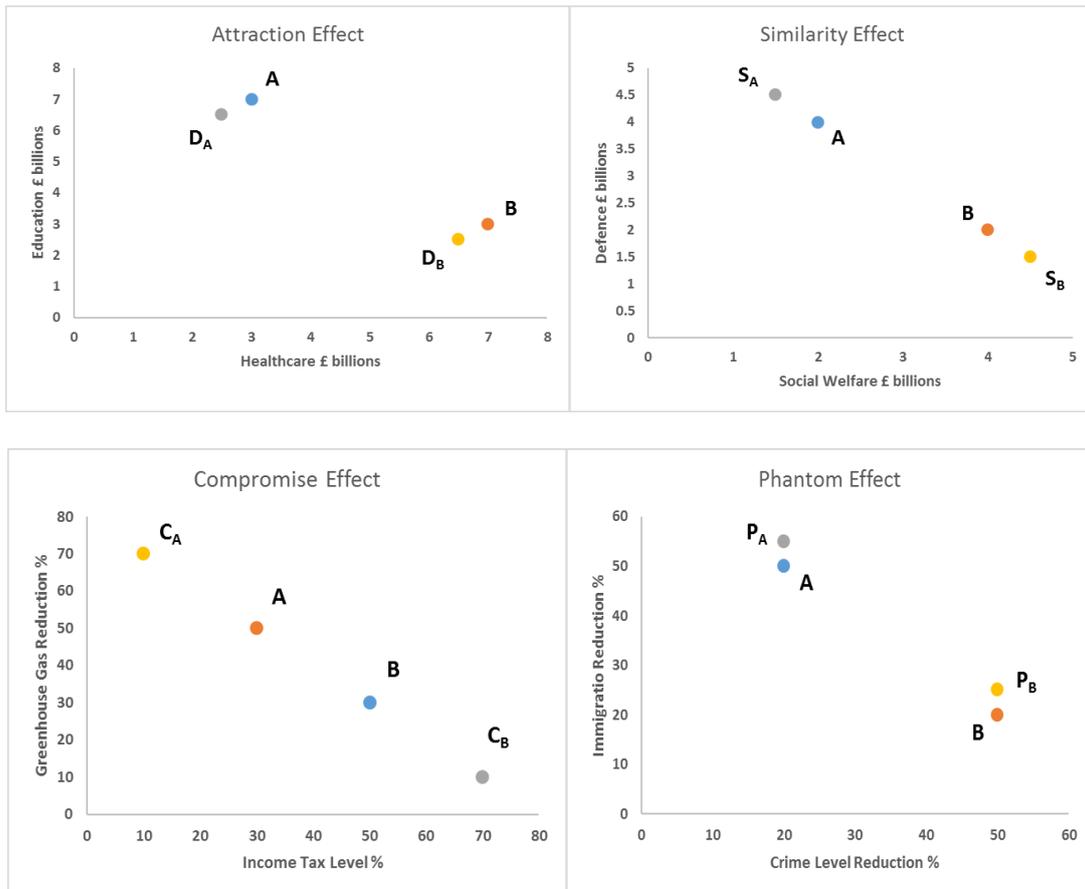


Figure 4.3-7: Option stimuli plotted for each context effect.

4.2.4. Procedure

Participants were self-selected through the online Prolific Academic subject pool, and screened by Prolific Academic as to ensure they meet the requirement criteria (i.e. born, and currently resident, in the UK). Participants are given a brief introduction & explanation of the study, and asked to indicate consent. Participants are asked to enter their age in years (e.g. ‘25’), and also their Prolific Academic ID for tracking purposes.

The experimental tasks were presented using the online Qualtrics survey software.

Participants are provided with an explanation of the task; to predict for a number of hypothetical ‘voters’ (e.g. ‘Grace’ or ‘Emily’) which was the best political party (choice option) for Grace/Emily to have chosen, based on 2 issues (attributes) presented to the participants that matter equally to the hypothetical voter. They are reminded to choose an option based on what the ‘voter’ would prefer, and *not* their own preferences.

Participants were randomly allocated to either the D_A or D_B conditions and then assigned to the expanded choice set, where they all four context effects ‘scenarios’ are randomly displayed. Participants are then asked to choose one of the 3 options available in each scenario. Upon completion, they then are assigned to the core set (AB), and all four context effects scenarios are randomly presented again, but for *different* voters, and participants asked to choose one of the 2 options available. We used this fixed order design in case carry-over effects from a fully randomised within-subjects manipulation affected our results; for instance, seeing the core set of AB may limit the effect of the introduced decoy in ABD_A (e.g. by simply defaulting to the initial choice); though we note choice repetition is not always proposed to limit context effects (Trueblood et al., 2013). As Malkoc et al. (2013) argue the strongest test of decoy effects comes from comparing the two expanded choice sets (ABD_A vs ABD_B), this design ensures participants will be as naïve as possible to our manipulation in the conditions that will provide the strongest test of any possible effects.

Upon completion, they are asked for demographic information (year of birth, gender, ethnicity, primary language, occupation), debriefed as to the nature of the task, and then forwarded to Prolific Academic for automatic payment.

Prior to analysis, a simple attention check was conducted by matching the reported year of birth to reported age in years. Those with consistent ages were deemed as passing the attention check.

4.2.5. Results

None of our participants failed an attention check, nor failed to meet the requirements of the study, leaving a total sample size of 300.

As mentioned in the introduction to this experiment, we analyse each context effect in two ways. First, we analyse the choice proportions between the two expanded choice sets where the decoy targets differing options (i.e. D_A vs D_B) without removing any participants.

Secondly, we remove those participants who choose the decoy in the expanded set, and directly comparing the pattern of choices made between the core options (AB) between the expanded and core choice sets for each context effect (Huber, 1982)⁵⁵. We would expect, for example, when the decoy (D_A) targets A in the attraction effect, choice share for A will increase; whereas if the decoy (D_B) targets B, choice share for B will increase.

4.4.5.1. Attraction Effect

For the attraction effect, we would expect to see an *increase* in the proportions of those choosing the target following the addition of the relevant decoy (D_A/D_B), and we would expect to still observe these differences when the decoy is removed. The choice proportions for the attraction effect are shown in Table 4.2.

Table 4.2: Choice Proportions for the Attraction Effect, per condition. Total counts in parentheses.

Option \ Condition	AB	ABD _A	ABD _B
A	19.8% (54)	25.3% (38)	17.3% (26)
B	80.2% (219)	66.7% (100)	72.7% (109)
Decoy	-	8.0% (12)	10% (15)
Total	273	150	150

D_A vs D_B : A chi-square analysis between the D_A and D_B conditions shows no significant difference in choice proportions between the two groups, $\chi^2(2, 300) = 2.97, p = .226, \phi_v = .10$. The pattern of results is in the expected direction for the attraction effect; option A's choice share increases when targeted by D_A (17.3% \rightarrow 25.3%), as does option B when targeted by D_B (66.7% \rightarrow 72.7%). The results remain non-significant when the decoy option is removed from the chi-square analysis ($p = .107$).

We note the overall preference for option B, and comment on this in the Discussion.

Core vs D_A/D_B : We compared the choice proportions between the Core and the D_A/D_B conditions separately, with those choosing the decoy removed ($N=27$). This tests the direct gain the target receives at the expense of the competitor following the addition of the decoy.

26.1% of participants chose A in the core set, increasing to 27.5% in the expanded set with D_A . This increase is in line with the attraction effect. However, a McNemar's test for changes in choice proportions between the

⁵⁵ We note that in Huber et al. (1982) they compared in two tests; firstly, those participants who did not choose the decoy; and secondly, they merged the competitor and decoy groups and compared switching to/from the target. We feel Malkoc et al. (2013) make a strong case for comparing D_A vs D_B , and Huber himself uses the exclusion method in later studies.

Core and D_A was non-significant, $p = .856$, with a net gain of 2 for the target (A) following the addition of the decoy at the expense of the competitor (B).

86.7% chose B in the core set, with a decrease to 80.7% when the D_B decoy was present; opposite to what was expected. A McNemar's test for Core vs D_B was also non-significant, $p = .152$, with a net loss of 8 for the target (B) following the addition of the decoy.

4.4.5.2. Similarity Effect

For the similarity effect, we would expect to see a relative *increase* in the proportions of the non-targeted option, following the addition of the relevant decoy (S_A/S_B). The choice proportions for the similarity effect are shown in Table 4.3.

Table 4.3: Choice Proportions for the Similarity Effect, per condition

Option \ Condition	AB	ABS _A	ABS _B
A	17.8% (48)	14.7% (22)	12% (18)
B	82.2% (222)	80% (120)	73.3% (110)
Decoy	-	5.3% (8)	14.7% (22)
Total	270	150	150

S_A vs S_B: A chi-square analysis between the S_A and S_B conditions shows a significant difference in choice proportions between the two groups, $\chi^2(2, 300) = 7.37, p = .025, \phi_v = .16$. The pattern of results is somewhat in the expected direction for the similarity effect; option A's choice share is higher when targeted by S_A (14.7% vs 12%), whereas option B's choice share decreases when targeted by S_B (80.0% -> 73.3%). The decoy's choice share increases when targeting option B in the S_B condition (5.3% -> 14.7%). The results become non-significant when the decoy option is removed from the chi-square analysis, $\chi^2(1, 270) = .109, p = .741, \phi_v = .02$, suggesting the effect is driven mostly by increased share for the similar decoy(s)- rather than direct gains by the competitor(s).

Core vs S_A/S_B: We compared the choice proportions between the Core and the S_A/S_B conditions separately, with those choosing the decoy removed (N= 30). This tests the direct loss the target has to the competitor following the addition of the decoy.

Relative share for the competitor (B) increased from the core set when A was targeted by S_A (83.1% -> 84.5%) - in line with the similarity effect. A McNemar's test for changes in choice proportions between the Core and S_A was non-significant, $p = .832$, with a net loss of 2 for the target (A) following the addition of the similarity decoy S_A .

Relative share for the competitor (A) decreased from the core set when B was targeted by S_B (18.8% -> 14.1%), opposite to predictions for the similarity effect. A McNemar's test for Core vs S_B was also non-significant, $p = .312$, with a net gain of 6 for the target (B) following the addition of the similarity decoy S_B .

4.4.5.3. Compromise Effect

For the compromise effect, we would expect to see an *increase* in the proportions of those choosing the target following the addition of the relevant decoy (C_A/C_B). The choice proportions for the compromise effect are shown in Table 4.4.

Table 4.4: Choice Proportions for the Compromise Effect, per condition

Option Condition	AB	ABC_A	ABC_B
A	51.3% (135)	42% (63)	42% (63)
B	48.7% (128)	38% (57)	53.3% (80)
Decoy	-	20% (30)	4.7% (7)
Total	263	150	150

C_{1A} vs C_{2B} : A chi-square analysis between the C_A and C_B conditions shows a significant difference in choice proportions between the two groups, $\chi^2(2, 300) = 18.16$, $p < .001$, $\phi_v = .246$. The pattern of results is somewhat in the expected direction for the compromise effect; option A's choice share is unchanged when targeted by C_A (42% -> 42%); whereas option B's choice share increases when targeted by C_B (38.0% -> 53.3%). The decoy's choice share decreases from C_A to C_B (20% -> 4.7%).

The relative choice proportions are in line with those expected by a compromise effect; A (52.5% -> 44.1%) comparing C_A to C_B , with a corresponding increase in the choice share for B (47.5% -> 55.9%). However, the results are non-significant when the decoy option is removed from the chi-square analysis, $\chi^2(1, 263) = .109$, $p = .172$, $\phi_v = .084$.

Core vs C_A/C_B: We compared the choice proportions between the Core and the C_A/C_B, with those choosing the decoy removed (N=37). We would expect the target’s share to increase at the expense of the competitor when the decoy is present.

Share for the target (A) increased from the core set when targeted by C_A (48.3% -> 52.5%) – in line with the compromise effect. A McNemar’s test for changes in choice proportions between the Core and C_A was non-significant, $p = .473$, with a net gain of 5 for the target (A) following the addition of C_A.

Share for the target (B) increased from the core set when targeted by C_B (46.2% -> 55.9%) – in line with the compromise effect. A McNemar’s test for Core vs C_B was marginally non-significant, $p = .059$ with a net gain of 14 for the target (B) following the addition of C_B.

4.4.5.4. Phantom Effect

As per the phantom effect, there is no actual decoy option included in the choice set for participants to choose, therefore we analyse the differences between the target/competitor between and within groups. We expect an increase in the share for the target following the depiction of an unavailable decoy (P). The choice proportions for the phantom effect are shown in Table 4.5.

Table 4.5: Choice Proportions for the Phantom Effect, per condition

Option	AB	ABP_A	ABP_B
Condition			
A	55% (165)	74% (111)	27.3% (41)
B	45% (135)	26% (39)	72.7% (109)
Decoy	-	-	-
Total	300	150	150

P_A vs P_B: The pattern of results is in the expected direction for the phantom effect; option A’s choice share increases when targeted by P_A (27.3% -> 74%); whereas option B’s choice share increases when targeted by P_B (26.0% -> 72.7%). A chi-square analysis between the P_A and P_B conditions shows a significant difference in choice proportions between the two groups, $\chi^2(2, 300) = 65.35, p < .001, \phi_v = .467$.

Core vs P_A/P_B: Share for the target (A) increased from the core set when P_A was introduced (60.7% -> 74.0%) – in line with the phantom effect. A McNemar’s test for changes in choice proportions between the Core and P_A was significant, $p = .005$, with a net gain of 20 for the target (A).

Share for the target (B) increased from the core set when P_B was introduced (50.7% \rightarrow 72.7%) – in line with the phantom effect. A McNemar's test for Core vs P_B was also significant, $p < .001$ with a net gain of 33 for the target (B).

4.4.5.5. Summary

We found no significant results for the attraction effect either between (D_A vs D_B) or within-subjects (Core vs D_A/D_B). Looking between-subjects (our stronger test for an effect), the pattern of results was in line with those expected for an attraction effect (target share increases). Looking within-subjects, when A was targeted results were in line with an attraction effect, but non-significant; whereas when B was targeted the results were in the opposite direction to what would be expected.

We did find significant results for the similarity effect comparing between the decoy (S_A vs S_B) groups, however effects largely disappear when comparing the AB options after the decoy was removed. This suggests that the similarity effect here results from participants choosing the decoy(s) (a legitimate choice, as outlined in Section 4.2), rather than the non-targeted option. Looking within-subjects, when A was targeted relative share for the competitor (B) increased, in line with a similarity effect; while the opposite was observed when B was targeted (share for A decreased).

For the compromise effect, we find a significant effect comparing between-groups (C_A vs C_B), but not when we remove the decoy; though the pattern of results for the remaining AB options are consistent with those expected for a compromise effect. This is likely due to participants choosing the C_A option at the expense of B (A was unchanged). Looking within-subjects, we find the results for either targeted option (A or B) in line with those expected in a compromise effect, but only the share for B in Core vs C_B neared significance ($p = .059$).

Significant results for the phantom effects in the predicted directions were observed with between groups (P_A vs P_B), and within-subjects (Core vs. P_A/P_B). Despite the dominating decoy's unavailability, participants chose the dominated available decoy at higher rates when informed of the unavailable alternative.

4.4.6. Discussion

We discuss each of our hypotheses in relation to each context effect separately below. We found no support for our first hypothesis (H1) pertaining to the *attraction effect*;

H1: *An increase in preference share for the targeted option in the 'attraction effect' condition.*

While our results, both between and within-subjects, were non-significant, we observe pattern of results between D_A and D_B groups are in the predicted direction as expected for an attraction effect, with the target increasing share when the inferior decoy is present (A: 25.3% \rightarrow 17.3%, B: 66.7% \rightarrow 72.7%). Removing the decoys and comparing directly the share for A and B between these groups does improve significance ($p=.109$) with the results in the expected direction. The lack of a significant finding is somewhat surprising, as of all the context effects, the attraction effect is considered the most documented and discussed in the consumer psychology literature; with numerous studies showing these effects (Doyle et al. 1999; Trueblood et al. 2013) regardless of the 'domain' examined (cf. Frederick, Lee, & Baskin, 2014). While it would be remiss of us to ignore the trend for increasing participant sizes generally in these studies (e.g. see Frederick et al., 2014), we do not think lack of power is an explanation. The mean effect size reported in Heath and Chatterjee's (1995) meta-analysis for the attraction effect is a 11.4% share shift (Binomial test $p < .001$), which corresponds to an *a priori* sample size of 390, while setting $\alpha = .05$ (power = .95) as per Yang and Lynn (2014) results in a sample size of 208 required. As we have 300 participants in our sample, this does not seem a major factor- though we note our share changes are slightly less than the 11.4% mean effect size, so it cannot be ruled out.

A more probable explanation lies in participants' prior preferences for our real-world attributes. A large number of participants choose the 'B' option in both conditions (209 out of 300), the commonality being that option B is highest on the 'healthcare spending' attribute (£7billion vs. £3 billion), while it is lowest on 'education spending' (£3 billion vs. £7billion). Considering our participant sample is made up of 27% students, this could be considered surprising as the traditional view of students' political choices around education (in particular the UK) would be to increase education spending (on its own merits, or as a view to limiting tuition fee contributions). Our research took place against a backdrop of large decreases in funding to the higher

education budgets by the then Conservative-Liberal Democrat government in 2010⁵⁶, with a trebling of higher-level tuition fees for students⁵⁷, and decreases in maintenance grants/supports.

It is likely this had become less of a dominant concern by the time of the experiment's data collection phase (mid-2015), when current headlines in the British media were reporting that the National Health Service (NHS) was 'in need of £8 billion in funding', and was a significant election issue in the run up to the 2015 General Election in 2015⁵⁸. Our sample's mean age is 30 years old, and 73% are *not* students with 17% self-reporting as public-sector workers, typically the demographics more likely to care about healthcare and current affairs generally, it does not seem a stretch of the imagination to assume that real-world influences are the cause of the overwhelming preference for option B.

We do ask participants to choose what a hypothetical voter who cares equally about the issues would pick, but whether participants are choosing based on their own preferences, or predicting what another would do (substituting their own preferences in lieu of more information about the imaginary voter), or choosing the subjectively 'best option' for an unknown other (e.g. believing such a voter would prefer/ benefit from greater NHS funding) is unclear. Yet, they all can lead to the same skewed preference. This is supported by Huber et al. (2014) who state if "*a decision maker has clear prior preferences between the target and the competitor, the effect of adding an undesired decoy will be muted.*" (p. 522). Indeed, there is a long tradition of 'leakage' of real-world concerns into experiments, for example: 'belief bias' (Evans, Barston, & Pollard, 1983; Newstead, Pollard, Evens, & Allen, 1993); and in studies on the role of memory accessibility in exaggerating risks, even when risk information is explicitly available (Kusev, van Schaik, Ayton, Dent, & Chater, 2009).

On a positive note, while irksome for research purposes, it is somewhat relieving that given the high importance real-world voters in the UK place on healthcare (42-50% of voters consistently say it is "*the most important issue facing the country at this time*", YouGov, 2015) that the addition of an irrelevant decoy does not significantly affect their preference for option B.

⁵⁶ "Universities alarmed by 40% cut to teaching budgets" *The Guardian*. 20th October 2010.

⁵⁷ "Tuition fees vote: Plans approved despite rebellion", *BBC*. 9th December 2010.

⁵⁸ "NHS needs £8 bn funding boost and 'major reforms' says health chief". *The Telegraph*. 23rd Oct 2014.

H2: *A decrease in preference share for the targeted option in the ‘similarity effect’ condition, with an increase in the competitor and/or the decoy*

We found support for H2 when comparing between groups, with the target losing relative choice share to the competitor and decoy. However, when you remove the decoy from analysis these effects disappear, suggesting they are mostly driven by the choice share gain by the decoy and less-so by the direct loss from the target to its competitor. This in itself is not an issue for the similarity effect *per se*, as choosing the decoy (which is marginally better on one attribute, but worse on the other) is a legitimate choice. Comparing with the core AB set, we see the trends in the predicted directions when A is targeted by the decoy (loss of relative share); but the opposite when B is targeted by the decoy relative to the core AB set (gain of relative share).

Again, despite telling participants that they should choose based on the hypothetical voters presented, it could be that they were basing the decision on their own preferences. Unlike the attraction effect, the decoy in the similarity effect is not ‘irrelevant’. 73.3%-80% of participants consistently preferred the B option which was highest on ‘social welfare’ spending, with 14.7% choosing the S_B decoy (S_A: 6.3%) when it was highest on the social welfare attribute. Our participant sample (majority female, young, university educated, student/public sector) can be considered typical of the voter profile that would be pro-welfare spending based on political research worldwide (Armingeon, 2004, Esping-Andersen, 1999). Participants may be expressing their viewpoint on social welfare, ignoring the task demands.

Alternatively, participants might be using stereotypic information to infer additional information about the hypothetical voters, who were both given female names. There is research to suggest that women are more likely to support traditionally left-wing/socially liberal political parties (Bonoli, 2005; Esping-Andersen, 1999), greater likelihood for females to support social welfare policies over males (Blekesaune & Quadagno, 2003), and a psychological stereotype that they will as both candidates (Huddy & Terkildsen 1993; Swers, 2002, p. 5-6) and therefore as voters.

H3: *An increase in preference share for the targeted option in the ‘compromise effect’ condition.*

We find support for the compromise effect. Comparing the expanded choice sets, relative choice share for the target increases when the decoy is in the choice set, and the pattern of results change depending on which is targeted. Looking within-subjects, we see the expected pattern of results, share for A increases when it is

the target, and the same when B is the target. However, these differences are non-significant, suggesting the effect is driven by the change in preference for the decoy (20% \rightarrow 7%; $C_A \rightarrow C_B$), and that the within-subjects analysis is a weak test of the effect.

Again, preference asymmetry may be a cause. Decoy C_A is highest on ‘reducing greenhouse gas emissions’ (GGEs) (70%) and lowest on the ‘top-rate of income tax’ (10%); while decoy C_B is highest on ‘top-rate of income tax rate’ (70%), and lowest on reducing GGEs (10%). As our hypothetical voter is said to prefer higher levels of both tax and reductions in GGEs and both were equally preferred, neither option should have an overall advantage. Yet, if participants are ignoring task demands, then the low-tax, eco-friendly option (C_A) could be seen as more appealing as people likely attempt to maximize personal benefit (economic, and sustainable environment) for the voter, compared to the relatively high-tax, less eco-friendly option (C_B). That we don’t see an overwhelming preference for C_A would suggest that, in general, participants are following the task demands and not ignoring them.

In the context of the British electoral landscape, the higher rate of income tax rate is 40% (as of May 2016), with the highest rate for those earning over £150,000 reduced from 50% to 45% during the 2010-2015 Conservative-Liberal Democrat government. Participants may be generally unwilling to support a higher rate of income tax, as they are aware of the historical downward trend. It may only be that the introduction of an option (C_B) that is ‘extreme’ on the dimension of income tax (70%) may cause them to see option B as a compromise on this dimension. Of all the attraction, similarity, and compromise effects, this scenario was the only one at near-significance ($\alpha = .05$) when directly comparing the core sets within-subjects, suggesting it was an effective manipulation for eliciting a compromise effect.

H4: An *increase* in preference share for the targeted option in the ‘phantom effect’, despite the unavailability of a decoy option.

We find strong support for the phantom effect, with all our analyses (between, and within) showing that the mention of an unavailable alternative had the effect of increasing preference for the targeted (dominated) option. Phantom effects represent a unique problem for models of political choice; ‘sincere voting’ assumes that voters will choose the alternative that is most preferred, while ‘correct voting’ assumes voters will choose the alternative most preferred (or confer highest utility) given some constraints (i.e. availability). However,

both presume that voters' actual preferences (i.e. between candidate A or B) are not affected by unavailable alternatives, while our results show that they can be. How then to reconcile this with correct voting: is the 'correct voice' that made with(out) knowledge of 'better' alternatives outside of the decision-task at hand? It is easy to dismiss these phantom scenarios as unlikely to occur in reality, in that only 2 political parties/candidates exist or contest an election while better alternatives are known but unavailable. The USA is a possible example, where Obama might be considered a better alternative to the US Presidential Democratic-Republican contest between Hilary Clinton and Donald Trump, but cannot run for a third term as President.

Overall, 'context effects' have strong parallels with the idea that participants ultimately narrow their options down to two main alternatives (Chapter 3) comparing them on differing attributes (Noguchi & Stewart, 2014) while remaining aware of other options that exist in the choice set. For example, the Labour and Green parties are often considered the main dyadic choices for those on the 'left', with Conservatives and UKIP on the 'right'. In either case, one may be aware of the Liberal Democrats and their stances on an issue, causing changes in preference for the other two alternatives along that issue dimension. For example, in the scenario that used 'immigration' and 'crime' one could easily imagine a voter oscillating between the Conservatives (considered 'tough on crime') and UKIP ('tough on immigration'), who becomes aware of the British Nationalist Party's (BNP) or Britain First's position⁵⁹ on anti-immigration, increasing relative share for Conservatives by splitting the UKIP share.

In summary, we observe support for the similarity, compromise, and phantom effects; with non-significant results for the attraction effect that mostly trend in the correct direction. That we are aware of, we are the only researcher besides Pan et al. (1995) to examine the attraction effect in political domains; and the first to explore the similarity, compromise, and phantom effects. We have raised possible influences on our results arising from the use of real-world political attributes and voters' own preferences for these, rather than weighting them equally, and we address these in Experiment 6.

⁵⁹ Owing to their views, party size, and geo-political distribution of their supporters, the BNP and BF field candidates for election in relatively few constituencies; whereas voter salience of them is relatively prominent due to media coverage (see national coverage during May 2016). In the London 2016 Mayoral Election, BF received 105,225 combined 1st & 2nd preferences (8th place out of 12), more than the BNP (49, 493).

4.3. Experiment 6: Context Effects in Fictional Political Scenarios

One of the main issues arising out of Experiment 5 was the possible effect of real-life political knowledge on participants' choices, even when asked to make them for hypothetical voters who cared about issues equally. For example, in the attraction effect scenario, the majority of participants (209 of 300) chose the option that maximized healthcare spending, despite being told that the hypothetical voter valued each attribute equally. This is likely due to the context in which the study took place, with headlines in the British media at the time reporting that the National Health Service (NHS) was 'in need of £8 billion in funding'.

Therefore, we decided to run an experiment fully abstracting the task scenarios to fictional decisions between fictional parties on fictional attributes. This was to remove as much as possible the possibility of participants having strong prior biases towards or against parties they think might represent 'real world' parties, and to minimise participants use of their own preferences for real-world policy attributes (e.g. taxes, healthcare, etc.).

To do this we created an overall scenario whereby the participant took the role of an 'inter-galactic observer' of different 'planets in the galaxy', who were having democratic elections between 2 or 3 parties. Participants were tasked with predicting what party the native inhabitants (or 'citizens') might elect.

We replicated the format of Experiment 5, where we created 4 conditions relating each of the 4 'context effects'; attraction, similarity, compromise, and phantom; and participants took part in each one. Unlike Experiment 5, we used a fully between-subjects design to assign participants to one of 3 differing choice sets, containing either 2 or 3 available options ('parties'), with the decoy counterbalanced to target each option (A or B).

As per Experiment 5, we hypothesised that we would observe the expected pattern of results for each 'context effect', namely:

H1: In the 'attraction effect', an increase in the choice share for the target following the addition of a dominated decoy.

H2: In the 'similarity effect', a decrease in the choice share for the target following the addition of an asymmetrically dominating decoy.

H3: In the ‘compromise effect’, an increase in the choice share for the target following the addition of an extreme but equal-value decoy.

H4: In the ‘phantom effect’, an increase in the choice share for the target following the addition of a dominating, but unavailable, decoy.

Methods

4.3.1. Participants

296 participants took part in the experiment online via Amazon Turk in return for \$0.25. Participants’ age ranged from 18-73 years ($\mu=36.15$ years $SD=12.35$); 53% were male, 47% were female, with 98.3% of participants reporting English as their primary or native language. 34.8% of participants were employed in the private sector, 20.9% in the public sector, 16.9% were self-employed, 12.8% unemployed and 10.5% were students; the remainder reported ‘Didn’t Know’ or ‘None of the above’. 66.6% participants identified as ‘White- European/American’, 4.4% as ‘White-Other’, 7.8% as ‘Black- African/American’, 6.4% as ‘Hispanic’, and the remainder as Asian or ‘Mixed Heritage’.

4.3.2. Design

We used a 4x3 between-subjects design (Context Effect) x (Choice Set). ‘Context Effect’ had 4 conditions: attraction, similarity, compromise, and phantom; corresponding to each type of ‘context effect’ under examination. Each participant completed all four of the Context Effect conditions. ‘Choice Set’ had 3 groups: Group 1(AB), Group 2 (ABD_A), and Group 3 (ABD_B); where D_A always targets option A, and D_B targets B.

4.3.3. Materials

Scenarios: In order to remove possible confounds as suspected from Experiment 5, such as the weighting of familiar or preferred attributes which prevents participants from treating attributes as equal, we created 4 hypothetical alien planets; each with their own political parties and ‘alien’ policies (attributes). For example, on ‘Planet Zog’ the *Zogonians*’ main issues were ‘zogabong’ production and ‘space exploration’.

We created 4 separate scenarios for each planet, where a hypothetical alien voter is trying to decide between the various parties on the relevant attribute dimensions. Participants are told voters equally prefer each of the attributes, and have no prior preference for any of the parties. Participants are told the direction of preference

each hypothetical alien voter has for each attribute. In the attraction, similarity and compromise conditions, the scenario makes clear that higher levels of each attribute is preferred. In the phantom effect, lower costs of ‘strawberry jelly’ in a fictional currency (‘Quixel credits’) are preferred, while higher ‘workforce places’ are preferred. Participants are reminded to judge only on the information in the scenario and then asked to predict which party the alien voter would choose (as per Experiment 5).

Stimuli: We generated 12 fictional parties (‘Zub’, ‘Axo’, etc.) that inhabit 4 fictional planets in the galaxy and 8 fictional planetary issues that the parties differ on (Table 4.6). ‘Zongabong’ production is measured in units of ‘millions’, and ‘atmospheric pollutants’ is measured in units of ‘parts per million’. We invented two fictional currencies to be the units for two of the attributes: ‘Kong Dollars’ (₩), and ‘Quixel credits’.

Table 4.6: Planetary Scenarios; attribute values per options per condition.

Planet 'Zog' (Attraction)				
Attributes	Zub (A)	Axo (B)	Xram (D_A)	Xram (D_B)
<i>Zogabong Production (units)</i>	60	30	50	20
<i>Space Exploration (% increase)</i>	30	60	20	50
Planet 'Slub' (Similarity)				
	Voron (A)	Grebulon (B)	Tantos (S_A)	Tantos (S_B)
<i>Free Water (litres)</i>	600	250	650	300
<i>Atmospheric Pollutants (ppm)</i>	250	600	200	550
Planet 'Kong' (Compromise)				
	Zargo (A)	Betelge (B)	Mittel (C_A)	Mittel (C_B)
<i>Furble Production (% increase)</i>	40	60	20	80
<i>Galactic Foreign Aid (₩ dollars)</i>	60	40	80	20
Planet 'Quix' (Phantom)				
	Zumba (A)	Arcturia (B)	Krak (P_A)	Krak (P_B)
<i>Strawberry Jelly Cost ('Quixels')</i>	50	80	50	80
<i>Workforce places (0,000s)</i>	500	800	550	850

The stimuli sets for each condition are presented graphically in Figures 4.8-11.

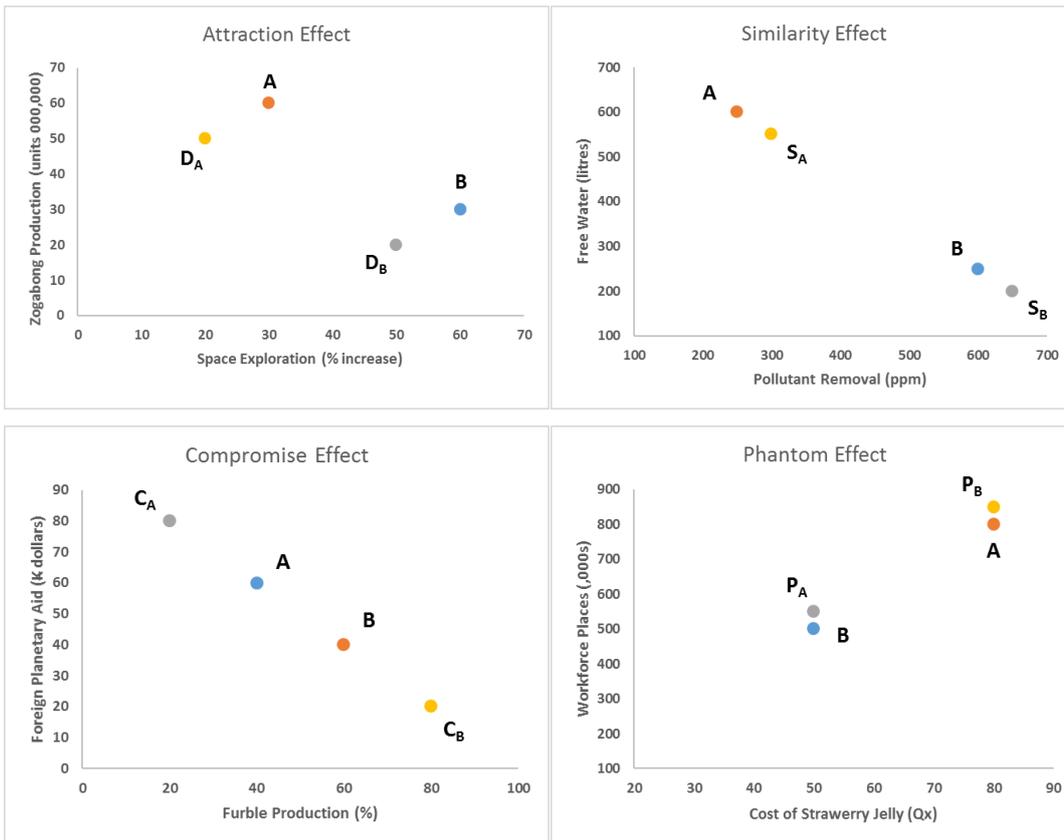


Figure 4.8-11: Option positions per context effect scenario.

4.3.4. Procedure

Participants signed up for the study via Amazon MTurk, and conducted the experiment via the online survey software ‘Qualtrics’. Participants were given information on the nature of the experiment, and the type of data that would be collected, and asked to provide consent via a web-form.

Upon consenting participants were given detailed task instructions, and told that they would be predicting what party citizens of various planets would be voting for, based on their preferences for 2 equally important and equally preferred attributes held by the ‘planetary citizens’.

Participants were randomly assigned to one of the 4 Context Effect conditions, and further randomly assigned to one of the 3 Choice Sets. They were presented with a fictional scenario about the planet and its inhabitants, what two attributes differentiated the parties from each other, and what the planetary inhabitants preferred for those attributes (higher or lower amounts). Participants were then asked to choose which option they thought the citizens of that planet would vote for. Upon indicating a choice, participants were re-assigned randomly into another context effect and choice set, until all four had been presented.

For example, for those assigned to the attraction effect condition, participants are told ‘Zogabongs’ are an important resource to have in order to fuel homes, and that Zogonians are eager to fund space exploration to seek out resources in space. Participants are told Zogonians care about each issue exactly the same amount, and to predict what the Zogonians would choose, based only on what is presented. Participants are then asked “Who would a Zogonian choose”: the ‘Zub’ (A), ‘Axo’ (B), or ‘Xram’ (D_A/D_B) party? Upon choosing, participants are randomly assigned to different context effect scenario.

Following the completion of the main part of the study, participants were asked to provide demographic information, and enter in their Amazon mTurk code for verification and payment, and were then debriefed as to the purpose of the study.

We constructed a simple attention check for participants, by asking them to provide their age in years at the beginning of the study and choosing their date of birth at the end in the demographics questionnaire. Consistent answers were deemed as having passed the attention check.

4.3.5. Results

8 participants failed the attention check and were excluded from further analysis. For analysis, we compare the choice-proportions for each decoy choice set (eg. D_A vs D_B) to each other, which is considered a more robust test for changes resulting from the addition of a decoy (Malkoc et al, 2013). We also compare the difference in relative choice proportions for those choosing A/ B from the Core Set to the counterbalanced Decoy choice-sets (e.g. AB D_A, ABD_B).

4.4.5.1. Attraction Effect

Planet Zog: The change in relative choice-share proportions between D_A and D_B was significant, $\chi^2(2, 194)=6.135, p=.047, \phi_v=.178$. We examined the difference in choice-share for A and B between the D_A and D_B conditions without those choosing the decoy, which was significant, $\chi^2(1, 164)=4.158, p=.041, \phi_v=.159$. We observed a decrease in choice share for A (target to competitor; 67.5% -> 51.9%) between the D_A and D_B, with a corresponding increase for B (competitor to target; 32.5% -> 48.1%).

There was no significant change in choice-share for the Decoy between D_A and D_B (11.7% vs 19%), $p=.50$. We report the figures below in Table 4.7.

Table 4.7: Attraction Effect; Options per choice-set condition, total counts and percentages.

Planet 'Zog' (Attraction)				
Option	Condition	AB_(Core)	ABD_A	ABD_B
	A	54.9% (56)	59.6% (56)	42% (42)
	B	45.1% (46)	28.7% (27)	39% (39)
	Decoy	-	11.7% (11)	19% (19)
	Total	102	94	100

A chi-square test of independence was carried out on the difference in relative choice-share proportions for the target (A) in the Core vs D_A condition (54.9% vs 67.5%), which was non-significant, $\chi^2(1, 185)= 3.026$, $p= .08$, $\phi_v=.128$; and the target (B) for Core vs D_B condition (45.1% vs 48%), which was non-significant, $\chi^2(1, 183)= .169$, $p= .681$, $\phi_v=0.03$.

4.4.5.2. Similarity Effect

Planet Slub: The changes in proportions between S_A and S_B were significant, $\chi^2(2, 195)= 33.42$, $p< .001$, $\phi_v=.414$; with the Decoy preferred more in ABS_A than ABS_B (21.65 vs. 59.2%; $p< .05$). Directly comparing choices in the S_A and S_B conditions without the decoy, we find a significant difference in the overall choice-share proportions, $\chi^2(2, 116)= 5.46$, $p= .02$, $\phi_v=.217$. When A is targeted by S_A, it loses relative share compared to when S_B is the target (44.7% -> 67.5%); while B loses relative share when it is targeted by S_B (55.3% -> 32.5%; competitor to target). These results are in line with those predicted for the similarity effect. Figures are in Table 4.8.

Table 4.8: Similarity Effect; Options per choice-set condition, total counts and percentages.

Planet 'Slub' (Similarity)				
Option	Condition	AB_(Core)	ABS_A	ABS_B
	A	50 (49.5%)	34 (35.1%)	27 (27.6%)
	B	51 (50.5%)	42 (43.3%)	13 (13.3%)
	Decoy	-	21 (21.6%)	58 (59.2%)
	Total	101	97	98

When analysing the difference in relative choice-share from Core to S_A we observed a non-significant decrease in the choice share for the target as predicted (49.5% to 44.7%), $\chi^2(1, 177)= .395$, $p= .529$, $\phi_v=.047$;

and a decrease in target share from Core to S_B (50.5% -> 32.5%) that approached significance, $\chi^2(1, 141)=3.743, p=.053$ ($p=.039$, one-sided), $\phi_v=.163$.

4.4.5.3. Compromise Effect

Planet Kong: Differences between C_A and C_B conditions were significant, $\chi^2(2, 198)=9.45, p=.009, \phi_v=.218$. Choice share for A when targeted by C_A is 25% compared to competitor B (60%); whereas choice share for B when targeted by C_B is 38.8% compared to competitor A (33.7%). These results are not in line with those expected by a compromise effect (i.e., an increase in the share for the targeted option)

Analysing the difference in relative choice share for AB between C_A and C_B without decoys, we find a significant change overall; with A increasing share from 29.4% to 46.5% (target -> competitor) and B decreasing from 70.6% to 53.5% (competitor -> target); $\chi^2(2, 156)=4.825, p=.028, \phi_v=.176$. Again, the opposite trend for a compromise effect.

The difference in choice-share proportions for the target in the Core vs C_A conditions (30.6% vs 29.4%) was non-significant, $\chi^2(1, 183)=.031, p=.86, \phi_v=.013$; and Core vs C_B conditions (69.4% vs 53.5%) was significant, $\chi^2(1, 169)=4.433, p=.035, \phi_v=.162$. Figures are in Table 5.

Table 4.9: Compromise Effect; Options per choice-set condition, total counts and percentages.

Planet 'Kong' (Compromise)			
Option	AB _(Core)	ABC _A	ABC _B
Condition			
A	30 (30.6%)	25 (25%)	33 (33.7%)
B	68 (69.4%)	60 (60%)	38 (38.8%)
Decoy	-	15 (15%)	27 (27.6%)
Total	98	100	98

We note the consistent preference for option B across conditions, and comment on it in the discussion.

4.4.5.4. Phantom Effect

Planet Quix: We observed no significant change in choice proportion overall, or for any option, across any comparison following the introduction of a dominating but unavailable decoy (P): P_A vs P_B, $p=.716$; AB vs P_A, $p=.985$; AB vs P_B, $p=.703$. None of the results differ significantly from chance; $p=.361$. The results are shown below in Table 4.10.

Table 4.10: Phantom Effect; Options per choice-set condition, total counts and percentages.

Planet ‘Quix’ (Phantom)			
Option			
Condition	AB_(Core)	ABP_A	ABP_B
A	42 (43.3%)	43 (43.4%)	46 (46%)
B	55 (56.7%)	56 (56%)	54 (54%)
Decoy	-	-	-
Total	97	99	100

4.4.5.5. Summary

We observe significant results in line with an attraction effect when comparing choice share between the D_A and D_B conditions, which remained significant when the decoys were removed. Choice share for AB comparing the Core set to either D_A and D_B showed no significant change in choice share for the target (though trends were in line with an attraction effect comparing Core to D_A).

We observe significant results in line with a similarity effect when comparing choice share between the S_A and S_B conditions, which remained significant when the decoys were removed. Choice share for AB comparing the Core set to either S_A and S_B showed no significant change in relative choice share for the target, though comparisons between Core and S_B bordered significance ($p = .053$; $p = .039$, one-sided test), with trends in the predicted direction for a similarity effect.

We observe significant results when comparing choice share for the compromise effect between the C_A and C_B conditions, with trends in the opposite direction expected for a compromise effect. We observe no significant results comparing the Core set to either C_A and C_B .

We observe no significant results in line with a phantom effect when comparing choice share between the P_A and P_B conditions, or comparing the Core set to either P_A and P_B ; with the results not being significantly different than those expected by chance.

4.4.6. Discussion

Our first hypotheses were that we would observe:

H1: In the ‘attraction effect’, an increase in the choice share for the target following the addition of a dominated decoy.

H2: In the ‘similarity effect’, a decrease in the choice share for the target following the addition of an asymmetrically dominating decoy.

In 2 out of 4 of the ‘context effect’ conditions (‘attraction’ & ‘similarity’), we observe a pattern of results that reached statistical significance that corresponded with the hypothesised pattern of results for those effects. Namely, in the ‘attraction effect’ condition we observe a significant *gain* in choice share for the target of the dominated decoy (D_A/D_B); and in the similarity effect we observe a *loss* of choice share for the target of the similar asymmetrically dominating decoy (S_A/S_B).

This may be as a result of using more abstracted scenarios and attribute dimensions, limiting the effect of participants’ prior preferences in muting decoys. In support of a more even trade-off of attributes, we see the share for the core AB sets in the attraction and similarity are closer to 50:50% (compared to Experiment 5), which gives the most power to detect changes and increases likelihood that the decoy’s presence will alter choices (Huber et al., 2014). The large choice share for the S_B decoy is worth noting, being best on the environmental attribute of ‘cleaning up the atmosphere’, a concept not wholly abstracted from the greenhouse gas attribute of Experiment 5 where participants also showed strong preferences. However, as the choice share in core AB set seem approximately 50:50 between the two, this does not seem a concern, and the S_B decoy’s share might just be a result of how we placed it on the indifference line relative to B. In our experiment, the option S_B lies ‘outside’ the option B, rather than ‘inside’ it as per A and S_A (a quirk in coding the stimuli). There is no exact position to place a decoy to elicit a similarity effect, the requirements being that it is not dominated by its target and is of approximate or equal value (i.e. it is located along the line of indifference’; Berkowitsch et al. 2014). Indeed, most stimuli set place both similarity decoy either on the ‘outside’ (Trueblood et al., 2013) or ‘inside’ (Noguchi & Stewart, 2014) of the core options. Here we have one on the ‘outside’, S_B , and one on the inside, S_A . We find no theoretical reason why this should make any difference to our results, but report it here anyway for consideration.

H3: In the ‘compromise effect’, an increase in the choice share for the target following the addition of an extreme but equal-value decoy.

While we observe a significant result for the ‘compromise effect’, the pattern of results the opposite of what was predicted. The results suggest there is a general strong preference for B (69.4%, Core AB set), which is better than A on the attribute ‘% Furbles Production’, which is not reversed following the introduction of decoy C_A . C_A is worse than A on ‘Furbles’, but better on ‘Galactic Foreign Aid’, and *should* cause an increase in relative choice-share for A as the compromise option between C_A and B, and a decrease for B as the ‘extreme option’ (Simonson, 1989; Simonson & Tversky, 1992). That this doesn’t occur suggests participants are overweighting the ‘Furbles Production’ attribute, and this B will be the more preferable and rational choice. Choice-share shifted significantly following the introduction of decoy C_B , with a significant decrease in the share for B (while retaining majority preference) and increasing share for A and C_B (relative to core and ABC_A), akin to a similarity effect. Given that the pattern of results is no better than if participants were choosing at chance levels (~33%), we could interpret the results as ambivalence between equally preferable options (i.e. at these values, all options in ABC_B trade off equally).

Given the significant increase in choice-share for C_B , we posit that C_B acts as a ‘similarity’ decoy for B, with C_B gaining choice-share at B’s expense rather than A (which does not change significantly). If our participant sample have a general preference for ‘Furbles over ‘Galactic Foreign Aid’ attribute, differences between C_B and B will seem less on this dimension, and preference for $C_B > B > A$; which is what we observe. While we cannot test this directly, we feel it’s a sensible interpretation. Indeed, in the real-world many voters prioritise foreign aid *far* below the economy⁶⁰, though this depends how the question of foreign aid support is asked (Eurobarometer, 2014), and if voters are asked to rank it in priority to other issues. Also, as ‘foreign aid’ has an intrinsic cost to it beyond the numerical value attached to it, this might have caused option A and decoy C_A to be evaluated over-negatively (despite framing increasing amounts of the attribute in the scenario as a positive) relative to B and decoy C_B .

H4: In the ‘phantom effect’, an increase in the choice share for the target following the addition of a dominating, but unavailable decoy.

⁶⁰ In the USA, the last time foreign policy appeared as the most important issue either a) facing the polling respondent, b) facing the country, or c) determining a voter’s choice in an election, was July 2015 where voters responded ‘Foreign Policy’ 9-10% vs ‘the Economy’ 37-44%. See: [The Polling Report](#) for a history of US polls. In the UK, YouGov’s ‘*Most Important Issues*’ tracker has not found foreign aid concerns to be the top 12 voter concerns since at least June 2010- while the economy is consistently number one. See: [YouGov Issues \(2\) 2016](#).

We observed no support whatsoever for the ‘phantom effect’, with no significant (or numeric) differences in choice share when a third but unavailable dominating decoy targeted a pre-existing option. The ‘phantom effect’ was not observed in any way, and there were nearly homogenous choices across all conditions. We interpret this in a number of positive ways; firstly, the stimuli have been shown to have been set up correctly, with no strong preference for either of the options across any choice set. Secondly, the idea of the phantom effect is to present an option that is better than any of the existing options available, in order to increase preference for its nearest alternative. Our pattern of results is what should be obtained if our participants are acting as rational decision-makers, in that they ignore an option they cannot choose, and base their decision only on what is available and will provide maximum utility. However, that we do not observe a phantom effect in *fictional* scenarios, and do in *realistic* scenarios (Experiment 5) should give us worry- ideally we would not observe phantom effects in either.

It is worth pointing out that in the conditions where we do observe the predicted effects, we did so by comparing the counterbalanced decoy conditions; whereas in nearly all cases comparing core AB sets to the AB options in the expanded sets yielded no significant results. This departs from the traditional method of observing context effects, which compares the choices between a pair of original options and the choices made following the introduction of a third option. Comparing choice shares between expanded sets should be a stronger test of context effects, as there is more power comparing the bias in choice share in one direction with the bias in the other direction, arising from the addition of counterbalanced decoys. This may be one potential explanation as to why decoy effects are difficult to observe when comparing only to the original core reference set.

One issue with the study is that we did not capture participants’ weighting of each of the attributes. The attributes were fictional, and we informed participants that the ‘planetary citizens’ valued all the attributes equally, and to predict which ‘planetary party’ the citizens would choose only based on this. This may not have prevented participants from bringing prior beliefs and biases to help them choose an option; due to the limits of the author’s creativity, the nature of some of the attributes are analogous to real-life attributes (as previously mentioned).

In conclusion, we observe the attraction and similarity effects in fictionalised political domains. We observe no support for the compromise effect, or the phantom effect. Due to the persistent issue of participants' prior preferences for attributes (even when abstracted to fictionalised versions), we attempt to resolve this in further experiments.

4.4. Experiment 7: Exploring Context Effects with 'Desirability'

Experiments 5 and 6 explored all context effects in 'real' and 'fictional' political scenarios, with mixed results. We observed the attraction effect and similarity effect in fictional, but not realistic, political scenarios; and the compromise effect and phantom effect in real, but not fictional, political scenarios. The mixed nature of our findings is out of step with other work, particularly on the attraction effect, which is considered a "*prominent and robust decision bias*" that occurs in fictional and real scenarios (Malkoc, Hedgecock, & Hoeffler, 2013, p.318), and even occurs in other species (e.g. hummingbirds; Bateson, Healy, & Hurly, 2002). Across Experiments 5 and 6, we identify participants' prior preferences as a probable factor in our results. Additionally, while we observe evidence for each effect, these are using third-party scenarios, and whether they occur when decision-makers are choosing for themselves is yet to be determined.

Further, a potential issue with our previous experiments may be that the scales we used are somewhat unconstrained and interpretable (e.g. '£X millions spending on healthcare'). Also, we use differing units for our attributes (e.g. %'s, GBP Sterling £, parts-per-million, fictional currency units, etc.). Other issues include the directional preference of voters, whereby asking a participant to make a decision based on a fictional voter's preference may conflict with a participants own; for example, lower/raising taxation despite having a differing direction preference on taxation changes. All these may lead to confusion in participants' appraisal of our stimuli and decision-conflict, leading to negative appraisal of the choice set, and negative processing.

Prior research has shown that processing negative (i.e., less desirable) information versus positive (i.e., desirable) information leads to systematic differences in motivation, perception, learning, and evaluation (Ahluwalia, 2002; Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001; Higgins, 1997; Kahneman & Tversky, 1979). Negative stimuli receive more attention during an evaluation stage, and memories for negative stimuli are better remembered than for positive stimuli (Pratto & John, 1991). Anticipated regret around outcomes arising out of choosing between unattractive options outcomes evokes negative emotions, which influence

information processing (Zeelenberg, 1999). People experiencing negative (vs. positive) moods engage in greater information search prior to making a decision (Bless et al., 1996), more local information processing, and pay more attention to details (Gasper & Clore, 2002). As a result, people in negative moods appear to be more accurate, showing fewer false memory biases and attribution errors than those in positive moods (Forgas, 1998; Storbeck & Clore, 2005). This suggests that people in negative moods process information more carefully, increasing accuracy and may serve to attenuate context effects.

Malkoc et al. (2013)'s work on context effects and choice set '*desirability*' (i.e., how much the choice set was perceived as 'good' or 'bad') is pertinent in this regard. Malkoc et al. (2013) found across five experiments that the attraction effect only occurs in desirable domains. Usefully, Malkoc et al. (2013) operationalised '*desirability*' by providing '*desirability ratings*' for choice options on 2 attributes on a scale ranging from '-10' to '+10' where '0' is average desirability. This eliminates issues of unit comparisons across attributes, and provides an intuitive and common directional preference for participants to understand.

We explore context effects in political domains, using '*desirability*' as a scale for each attribute, assigning participants to differing scenarios based on their *own* preferences for each attribute (see, Malkoc et al. 2013), and asking them to make the choices for themselves. Contrary to Malkoc et al. (2013), whom focussed only on the attraction effect, we use '*desirability*' to test across all four context effects. Formally, we hypothesise that, when the choice set is *desirable*, we will see:

H₁: an increase in choice share for the 'target' following the introduction of a dominated 'decoy' (attraction effect),

H₂: a decrease in the choice share for the 'target', following the introduction of an asymmetrically dominated 'decoy' (similarity effect),

H₃: an increase in the choice share for the 'target' following the introduction of a decoy that causes they target to be equidistant between the decoy and competitor (compromise effect),

H₄: an increase in choice share for the 'target' after informing participants of an unavailable, dominating, option (phantom effect).

Methods

4.4.1. Participants

789 participants were recruited using the Prolific Academic database, and took part in the study for £0.50. All participants reported English as their primary language, and ranged between 18-71 years of age ($\mu=29.9$, $SD=9.9$). 58.7% of participants were female. 88.8% of participants reported their ethnicity as ‘White: European/American’, with 3.3% reporting ‘White: Other’; the largest remaining group as ‘Mixed Heritage’ (1.8%). 29.5% of participants were students, 26.6% worked in the private sector, 18.7% in public sector, 11.1% were ‘self-employed’, 10.2% were unemployed, 0.8% were retired, and 3.2% responded ‘None of the Above’ or ‘Don’t Know’.

4.4.2. Design

A 4x3 between-within mixed design; (*Context Effect*: Attraction, Compromise, Similarity, and Phantom) x (*Choice Set*: AB, ABA’, ABB’).

After indicating a preference for an option in each context effect scenario (e.g. between A/B/A’), participants were asked to repeat their choice with the decoy removed (i.e. between A/B).

4.4.3. Materials

Attributes: We used pilot data from some of our prior experiments on the UK public (not included in this thesis), along with polling of public opinion openly available online (YouGov, April 2015), which showed that the two most important issues (that are also approximately equally important) to the UK public were (at the time of the experiment) ‘*healthcare*’ and ‘*education*’.

Scenarios: There are some differences in how we constructed the scenarios compared to Experiments 5 and 6. Firstly, the voter is asked to make their choice on their own behalf, not for a hypothetical voter. Secondly, they are told the parties presented care about the issues of healthcare and education equally, as to minimise any inferring about party-level preferences for attributes (as provided ratings are sourced from external opinion).

Stimuli: We use a modified version of the stimuli found in Malkoc et al. (2013), whom used ‘desirability’ ratings as proxies for specific attribute values. ‘Desirability’ of an option on each attribute ranged from ‘0’

(Very undesirable) to ‘10’ (Very Desirable), and were ostensibly taken from the average ratings of that party’s policy from other participants with ‘similar political views’ (see Procedure, this section).

We fix three different choice options (Party A, Party B, Party D) on a 10-point desirability scale (‘0’ being ‘*Very Undesirable*’ – ‘10’ being ‘*Very Desirable*’) for both attributes designed to elicit each of the four context effects. For example, for the ‘*attraction effect*’, we place the decoy C as to be inferior to the target (ABA’, where the decoy targets A; or ABB’ where the decoy targets B) on one or both attributes. We have provided the stimuli for each context effect in Table 4.10, and plotted in Figures 4.12.

Table 4.10: Attribute stimuli values for each option, per context effect scenario.

Context Effect	Attribute	A	B	ABA'	ABB'
<i>Attraction</i>	Healthcare	6	4	5	3
	Education	4	6	3	5
<i>Similarity</i>	Healthcare	6	4	7	3
	Education	4	6	3	7
<i>Compromise</i>	Healthcare	6	4	8	2
	Education	4	6	2	8
<i>Phantom</i>	Healthcare	6	4	7	4
	Education	4	6	4	7

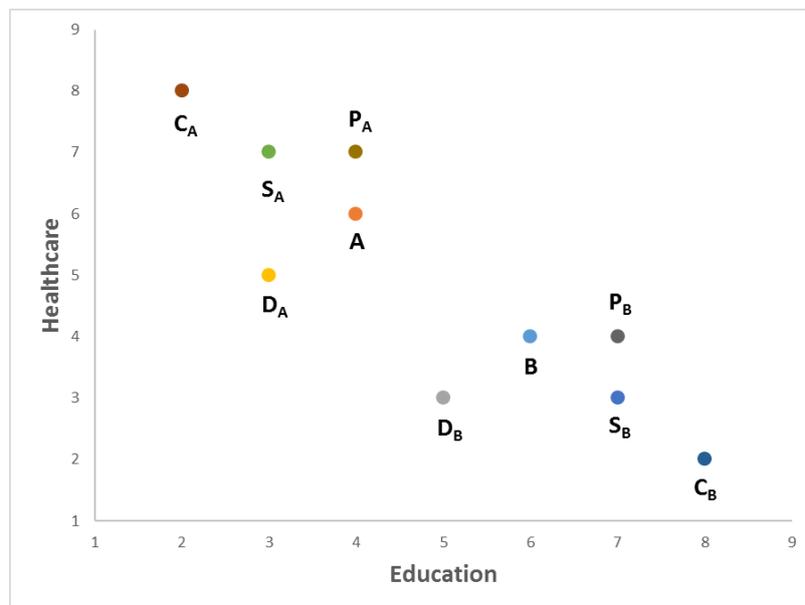


Figure 4.12: Relative positions of option stimuli per context effect.

4.4.4. Procedure

Participants were all sourced using the online participant pool ‘Prolific Academic’ (PA), with the criteria that they were born, and were currently resident at the time of the experiment, in the UK. Participants were given a brief explanation about the study’s aims, informed they would be asked some political questions (e.g., on their opinions), and that they would be given a scenario to choose an option (fictional candidate/party) in.

Participants then indicated consent, and entered their Prolific Academic ID, and their age in numbers (as part of an attention check). Participants were asked to indicate their interest level in politics on a 3-point scale (‘Not at all Interested’, ‘Somewhat’, or ‘Very Interested’); and answered 5 questions on whether, generally, they preferred ‘higher’ or ‘lower’ amounts (i.e. ‘spending’) in relation to 5 key policy areas: Healthcare, Defence, Education, Immigration, Income Tax. For example, for ‘healthcare/NHS’ participants are asked *‘Of the following two statements, please indicate which is closest to your own opinion: “I would prefer higher levels of spending on healthcare/the NHS”, or “I would prefer lower levels of spending on healthcare/the NHS”*. Not all the questions were relevant to the study, and were included as to make the main experimental items of interest less obvious to the participant.

After completing the questionnaire, participants were randomly assigned each of 4 context effect conditions, and further randomly assigned to one of two decoy conditions (ABA’/ABB’). Participants were informed that *“People sharing your political outlook have rated the following parties below on how ‘desirable’ they are, based on their policies on healthcare and education.”*, and were given an explanation of the desirability ratings.⁶¹

Participants were informed that the parties presented all supported higher/lower spending on Healthcare, or higher/lower levels of spending on Education, (depending on the participant’s choices previously in the questionnaire). This was to ensure participants would perceive the desirability of each party as consistent with *their own* preferences for a given policy direction. Participants were asked *“If you had to choose one of the following below options, which one would it be?”*, and chose one of the 3 options.

⁶¹ This stays true to the spirit of Malkoc et al. (2013), whom informed participants that the ratings provided were averages from members of the public; and also to Pan, O’ Curry & Pitts (1995) whom used ‘favourability ratings’ by the public for candidates (choice options) on issues as the attribute stimuli.

Participants are then subsequently re-shown the scenario, and asked to choose one of the 2 ‘core’ options, if the previous 3rd option had not been available.

Finally, participants were asked to provide demographic details (year of birth gender, ethnicity, English language proficiency). Participants were then debriefed as to the purpose of the study, explained as to the nature and purpose of the mild deception in the scenario presentation, and reminded that the parties presented were fictional. Participants were then told to close the study, and were auto-forwarded to PA to register completion, and processed for payment.

4.4.5. Results

8 participants were identified for exclusion on the basis of either failing the attention check⁶², or taking the survey from an IP located outside of the United Kingdom.

4.5.5.1. Attraction Effect

D_A vs. D_B: A chi square analysis showed a significant difference in the choice proportions of those choosing the target in the ABD_A vs. ABD_B conditions in the predicted direction, $\chi^2(2, 197) = 10.56, p = .005, \phi_v = .232$. 66.7% chose A when it was the target in the D_A condition (B: 24.2%), 55.1% in the D_B condition (B: 42.9%). These results remained significant after the decoy options were removed, $\chi^2(1, 186) = 5.92, p = .015, \phi_v = .178$. The pattern of results are shown in Table 4.11.

Table 4.11: Attraction Effect; Options per choice-set condition, total counts and % share.

Option	Condition	AB_(Core)	ABD_A	ABD_B
A		69.3% (129)	67.3% (66)	55.1% (54)
B		30.7% (57)	24.5% (24)	42.9% (42)
Decoy		-	8.2% (8)	2.0% (2)
Total		186	98	98

Core vs. D_A/D_B: A non-parametric chi square (McNemar’s), comparing the choice proportions of the Core set (AB) to the Expanded set (ABA’/ABB’), revealed no significant changes in choice proportions for A or B between the Core and Expanded sets ($p = .18; p = .29$).

⁶² Participants who did not correctly match their age in years, with their year of birth, were failed on our attention check.

4.5.5.2. Similarity Effect

S_A vs. S_B : The pattern of results are shown in Table 4.12. When A is the target, 55.1% chose A (B: 31.6%; S_A : 13.3%); when B is the target, 30.6% choose B (A: 65.3%; S_B : 4.1%). This conforms to the predicted pattern of results for a similarity effect. A chi square analysis showed a marginally significant difference in the choice proportions between the S_A vs. S_B conditions in the predicted direction when we include those choosing the decoy, $\chi^2(2, 196)= 5.63, p= .06, \phi_v= .169$; but not when we exclude them, $\chi^2(2, 179)= .412, p= .521, \phi_v= .048$. As the similarity effect predicts loss of share for the target to the competitor, and does not discount the decoy as legitimate option, we address this analysis here.

Table 4.12: Similarity Effect; Options per choice-set condition, total counts and % share.

Option	Condition	AB_(Core)	ABS_A	ABS_B
A		66.4% (119)	55.1% (54)	65.3% (64)
B		33.6% (60)	31.6% (31)	30.6% (30)
Decoy		-	13.3% (13)	4.1% (4)
Total		179	98	98

$Core$ vs. S_A/S_B : A McNemar's test comparing the choice proportions of the Core set (AB) to the Expanded set (ABA'/ABB'), revealed no significant changes in choice proportions for A or B between the Core and Expanded sets (both $p > .72$).

4.5.5.3. Compromise Effect

C_A vs. C_B : The pattern of results are shown in Table 4.13. When A is the target, 64.2% chose A (B:26.3%; C_A : 9.5%); when B is the target, 27.1% choose B (A: 64.6%; C_B : 8.3%). A chi square analysis showed a non-significant difference in the choice proportions between the C_A vs. C_B conditions, $\chi^2(2, 191)= .08, p= .96, \phi_v= .021$.

Table 4.13: Compromise Effect; Options per choice-set condition, total counts and % share.

Option	Condition	AB_(Core)	ABC_A	ABC_B
A		70.6% (123)	64.2% (61)	64.6% (62)
B		29.4% (51)	26.3% (25)	27.1% (26)
Decoy		-	9.5% (9)	8.3% (8)
Total		174	95	96

Core vs. C_A/C_B : A McNemar’s test comparing the choice proportions of the Core set (AB) to the Expanded set (C_A/C_B), revealed no significant changes in choice proportions for A or B between the Core and Expanded sets (all $p > .75$).

4.5.5.4. Phantom Effect

P_A vs. P_B : The pattern of results are shown in Table 4.14. When A is the target, 63% chose A (B: 37%); when B is the target, 43.9% choose B (A: 56.1%). A chi square analysis showed a no significant difference in the choice proportions between the P_A vs. P_B conditions, $\chi^2(1, 198) = .972, p = .324, \phi_v = .07$.

Table 4.14: Phantom Effect; Options per choice-set condition, total counts and % share.

Option	Condition	AB_(Core)	ABP_A	ABP_B
A		68.6% (135)	63% (63)	56.1% (55)
B		21.4% (63)	37% (37)	43.9% (43)
Decoy		-	-	-
Total		198	100	98

Core vs. P_A/P_B : A McNemar’s test comparing the choice proportions of the Core set (AB) to the Expanded set (P_A/P_B), revealed no significant changes in choice proportions for A or B between the Core and Expanded sets (all $p > .51$).

4.5.5.5. Summary

We observe the attraction effect, and the similarity effect, in our experimental results looking between-subjects, but not when comparing choice share for the core AB options to the extended sets. We find no evidence of the compromise or the phantom effects, either between or within-subjects.

These results mirror our findings in Experiment 2.

4.5.6. Discussion

We hypothesised that when the choice set is desirable, we would see:

H₁: an increase in choice share for the ‘target’ following the introduction of a dominated ‘decoy’ (attraction effect).

We observe the attraction effect in our results in this experiment, with 55.1% choosing the target when targeted by D_A and 66.7% when targeted by D_B . This would seem to suggest that the attraction effect can occur in political domains; when the choice set is ‘desirable’ (i.e., the options match the directional preferences of the political decision-maker), and the relative importance of the policy attributes to participants is approximately equal. This result is in line with Malkoc et al. (2013) who found fairly consistent evidence across four differing choice scenarios (e.g., frequent-flier programs and humidifiers) that the attraction effect only occurs in desirable domains (relative to undesirable domains).

H₂: a decrease in the choice share for the ‘target’, following the introduction of an asymmetrically dominated ‘decoy’ (similarity effect).

We observed some support for H₂, with marginally significant differences in the choice proportions of those choosing the targeted option depending on the position of the decoy; however, these differences are non-significant if we exclude those choosing the decoy. These results are in line with our positive results for the similarity effect in Experiments 5 and 6 (this chapter).

Whether or not the decoy option in the similarity effect is a ‘legitimate’ choice to include/exclude from the method of an analysis does not seem something considered in the literature, and there is little consistency in *how* context effects are analysed; hence why we compare the choice patterns between the expanded choice sets with the differing decoy-targets (as per Malkoc et al., 2013; Nagouchi & Stewart, 2014), and the choice patterns of the main AB options with a ‘core set’ with the decoy removed (Huber, Payne, & Puto, 1982). It may be that for certain context effects including/excluding the decoy makes more sense, and testing the shift in choice proportions for the core options is a stronger test of the effect; for instance, in the case of the attraction effect which predicts that no one should choose the inferior decoy; or the phantom effect where no decoy exists. At least in our three experiments here (Exps. 5-7), only looking at the shift in the choice share for the core options relative to the expanded set(s) where the decoy is included, will nearly always lead to non-significant results for the similarity effect.

There is also the perceived importance of the attributes to consider; 95.9% of participants preferred higher spending on the NHS/Healthcare, and 91.8% of participants wanted higher levels of spending on education, with 87.4% wanting both higher healthcare spending *and* higher education spending. However, we do not trade

off the degree to which they prefer each as to make them equally weighted. Changes in the choice shares for AB and the decoy(s) are not perfectly mirrored in our results, with greater than 50% choosing A (and ~ 30% choosing B) in both conditions. More participants chose the D_A decoy when both A and D_A were better on the ‘healthcare’ attribute. It seems likely that despite our best efforts the majority of participants had a greater importance weighting for healthcare relative to education, attenuating the competing effect of our D_B decoy on B.

H₃: an increase in the choice share for the ‘target’ following the introduction of a decoy that causes they target to be equidistant between the decoy and competitor (compromise effect).

We observe no support for H₃, with 63.6% choosing A when it is the target, and 64.3% choosing A when it is not. This is in contrast to our positive result in Experiment 5 where we used more realistic scenarios, and in line with our negative result in Experiment 6 using fictional scenarios. However, in light of the point around preferences above for H₂, we suspect that participants’ preferences are the explanation for the lack of an observable effect. The compromise effect relies on including ‘extreme’ options as to make the targeted option equidistant (or less so, depending on the degree to which you want to make the targeted option a ‘compromise’) between the ‘extreme’ decoy’ and the competitor on the two attributes considered. Yet the preferences of our participants are strongly in favour of both healthcare *and* education spending to *increase*. Introducing either decoy that is closer to ‘0-Not at all desirable’ on either of these attributes (a ‘2’ out of 10 on our scale) may result in participants effectively removing it from consideration. Given the greater tendency of our participants to place greater importance on healthcare over education, it seems understandable this option would be consistently chosen by our participants regardless of the decoy introduced to the AB set.

H₄: an increase in choice share for the ‘target’ after informing participants of an unavailable, dominating, option (phantom effect).

We observe no support for H₄, with no effect of an unavailable dominating option on the choice share for A or B in this experiment, in contrast with Experiment 5 and in line with Experiment 6. Again, returning to our discussion around the preferences of our sample, this is somewhat unsurprising. People should ignore the presence of an irrelevant alternative, and focus on the options that are present; considering that we focus (even in our task descriptions) on presenting the options in the choice set as ‘desirable’, it is possible we are

unintentionally encouraging participants to making simplified decisions- that is, they are not considering the unavailable alternative and deciding only on what is present and available. This is similar to the position Malkoc et al. (2013) put forward in how ‘desirable’ choice sets options elicit non-vigilant mind-sets in decision-makers, and less critical processing as a result of affective arousal. A possible criticism of Malkoc et al. (2013)’s work that may apply to our own, is that our instructions might be encouraging a more cognitive (think vs. feel) mind-set (Zajonc, 2000) in participants, thus increasing critical processing and attenuating the phantom effect.

So far in three separate experiments, we have studied all four context effects in online studies, using hypothetical materials and scenarios, real-world materials and scenarios, differing attribute measures, and even considering voters’ directional preferences on issues. However, all these experiments attempt to elicit context effects in political domains by manipulating artificially created stimuli to create asymmetric preference structures, in an attempt to infer their existence in real-world political decision-making. A question therefore springs to mind: do asymmetric preference structures exist naturally in voters’ preferences? And if so, can these can lead to situations where voters’ violate their own preferences in voting for a political candidate/party? In 2015 we had a unique opportunity to engage with voters during the UK’s 2015 General Election, and test these questions.

4.5. Experiment 8: Attraction Effect in UK General Election 2015

One of the main assumptions of political models, such as the ‘spatial model’, is that political candidates (and/or parties) can position themselves (intentionally or otherwise) in such a way as to capture the maximum amount of vote share. This positioning is also subject to the perceived positing of political options by voters in relation to others on various policy attributes. In the previous three studies, we have looked at how positioning political options in a choice set affects the vote share for each of the options, positioning them in line with research on ‘context effects’ to see if voters’ choices may violate rational assumptions and lead to preference reversals.

Our results are for each context effect are fairly consistent across Experiments 5-7. The ‘attraction effect’ shows the most consistent evidence, in line with the idea it is the most robust context effect in the psychological literature (Doyle et al. 1999; Trueblood et al. 2013). While efforts were taken to minimise moderators of the

attraction effect (e.g. relevance of materials, equal attribute weighting, presentation format, etc.; Frederick et al., 2014), it may be that it is impossible to control all these factors and retain the real-world aspects (and relevance) of studying these effects in relation to political decision-making. However, previous authors have stated “*the attraction effect is a real-world phenomenon, not just an experimental artefact*”, (Mishra, Umesh, & Stem, 1993, p. 331). Thus, an obvious question to ask is: does the attraction effect naturally exist in real-world political decision-making, and how does one measure this phenomenon?

Previous studies by Pan, O’ Curry and Pitts (1995) have shown that the attraction effect can be observed in political decision-making between 2 and 3 candidates, and when considering 2 or 3 attributes, in real world political decision making (i.e. the 1994 Illinois Primary election, and the 1992 U.S. Presidential election). In one study they provided college students in an Illinois university with fictional ratings from ‘0- Very Unfavourable’ to ‘100- Very favourable’ for with 3 real-world candidates on ‘education’, ‘crime control’, ‘and tax policy’ (including their relative importance on a 0-100 point scale), allowing subjects to entire their own ratings if they disagreed with those presented. Their results showed a significant effect for the asymmetrically dominating alternatives (an attraction effect), and no effect of the number of attributes.

In second study, Pan et al. (1995) show that asymmetric preference structures (perceived one candidate to be better than another candidate but not both other candidates on two attribute dimensions) existed in voters’ perceptions of the main Presidential candidates (Bush, Clinton, & Perott) in the 1992 elections, and were significantly related to their resulting vote choice. The authors recruited 485 students from three business schools to rate the desirability of each of the three presidential candidates on ‘national defense’ and ‘health care’ on a 7-point scale ranging from ‘1- undesirable’ to ‘7- very desirable’, along with the relative importance of each of the issues (0-100). Participants were categorised into one of seven groups (two possible asymmetric dominance structures per candidate, and no asymmetric dominance structure). Pan et al. (1995) found 67.4% of people had asymmetric dominance for the three presidential candidates, increasing choice share for the dominating candidate, and took this as evidence for an ‘attraction effect’ in real-world political decisions.

We replicate this real-world study looking at the UK General Election in 2015, considering the 3 main political parties (Labour, Liberal Democrats, & Conservative Party)⁶³, and how the public perceive their

⁶³ We do also consider the Green Party and UKIP in a secondary part of the study, but we do not report the results here.

‘desirability’ on two major issues: the Economy, and the NHS. We continue to use desirability scales for our attributes, as it is a straightforward way of eliciting policy preferences without any prior specialist knowledge, or need for specific units. Therefore, we adapt Pan, O’ Curry and Pitts (1995)’s methodology to be more consistent with our approach, and investigate if the attraction effect is present in real-world political decisions by uncovering voters’ actual perceptions.

We are conscious of the socio-geographical nature of politics in the UK, with the locality of the experimental setting (London) representing a certain section of the population (Hall, 2006; ONS, 2013). Therefore, we conduct our study on two samples of the UK population: a field study carried out in differing public locations in London, and a replication of the field study online open to the larger UK population regardless of geographic location within the UK. We wished to carry out a field study in order to gain a more heterogeneous sample of the UK in relation to political outlook (e.g. more Conservatives, Liberal Democrats, and UKIP supporters), as our previous online samples have been relatively left-leaning and liberal in outlook (see Experiments 5 & 6, this chapter). While these samples are not specifically designed to be representative samples of the UK population, they provide a useful comparison of results between the online and field samples. To the best of our knowledge, this is the first study of its kind outside of the US.

Formally, we hypothesise that:

H1: Where we observe symmetric dominance structures among the general public, we will observe greater preference for the dominating option (the target) as per the attraction effect.

Methods

4.5.1. Participants

Two samples of participants were collected from a public field study, and an online version of the study. Only participants eligible to vote in the upcoming UK General Election were allowed to take part in the study (i.e. over 18 years old; registered as resident in the UK; and either a UK, Commonwealth, Irish citizen).

In the first (Field Sample), 288 participants were opportunistically recruited from members of the general public in a marginal constituency in Central London⁶⁴, 5-10 days away from the General Election on May 8th 2015. Participants were 50% male and 49.3% female, with an age range of 18-72 ($\mu= 34.42$ $SD= 12.43$). 20.1% reported their occupation as ‘Student’, 14.9% as ‘Unemployed’, 35.8% as ‘Private Sector’, 18.8% as ‘Public Sector’, 2.1% as ‘Self-Employed’, 8.3% as ‘Public Representative’.

In the second (Online Sample), 306 participants were recruited online via the subject pool ‘Prolific Academic’ 3 days before the 2015 General Election (Cohort Two), and completed the same questionnaire as the participants recruited in cohort one. Participants were compensated £0.30 upon completion. Participants were 41% male and 58.3% female, with an age range of 19-68 ($\mu= 30.36$, $SD= 10.31$). 46.6% reported their occupation as ‘Student’, 4.9% as ‘Unemployed’, 19.5% as ‘Private Sector’, 12.1% as ‘Public Sector’, 15.0% as ‘Self Employed’, 1% as ‘Retired’ and 1% as ‘Other’.

4.5.2. Design

Participants were briefed that the study was about how people perceive the main political parties in the United Kingdom. Each participant was asked to rate the desirability of each of the main political parties (Labour, Liberal Democrats, and Conservative Party) on two attributes (‘the Economy’ & ‘the NHS’) using a 7-point ‘desirability’ scale. Participants were asked then to indicate their vote choice for one of the three parties if they were to base their vote choice on these two issues. Finally, participants were asked to rate both attributes’ perceived importance on a constant sum 0-10 point scale. At the end of the experiment, subjects were debriefed and were reminded to consider all relevant issues when they voted.

4.5.3. Materials

Attributes: We chose two issues that national polling data (‘Most Important Issues’; YouGov, 30th & 31st March) indicated were both the most important, and the most likely to be equally important, to the UK electorate around the time of data collection: the ‘economy’, and the ‘NHS’. This also is in line with previous importance ratings provided from our own participant samples in previous experiments.

⁶⁴ Constituency of Hampstead & Kilburn; 42 votes separated the Labour and Conservative candidates in 2010’s General Election, and is considered to have a high population of Liberal Democrat supporters. Actual vote share for the seat in 2015: 42.3% for Conservatives, 44.4% for Labour, and 5.6% for the Liberal Democrats.

Questionnaire: For the Field Sample, we distributed the questionnaire in a 4-page paper format. Page 1 contained information about the study, its general aims, the researcher details, and a consent form where participants indicated consent to take part. This page was designed to be a tear-away page as to preserve participant anonymity and was removed after consent was provided.

Page 2 asked participants to rate each of the parties' stances on two attributes ('the economy' and 'the NHS') on a 7-point desirability scale (1-7; anchored on 'Undesirable' and 'Very Desirable'). For example, "*Thinking about how they stand on the Economy, please rate the desirability of each of the parties (Please Circle)*". At the bottom of Page 2 participants were asked: "*If you were to base your decision on just these two issues, of the three parties above, who would you be most likely to vote for*" in a free-text box.

Page 3 asked for their importance ratings of both attributes (0-10, anchored on 'Not at all' and 'Extremely Important'), and were also asked to rate two additional parties (Green Party, UKIP) on the same attributes and indicate their vote choice out of all 5 parties. Page 4 asked participants for their age, gender, and occupation. Pages 2-4 had a blank box in the top right corner where the researcher entered a numerical participant ID. A copy of the study form is included in Appendix C.

For the Online Sample, the same materials are replicated online using the 'Qualtrics' survey software.

The order of attribute presentation, and the order of the political parties are all counterbalanced both in the field study, and online, to minimise order effects.

4.5.4. Procedure

For the Field Sample, recruitment was carried out in two main public areas of Hampstead & Kilburn: Queen's Park public park, and Kilburn High Road (including various cafés) during May 1st 2015- May 7th 2015. Members of the public were approached by the researcher, who identified themselves as a researcher from UCL, and invited them to take part in the study. Upon meeting the eligibility criteria, and providing consent, the experimenter removed the tear-away Page 1, and participants were left to complete the questionnaire in private, and asked to return to the researcher upon finishing. Participants were then debriefed as to the nature of the study orally and provided with a takeaway debrief form containing the researcher's email if there were any further questions arising from the study.

For the Online Sample, participants were recruited via ‘Prolific Academic’ during the same time period, and restricted to UK-only residents over 18 years of age, and were eligible to vote in the 2015 General Election (GE). Participants were self-selecting and indicated consent after reading an explanation of the study and its requirements. Participants then completed the same study as per the field cohort, adapted for the online Qualtrics platform, with the additional of a question at the end of the study as to whether they were eligible to vote in the GE as an additional check.

4.5.5. Results

12 participants were removed from the analysis for providing a blank or ‘None of the Above’ response for the Party Choice question. While we recorded ratings for the Green Party and UKIP, we only report the results for the 3 main political parties (Labour, Conservatives, Liberal Democrats) here, deeming them of greatest interest given their predominant status in the UK electoral system. There were no meaningful differences in the results of our analyses for each of our samples, so we merge both into one overall sample and report the results here.

4.6.5.1. Desirability & Importance Ratings

Labour was the most desirable on the NHS, compared to the Conservative Party and Liberal Democrats. The Conservatives were most desirable on the Economy, compared to the Liberal Democrats and Labour. Desirability ratings descriptive statistics are in Table 4.15.

Table 4.15: Overall mean Desirability Ratings per issue per Party, and Standard Deviations (N=226).

Issue	Party	Mean Desirability (1-7)	SD (+/-)
<i>NHS</i>	Labour	4.82	1.49
	Conservatives	3.1	1.68
	Liberal Democrats	4.80	1.52
<i>Economy</i>	Labour	3.83	1.52
	Conservatives	4.71	1.86
	Liberal Democrats	4.36	1.44

Importance Ratings: Attribute importance ratings for the NHS are $\mu^{\text{NHS}}=7.90$ (SD=1.85), and are $\mu^{\text{ECON}}=7.86$ (SD=1.81) for the Economy. Only 12.4% of participants rated NHS <5, and only 11.9% of participants rated the Economy <5, on a 10-point scale. A one-way ANOVA between participants’ attribute

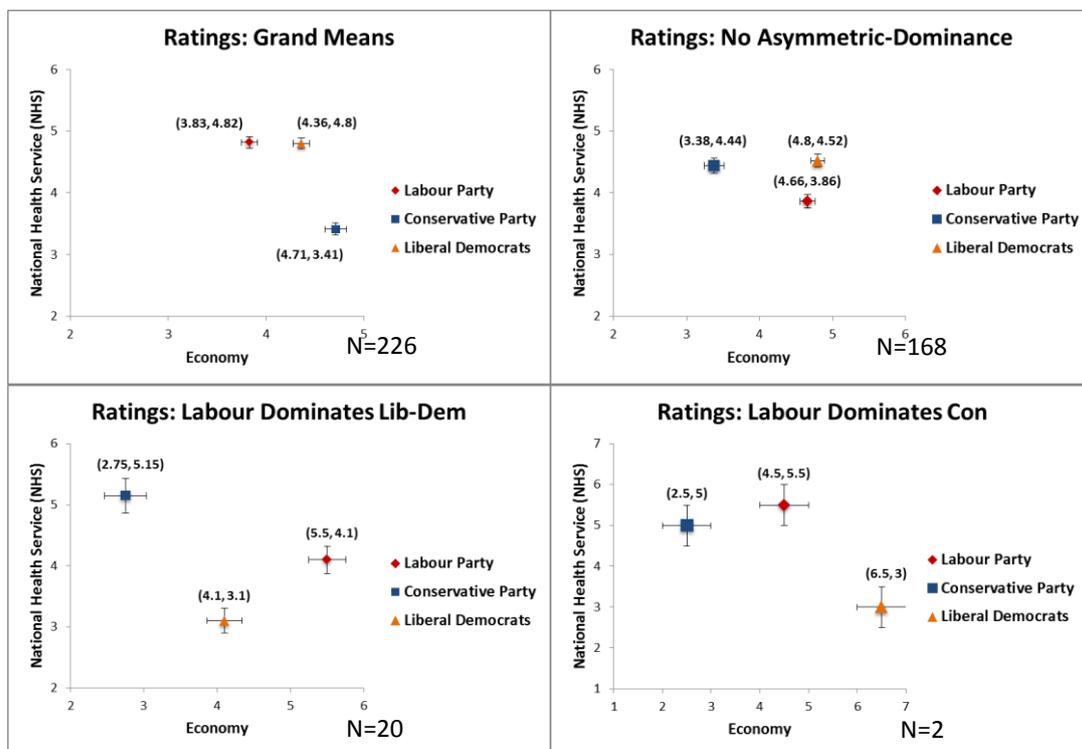
importance ratings and perceptual structure showed no significant difference in perceived importance on the NHS, $F(6, 225) < 1$; or on the Economy, $F(6, 225) < 1$ across the perceptual structures.

4.6.5.2. Perceptual Structure and Vote Choice:

In keeping with Pan et al. (1995), we removed all participants that had one option which dominated all others (Labour: $N=211$; Conservatives: $N= 106$; Liberal Democrats: $N=45$), leaving $N=226$ participants in the sample. These participants are not needed for our research questions, as we are only interested in those with non-dominated options (i.e. had an asymmetric preference structure, or had no asymmetric dominance structures).

Including those who had no asymmetric-dominance structure, 35.8% ($N=81$) participants chose the Labour Party, 31.4% ($N=71$) chose the Conservative Party, and 32.7% ($N=74$) chose the Liberal Democrats. Of those with an asymmetric dominance structure, 37.9% ($N=22$) of people chose Labour, 37.9% ($N=22$) chose the Conservative party, and 24.1% ($N=-14$) chose the Liberal Democrats.

We plot the mean positions of the parties for each of the dominance structure for visual aid in Figures 4.13-20.



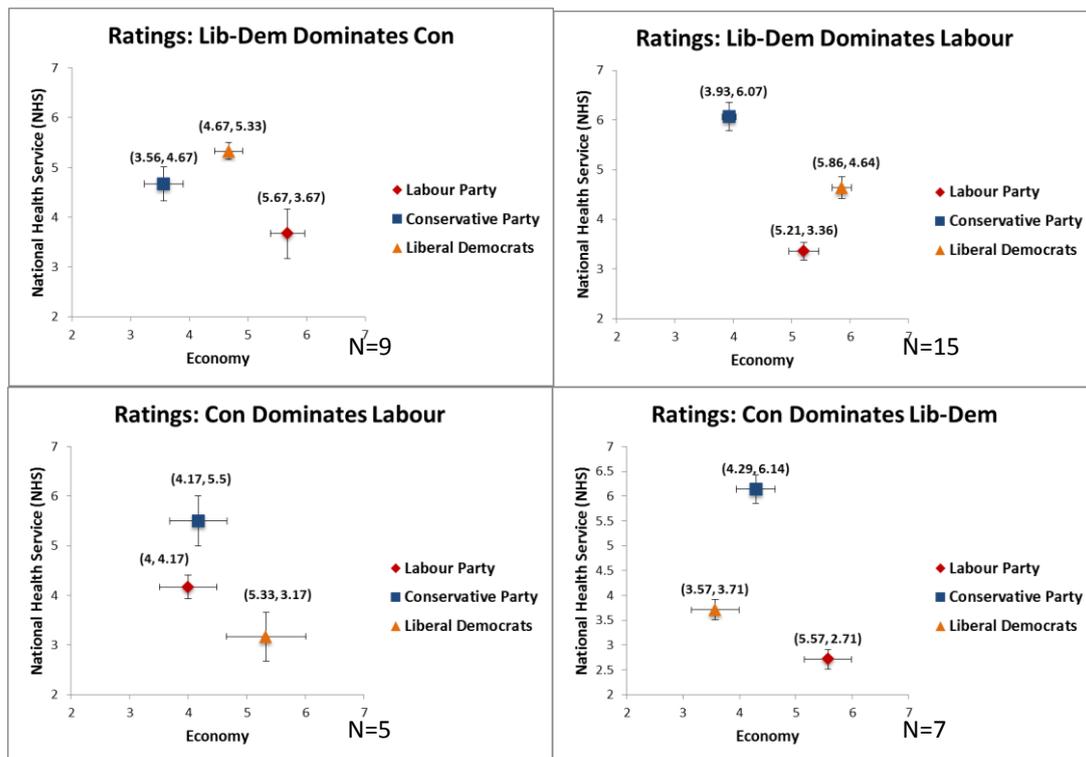


Figure 4.13-20 Party positions using attribute ratings. Standard Error bars (SE +/-) included.

A one-way ANOVA of vote choice with Perceptual Structure as the independent variable (7 levels) was significant, $F(6, 225) = 2.55, p = .021$. We also used a 3×7 (Vote Choice x Perceptual Structure) chi-square analysis, which showed a significant relationship between Party Choice, and the perceived asymmetrical dominance structure of the participant; $\chi^2(12, 226) = 25.58, p = .012, \phi_v = .238$. This remains significant even when removing those with a non-asymmetric dominance structure, $\chi^2(10, 58) = 23.99, p = .008, \phi_v = .643$. This result shows that participants are taking the task seriously, as participants who rate parties differently should choose them differently. The exact breakdown pattern of choices can be seen in Table 4.16. We now consider if any of these patterns provide evidence for a real-world attraction effect.

Table 4.16: Vote Choice per Perceived Asymmetric Dominance Structure. % share of structure in parentheses.

	LAB LIB	LAB CON	LIB CON	LIB LAB	CON LAB	CON LIB	NO AD
LAB	12 (60%)	1 (50%)	5 (55.6%)	1 (6.7%)	1 (20%)	2 (28.6%)	59 (35.1%)
CON	7 (35%)	0 (0%)	1 (11.1%)	6 (40%)	3 (60%)	5 (71.4%)	49 (29.2%)
LIB	1 (5%)	1 (50%)	3 (33.3%)	8 (53.3%)	1 (20%)	0 (0%)	60 (35.7%)

Total (N)	20	2	9	15	5	7	168
-----------	----	---	---	----	---	---	-----

Note: Columns indicate party asymmetric dominance. For example, 'LAB LIB' denotes Labour asymmetrically dominates Liberal Democrats, and so forth. 'NO AD' indicates a lack of asymmetrical in perceptual structure.

4.6.5.3. Attraction Effect

We note the low observed frequencies in our cells. A requirement for chi-square analysis in for contingency table greater than 2x2 is that "*no more than 20% of the expected counts are less than 5 and all individual expected counts are 1 or greater*" (Yates, Moore & McCabe, 1999, p. 734). However, it is generally considered acceptable if expected counts are less than 5, provided none are less than 1, and at least 80% of the expected counts are equal to or greater than 5 (Weaver, 2016; Yates, Moore & McCabe, 1999). Only the No Asymmetric-Dominance (NA-D) perceptual structure, Labour-Dominates-Liberal Democrats, and Liberal-Dominates-Labour, perceptual structures meet these criteria; therefore, we only analyse these here.

We analysed whether the pattern of choices for the individual perceptual structures differed from the No Asymmetric-Dominance (NA-D) perceptual structure. There was (marginally) no significant difference in choice proportions for each political party between the NA-D and when Liberal Democrats dominated Labour, $\chi^2(2, 183) = 5.08, p = .079$; However, we found significant differences when Labour dominated Liberal Democrats (LAB-D-LIB), $\chi^2(2, 188) = 8.33, p = .016, \phi_v = .21$.

Finally, we replicated the method of analysis by Pan et al. (1995) in using a series of binomial logistic regressions to analyse the attraction effect for each party choice. Three dependant variables were coded 0-1, if they had chosen that party (1) or not (0). The independent variables were: the desirability ratings for that party on the NHS and the Economy, and a *dominating* dummy variable; coded 1 if the party dominated one of the other options in the set, and 0 if not (Pan et al., 1995). The attraction effect predicts that the dominating dummy variable should have a positive coefficient.

We also included stepwise in 2 extra blocks: 1) the attribute importance ratings, and 2) the interaction terms between the attribute(s) and perceived importance. As the inclusion of the interaction terms did not significantly improve our model for any of the 3 binomial regressions (i.e. increase Nagalkerke's R^2), we omit them from our final model. Our results are shown in Table 4.17.

Table 4.17: Binomial Logistical Regression Analyses of Choice.

Predictors	Labour	Conservatives	Liberal Democrats
Economy (β)	.641*** (18.20)	.662*** (15.93)	.345** (5.84)
NHS (β)	-.082 (.42)	.370** (6.64)	.426** (7.92)
Imp: Economy (β)	-.178** (4.00)	.206 (2.97)	-.226** (6.40)
Imp: NHS (β)	.254* (6.67)	-.266** (6.86)	-.023 (.067)
Dominating (β)	-21.59 (.00)	21.17 (.00)	21.85 (.00)
Model Wald χ^2	57.24***	84.59***	50.22***
Nagelkerke R ²	.31	.44	.28

Note: *p< .05. ** p< .01. *** p< .001. Wald chi-square statistics in parentheses. N=588.

The dummy variable is non-significant for each of the parties and is negatively signed (and non-significant) in the case of the Labour Party.

4.6.5.4. Attribute Importance & Vote Choice

An interesting side question is whether or not perceived importance of attributes are predictive of vote choice for any particular political party (i.e. ‘issue ownership’; Green & Hobolt, 2008). We regressed attribute importance ratings on vote choice for each of the 3 main parties. Results indicate that higher ratings on the Economy are significantly associated with higher likelihood of choosing any of the parties, with a slight edge for the Conservatives; Labour (OR=1.9), Conservatives (OR= 1.94), and Liberal Democrats (OR= 1.41), which would be expected. Higher ratings on the NHS is only significantly related to a higher likelihood of choosing the Liberal Democrats (OR= 1.53), and the Conservative Party (OR= 1.45). Attribute importance ratings indicate that Labour is more likely to be chosen as the perceived importance of the NHS increases (OR= 1.29), with a decreased likelihood of the Conservatives (OR=.76). With higher ratings of importance for the Economy (OR= 1.2), there is a decreased likelihood of Labour (OR= .83) or the Liberal Democrats being chosen (OR= .79).

We tested to see if the attribute importance ratings were correlated with the actual ratings given to the parties, finding results only in the case of the Conservative Party. The perceived importance of the NHS negatively correlated with desirability ratings for the Conservative Party on the NHS, $r(226) = -.212, p = .001$; and the

perceived importance of the Economy was positively correlated with desirability ratings on the Economy, $r(226) = .31, p < .001$. As these are medium-strength correlations ($r \leq .30$), and tests for collinearity for these variables were all within acceptable limits (Tolerance = 1, VIF = 1), and as they improve the R^2 of our model, we leave them in our subsequent binomial regression for the Conservative Party.

The dominating dummy variable is non-significant ($p > .99$) for all choices, which suggests the attraction effect is not a significant predictor of vote choice in our model; this is likely due to the small amount of data points corresponding to dominating perceptual structures in the regression.

4.6.5.5. Discussion

H1: Where we observe asymmetric dominance structures among the general public, we will observe greater preference for the dominating option (the target) as per the attraction effect.

We found an overall significant difference in choice share due to perceptual structure, using both an ANOVA and a chi-square analysis. Only the party-choice proportions for when the Labour dominated the Liberal Democrats, or the Conservatives dominated the Liberal Democrats, were significantly different from those who had no asymmetric dominance perceptual structure. Looking at the pattern of choices made across the perceptual structures, they seem consistent with our hypotheses that the dominating option is chosen more often than others. Also we note that across a 6 asymmetric dominance structures, few people (or none) seem to choose the decoy option, which is encouraging; people should not be choosing the dominated option that they rated inferior if the attraction effect is to hold, or even on a rational level if they are trying to maximise utility from their choices. However, all these results are limited by the low number of cases where participants display an asymmetric dominance pattern, and that a number of the cells compared in the chi-square analyses have a count less than 5. Thus it is hard to make strong declarative statements on the prevalence of perceived asymmetric dominance structures, and potential effects on real-world political decisions.

Using binomial logistic regression and a dummy variable to code for the presence of an asymmetric dominance structure, we found no statistically significant relationship between the presence of an asymmetric dominance structure and the vote choice for that party, controlling for all other variables.

Overall, our results show that the majority of people do not seem to have an asymmetric dominance structure, at least on the two attribute issues we tested. This is in stark contrast to Pan et al. (1995) who found 67.4% of their participant sample had asymmetric dominating structures, whereas we find only them among 14.1% of our sample⁶⁵. A possible explanation may be that Pan et al. (1995) test individual candidate perceptions, whereas we test party-level perceptions and not for any one candidate (i.e. a party leader). Another difference is that in our study all the parties are seen as viable candidates (~33% vote share each), whereas in the US third party candidates are seen as less viable; indeed, vote share for Clinton was 51% overall in Pan et al. (1995).

At grand mean level, Liberal Democrats and the Conservatives seem to trade off on the NHS and Economy, with Labour being slightly better than the Liberal Democrats on the NHS, and worse on the Economy. This is more in line with a 'similarity effect' (Huber, Payne, & Puto, 1982), where one predicts a split in the choice share for Labour and Liberal Democrats to the benefit of the Conservative Party.

There are some notable key differences between our study and Pan et al. (1995): 1) Pan et al. (1995) use 'Healthcare' and 'Defence' as attributes for participants to rate the options on, whereas we use 'Healthcare/the NHS' and 'the Economy'; 2) we use political parties rather than presidential candidates as our options; 3) and their sample was relatively homogenous in that they tested graduate students in 3 separate business schools, whereas ours had 2 cohorts designed to capture the general public.

On 1): we used public opinion polls which have been consistent in their ranking of 'the NHS' and 'the Economy' as the two most important issues according to the public for months prior to the 2015 UK General Election, whereas Pan et al. (1995) based their attribute choices on judgments by 6 experts; we believe our choice of attributes is robust. Further, the mean importance ratings of the two attributes in our study are at the high end of the scale for ~80% of our sample.

On 2): while the USA political system is considered to focus more on the personal aspects of a candidate, the UK is considered to be a more party-brand electoral system. It is possible that people rate candidates' positions on attributes separately to the perceived position of the party they belong to, and indeed there is

⁶⁵ Both of our samples had a clear lack of asymmetric dominance structures present, with each having 28 people (~10% of each cohort) who exhibit one of 6 possible asymmetric structures.

evidence that suggests candidates in all democracies utilize this as a vote maximising or survival tactic in elections (Quinlavan & Weeks, 2009).

Partisan support often has emotional qualities (Burden & Klotz, 2005), and it could be that evaluating parties (versus candidates) leads to differences on scales that ask how ‘*desirable*’ the party is on that attribute; ‘desirability’ itself having an affective element. Asking people to consider candidates (i.e. people) may cause affective responses, by bringing to mind candidate images and/or personal traits like trustworthiness and competence (Olivola & Todorov, 2010). There is evidence to suggest that the personalisation of ‘*leader images*’ in the UK are a significant factor in voters’ decisions (Adams, 2001; Langer, 2009; Stewart & Clarke, 1992), something we do not control for as we are assessing the parties on only two issue dimensions. The problems of prior biases in context effects studies are not new (Mishra, Umesh, & Stem, 1993), but are difficult to account for *a priori*. Perhaps it is no longer useful to only ask for an appraisal of the party brand, and we should control for differences between them. However, controlling factors as to artificially reduce all decisions down to 2 attributes may not be ecologically valid, and alternatively, we could consider leader images as another dimensional attribute for evaluation. This would require consideration of context effects in *n*-dimensional space, literature on which is not currently available (to our knowledge).

Alternatively, participants may be more likely to give high ratings of desirability to a party they support on some/all issues under consideration, rather than undergo a cognitively effortful and potentially discomforting reappraisal of their party perceptions upon request (Lau & Redlawsk, 2006; Redlawsk, Civettini, & Emmerson, 2010). Also, in our study participants indicated their vote choice and ratings on the same page, and therefore it is possible that they simply indicated their vote choice as the one they rated highest on both attributes as to appear consistent- but still may not be their actual intended vote choice vote once in the ballot box, as other factors may determine their vote choice (e.g. perceived competence, Green & Hobolt, 2008). However, we did explicitly request participants to base their vote choice on just these two issues and assume representativeness of participant’s actual vote choice if based only on these issues.

The final difference (3) between Pan et al. (1995) and our study, is that we believe testing the general public is a more useful (if noisy) strategy to follow. Our results are more generalizable to the real world, and capture data using two differing methods: a field test in a marginal parliamentary seat considered a 3-way race; and

online in order to sample opinion across the UK, both geographically and politically. Pan et al. (1995) used business college populations in their study and retained 64.7% of their sample after excluding those who had one completely dominating option, whereas only 37% of our general population sample did not have a dominating option between the three main political parties. Pan et al. (1995)'s sample contained only 12% who had no asymmetric dominance structure, compared to 74% of our sample (i.e. most of our sample had a clearly dominating choice). A possible explanation for these differences might be education levels (our sample should have a more heterogeneous distribution of education), or political sophistication levels, which neither Pan et al. (1995) or we capture in our studies. Yet, as our sample is a more random sample of the population in the UK, we argue it is far more representative of the preference structures naturally present in the UK population, and that asymmetric preferences structures for political choices are far less prevalent than may be thought by Pan et al. (1995).

Despite limitations, our study has real world implications. In the 2015 General Election, 23,060,519 people cast votes for the Labour Party, the Liberal Democrats, or the Conservative Party. Those with an asymmetric dominance structure make up 9.5% of our sample, which would correspond to 2,196,240 voters in the UK whom may have an asymmetric dominance structure that may elicit an 'attraction effect'. This is not an insignificant number when we consider that the UK political system is a 'First-Past-The-Post' majoritarian democracy, where very small vote differences in constituencies have a larger impact on the overall representation in the UK parliament (in 2015 there were 194 marginal seats in Britain, needing up to a 5% swing to change hands)⁶⁶. These figures also ignore the existence of the other two smaller mainstream parties in the UK, the Green Party and the UK Independence Party (UKIP), which exist on the left and right of the spectrum respectively. It is quite possible that subsets of these 5 parties may be more relevant to explore, particularly for voters who perceive themselves on the 'left' or 'right' of the political spectrum and would be unlikely to ever consider a vote for a party on the opposite side of the 'centre' (e.g. Green, Labour, and Lib Dem; UKIP, Conservative, and Lib Dem).

Reassuringly, our logistic regression results mirror the dominant post-election opinion amongst pollsters and political pundits, that Labour's poor results in the 2015 General Election were due to their perceived weakness

⁶⁶ "[Election 2015: The political battleground](#)" BBC News, 24-02-2014

on the issue of the Economy⁶⁷ (although this may be conflated with overall ‘competence’⁶⁸). Our regression analyses show that voters’ ratings of Labour on the Economy (but not the NHS, their ‘owned’ issue) was positively associated with increased likelihood of choosing Labour; voters were 1.9 times more likely to choose Labour with each unitary increase on our 7-point desirability scale, but .83 times *less* likely to choose Labour as voters’ perceived *importance* of the Economy increases (10-point scale). By contrast, desirability ratings on both the Economy and the NHS, and the perceived importance of the Economy, were associated with an increased likelihood of choosing the Conservative Party; and only for the Conservatives was the Economy’s importance positively correlated with higher ratings on the Economy. The poll results by YouGov published before May 7th that tracked voter opinion showed that more people thought the economy was a greater issue “... *facing the country*” and “... *their family*” (52%/44%, and 45%/41%); that more people were worried about the economy (54% vs. 42%); that the coalition was handling the economy well (50% vs. 41%); and that the Conservatives would handle the economy better than Labour (40 vs 22%)⁶⁹. Therefore, we can take reasonable reassurance from the alignment of our studies results with real world polling results, that our study’s findings capture voters’ decision-making both pre- and post- the 2015 General Election in a realistic manner.

One must spare a moment for the Liberal Democrats for whom the NHS was not considered a significant predictor, and were less likely to be chosen with higher ratings of the Economy’s importance. Given the high mean importance ratings of both issues in our study (and in national polls), we find the low vote for the Liberal Democrats in our study and nationally, somewhat unsurprising. This suggests that the Liberal Democrats were not seen as dependable on the economy, with its increasing importance meaning voters were less likely to consider voting for them. That the NHS was not an issue that predicted voters’ choosing them *is* slightly surprising, given their pledge to spend £8 billion extra per year on the NHS; however, this was a pledge quickly adopted by all the political parties (e.g. Labour, Conservatives etc.) in some form or another, suggesting any initial tactical advantage arising from attempted ‘issue ownership’ was neutralised by competing parties. It also may be due to perceived likelihood of delivering on pledges and perceived ‘competence’ in achieving these goals in government. Although the Liberal Democrats were in coalition with the Conservative Party from

⁶⁷ “[UK post-election poll for the TUC](#)” GQR Polling, May 2016.

⁶⁸ “[A defeat to reckon with: On Scotland, economic competence, and the complexities of Labour's losses](#)”, John Curtice, *IPPR*, June 2015.

⁶⁹ <https://yougov.co.uk/publicopinion/archive/>

2010-2015, their effectiveness in achieving their policy goals is, literally, debatable⁷⁰. An example being their immediate inability to prevent a rise in UK tuition fees by their coalition partners to £9,000 within a short time of taking office. The widely-accepted sentiment in UK political discourse is that large majority parties are the most likely to deliver on policy pledges^{71,72}.

To summate: we have provided evidence of perceptual asymmetric dominance structures in a minority of the general public's political perceptions of the main 3 UK parties in the run-up to the UK 2015 General Election. There is tentative support that these are related to voters' political vote choice, but analysis is highly constrained by the low prevalence of voters with these structures in our sample. We recommend further studies done with much larger sample sizes, as done by other authors on the attraction effect among the general population using Google Surveys (Huber, Payne & Puto, 2014), or using data from the British Election Survey(s). We have also explored the impact of the two attributes and their perceived importance on the likelihood of voting for any of the 3 main parties, and find our results complimentary to the current discourse on the 2015 General Election outcome.

4.6. General Discussion

We investigated the main 'context effects' prevalent in the literature in four differing experiments, using online studies both realistic and fictional in the 3rd and 1st person, and field tests of the general public; and using differing attributes and scales (%s, monetary units, 'desirability' ratings, etc.). In Experiments 5-7 we studied the *attraction*, *similarity*, *compromise*, and *phantom* effects in controlled online studies, while we focussed solely on the attraction effect in Experiment 8.

We observe the **attraction effect** in Experiments 6 and 7 (but not Experiment 5), and not in our study (Experiment 8) during the 2015 UK General Election where we sampled widely from the general UK population- though this could be due to low statistical power. This evidence suggests that the attraction effect can indeed occur in political decision-making. Still, recent offerings from the consumer psychology literature have brought the robustness of the attraction effect into question (Frederick et al., 2014; Huber, et al., 2014; Yang et al., 2014). Frederick et al. (2014) conducted 38 studies, some replicating studies eliciting the attraction

⁷⁰ "[Liberal Democrat general election disaster was caused by 'perfect storm'](#)", *The Independent*, February 2016

⁷¹ "[How will a Conservative majority government affect Britain's foreign policy?](#)" *The Telegraph*, May 2015

⁷² "[Hung Parliaments- What you need to Know](#)"- Institute for Government (2015)

effect, finding attraction effects when choice options were described numerically, but not when those same options and attributes were visually depicted. They conclude that the attraction effect is not as robust or useful as is widely believed and that it seems limited to highly abstract and numeric stimulus presentations- which differ from those in real-world contexts. Specifically, the authors note that in 29 studies where at least one attribute could be directly experienced, they found no instances of a significant attraction effect. In fact, in some instances they find ‘repulsion’ effects, where the introduction of an asymmetrically dominated decoy reduced choice share for the target; for example, diluted grape ‘Kool-Aid’ increased preference for cherry ‘Kool-Aid’, rather than for the full-strength grape-flavour option.

While we do not observe any instances in our results corresponding to a ‘repulsion effect’, it is an interesting idea. Could ‘watered-down’ versions of political parties (e.g. a ‘Tory-lite’ option) lead to increase in preference for non-dominating alternatives? There is a real world example in the UK; in the decade between 2005-2015 the UK Labour Party were described as just that: “*Tory-lite*”^{73,74}. Were this perception held by members of the public, then an ‘attraction effect’ would predict this would increase support for the Conservative Party (the ‘Tories’), while a ‘repulsion effect’ would predict greater support for competing parties. We do not speculate as to whether these effects may have occurred in reality, only to note that the Conservative, Liberal Democrat, and UKIP vote share has increased (largely) at Labour’s expense (Ford & Goodwin, 2014)⁷⁵ from 2001-2010. This may represent both an attraction effect and a repulsion effect for differing types voters (e.g. ‘working class’ voters in more rural areas vs. ‘middle-class’ voters in urban cities). Indeed, Evans and Mellon (2015) posit that Labour’s move to a more socially-liberal stance (on the EU and immigration) increased support for the Conservatives (at Labour’s expense) among the disaffected working-class in 2010, who switched to UKIP in 2015 when UKIP became seen as a more viable entity. We don’t presume to simplify the complexity of electoral politics down to attraction/repulsion effects, but we argue there is more research to conduct before claiming they do (not) exist in real-world political decision-making.

Yang & Lynn (2014) add to our understanding of when the attraction effect may be observed, noting that the use of meaningful qualitative-verbal descriptions to differentiate choice options significantly reduced the

⁷³ “[Jeremy Corbyn: Labour cannot go on being ‘Tory-lite’](#)”, *Independent*, August 2016.

⁷⁴ “[It’s not ‘Tory lite’ to recognise that Labour’s problem is economic credibility](#)” *The Guardian*, Jun 2015.

⁷⁵ Some may point to the fairly consistent vote share of Labour in 2010 and 2015 (29% & 30%) in disagreement, however this ignores the decimation of the Liberal Democrats to Labour’s benefit in 2015, whose vote share increased in 2005 as a results of Labour’s support for the Iraq War.

effect size of any attraction effects; whereas, numeric representations of choice attributes elicited effect sizes for the attraction effect at expected levels (see Yang & Lynn, 2014). Essentially this suggests that the more meaningful and relevant we attempt to make each scenario (a core objective of this body of research here), versus non-meaningful and abstract, may limit our attempts at eliciting an attraction effect. This is clearly encouraging *vis-a-vie* real-world political decision-making, and points to the challenge of framing the act of voting, and the issues voters consider, in such a way as to be as meaningful and relevant in order to attenuate possible rational choice violations.

This may explain why we observe an attraction effect in Experiments 6 and 7, where the options are abstracted from everyday reality (using ‘desirability’, or fictional attributes); thus, participants may have engaged in less meaningful (or ‘effortful’) decision-making. In the original work by Malkoc et al. (2013), the authors did use standard ‘product description scenarios’ typical of those explored by Yang & Lynn (2014), along with desirability ratings, so our explanation is not necessarily in conflict with Malkoc et al.’s (2013) positive findings for the attraction effect.

There is no comparable discussion in the literature as to the robustness, given the previous considerations mentioned around the attraction effect, for the similarity effect, compromise, or phantom, effects.

We find fairly consistent evidence for the **similarity effect** in Experiments 5-7. In a way this effect is the most analogous to what is predicted by political models of competing parties, in that, parties should (and do) adjust their policy positions in order to compete with and maximise vote share (Adams & Merrill, 2003; Green & Hobolt, 2008). In other words, a party should alter their perceived position one or more policy attributes (in particular those considered most important to voters) relative to competitor parties, as to capture and/or split the share of a competitor’s vote (nominally, in the party’s favour). Any party engaging in rational vote maximisation will seek to be perceived as slightly better on at least one attribute, and seek to minimise perceptual differences on others, relative to competitors (Ansolabehere & Snyder, 2000). Therefore, the similarity effect should be the most obvious expected effect to be observed in political decision-making scenarios, which our results would seem to support.

Whether or not the ‘meaningfulness’ or ‘abstractedness’ of the presented scenarios *may* moderate the similarity effect is outside of this thesis to give evidence for. However, one does not see how it would, as the

similarity effect is fundamentally different from the attraction effect, in that the ‘decoy’ option is not an irrelevant option. Unless voters’ have perfectly equal weighting of attributes (which seems unlikely in reality), loss of share to the decoy with no change in preference for the other option(s) in the choice set will still elicit the similarity effect; that is, the relative loss of choice share for the target. Whether a scenario where the introduction of a (correctly positioned) decoy causes a perfect share shift from the target to the decoy (i.e., 50%:50% AB to 50%:0%:50% ABD) can be considered a ‘similarity’ effect is unclear, but based on current theory it should be considered valid.

We observe direct support for the **compromise effect** only once, in Experiment 5, where results trended in the predicted direction and reached significance on some (but not all) of our analyses. In many respects, this is our most surprising result as the compromise effect is supposedly the most ubiquitous, and easy to elicit, context effect (Kivetz, Netzer & Srinivasan, 2004). Common sentiment would hold that a compromise is considered more acceptable than an extreme option- but this ignores the perceived importance of the attributes, and indeed the context in which the options are appraised. In Experiment 7, there was no evidence for a compromise effect and a consistent preference for those parties that were higher in desirability for ‘healthcare’ over ‘education’ in all conditions. Participants reported a preference for increasing healthcare spending at higher rates than education spending, though only marginally so. Therefore, it is not unsurprising that voters would seek an option that provides relative balance between healthcare than education, with a tendency overall to prefer the option conferring a slightly greater benefit for healthcare, and not be affected by the introduction of ‘extreme’ options that forces a compromise between it and two options that are more preferable.

In UK politics the Liberal Democrats are often considered the ‘compromise’ option between the Labour Party and the Conservative Party; representing socially liberal policies, and centre/centre-right economic policies. Yet the vote share for the Liberal Democrats has not risen above 22.1% (its zenith; currently 7.9% in 2015) in the last few decades. It may very well be a ‘compromise’ option for some voters, but either a) not on the issues that matter, or b) enough issues to be relevant. This may be doing the Liberal Democrats a mild disservice, as there are other factors that voters may be utilizing in determining vote choice- the most obvious of which is partisanship, but also that their relative media share and party size are smaller than the Conservatives and Labour; representing more structural barriers than simply party positioning.

Intriguingly, compromise options might simply not be popular in politics generally. Guttman and Thompson (2010) discuss in length how political compromise is resisted (at least in the USA), due to tenaciously clinging to principles or ‘core values’, rather than seeing such things as ‘interests’ that are compromisable. Additionally, research in the USA by Pew Research Centre (2014, p.56) has shown the increasing polarisation of the USA affects where liberals/conservatives believe the ideal point of compromise should lie between negotiations between President Obama and Republicans in Congress. About 34% of liberals see the ideal point as halfway between Obama and the Republicans, while 62% see it as closer to Obama’s position than the GOP’s position. The opposite is true for conservatives: 57% say the point lies closer to the Republicans, and 34% closer to Obama. Therefore, voters may not be motivated to see available options as a compromise, regardless of their objective position on policy issues, due to voters’ core values and the distorting effect of ideological polarisation.

Finally, we only observe the **phantom effect** in Experiment 5, failing to find any evidence of it in subsequent studies. The phantom effect is one that has been observed in various studies (Choplin & Hummel, 2005; Dhar & Glazer, 1996; Pettibone & Wedell, 2000, 2007; Pratkanis & Farquhar, 1992) and even among honeybees (Tan et al., 204); however, the conditions for its effects are not yet widely understood, and theoretical accounts are still debated (Pettibone & Wedell, 2007; Tsetsos et al., 2010). We are not surprised we do not observe phantom effects. Political decision-making in real world elections is nearly *always* about making a decision based on the actual options available, with a ‘better’ option (either physical or imaginary) unavailable. This is true for candidates, parties, policy decisions, etc. In Chapter 2 (2.6, General Discussion) we noted one of correct voting’s assumptions is that people should vote for the highest preferred alternative in a choice set, even if a better preferred alternative is known but unavailable. The phantom effect directly tests this assumption, and that we do not observe it lends empirical strength to correct voting’s assumptions.

There is a question as to what degree we can claim a context effect’s (non-) existence based on observed frequency across (or within) studies (Yang & Lynn, 2014). Berkowitsch, Scheibehenne, and Rieskamp (2014), and Nagouchi and Stewart (2014), both determine evidence for the attraction, similarity, and compromise effects, by computing some relative proportion of each alternative chosen for each choice type. Berkowitsch et al. (2014) compute the ‘relative share choice share of the target’ (RST) from hundreds of trials per effect; whereas Nagouchi & Stewart (2014) computed the proportion of times each alternative was chosen for each

choice type per participant, over 10 trials per context effect. We clearly do not carry out multiple trials per experiment, and comparisons across each are not easily done. Yet it raises an important point; we should not expect any context effect to be elicited 100% of the time, and our ‘one-shot’ designs should be seen in that context. Indeed, in our final study of the general public, only 9.5% have an asymmetric dominance structure that may elicit an ‘attraction effect’, but this would correspond to 2,196,240 voters in the UK. This points to a clear need to examine context effects in larger populations than currently used in the literature (Frederick et al., 2014; Huber et al., 2014).

In addition, both Berkowitsch et al. (2014) and Nagouchi & Stewart (2014) vary the relative position of the decoy to the stimuli presented; in the case of, Berkowitsch et al. (2014) get participants to set a value for one option as to trade-off equally the other option, and the experimenters vary the decoy 10% of the distance between AB along (or orthogonal to) the ‘indifference line’. In general, we do not use this 10% rule to construct our stimuli in each experiment, but the question as to what distance/values stimuli should be set around a target as to elicit these context effects in political domains is an open one- and understandably one that would highly interest party political strategists looking to maximise candidate/party vote share.

Thus we suggest future research should examine context effects in political domains considering if context effects could occur systemically over repeated presentations of similar decisions, and what may be the optimal distance to set stimuli as to elicit each of context effects in political scenarios.

On a final note, it is worth bearing in mind the wider context of our research. Preference reversals, and violations of rational choice, are a particular expression of ‘correct voting’ concept, which assumes choosing the candidate (option) that best matches a voter’s preferences out of an available choice set. However, context effects raise a problem for current concepts of correct voting: if a voter prefers Party A overall and subsequently switches to Party B (of equivalent utility, but differing on attribute values) due to the presence of Party C, it is difficult to state which choice is ‘correct’, only that one option must be incorrect: is the initial choice ‘correct’, or the subsequent choice?

While in Chapter 2 we explored how the size of the choice set can lead to incorrect voting, here we have shown how the choices for those options based on voter preferences can be reversed following those choice set increases, depending on the relative location of the additional parties on certain issues. Whether preference

reversals arising from context effects are the reason for decreasing rates of correct voting arising from choice set size increases is, as yet, unclear, but our results suggest it is possible. This explanation is a novel contribution to correct voting research, and warrants further investigation.

We should be concerned that we find in four differing studies, one being a large study of the voting UK public that, preference violations can occur when people make political decisions for candidates or parties (but not always). While there is low risk and cost to the self, or society, in a person changing their mind from the salad to the burger, after being informed today's special is fish (a classic food menu metaphor for preference reversals), preference reversals and violations of rationality in voting can lead to negative outcomes for the self (not least affective concerns like 'regret' and stress), and also negative effects on wider society. The possibility of people being elected whom do not represent the actual preferences of the electorate, simply due to a quirk of human psychology, could concern all fans of the democratic system.

Chapter 5: Conclusion

“Our ability to predict how voters will vote is far more solidly based, than our ability to explain why they vote as they do”

- Kelly & Mirer (1974). *The Simple Act of Voting*.⁷⁶

5.1. Summary of Main Findings

We begin our journey asking some simple questions: do voters vote ‘correctly’ in elections? More to the point, do they vote in line with their preferences on issues that matter to them? And what, if any, factors might help or hinder their ability to vote correctly?

Prior research led us to identify two fruitful areas for investigation. Firstly, that increasing numbers of parties (‘alternatives’) in democratic elections (Lau et al., 2013) led to drastic decreases in the rate of correct voting. Secondly, research on ‘political heuristics’ (Lau & Redlawsk, 2001, 2006), in particular, party affiliation (i.e. party brands/labels); and may bias voters’ choices by causing them to ignore useful information about other candidates, and thus vote incorrectly.

In **Chapter 2**, we investigated whether increasing choice set size and the presence of party labels would lead to greater rates of incorrect voting. We utilized real-world materials from the 5 main UK political parties from their 2010 and 2015 manifestos, presenting information to participants via dynamic information boards across four in-lab experiments.

We found when the increase in the available candidates in the choice set is minimal (2 alternatives to 3 alternatives), voters seem unable to correctly identify the candidate that overall best matches their own reported preferences; voting correctly as low as 39% of the time, and not differing from what would be expected by simply choosing at chance. When we increase the choice set size to 5 alternatives, correct voting rates decrease as low as 26%. This is likely as a result of the increased task complexity arising from attempting to integrate additional alternatives and their accompanying information into voter’s decision-making (Timmermans, 1993).

⁷⁶ Kelley, S., & Mirer, T. W. (1974). The Simple Act of Voting. *The American Political Science Review*, 68(2), 572–591

We find mixed evidence for the idea that partisan labels act to negatively impact correct voting; with party label possibly improving correct voting as the choice set size increases, contrary to our hypotheses that it decrease correct voting. We find the effect mildly elusive, however, in all our results participants vote correctly at the lowest rates when the choice set size increases and there is an absence of partisan labels, which improves when party label is present.

Our results also point towards the role of *ideological* (or inter-alternative) *distinctiveness* in playing a role in voters' ability to correctly vote, such that greater distinctiveness (or decreasing similarity) of alternatives leads to greater rates of correct voting. This supports Scheibehenne et al. (2010), who posited that greater alternative similarity in choice sets would lead to adverse outcomes by increasing task complexity; and assumptions of the spatial model in politics, which posits that if two or more parties are equidistant (similar), this produces voter indifference and increases the likelihood of negative outcome (Downs, 1957).

We also find that there are no key differences in our results whether we use the directional (Rabinowitz & MacDonald, 1989) or proximal spatial model (Downs, 1957), in determining if voters' chose correctly; at least, based on the candidates in our studies. While Lau et al. (2013) note that the use of either rarely manifest in differing results, we show this empirically. We also lay out theoretical and methodological reasons why their correct voting method may lead to flawed results in the next section (Chapter 5.2.1).

In **Chapter 3**, we explored these results further in order to gain a better understanding of the potential effects of party label and choice set size on voters' cognitive processes, and relationship with correct voting rates. In particular, exploring the concept of party label as a heuristic, acting to reduce voter effort by limiting information search requirements and examine fewer alternatives. We examined the amount of information search, the average duration spent on time searched, and developed a number of novel metrics to explore equality of sampling between (sub-) sets of alternatives.

Using our measures of equality of search and average duration between alternatives in choice sets, we find evidence that party label is encouraging participants into utilizing confirming heuristic strategies (Russo & Doshier, 1983), such that over time participants make pairwise comparisons between their chosen and another alternative. We see this process evolve over the course of participant's information search in our experimental flow stages, and seems to correspond with the *choice by most attractive aspect heuristic* (Svenson, 1979). We

also find evidence that increasing choice set size encourages more unequal consideration in favour of the chosen candidate overall, but more equal consideration between the two most-preferred alternatives, presumably through eliciting heuristic strategies to reduce task complexity. We find that choice set size is negatively predictive of correct voting, even after accounting for levels of information search, and duration spent evaluating the information, and offer evidence that incorrect voting results from the incorrect selection of alternatives to consider between as choice set size increases. However, party label seems to exert a positive effect such that it improves the likelihood of participants correctly selecting sets of alternatives that may result in a ‘correct vote’.

In **Chapter 4**, we investigated correct voting in a differing matter, drawing upon extensive literature in consumer psychology around ‘context effects’; the phenomenon where the addition of alternatives into a choice set can cause violations of rational preference, and even the reversal of preference, depending on their relative position to other choice options on two or more attributes (i.e. issues). We hypothesised that we would observe the *attraction*, *similarity*, *compromise*, and *phantom* effects (Tsetsos et al., 2010) in political scenarios, using political issues as attributes, and asking participants to indicate a vote choice out of two or three alternatives placed along those attributes. We tested all four of these effects across three online studies, using both: within and between-subjects designs, fictional and hypothetical scenarios, and both real and abstracted attributes scales (e.g. ‘£’s or ‘desirability’ ratings). We found consistent evidence for the similarity and attraction effect, none for the compromise effect, and the phantom effect in only our ‘realistic’ scenario.

Further, we followed work conducted by Pan et al. (1995) on the attraction effect in preferences for real world political candidates. Using a joint online and field study during the UK 2015 General Election, we investigated whether asymmetric preferences for the main political parties in the UK (i.e. a party is perceived as better than others on one attribute, but not both) existed naturally among voters’ preferences in the UK; and whether these asymmetries corresponded to what would be expected for an ‘attraction effect’. We found 63% of voters sampled in the UK had a dominating option (i.e. felt a party was best on both ‘healthcare’ and ‘the economy’), with a minority having asymmetric preference structures (12%); in comparison to Pan et al. (1995) who found 67% of their sample did not have a dominating option for a real-world candidate. While we found tentative support that these asymmetric structures do predict voters’ choice for political party, our results are constrained by the small sample size we were left with.

In beginning this body of work, we started with a seemingly simple question: what, if any, is the effect of increasing numbers of political options (parties/candidates) on the ability for voters' to decide in line with their own political preferences? The assumption underlying the democratic process is a simple, and rational, one: that voters choose a party or candidate based on their preferences across a range of attributes. Adopting the correct voting framework from Lau and Redlawsk (2006) using an n -dimensional proximity model of correct voting, we show that voters' inability to choose the alternative that best matches their own preferences on multiple attributes increases as the number of alternatives increases. Using an information processing approach, we examined the possible underlying mechanisms for this, finding voters appear to engage in greater confirmatory heuristic processing strategies that utilize pairwise comparisons (e.g. Elimination-By-Aspects) as the choice set size increases. We suggest that the decrease in correct voting rates may be a result of selecting inappropriate alternatives to compare between, decreasingly the likelihood of making a correct vote.

However, in Chapter 4 we investigated an alternative explanation, whereby the addition of alternatives into a choice set may lead to violations of rational preference for a preferred option. For example, switching voters' preference for Party A to an originally lesser preferred Party B, by introducing an irrelevant decoy Party C (e.g. the attraction effect), We found in certain cases that this indeed occurs, with the similarity effect being the most consistently observed across both realistic and fictional political scenarios. To the extent of our knowledge, we are the first to investigate context effects other than the attraction effect in political decision-making, and the first to evidence for their presence, and possible factors that may attenuate their effects.

Our finding of preference reversals represent a particular problem for current concepts of correct voting. Correct voting assumes that voters should choose the option that provides the highest utility based their preferences on certain attributes, or, 'highest on preferred value dimensions (Chapter 1.5.2.). The proximal model of correct voting assumes that in an infinite n -dimensional attribute (policy) space with infinite alternatives, there is an option that perfectly aligns with a voter's own position in this space, and voter's attempt to choose an option that approximates this ideal point (i.e. highest preferred on their value dimensions). While correct voting does not assume that preferences are immutable, it implicitly assumes that when considering a subset of these alternatives, the adding or removing of irrelevant alternatives should not affect a voter's preferences in this n -dimensional attribute space; as, similar to option-based accounts of choice (e.g. expected utility theory), alternative values are assigned independently of each other.

Preference reversals may explain the decrease in correct voting rates as alternatives are introduced, causing temporary shifts in the perceived relative values of the options available, leading to a choice for an ‘incorrect’ alternative. However, this terminology becomes problematic: if the relative value of Party B is perceived as greater following the addition of Party C resulting in a change of preference, then this surely is a ‘correct choice’? Is the original choice for party A the ‘correct’ choice, or the subsequent choice for Party B? Resolving these questions are outside the scope of this body of work, but given the evidence for contextual reversal of preferences for political options, resolving these seem pertinent for the correct voting paradigm.

5.2. Future Directions

There are a number of possible future directions for each of the theoretical areas explored across all our studies. We explore them in turn below.

5.2.1. Correct Voting

We do not explore a variety of factors in our analyses that could possibly provide additional insights into correct voting, chief among them is the concept of ‘political sophistication’ (Luskin, 1990); a person’s political awareness and political knowledge (Lupia, 2002). One of the main reasons for avoiding investigating the role of political sophistication has been the presence of a decades-long debate between political psychologists and political scientists over what exactly *is* political sophistication, what psychological constructs underpin it, and best how to measure it (Luskin, 1990). The debate is beyond summation here and the reader is directed to a review of the area by Lawrence (2003). Despite this, political sophistication as a concept has been widely utilized in political science (McGraw et al., 1990; Miller, 2011; Weisberg & Nawara, 2010; Zaller, 1996).

Lau and Redlawsk (2006) investigated the relationship between political sophistication and correct voting, finding it positively predictive of correct voting; but found no evidence that differing decision-strategies of voters between political ‘sophisticates’ or ‘novices’ improved correct voting (p. 216). Additionally, Lau and Redlawsk (2006) found no significant difference in the use of their ‘party heuristic’ based on political sophistication, but did find after controlling for a multitude of other variables, that party heuristic use by sophisticates in general election campaigns increased the probability of correct voting and decreased for novices (p. 251), albeit weakly. Whether political sophistication levels relate to correct voting rates, and if the

effect of *our* party label heuristic differs by level of political sophistication, are both avenues for future research.

A particular question for the correct voting paradigm as put forward by Lau and Redlawsk (1997) and utilized by Lau et al. (2013), regards the operationalization of directional measure used to calculate candidate utility, and subsequently correct voting. Under their operationalization of Rabinowitz & MacDonald's (1989) directional model, if either a voter OR a candidate occupies the neutral point (i.e. the midpoint) on an issue dimension, then the resulting term will be '0', and the entire utility score for that issue will result in '0' for all candidates; or for any candidate that occupies the neutral point and the voter does not. This seems completely at odds with the concept of the directional model (Rabinowitz & MacDonald, 1989). The 'neutral' point is often interpreted as 'keeping the status quo', or the midpoint between two extremes (i.e. the 'centre ground'). Given the dominant belief that parties (and voters) converge towards the 'centre ground' between political extremes, and 'centrist parties' certainly exist (e.g. the Liberal Democrats in the UK), assigning a utility score of '0' in the scenarios mentioned seems incorrect.

A solution would be to provide an exception in the directional model, that changes the product term to a subtraction term whenever either voter or candidate occupies the neutral point. This would seem to reflect the idea that movement in either direction from the neutral point is unfavourable to a candidate, though we acknowledge that voters may have a directional preference for policy issues. The resulting model would better reflect the utility arising from '(dis)agreement' between a voter and a candidate on an issue, which is more in line with Rabinowitz & MacDonald (1989).

Perhaps the most fundamental issue with the current concept of correct voting is its classification of a correct vote as a binary outcome, rather than as a continuous discrete measure. Simply, *how* correct is a correct vote? Correct voting's underlying premise is the accuracy of voters in aligning their preference with their choice, but surely if the difference between choices is negligible and one chooses the slightly inferior option, this is *more* correct than if one chooses an option where the difference is greater? Putting it more concretely, is a voter 99% correct, or just 'incorrect' in their vote choice? The latter purely rationalist assumption seems overly harsh, in comparison with concepts of 'bounded rationality' and 'everyday rationality' (Anderson, 1990, 1991), which consider what is the optimal choice given the goals of the cognitive system, the environmental

structure, and cognitive limitations. Under the current framework of correct voting, it does not matter ‘how close’ a voter got to their ‘correct’ or ‘optimal’ vote, or what their constraints or goals were; for instance, whether they were voting strategically for some reason.

On the issue of discrete scales of correct voting, under the proximity model we know the option co-ordinates in n -dimensional space; returning a percentage ‘correctness’ is simply a matter of dividing a voter’s actual choice’s distance from the origin (0, 0) from that closest to the origin (the ‘best possible’ option). Strategic voting is a far more difficult issue to resolve, but one could start by investigating the roles of ‘electability’ (Lau et al., 2013) and perceived ‘competence’ of political options (Jellison & Harvey, 1973; Merrill & Groffman, 1999). Electability, or ‘viability’, is often signaled through polling results, but basing measures of perceived electability on polls is not without problems. People may vote for poll leaders to ‘be on the winning team’ (Deutsch & Gerard, 1955), or just to resolve cognitive dissonance by switching to the side they infer is going to win based on the poll (Kay et al. 2002). Polls may act as *self-fulfilling prophecies*, (Rothschild & Malhorta, 2014) such that people are more supportive of parties/policies that are seen to have higher general public support. In relation to perceived competence, Clarke et al. (2004) put forward this as the reason why despite the average voter lying closer to Labour and the Liberal Democrats/Alliance than to the Conservatives on a whole range of policy issues since 1987, the Conservatives won in both 1987 and 1992; and again in 2010 (Clarke et al., 2011) and 2015.

We see no reason why all of these considerations cannot be addressed in future research.

Finally, while we have investigated correct voting in an experimental setting, there are two fruitful avenues for research in the real-world. Lau et al. (2013) show that correct voting rates in the UK have dropped slightly from 79.3% (1997) to 78% (2005), but provide no data on correct voting rates in the more recent elections in 2010 and 2016. One could utilize data from the British Election Survey for each of these elections, using similar methodology to examine how correct voting has changed over time, and what potential factors may be involved. More important is the question: what to do with incorrect voting? A look at Table 1 in Lau et al. (2013, p.15) shows that in 2001 Poland had a correct voting rate of 44%. How then does one *improve* correct voting? Results in the same paper show that structural aspects of the democratic systems like information availability, and ideological distinctiveness (the *clarity* of choices) are both positively predictive of increased

correct voting; albeit weakly for the latter. However, at the cognitive level, perceived *political efficacy* was the strongest predictor of correct voting rates across thirty-three democracies (person's belief they have the ability to influence their political outcomes, thus increasing motivation to vote correctly). Beliefs and motivations are the bread and butter of psychologists, and understanding how to better increase political efficacy amongst voters seems like a noble cause, and useful research. One avenue may lie in methods to increase voters' perceived responsibility (accountability) for outcomes, shown to lead to increasing effort on vote tasks (Weldon & Gargano, 1985) and judgment accuracy (Mero and Motowidlo, 1995; for a review see Lerner & Tetlock, 1999).

5.2.2. Context Effects

Context effects represent a differing problem for correct voting assumptions. While correct voting assumes that voters should match their preferences with some target option available, context effects lead to violations of those preferences even if the target is 'correctly' identified.

It is unclear to what extent context effects themselves exist in natural settings outside of tightly controlled experimental setups, with recent findings that find that the attraction effect (at least) is significant in choice sets where abstract and numerical attributes describe the options, but not when options are described by more realistic, qualitative-verbal descriptions and pictorial information (Frederick et al., 2014; Yang & Lynn, 2014). While political campaigning pledges often involve numbers (e.g. '£8billion for the NHS'), arguably most voters do not place all parties' policy pledges in some convenient numeral array for comparison (the standard in context effects research). While these findings may hold true for the attraction effect, and indeed our inability to find the attraction effect in our two most 'realistic' experimental scenarios would support it, there is no similar investigation around the similarity, compromise, and phantom effects. In fact, for the similarity effect, we find it the most robust across the three experiments in which we investigated it, and is most analogous to the 'vote splitting' concept of competitive electoral politics (where similar candidates/parties position to 'split the vote', often benefitting a third competitor).

This negative view of the attraction effect's robustness is not shared by all (Lichters, Sarstedt, & Voght, 2015; Simpson, 2014). In a critique of Frederick et al. (2014) and Yang and Lynn's (2014), Simonson (2014) stating their negative findings is a result of participants being unable to identify the dominated option, and

ignoring ‘repulsion effects’, which may account for the absence of an attraction effect. Lichters et al. (2015) provide a stunningly comprehensive review of the extant literature to identify the “*seven ingredients for an ‘ideal’ context effect experiment*” (p. 14). While we do not repeat them here, we note three of relevance: using real items or realistic attributes/attribute; corresponding the choice alternatives’ relevance between subjects sampled in experiments and individuals in real-world applications; avoiding artificial learning processes triggered by a high number of repeated choices. Our experiments follow this ‘ideal’ experimental standard, however we do not control for subjects’ perception of choice alternatives (another ingredient) - a theme that emerges consistently. Sinn et al. (2007) highlight this by investigating ‘familiarity’ with brands, finding that the compromise effect only occurs when brand familiarity for choice set options is high. Considering we do not use any real-world party ‘brands’ in our experiments on context effects, with the exception of Experiment 8 where we test only for the attraction effect, this seems a worthwhile avenue of investigation for future research.

We do address recommendations by Lichters et al. (2015) who suggest research address the differences between between-subjects designs and within-subjects designs. We use a within-subjects design in Experiment 5, and between-subjects in the others, finding in almost no case do context-effects occur within-subjects. Arguably, we do not design our experiments to test this directly (as we use differing scenarios but the same options) as to minimize carry-over effects, therefore we should control all aspects in order to directly test if the same choices will occur in the same decision scenario.

A key need of future research is how context effects differ as the number of products in a choice set increases, as political choices in democracies are not, barring the USA, often constrained to two or three choices. While we have not found the compromise effect in any of our experiments here, Kivet, Netzer, and Srinivasan (2004) have demonstrated that compromise effects do occur in choice states that comprise of five alternatives that differ on 4 attribute dimensions. This high dimensionality, multi-alternative, approach is a highly promising area for future research, allowing us to begin testing context effects in scenarios more reflective of reality’s complexity.

An interesting question is what happens if a candidate, or party, drops out of an election, rather than entering? Hedgcock, Rao, and Chen (2009) found a ‘phantom attraction’ effect whereby the choice share for a

dominating target stayed significantly greater after the inferior decoy was removed from the choice set, suggesting this may mimic the ‘dropping out’ of candidates in three-way elections (specifically Nader’s exit from the 2000 US Presidential election). It is interesting then that the Merriam-Webster definition of a ‘stalking horse’ is: “*a candidate put forward to divide the opposition or to conceal someone's real candidacy*”⁷⁷. This suggests that ‘stalking horses’ in politics can also be used tactically to increase choice share for a preferred candidate, simply by getting a slightly less superior candidate to announce their entry to (and later exit from) an election. From a review of the extant literature, there does not seem to be any additional research into how removing contextual decoys may affect preferences for targeted options; and no research on whether these effects actually occur in political scenarios. While Hedgcock et al. (2009) related their findings to politics, they used the price/quality of beer as their two attributes, rather than, for example, healthcare and education.

We have also not investigated other curious violations of preferences as a result of context. For example, ‘*single option aversion*’ (Mochon, 2013), where decision-makers were less likely to make a choice (e.g. a purchase decision, a donation to Red Cross) more when faced with just a single option, but more likely to choose that option when competitors are present in the choice set. This is similar to Glazer, Khan, and Moore (1991) finding for the ‘*lone-alternative-effect*’, whereby an option is more preferable when offered in a choice set of two than alone, with the effect strengthening as option similarity in the choice set increases. This may be due to task difficulty eliciting the use of heuristics (Glazer et al., 1991), or simply that justifying a preferred choice is easier when it is not the only option (as multiple explanations can be generated). To briefly take an example from current UK politics, it would suggest that the (current) leader of the Labour Party, Jeremy Corbyn, would actually benefit far more from having a competitor (i.e. Owen Smith) in the Labour Leadership race than running unopposed. Indeed, poll results suggesting Corbyn has seen an increase in support following the entry/exit of Angela Eagle, and the continuing context with Owen Smith, lends conjecture of such context effects credence^{78,79}.

⁷⁷ Or: someone or something that is used to hide a true purpose; especially: a candidate for a political office or position who has no real chance of winning but is being used by a political party to weaken the support for an opposing party. Retrieved from [Merriam-Webster.com](https://www.merriam-webster.com/dictionary/stalking%20horse).

⁷⁸ “Jeremy Corbyn increases dominant lead over Angela Eagle and Owen Smith among Labour Party members, poll finds”, *The Independent*, [July 2016](#).

⁷⁹ “Jeremy Corbyn has more than double the support of Owen Smith, poll shows”, *The Guardian*, [July 2016](#).

5.2.3. Heuristics

We found that increasing choice set size does result in information processing patterns that conform to those expected by decision-makers utilizing heuristic strategies. However, we are still unclear as to what types of heuristic strategies are used, and what models best explain how decision-makers decide between options as choice set size increased. We only investigated one possible heuristic here, namely the effect of partisan identity by way of global party brand-labels. There are others identified by Lau and Redlawsk (2001, 2006), such as ‘endorsements’, ‘candidate ideology’, ‘candidate appearance’, and ‘polls’, however their findings for each were mixed, and no follow up research on their use, the conditions in which they may be most utilized, or the mechanisms underlying them, seems to have occurred. Particularly, it is unclear how candidate ideology interacts with party label, and how much of a concern outside of the USA (where discussions of liberal/conservative ideology are ubiquitous) candidate ideology is. Or indeed, if there are other (political) heuristics that might be utilized in more complex electoral systems like those in the EU (e.g. recognition heuristic, Gigerenzer & Gaissmaier, 2011). It seems clear that there is scope for further work in the area.

There are questions about the appropriateness of testing party label as a heuristic through information boards, which we raised at the end of Chapter 3, namely that the ability to re-access information reduces the reliance on possible heuristics that may be utilized to decrease working memory load (Shah & Oppenheimer, 2008). Therefore, it may be better to test party label’s effects in low information environments, as the reliance on it should be greater. One could do this simply by preventing re-access of information after access in the flow stage. As a counterpoint, such a scenario is hardly reflective of reality- hence why we originally chose to allow repeat access. Is the real world a low information environment? Perhaps to some, and perhaps not to others, dependent on the media saturation in their personal context, and the motivation they have to appraise the information or seek it out. The advent of the internet, and the pervasiveness of access through modern technology has essentially removed many of the structural barriers to information access that may have existed and has made information almost permanently re-accessible. If one needs to look up a party position, Google will provide in seconds. Researching these questions of heuristic use in political scenarios that may reflect low, moderate, and high information environments would answer many of these questions, and shed light on when and how voters’ may engage in heuristic processing.

One aspect under considered is ‘stopping rules’, the idea that heuristics have rules whereby they stop seeking information once the considered alternatives reach a certain criterion. In our experiments using the dynamic processing tracing method, we do not allow participants to terminate the flow stage early in order to vote (contrary to Lau & Redlawsk, 2006). In addition, we lengthen the time participants spend in the flow stage commensurate with how much information we included with each additional candidate. However, election campaigns (by and large) don’t lengthen in the real world the more candidates/parties enter the race, nor do they suddenly terminate when a voter feels ready to vote. Future research should limit the amount of time participants have as to be constant across conditions, while increasing the amount of information/alternatives, to examine how processing changes as a result. Also, allowing participants to terminate their information search when they are ready may allow us to identify points where they have reached a threshold under some heuristic strategy, and whether allowing participants to terminate early could result in greater or lesser rates of correct voting.

Finally, there is great value in further pursuing the 4 ‘models’ of voters developed by Lau & Redlawsk (2006). While we have not sought to classify our voters under these models, we have investigated whether voters by-and-large confirm to ‘Model 4’ types that would expect to utilize heuristics and other shortcuts (i.e. stereotypes, schemes, etc.), as Lau and Redlawsk (2006) find the majority of voters in their samples conform to this voter type across differing electoral scenarios. However, they do find large numbers of voters also conform to Model 1 (classic ‘rational decision-makers who seek out all information), Model 2 (confirming prior beliefs through partisan voting), and yet more (6-15%) are ‘unclassified’ under any of these models. Their other model, ‘Model 3’ (‘fast & frugal’ by seeking out few but highly valid informational cues), had the lowest prevalence among their sample. In the latter case, it is likely the low prevalence is due to the fact such (heuristic) strategies are common with those exhibited by Model 4 voters.

Whether or not these models accurately capture voter decision-making is unclear, and whether some can be either merged, or sub-divided, or new ones created, based on observations about how voters’ process information remains an open research question. Further, we have no insight as to how these models may apply to voters in democracies outside of the USA, or how they might be influenced by the context voters exist in; or the prevalence of such voters across democracies. Such questions require deeper thought, and considerations

of how to test such comparative analyses across democracies, it seems a pursuit that lies at the heart of understanding voter decision-making, and human decision-making more generally.

5.3. Conclusion

“We are the model citizens; We are the absentees; We are the politicians; I am exactly like you, you're just like me.”

- **The Living End (*The Ending Is Just the Beginning Repeating*)**

It is a tired phase: the end is just the beginning. Indeed, for Ph.D. work and most theses, the above album name by a certain Australian rock band is a better reflection of the reality. As such, let us repeat the beginning: What is it to ‘vote’?

To vote is to express through almost unfathomable processes, influenced by innumerable factors, the preferences that have been constructed in one’s mind for abstract concepts like ‘social justice’, and to mark on a (literally) paper thin sheet, who would be best placed to run the complex machinery of democratic government. It is, at every level, one of the complex pieces of human psychology imaginable; possibly secondary to understanding why anyone would want to vote for Donald Trump in the 2016 USA Presidential Elections. Yet, there is beauty in its simplicity.

Psychology has informed us for over 50 years that as humans, we make poor decisions, even when we simply increase the number of options available to us; be they pots of jam, or here, political candidates and parties. Be it in the bar after a country leaves the EU, or in an academic journal, the question asked is: do voters vote correctly? This thesis attempts to grapple with such a seemingly benign question.

Our findings should provide a degree of worry as an answer: as voters seem to do no better than if they were choosing by chance when there are three or more parties. Thankfully, voters do not seem to change their vote choice if we tell them of some ‘ideal’ party out of reach, or take a compromise choice following the introduction of extremist options. Yet we do find voters can be influenced through canny positioning by other parties in order to ‘compete’ and split vote share, and possibly voters’ choices can be influenced by considering additional inferior political options. All of these makes one think: yes, voters do vote incorrectly.

Yet democracy assumes we are all ‘model citizens’; rational, informed, and whatever our vote, they reflect the needs, moods, sentiment, and preferences of the voter. Should they not, therefore, reflect the limitations, the frailties, the inaccuracies?

It begs the question: why is the gold standard for elections ‘free and fair’, but not ‘accurate’? Why is it that we measure the health of a democracy by how many electors turn out to vote on a given day, and not how well supported they are in making an accurate vote? It seems policy-makers should be asking these questions. What steps can we take to measure and improve the systems and structures that voters in society exist in, to aid them in voting, and provide a voter the greatest personal utility (and/or the highest utility for society) based on their true preferences? Should a government elected with high turnout, but with low voter ‘correctness’, be preferable to one where few vote but with high accuracy? What of democracies where voting is compulsory (i.e. Australia), but the accuracy of those votes are ignored?

The last major revision of the fundamentals of democracy in the UK (ignoring the suffrage movement) was the introduction of the secret ballot via the Ballot Act of 1872⁸⁰. Perhaps it is time for a fundamental re-think of how we view our democratic health: we do not sit idly by when a patient is in questionable health, or a friend is making a poor decision; so why do so for our democracy?

⁸⁰ Co-incidentally linked with the decline in the 20th century of voter turnout (Davenport et al., 2010; Green & Gerber, 2010)

References

- Achen, C. H. (2002). Parental Socialization and Rational Party Identification. *Political Behavior*, 24(2), 151–170.
<https://doi.org/10.1023/A:1021278208671>
- Ahluwalia, R. (2002). How Prevalent Is the Negativity Effect in Consumer Environments? *Journal of Consumer Research*, 29(2), 270–279. <https://doi.org/10.1086/341576>
- Aldrich, J. H. (1993). Rational Choice and Turnout. *American Journal of Political Science*, 37(1), 246–278.
<https://doi.org/10.2307/2111531>
- Anderson, J. R. (1983). A spreading activation theory of memory. *Journal of Verbal Learning and Verbal Behavior*, 22(3), 261–295. [https://doi.org/10.1016/S0022-5371\(83\)90201-3](https://doi.org/10.1016/S0022-5371(83)90201-3)
- Armingeon, K. (2006). Reconciling Competing Claims of the Welfare State Clientele: the Politics of Old and New Social Risk Coverage in Comparative Perspective. In K. Armingeon & G. Bonoli (Eds.), *The Politics of Post-Industrial Welfare States. Adapting post-war social policies to new social risks* (pp. 100–123). London: Routledge. Retrieved from <http://boris.unibe.ch/19682/>
- Arrow, K. J. (2001). Uncertainty and Technological Change in Medicine. *Journal of Health Politics, Policy and Law*, 26(5), 851–883. <https://doi.org/10.1215/03616878-26-5-851>
- Augenblick, N., & Nicholson, S. (2016). Ballot Position, Choice Fatigue, and Voter Behaviour. *The Review of Economic Studies*, 83(2), 460–480. <https://doi.org/10.1093/restud/rdv047>
- Austen-Smith, D. (1988). Sincere voting in models of legislative elections. *Social Choice and Welfare*, 6(4), 287–299.
<https://doi.org/10.1007/BF00446986>
- Badawood, D., & Wood, J. (2012). Effects of candidate position on ballot papers: Exploratory visualization of voter choice in the London local council elections 2010. Presented at the Geographic Information Science Research UK 19th Annual Conference (GISRUK 2011), University of Portsmouth, Portsmouth, UK. Retrieved from <http://openaccess.city.ac.uk/1740/>
- Ballew, C. C., & Todorov, A. (2007). Predicting political elections from rapid and unreflective face judgments. *Proceedings of the National Academy of Sciences*, 104(46), 17948–17953. <https://doi.org/10.1073/pnas.0705435104>

- Barbaranelli, C., Caprara, G. V., Vecchione, M., & Fraley, C. R. (2007). Voters' personality traits in presidential elections. *Personality and Individual Differences, 42*(7), 1199–1208. <https://doi.org/10.1016/j.paid.2006.09.029>
- Bargh, J. A., & Thein, R. D. (1985). Individual construct accessibility, person memory, and the recall-judgment link: The case of information overload. *Journal of Personality and Social Psychology, 49*(5), 1129–1146. <https://doi.org/10.1037/0022-3514.49.5.1129>
- Baron, J. (1994). Nonconsequentialist decisions. *Behavioral and Brain Sciences, 17*(1), 1–10. <https://doi.org/10.1017/S0140525X0003301X>
- Barrick, M. R., & Mount, M. K. (1991). The Big Five Personality Dimensions and Job Performance: A Meta-Analysis. *Personnel Psychology, 44*(1), 1–26. <https://doi.org/10.1111/j.1744-6570.1991.tb00688.x>
- Bartels, L. M. (2000). Partisanship and Voting Behavior, 1952-1996. *American Journal of Political Science, 44*(1), 35–50. <https://doi.org/10.2307/2669291>
- Bartels, L. M. (2002). Beyond the Running Tally: Partisan Bias in Political Perceptions. *Political Behavior, 24*(2), 117–150.
- Bassi, A. (2015). Voting systems and strategic manipulation: An experimental study. *Journal of Theoretical Politics, 27*(1), 58–85. <https://doi.org/10.1177/0951629813514300>
- Bateson, M., Healy, S. D., & Hurly, T. A. (2002). Irrational choices in hummingbird foraging behaviour. *Animal Behaviour, 63*(3), 587–596. <https://doi.org/10.1006/anbe.2001.1925>
- Baumeister, R. F., Bratslavsky, E., Finkenauer, C., & Vohs, K. D. (2001). Bad Is Stronger Than Good. *Review of General Psychology, 5*(4), 323–370.
- Bearden, J. N., & Connolly, T. (2008). On Optimal Satisficing: How Simple Policies Can Achieve Excellent Results. In T. Kugler, J. C. Smith, T. Connolly, & Y.-J. Son (Eds.), *Decision Modeling and Behavior in Complex and Uncertain Environments* (pp. 79–97). Springer New York. Retrieved from http://link.springer.com/chapter/10.1007/978-0-387-77131-1_4
- Benney, K. S., & Henkel, L. A. (2006). The role of free choice in memory for past decisions. *Memory, 14*(8), 1001–1011. <https://doi.org/10.1080/09658210601046163>
- Berkowitsch, N. A. J., Scheibehenne, B., & Rieskamp, J. (2014). Rigorously testing multialternative decision field theory against random utility models. *Journal of Experimental Psychology: General, 143*(3), 1331–1348. <https://doi.org/10.1037/a0035159>

- Bettman, J. R., Luce, M. F., & Payne, J. W. (1998). Constructive Consumer Choice Processes. *Journal of Consumer Research*, 25(3), 187–217. <https://doi.org/10.1086/jcr.1998.25.issue-3>
- Blais, A., Nadeau, R., Gidengil, E., & Nevitte, N. (2001). The formation of party preferences: Testing the proximity and directional models. *European Journal of Political Research*, 40(1), 81–91. <https://doi.org/10.1111/1475-6765.00590>
- Blavatsky, P. R. (2007). Stochastic expected utility theory. *Journal of Risk and Uncertainty*, 34(3), 259–286. <https://doi.org/10.1007/s11166-007-9009-6>
- Blekesaune, M., & Quadagno, J. (2003). Public Attitudes toward Welfare State Policies A Comparative Analysis of 24 Nations. *European Sociological Review*, 19(5), 415–427. <https://doi.org/10.1093/esr/19.5.415>
- Bless, H., Schwarz, N., Clore, G. L., Golisano, V., Rabe, C., & Wölk, M. (1996). Mood and the use of scripts: does a happy mood really lead to mindlessness? *Journal of Personality and Social Psychology*, 71(4), 665–679.
- Bonoli, G. (2005). The politics of the new social policies: providing coverage against new social risks in mature welfare states. *Policy & Politics*, 33(3), 431–449. <https://doi.org/10.1332/0305573054325765>
- Botti, S., & Lyengar, S. S. (2004). The psychological pleasure and pain of choosing: when people prefer choosing at the cost of subsequent outcome satisfaction. *Journal of Personality and Social Psychology*, 87(3), 312–326. <https://doi.org/10.1037/0022-3514.87.3.312>
- Brandstatter, E., Gigerenzer, G., & Hertwig, R. (2006). The Priority Heuristic: Making Choices Without Trade-Offs. *Psychological Review*, 113(2), 409–432.
- Brehm, J. W. (1956). Postdecision changes in the desirability of alternatives. *The Journal of Abnormal and Social Psychology*, 52(3), 384–389. <https://doi.org/10.1037/h0041006>
- Buckler, S., & Dolowitz, D. (2012). Ideology Matters: Party Competition, Ideological Positioning and the Case of the Conservative Party under David Cameron. *The British Journal of Politics and International Relations*, 14(4), 576–594. <https://doi.org/10.1111/j.1467-856X.2011.00482.x>
- Busemeyer, J. R., Barkan, R., Mehta, S., & Chaturvedi, A. (2007). Context effects and models of preferential choice: implications for consumer behavior. *Marketing Theory*, 7(1), 39–58. <https://doi.org/10.1177/1470593107073844>
- Campbell, A., Converse, P. E., Miller, W. E., & Stokes, D. E. (1960). *The American voter* (Vol. viii). Oxford, England: John Wiley.

- Campbell, I. (2007). Chi-squared and Fisher–Irwin tests of two-by-two tables with small sample recommendations. *Statistics in Medicine*, 26(19), 3661–3675. <https://doi.org/10.1002/sim.2832>
- Carlson, K. A., Meloy, M. G., & Russo, J. E. (2006). Leader-Driven Primacy: Using Attribute Order to Affect Consumer Choice. *Journal of Consumer Research*, 32(4), 513–518. <https://doi.org/10.1086/500481>
- Castles, F. G., & Mair, P. (1997). Left-right political scales. *European Journal of Political Research*, 31(1–2), 147–157. <https://doi.org/10.1023/A:1006874631504>
- Chaiken, S., & Trope, Y. (1999). *Dual-process Theories in Social Psychology*. Guilford Press.
- Chater, N., & Oaksford, M. (2008). *The Probabilistic Mind: Prospects for Bayesian Cognitive Science*. Oxford University Press.
- Chernev, A. (2001). The Impact of Common Features on Consumer Preferences: A Case of Confirmatory Reasoning. *Journal of Consumer Research*, 27(4), 475–488. <https://doi.org/10.1086/319622>
- Chernev, A. (2003a). Product assortment and individual decision processes. *Journal of Personality and Social Psychology*, 85(1), 151–162. <https://doi.org/10.1037/0022-3514.85.1.151>
- Chernev, A. (2003b). When More Is Less and Less Is More: The Role of Ideal Point Availability and Assortment in Consumer Choice. *Journal of Consumer Research*, 30(2), 170–183. <https://doi.org/10.1086/376808>
- Chernev, A. (2006). Decision Focus and Consumer Choice among Assortments. *Journal of Consumer Research*, 33(1), 50–59. <https://doi.org/10.1086/504135>
- Chernev, A., Böckenholt, U., & Goodman, J. (2015). Choice overload: A conceptual review and meta-analysis. *Journal of Consumer Psychology*, 25(2), 333–358. <https://doi.org/10.1016/j.jcps.2014.08.002>
- Cho, S., & Endersby, J. W. (2003). Issues, the spatial theory of voting, and British general elections: A comparison of proximity and directional models. *Public Choice*, 114(3–4), 275–293.
- Choplin, J. M., & Hummel, J. E. (2005). Comparison-induced decoy effects. *Memory & Cognition*, 33(2), 332–343. <https://doi.org/10.3758/BF03195321>
- Claassen, R. L. (2007). Ideology and Evaluation in an Experimental Setting Comparing the Proximity and the Directional Models. *Political Research Quarterly*, 60(2), 263–273. <https://doi.org/10.1177/1065912907302050>
- Clarke, H. D. (2004). *Political Choice in Britain*. Oxford University Press.

- Clarke, H., Sanders, D., Stewart, M., & Whiteley, P. (2011). Valence Politics and Electoral Choice in Britain, 2010. *Journal of Elections, Public Opinion and Parties*, 21(2), 237–253. <https://doi.org/10.1080/17457289.2011.562614>
- Clore, G. L., & Huntsinger, J. R. (2007). How emotions inform judgment and regulate thought. *Trends in Cognitive Sciences*, 11(9), 393–399.
- Collange, J., Fiske, S. T., & Sanitioso, R. (2009). Maintaining a Positive Self-Image by Stereotyping Others: Self-Threat and the Stereotype Content Model. *Social Cognition*, 27(1), 138–149. <https://doi.org/10.1521/soco.2009.27.1.138>
- Cox, G. W. (1997). *Making Votes Count: Strategic Coordination in the World's Electoral Systems*. Cambridge University Press.
- Cutler, F. (2002). The Simplest Shortcut of All: Sociodemographic Characteristics and Electoral Choice. *The Journal of Politics*, 64(2), 466–490. <https://doi.org/10.2307/2691857>
- Czerlinski, J., Gigerenzer, G., & Goldstein, D. G. (1999). How good are simple heuristics? In *Simple heuristics that make us smart* (pp. 97–118). New York, NY, US: Oxford University Press.
- Dalton, R. J. (2008). The Quantity and the Quality of Party Systems Party System Polarization, Its Measurement, and Its Consequences. *Comparative Political Studies*, 41(7), 899–920. <https://doi.org/10.1177/0010414008315860>
- Danziger, S., Levav, J., & Avnaim-Pesso, L. (2011a). Extraneous factors in judicial decisions. *Proceedings of the National Academy of Sciences*, 108(17), 6889–6892. <https://doi.org/10.1073/pnas.1018033108>
- Danziger, S., Levav, J., & Avnaim-Pesso, L. (2011b). Extraneous factors in judicial decisions. *Proceedings of the National Academy of Sciences*, 108(17), 6889–6892. <https://doi.org/10.1073/pnas.1018033108>
- Davis, O. A., & Hinich, M. J. (1966). *Some results related to a mathematical model of policy formation in a democratic society*. Carnegie Institute of Technology, Graduate School of Industrial Administration.
- Dawes, R. M. (1979). The robust beauty of improper linear models in decision making. *American Psychologist*, 34(7), 571.
- Debreu, G. (1960). [Review of *Review of Individual Choice Behavior: A Theoretical Analysis*, by R. D. Luce]. *The American Economic Review*, 50(1), 186–188.
- DeKay, M. L. (2015). Predecisional Information Distortion and the Self-Fulfilling Prophecy of Early Preferences in Choice. *Current Directions in Psychological Science*, 24(5), 405–411. <https://doi.org/10.1177/0963721415587876>
- DeKay, M. L., Stone, E. R., & Sorenson, C. M. (2011). Sizing up information distortion: Quantifying its effect on the subjective values of choice options. *Psychonomic Bulletin & Review*, 19(2), 349–356. <https://doi.org/10.3758/s13423-011-0184-8>

- Dhar, R. (1997). Consumer Preference for a No-Choice Option. *Journal of Consumer Research*, 24(2), 215–231.
<https://doi.org/10.1086/209506>
- Dhar, R., & Glazer, R. (1996). Similarity in context: Cognitive representation and violation of preference and perceptual invariance in consumer choice. *Organizational Behavior and Human Decision Processes*, 67(3), 280–293.
- Dhar, R., Nowlis, S. M., & Sherman, S. J. (1999). Comparison Effects on Preference Construction. *Journal of Consumer Research*, 26(3), 293–306. <https://doi.org/10.1086/jcr.1999.26.issue-3>
- Dhar, R., & Simonson, I. (1992). The Effect of the Focus of Comparison on Consumer Preferences. *Journal of Marketing Research*, 29(4), 430–440.
- DiMaggio, P., Evans, J., & Bryson, B. (1996). Have Americans' social attitudes become more polarized? *American Journal of Sociology*, 102(3), 690–755. <https://doi.org/10.1086/230995>
- Downs, A. (1957). An Economic Theory of Political Action in a Democracy. *Journal of Political Economy*, 65(2), 135–150.
- Druckman, J. N. (2004). Political Preference Formation: Competition, Deliberation, and the (Ir)relevance of Framing Effects. *American Political Science Review*, 98(4), 671–686. <https://doi.org/10.1017/S0003055404041413>
- Druckman, J. N., Jacobs, L. R., & Ostermeier, E. (2004). Candidate Strategies to Prime Issues and Image. *The Journal of Politics*, 66(4), 1180–1202. <https://doi.org/10.1111/j.0022-3816.2004.00295.x>
- Druckman, J. N., Kuklinski, J. H., & Sigelman, L. (2009). The Unmet Potential of Interdisciplinary Research: Political Psychological Approaches to Voting and Public Opinion. *Political Behavior*, 31(4), 485–510.
<https://doi.org/10.1007/s11109-009-9092-2>
- Druckman, J. N., & Lupia, A. (2000). Preference Formation. *Annual Review of Political Science*, 3(1), 1–24.
<https://doi.org/10.1146/annurev.polisci.3.1.1>
- Easton, D. (1953). *The Political System: An Inquiry Into the State of Political Science*. Knopf.
- Esping-Andersen, G. (1999). Politics without Class: Postindustrial Cleavages in Europe and America. In *Continuity and Change in Contemporary Capitalism*. Cambridge University Press. Retrieved from <http://dx.doi.org/10.1017/CBO9781139175050.012>
- Evans, J. S. B. T., Barston, J. L., & Pollard, P. (2013). On the conflict between logic and belief in syllogistic reasoning. *Memory & Cognition*, 11(3), 295–306. <https://doi.org/10.3758/BF03196976>

- Fasolo, B., McClelland, G. H., & Todd, P. M. (2007). Escaping the tyranny of choice: When fewer attributes make choice easier. *Marketing Theory*, 7(1), 13–26.
- Festinger, L. (1962). *A Theory of Cognitive Dissonance*. Stanford University Press.
- Field, A. P. (2003). The Problems in Using Fixed-Effects Models of Meta-Analysis on Real-World Data. *Understanding Statistics*, 2(2), 105–124. https://doi.org/10.1207/S15328031US0202_02
- Field, A. P. (2005). Is the Meta-Analysis of Correlation Coefficients Accurate When Population Correlations Vary? *Psychological Methods*, 10(4), 444–467. <https://doi.org/10.1037/1082-989X.10.4.444>
- Field, A. P., & Gillett, R. (2010). How to do a meta-analysis. *British Journal of Mathematical and Statistical Psychology*, 63(3), 665–694. <https://doi.org/10.1348/000711010X502733>
- Finkel, E. J., Eastwick, P. W., Karney, B. R., Reis, H. T., & Sprecher, S. (2012). Online dating a critical analysis from the perspective of psychological science. *Psychological Science in the Public Interest*, 13(1), 3–66.
- Fiorina, M. P. (1981). *Retrospective Voting in American National Elections*. Yale University Press.
- Fischer, J., Fischer, P., Englich, B., Aydin, N., & Frey, D. (2011). Empower my decisions: The effects of power gestures on confirmatory information processing. *Journal of Experimental Social Psychology*, 47(6), 1146–1154. <https://doi.org/10.1016/j.jesp.2011.06.008>
- Fischer, P., Fischer, J., Weisweiler, S., & Frey, D. (2010). Selective exposure to information: How different modes of decision making affect subsequent confirmatory information processing. *British Journal of Social Psychology*, 49(4), 871–881. <https://doi.org/10.1348/014466610X499668>
- Fischer, P., Lea, S., Kastenmüller, A., Greitemeyer, T., Fischer, J., & Frey, D. (2011). The process of selective exposure: Why confirmatory information search weakens over time. *Organizational Behavior and Human Decision Processes*, 114(1), 37–48. <https://doi.org/10.1016/j.obhdp.2010.09.001>
- Fishburn, P. C. (1967). Methods of Estimating Additive Utilities. *Management Science*, 13(7), 435–453.
- Fishburn, P. C. (1974). Lexicographic Orders, Utilities and Decision Rules: A Survey. *Management Science*, 20(11), 1442–1471.
- Frederick, S., Lee, L., & Baskin, E. (2014). The Limits of Attraction. *Journal of Marketing Research (JMR)*, 51(4), 487–507.

- Funk, C. L. (1999). Bringing the Candidate into Models of Candidate Evaluation. *The Journal of Politics*, 61(3), 700–720.
<https://doi.org/10.2307/2647824>
- Gaissmaier, W., & Marewski, J. N. (2011). Forecasting elections with mere recognition from small, lousy samples: A comparison of collective recognition, wisdom of crowds, and representative polls. *Judgment and Decision Making*, 6(1), 73–88.
- Gaspar, K., & Clore, G. L. (2002). Attending to the big picture: mood and global versus local processing of visual information. *Psychological Science*, 13(1), 34–40.
- Gerber, A. S., Huber, G. A., & Washington, E. (2010). Party Affiliation, Partisanship, and Political Beliefs: A Field Experiment. *American Political Science Review*, 104(4), 720–744. <https://doi.org/10.1017/S0003055410000407>
- Gigerenzer, G. (2015). *Simply Rational: Decision Making in the Real World*. Oxford University Press. Retrieved from <http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199390076.001.0001/acprof-9780199390076>
- Gigerenzer, G., & Gaissmaier, W. (2011). Heuristic Decision Making. *Annual Review of Psychology*, 62(1), 451–482.
<https://doi.org/10.1146/annurev-psych-120709-145346>
- Gigerenzer, G., & Goldstein, D. G. (1996). Reasoning the fast and frugal way: Models of bounded rationality. *Psychological Review*, 103(4), 650–669. <https://doi.org/10.1037/0033-295X.103.4.650>
- Gigerenzer, G., & Todd, P. M. (1999). *Simple Heuristics that Make Us Smart*. Oxford University Press.
- Gilovich, T. D., & Griffin, D. W. (2010). Judgment and Decision Making. In *Handbook of Social Psychology*. John Wiley & Sons, Inc. Retrieved from <http://onlinelibrary.wiley.com/doi/10.1002/9780470561119.socpsy001015/abstract>
- Glazer, R., Kahn, B. E., & Moore, W. L. (1991). The Influence of External Constraints on Brand Choice: The Lone-Alternative Effect. *Journal of Consumer Research*, 18(1), 119–127.
- Gourville, J. T., & Soman, D. (2005). Overchoice and Assortment Type: When and Why Variety Backfires. *Marketing Science*, 24(3), 382–395. <https://doi.org/10.1287/mksc.1040.0109>
- Graham, J., Haidt, J., & Nosek, B. A. (2009). Liberals and conservatives rely on different sets of moral foundations. *Journal of Personality and Social Psychology*, 96(5), 1029–1046. <https://doi.org/10.1037/a0015141>
- Green, D. P., & Gerber, A. S. (2010). Introduction to Social Pressure and Voting: New Experimental Evidence. *Political Behavior*, 32(3), 331–336. <https://doi.org/10.1007/s11109-010-9120-2>

- Green, D., Palmquist, B., & Schickler, E. (2002). *Partisan Hearts and Minds: Political Parties and the Social Identities of Voters*. Yale University Press. Retrieved from <http://www.jstor.org/stable/j.ctt1npp6m>
- Greene, J., & Haidt, J. (2002). How (and where) does moral judgment work? *Trends in Cognitive Sciences*, 6(12), 517–523. [https://doi.org/10.1016/S1364-6613\(02\)02011-9](https://doi.org/10.1016/S1364-6613(02)02011-9)
- Greifeneder, R., Scheibehenne, B., & Kleber, N. (2010). Less may be more when choosing is difficult: Choice complexity and too much choice. *Acta Psychologica*, 133(1), 45–50.
- Grofman, B. (2004). Downs and Two-Party Convergence. *Annual Review of Political Science*, 7(1), 25–46. <https://doi.org/10.1146/annurev.polisci.7.012003.104711>
- Guo, F. Y., & Holyoak, K. J. (2002). Understanding similarity in choice behavior: A connectionist model. In *Proceedings of the twenty-fourth annual conference of the cognitive science society* (pp. 393–398).
- Gutmann, A., & Thompson, D. (2010). The Mindsets of Political Compromise. *Perspectives on Politics*, 8(4), 1125–1143. <https://doi.org/10.1017/S1537592710003270>
- Ha, S. (2011). Attribute Priming Effects and Presidential Candidate Evaluation: The Conditionality of Political Sophistication. *Mass Communication and Society*, 14(3), 315–342. <https://doi.org/10.1080/15205436.2010.490894>
- Haidt, J. (2012). *The Righteous Mind: Why Good People are Divided by Politics and Religion*. Penguin UK.
- H J Einhorn, & Hogarth, and R. M. (1981). Behavioral Decision Theory: Processes of Judgement and Choice. *Annual Review of Psychology*, 32(1), 53–88. <https://doi.org/10.1146/annurev.ps.32.020181.000413>
- Hall, C. C., Ariss, L., & Todorov, A. (2007). The illusion of knowledge: When more information reduces accuracy and increases confidence. *Organizational Behavior and Human Decision Processes*, 103(2), 277–290. <https://doi.org/10.1016/j.obhdp.2007.01.003>
- Hall, L., Johansson, P., & Strandberg, T. (2012). Lifting the Veil of Morality: Choice Blindness and Attitude Reversals on a Self-Transforming Survey. *PLoS ONE*, 7(9), e45457. <https://doi.org/10.1371/journal.pone.0045457>
- Hasenfeld, Y., & Rafferty, J. A. (1989). The Determinants of Public Attitudes Toward the Welfare State. *Social Forces*, 67(4), 1027–1048. <https://doi.org/10.1093/sf/67.4.1027>
- Hastie, R., & Dawes, R. M. (2001). *Rational Choice in an Uncertain World: The Psychology of Judgement and Decision Making*. SAGE.

- Hastie, R., & Park, B. (1986). The relationship between memory and judgment depends on whether the judgment task is memory-based or on-line. *Psychological Review*, 93(3), 258–268. <https://doi.org/10.1037/0033-295X.93.3.258>
- Hayes, D. (2005). Candidate Qualities through a Partisan Lens: A Theory of Trait Ownership. *American Journal of Political Science*, 49(4), 908–923. <https://doi.org/10.1111/ajps.2005.49.issue-4>, 10.1111/j.1540-5907.2005.00163.x
- Haynes, G. A. (2009). Testing the boundaries of the choice overload phenomenon: The effect of number of options and time pressure on decision difficulty and satisfaction. *Psychology and Marketing*, 26(3), 204–212. <https://doi.org/10.1002/mar.20269>
- Heath, T. B., & Chatterjee, S. (1995). Asymmetric Decoy Effects on Lower-Quality Versus Higher-Quality Brands: Meta-Analytic and Experimental Evidence. *Journal of Consumer Research*, 22(3), 268–284.
- Hedgcock, W., Rao, A. R., & Chen, H. (Allan). (2009). Could Ralph Nader’s Entrance and Exit Have Helped Al Gore? The Impact of Decoy Dynamics on Consumer Choice. *Journal of Marketing Research*, 46(3), 330–343. <https://doi.org/10.1509/jmkr.46.3.330>
- Hedges, L. V. (1992). Meta-Analysis. *Journal of Educational Statistics*, 17(4), 279–296. <https://doi.org/10.2307/1165125>
- Hedges, L. V., & Pigott, T. D. (2001). The power of statistical tests in meta-analysis. *Psychological Methods*, 6(3), 203–217. <https://doi.org/10.1037/1082-989X.6.3.203>
- Hedges, L. V., & Vevea, J. L. (1998). Fixed- and Random-Effects Models in Meta-Analysis. *Psychological Methods*, 3(4), 486–504.
- Higgins, E. T. (1997). Beyond Pleasure and Pain. *American Psychologist*, 52(12), 1280–1300.
- Hogarth, R. M., & Karelaia, N. (2007). Heuristic and Linear Models of Judgment: Matching Rules and Environments. *Psychological Review*, 114(3), 733–758. <https://doi.org/10.1037/0033-295X.114.3.733>
- Huang, L.-N. (2000). Examining candidate information search processes: the impact of processing goals and sophistication. *Journal of Communication*, 50(1), 93–114. <https://doi.org/10.1111/j.1460-2466.2000.tb02835.x>
- Huang, L.-N., & Price, V. (2001). Motivations, Goals, Information Search, and Memory about Political Candidates. *Political Psychology*, 22(4), 665–692. <https://doi.org/10.1111/0162-895X.00258>
- Huber, J., Payne, J. W., & Puto, C. (1982). Adding Asymmetrically Dominated Alternatives: Violations of Regularity and the Similarity Hypothesis. *Journal of Consumer Research*, 9(1), 90–98.

- Huber, J., Payne, J. W., & Puto, C. P. (2014). Let's Be Honest About the Attraction Effect. *Journal of Marketing Research (JMR)*, 51(4), 520–525.
- Huddy, L., & Terkildsen, N. (1993). Gender Stereotypes and the Perception of Male and Female Candidates. *American Journal of Political Science*, 37(1), 119–147. <https://doi.org/10.2307/2111526>
- Hunter, J. E., & Schmidt, F. L. (2000). Fixed Effects vs. Random Effects Meta-Analysis Models: Implications for Cumulative Research Knowledge. *International Journal of Selection and Assessment*, 8(4), 275–292. <https://doi.org/10.1111/1468-2389.00156>
- Hunter, J., & Schmidt, F. (2004). *Methods of Meta-Analysis*. 2455 Teller Road, Thousand Oaks California 91320 United States of America: SAGE Publications, Inc. Retrieved from <http://methods.sagepub.com/book/methods-of-meta-analysis>
- Hurly, null, & Oseen, null. (1999). Context-dependent, risk-sensitive foraging preferences in wild rufous hummingbirds. *Animal Behaviour*, 58(1), 59–66. <https://doi.org/10.1006/anbe.1999.1130>
- Inbar, Y., Botti, S., & Hanko, K. (2011). Decision speed and choice regret: When haste feels like waste. *Journal of Experimental Social Psychology*, 47(3), 533–540. <https://doi.org/10.1016/j.jesp.2011.01.011>
- Inc, G. (2012). The Truth About How We Think. Retrieved 26 August 2016, from <http://www.gallup.com/businessjournal/153062/Truth-Think.aspx>
- Iyengar, S. S., & Kamenica, E. (2010). Choice proliferation, simplicity seeking, and asset allocation. *Journal of Public Economics*, 94(7–8), 530–539. <https://doi.org/10.1016/j.jpubeco.2010.03.006>
- Iyengar, S. S., & Lepper, M. R. (2000). When choice is demotivating: Can one desire too much of a good thing? *Journal of Personality and Social Psychology*, 79(6), 995–1006. <https://doi.org/10.1037/0022-3514.79.6.995>
- Iyengar, S. S., Wells, R. E., & Schwartz, B. (2006). Doing Better but Feeling Worse Looking for the 'Best' Job Undermines Satisfaction. *Psychological Science*, 17(2), 143–150. <https://doi.org/10.1111/j.1467-9280.2006.01677.x>
- Jacoby, J., Speller, D. E., & Berning, C. K. (1974). Brand Choice Behavior as a Function of Information Load: Replication and Extension. *Journal of Consumer Research*, 1(1), 33–42.
- Jacoby, J., Speller, D. E., & Kohn, C. A. (1974). Brand Choice Behavior as a Function of Information Load. *Journal of Marketing Research*, 11(1), 63–69. <https://doi.org/10.2307/3150994>

- Jellison, J. M., & Harvey, J. H. (1973). Determinants of perceived choice and the relationship between perceived choice and perceived competence. *Journal of Personality and Social Psychology*, 28(3), 376–382. <https://doi.org/10.1037/h0035110>
- Jennings, M. K., & Niemi, R. G. (1981). *Generations and Politics: A Panel Study of Young Adults and Their Parents*. Princeton University Press. Retrieved from <http://www.jstor.org/stable/j.ctt7ztk9v>
- Johnson, A. J., & Miles, C. (2011). Order effects of ballot position without information-induced confirmatory bias. *British Politics*, 6(4), 479–490. <https://doi.org/10.1057/bp.2011.26>
- Johnson, E. J., & Russo, J. E. (1984). Product Familiarity and Learning New Information. *Journal of Consumer Research*, 11(1), 542–550. <https://doi.org/10.1086/208990>
- Kahn, B. E., & Lehmann, D. R. (1991). Modeling choice among assortments. *Journal of Retailing*, 67(3), 274–299.
- Kahneman, D. (2003). A perspective on judgment and choice: Mapping bounded rationality. *American Psychologist*, 58(9), 697–720. <https://doi.org/10.1037/0003-066X.58.9.697>
- Kahneman, D. (2011). *Thinking, Fast and Slow*. Doubleday Canada. Retrieved from <http://books.google.co.uk/books?id=TA7Q27RWlj0C>
- Kahneman, D., & Frederick, S. (2002). Representativeness revisited: Attribute substitution in intuitive judgment. In T. Gilovich, D. Griffin, & D. Kahneman (Eds.), *Heuristics and biases: The psychology of intuitive judgment* (pp. 49–81). New York, NY, US: Cambridge University Press.
- Kahneman, D., Slovic, P., & Tversky, A. (1982). *Judgment Under Uncertainty: Heuristics and Biases*. Cambridge University Press.
- Kahneman, D., & Tversky, A. (1972). Subjective probability: A judgment of representativeness. *Cognitive Psychology*, 3(3), 430–454.
- Kahneman, D., & Tversky, A. (1979). Prospect Theory: An Analysis of Decision under Risk. *Econometrica*, 47(2), 263. <https://doi.org/10.2307/1914185>
- Karelaia, N. (2006). Thirst for confirmation in multi-attribute choice: Does search for consistency impair decision performance? *Organizational Behavior and Human Decision Processes*, 100(1), 128–143. <https://doi.org/10.1016/j.obhdp.2005.09.003>
- Kelley, S., & Mirer, T. W. (1974). The Simple Act of Voting. *The American Political Science Review*, 68(2), 572–591. <https://doi.org/10.2307/1959506>

- Kerstholt, J. (1992). Information search and choice accuracy as a function of task complexity and task structure. *Acta Psychologica*, 80(1–3), 185–197. [https://doi.org/10.1016/0001-6918\(92\)90046-G](https://doi.org/10.1016/0001-6918(92)90046-G)
- Kim, S., & Hasher, L. (2005). The attraction effect in decision making: superior performance by older adults. *The Quarterly Journal of Experimental Psychology Section A*, 58(1), 120–133. <https://doi.org/10.1080/02724980443000160>
- Kim, Y. M., & Garrett, K. (2011). On-line and Memory-based: Revisiting the Relationship Between Candidate Evaluation Processing Models. *Political Behavior*, 34(2), 345–368. <https://doi.org/10.1007/s11109-011-9158-9>
- Kivetz, R., Netzer, O., & Srinivasan, V. (2004). Alternative Models for Capturing the Compromise Effect. *Journal of Marketing Research*, 41(3), 237–257.
- Klofstad, C. A., McDermott, R., & Hatemi, P. K. (2012). The Dating Preferences of Liberals and Conservatives. *Political Behavior*. <https://doi.org/10.1007/s11109-012-9207-z>
- Kusev, P., van Schaik, P., Ayton, P., Dent, J., & Chater, N. (2009). Exaggerated Risk: Prospect Theory and Probability Weighting in Risky Choice. *Journal of Experimental Psychology*, 35(6), 1487–1505.
- Lacy, D., & Paolino, P. (2010). Testing proximity versus directional voting using experiments. *Electoral Studies*, 29(3), 460–471. <https://doi.org/10.1016/j.electstud.2010.04.008>
- Ladd, J. M., & Lenz, G. S. (2008). Reassessing the Role of Anxiety in Vote Choice. *Political Psychology*, 29(2), 275–296. <https://doi.org/10.1111/j.1467-9221.2008.00626.x>
- Ladd, J. M., & Lenz, G. S. (2011). Does Anxiety Improve Voters' Decision Making? *Political Psychology*, 32(2), 347–361. <https://doi.org/10.1111/j.1467-9221.2010.00805.x>
- Lakens, D. (2013). Calculating and reporting effect sizes to facilitate cumulative science: a practical primer for t-tests and ANOVAs. *Cognition*, 4, 863. <https://doi.org/10.3389/fpsyg.2013.00863>
- Lakoff, G. (2008). *The Political Mind: A Cognitive Scientist's Guide to Your Brain and Its Politics*. Penguin Group US.
- Lane, R. E. (2000). *The Loss of Happiness in Market Democracies*. Yale University Press.
- Langworth, R. (2011). *Churchill by Himself: The Definitive Collection of Quotations*. PublicAffairs.
- Lau, R. R., Andersen, D. J., & Redlawsk, D. P. (2008). An exploration of correct voting in recent US presidential elections. *American Journal of Political Science*, 52(2), 395–411.

- Lau, R. R., Patel, P., Fahmy, D. F., & Kaufman, R. R. (2013). Correct Voting Across Thirty-Three Democracies: A Preliminary Analysis. *British Journal of Political Science, FirstView*, 1–21. <https://doi.org/10.1017/S0007123412000610>
- Lau, R. R., & Redlawsk, D. P. (1997). Voting Correctly. *The American Political Science Review*, 91(3), 585–598. <https://doi.org/10.2307/2952076>
- Lau, R. R., & Redlawsk, D. P. (2001). Advantages and Disadvantages of Cognitive Heuristics in Political Decision Making. *American Journal of Political Science*, 45(4), 951–971. <https://doi.org/10.2307/2669334>
- Lau, R. R., & Redlawsk, D. P. (2006). *How Voters Decide: Information Processing During Election Campaigns*. Cambridge University Press.
- Lau, R. R., & Redlawsk, D. P. (2008). Older but Wiser? Effects of Age on Political Cognition. *The Journal of Politics*, 70(1). <https://doi.org/10.1017/S0022381607080127>
- Lau, R. R., & Sears, D. O. (1986). *Political Cognition: The 19th Annual Carnegie Symposium on Cognition*. L. Erlbaum Associates. Retrieved from <http://books.google.co.uk/books?id=r9dsrSJ5xXAC>
- Lawrence, C. N. (2003). *The Role of Political Sophistication in the Decision-Making Processes of Voters* (info:eu-repo/semantics/doctoralThesis). University of Mississippi. Retrieved from <http://www.lordsutch.com/chris/papers/dissertation.pdf>
- Lee, B.-K., & Lee, W.-N. (2004). The effect of information overload on consumer choice quality in an on-line environment. *Psychology and Marketing*, 21(3), 159–183. <https://doi.org/10.1002/mar.20000>
- Lehmann, D. R., & Pan, V. (1994). Context Effects, New Brand Entry, and Consideration Sets. *Journal of Marketing Research*, 31(3), 364–374.
- Lenton, A. P., Fasolo, B., & Todd, P. M. (2008). ‘Shopping’ for a Mate: Expected versus Experienced Preferences in Online Mate Choice. *IEEE Transactions on Professional Communication*, 51(2), 169–182. <https://doi.org/10.1109/TPC.2008.2000342>
- Lerner, J. S., & Tetlock, P. E. (1999). Accounting for the Effects of Accountability. *Psychological Bulletin*, 125(2), 255–275.
- Levendusky, M. S. (2009). Clearer Cues, More Consistent Voters: A Benefit of Elite Polarization. *Political Behavior*, 32(1), 111–131. <https://doi.org/10.1007/s11109-009-9094-0>

- Levine, T. R., & Hullett, C. R. (2002). Eta Squared, Partial Eta Squared, and Misreporting of Effect Size in Communication Research. *Human Communication Research*, 28(4), 612–625. <https://doi.org/10.1111/j.1468-2958.2002.tb00828.x>
- Lewin, K. (1951). *Field theory in social science: selected theoretical papers*. Harper.
- Lewis, J. B., & King, G. (1999). No evidence on directional vs. proximity voting. *Political Analysis*, 8(1), 21–33.
- Lichtenstein, S., & Slovic, P. (1971). Reversals of preference between bids and choices in gambling decisions. *Journal of Experimental Psychology*, 89(1), 46–55. <https://doi.org/10.1037/h0031207>
- Lichters, M., Sarstedt, M., & Vogt, B. (2015). On the practical relevance of the attraction effect: A cautionary note and guidelines for context effect experiments. *AMS Review*, 5(1–2), 1–19. <https://doi.org/10.1007/s13162-015-0066-8>
- Lieberman, M. D., Ochsner, K. N., Gilbert, D. T., & Schacter, D. L. (2001). Do Amnesics Exhibit Cognitive Dissonance Reduction? The Role of Explicit Memory and Attention in Attitude Change. *Psychological Science*, 12(2), 135–140. <https://doi.org/10.1111/1467-9280.00323>
- Lipowski, Z. J. (1970). The conflict of Buridan's ass or some dilemmas of affluence: the theory of attractive stimulus overload. *The American Journal of Psychiatry*, 127(3), 273–279. <https://doi.org/10.1176/ajp.127.3.273>
- Lipset, S. M. (1969). *Politics and the social sciences*. Ed. by seymour martin lipset. New York: Oxford University Press.
- Lodge, M., McGraw, K. M., & Stroh, P. (1989). An Impression-Driven Model of Candidate Evaluation. *The American Political Science Review*, 83(2), 399–419. <https://doi.org/10.2307/1962397>
- Lodge, M., Steenbergen, M. R., & Brau, S. (1995). The responsive voter: Campaign information and the dynamics of candidate evaluation. *The American Political Science Review*, 89(2), 309.
- Lodge, M., & Taber, C. (2000). Three steps toward a theory of motivated political reasoning. *Elements of Reason: Cognition, Choice, and the Bounds of Rationality*, 183–213.
- Luce, R. D. (1977). The choice axiom after twenty years. *Journal of Mathematical Psychology*, 15(3), 215–233. [https://doi.org/10.1016/0022-2496\(77\)90032-3](https://doi.org/10.1016/0022-2496(77)90032-3)
- Lurie, N. (2002). Decision Making in Information-Rich Environments: the Role of Information Structure. *NA - Advances in Consumer Research Volume 29*. Retrieved from <http://acrwebsite.org/volumes/8566/volumes/v29/NA-29>
- Luskin, R. C. (1990). Explaining political sophistication. *Political Behavior*, 12(4), 331–361.

- MacDonald, S. E., Listhaug, O., & Rabinowitz, G. (1991). Issues and Party Support in Multiparty Systems. *The American Political Science Review*, 85(4), 1107–1131. <https://doi.org/10.2307/1963938>
- Maio, G., Maio, G. R., & Haddock, G. (2010). *The Psychology of Attitudes and Attitude Change*. SAGE.
- Malkoc, S. A., Hedgcock, W., & Hoeffler, S. (2013). Between a rock and a hard place: The failure of the attraction effect among unattractive alternatives. *Journal of Consumer Psychology*, 23(3), 317–329. <https://doi.org/10.1016/j.jcps.2012.10.008>
- Marsiske, M., & Margrett, J. A. (2006). Fourteen - Everyday Problem Solving and Decision Making A2 - Birren, James E. In K. W. Schaie, R. P. Abeles, M. Gatz, & T. A. Salthouse (Eds.), *Handbook of the Psychology of Aging (Sixth Edition)* (pp. 315–342). Burlington: Academic Press. Retrieved from <http://www.sciencedirect.com/science/article/pii/B9780121012649500173>
- Massaro, D. W., & Anderson, N. H. (1971). Judgmental model of the Ebbinghaus illusion. *Journal of Experimental Psychology*, 89(1), 147–151.
- McGraw, K. M., Hasecke, E., & Conger, K. (2003). Ambivalence, Uncertainty, and Processes of Candidate Evaluation. *Political Psychology*, 24(3), 421–448. <https://doi.org/10.1111/0162-895X.00335>
- McGraw, K. M., Lodge, M., & Stroh, P. (1990). On-line processing in candidate evaluation: The effects of issue order, issue importance, and sophistication. *Political Behavior*, 12(1), 41–58. <https://doi.org/10.1007/BF00992331>
- Mellers, B. A., & Baron, J. (Eds.). (1993). *Psychological perspectives on justice: Theory and applications*. Cambridge: Cambridge University Press. Retrieved from <http://ebooks.cambridge.org/ref/id/CBO9780511552069>
- Meredith, M., & Salant, Y. (2013). On the Causes and Consequences of Ballot Order Effects. *Political Behavior*, 35(1), 175–197. <https://doi.org/10.1007/s11109-011-9189-2>
- Mero, N. P., & Motowidlo, S. J. (1995). Effects of rater accountability on the accuracy and the favorability of performance ratings. *Journal of Applied Psychology*, 80(4), 517–524. <https://doi.org/10.1037/0021-9010.80.4.517>
- Merrill, S., & Grofman, B. (1999). *A Unified Theory of Voting: Directional and Proximity Spatial Models*. Cambridge University Press.
- Miller, P. R. (2011). The Emotional Citizen: Emotion as a Function of Political Sophistication. *Political Psychology*, 32(4), 575–600. <https://doi.org/10.1111/j.1467-9221.2011.00824.x>

- Miller, S. A., DeKay, M. L., Stone, E. R., & Sorenson, C. M. (2013). Assessing the sensitivity of information distortion to four potential influences in studies of risky choice. *Judgment and Decision Making*, 8(6), n/a.
- Miller, W. E., & Shanks, J. M. (1996). *The new American voter*. Harvard University Press Cambridge, MA. Retrieved from http://archive.wilsonquarterly.com/sites/default/files/articles/WQ_VOL21_W_1997_Research.pdf
- Mitchell, O. S., & Utkus, S. P. (2004). *Pension Design and Structure: New Lessons from Behavioral Finance*. OUP Oxford.
- Mochon, D. (2013). Single-Option Aversion. *Journal of Consumer Research*, 40(3), 555–566. <https://doi.org/10.1086/671343>
- Mogilner, C., Rudnick, T., & Iyengar, S. S. (2008). The Mere Categorization Effect: How the Presence of Categories Increases Choosers' Perceptions of Assortment Variety and Outcome Satisfaction. *Journal of Consumer Research*, 35(2), 202–215.
- Monin, B., & Oppenheimer, D. M. (2005). Correlated Averages vs. Averaged Correlations: Demonstrating the Warm Glow Heuristic Beyond Aggregation. *Social Cognition*, 23(3), 257–278. <https://doi.org/10.1521/soco.2005.23.3.257>
- Mourali, M., Böckenholt, U., & Laroche, M. (2007). Compromise and Attraction Effects under Prevention and Promotion Motivations. *Journal of Consumer Research*, 34(2), 234–247. <https://doi.org/10.1086/518524>
- Mutz, D. C., Sniderman, P. M., & Brody, R. A. (1996). *Political Persuasion and Attitude Change*. University of Michigan Press.
- Newstead, S. E., Pollard, P., Evans, J. S., & Allen, J. L. (1992). The source of belief bias effects in syllogistic reasoning. *Cognition*, 45(3), 257–284.
- Nickerson, R. S. (1998). Confirmation bias: A ubiquitous phenomenon in many guises. *Review of General Psychology*, 2(2), 175–220. <https://doi.org/10.1037/1089-2680.2.2.175>
- Noguchi, T., & Stewart, N. (2014). In the attraction, compromise, and similarity effects, alternatives are repeatedly compared in pairs on single dimensions. *Cognition*, 132(1), 44–56. <https://doi.org/10.1016/j.cognition.2014.03.006>
- Olejnik, S., & Algina, J. (2003). Generalized Eta and Omega Squared Statistics: Measures of Effect Size for Some Common Research Designs. *Psychological Methods*, 8(4), 434–447. <https://doi.org/10.1037/1082-989X.8.4.434>
- Olivola, C., & Todorov, A. (2010). Elected in 100 milliseconds: Appearance-Based Trait Inferences and Voting. *Journal of Nonverbal Behavior*, 34(2), 83–110. <https://doi.org/10.1007/s10919-009-0082-1>
- Olivola, C. Y., & Todorov, A. (2010). Fooled by first impressions? Reexamining the diagnostic value of appearance-based inferences. *Journal of Experimental Social Psychology*, 46(2), 315–324. <https://doi.org/10.1016/j.jesp.2009.12.002>

- Ortmann, A., Gigerenzer, G., Borges, B., & Goldstein, D. G. (2008). The Recognition Heuristic: A Fast and Frugal Way to Investment Choice? In C. R. P. and V. L. Smith (Ed.), *Handbook of Experimental Economics Results* (Vol. 1, pp. 993–1003). Elsevier. Retrieved from <http://www.sciencedirect.com/science/article/pii/S1574072207001072>
- Osburn, H., & Callender, J. (1992). A note on the sampling variance of the mean uncorrected correlation in meta-analysis and validity generalization. *Journal of Applied Psychology*, *77*(2), 115–122. <https://doi.org/10.1037/0021-9010.77.2.115>
- Pan, Y., Sue O'Curry, & Pitts, R. (1995). The Attraction Effect and Political Choice in Two Elections. *Journal of Consumer Psychology*, *4*(1), 85–101. https://doi.org/10.1207/s15327663jcp0401_04
- Park, J., & Kim, J. (2005). The Effects of Decoys on Preference Shifts: The Role of Attractiveness and Providing Justification. *Journal of Consumer Psychology*, *15*(2), 94–107. https://doi.org/10.1207/s15327663jcp1502_2
- Payne, J. W. (1980). Information processing theory: Some concepts and methods applied to decision research. *Cognitive Processes in Choice and Decision Behavior*, *95*, 115.
- Payne, J. W., Bettman, J. R., & Johnson, E. J. (1992). Behavioral Decision Research: A Constructive Processing Perspective. *Annual Review of Psychology*, *43*(1), 87–131. <https://doi.org/10.1146/annurev.ps.43.020192.000511>
- Payne, J. W., Bettman, J. R., & Johnson, E. J. (1993). *The Adaptive Decision Maker*. Cambridge University Press.
- Pedersen, M. N. (1979). The Dynamics of European Party Systems: Changing Patterns of Electoral Volatility. *European Journal of Political Research*, *7*(1), 1–26. <https://doi.org/10.1111/j.1475-6765.1979.tb01267.x>
- Pennington, N., & Hastie, R. (1993). Reasoning in explanation-based decision making. *Cognition*, *49*(1–2), 123–163. [https://doi.org/10.1016/0010-0277\(93\)90038-W](https://doi.org/10.1016/0010-0277(93)90038-W)
- Pettibone, J. C., & Wedell, D. H. (2000). Examining Models of Nondominated Decoy Effects across Judgment and Choice. *Organizational Behavior and Human Decision Processes*, *81*(2), 300–328. <https://doi.org/10.1006/obhd.1999.2880>
- Pettibone, J. C., & Wedell, D. H. (2007). Testing alternative explanations of phantom decoy effects. *Journal of Behavioral Decision Making*, *20*(3), 323–341. <https://doi.org/10.1002/bdm.557>
- Popkin, S. L. (1991). *The Reasoning Voter: Communication and Persuasion in Presidential Campaigns*. University of Chicago Press.
- Popkin, S. L. (1994). *The Reasoning Voter: Communication and Persuasion in Presidential Campaigns*. University of Chicago Press.

- Poynor, C., & Diehl, K. (2007). The Psychology of Category Design: the Impact of Goal-Derived Structures on Consumer Information Processing and Choice. *NA - Advances in Consumer Research Volume 34*. Retrieved from <http://acrwebsite.org/volumes/12567/volumes/v34/NA-34>
- Pratkanis, A. R., & Farquhar, P. H. (1992). A Brief History of Research on Phantom Alternatives: Evidence for Seven Empirical Generalizations About Phantoms. *Basic and Applied Social Psychology*, *13*(1), 103–122. https://doi.org/10.1207/s15324834basp1301_9
- Pratto, F., & John, O. P. (1991). Automatic vigilance: the attention-grabbing power of negative social information. *Journal of Personality and Social Psychology*, *61*(3), 380–391.
- Rabinowitz, G., & Macdonald, S. E. (1989). A Directional Theory of Issue Voting. *The American Political Science Review*, *83*(1), 93–121. <https://doi.org/10.2307/1956436>
- Rahn, W. M. (1993). The Role of Partisan Stereotypes in Information Processing about Political Candidates. *American Journal of Political Science*, *37*(2), 472–496. <https://doi.org/10.2307/2111381>
- Redlawsk, D. P. (2004). What voters do: Information search during election campaigns. *Political Psychology*, *25*(4), 595–610.
- Redlawsk, D. P., Civettini, A. J. W., & Emmerson, K. M. (2010). The Affective Tipping Point: Do Motivated Reasoners Ever ‘Get It’? *Political Psychology*, *31*(4), 563–593. <https://doi.org/10.1111/j.1467-9221.2010.00772.x>
- Redlawsk, D. P., & Lau, R. R. (2009). Understanding individual decision making using process tracing. In *General Conference of the European Consortium for Political Research, Potsdam, Germany*. Retrieved from http://dppe.polisci.uiowa.edu/dppe/assets/docs/Process_Tracing_Studies_ECPR_2009a.pdf
- Ridout, T. N., & Searles, K. (2011). It’s My Campaign I’ll Cry if I Want to: How and When Campaigns Use Emotional Appeals. *Political Psychology*, *32*(3), 439–458. <https://doi.org/10.1111/j.1467-9221.2010.00819.x>
- Rieskamp, J., Busemeyer, J. R., & Mellers, B. A. (2006). Extending the Bounds of Rationality: Evidence and Theories of Preferential Choice. *Journal of Economic Literature*, *44*(3), 631–661. <https://doi.org/10.1257/jel.44.3.631>
- Riggle, E. D. B., & Johnson, M. M. S. (1996). Age Difference in Political Decision Making: Strategies for Evaluating Political Candidates. *Political Behavior*, *18*(1), 99–118.
- Roe, R. M., Busemeyer, J. R., & Townsend, J. T. (2001). Multialternative Decision Field Theory: A Dynamic Connectionist Model of Decision Making. *Psychological Review*, *108*(2), 370–392.

- Rosenthal, R., & DiMatteo, M. R. (2001). Meta-Analysis: Recent Developments in Quantitative Methods for Literature Reviews. *Annual Review of Psychology*, 52(1), 59–82. <https://doi.org/10.1146/annurev.psych.52.1.59>
- Rothschild, D., & Malhotra, N. (2014). Are public opinion polls self-fulfilling prophecies? *Research & Politics*, 1(2), 2053168014547667. <https://doi.org/10.1177/2053168014547667>
- Russo, J. E., & Chaxel, A.-S. (2010). How persuasive messages can influence behavior without awareness. *Journal of Consumer Psychology*, 20(3), 338–342. <https://doi.org/10.1016/j.jcps.2010.06.005>
- Russo, J. E., & Doshier, B. A. (1983). Strategies for multiattribute binary choice. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 9(4), 676–696.
- Sartori, G. (1966). Opposition and Control Problems and Prospects. *Government and Opposition*, 1(2), 149–154. <https://doi.org/10.1111/j.1477-7053.1966.tb00368.x>
- Sartori, G. (2005). *Parties and Party Systems: A Framework for Analysis*. ECPR Press.
- Scheibehenne, B., Greifeneder, R., & Todd, P. M. (2009). What moderates the too-much-choice effect? *Psychology and Marketing*, 26(3), 229–253. <https://doi.org/10.1002/mar.20271>
- Scheibehenne, B., Greifeneder, R., & Todd, P. M. (2010). Can There Ever Be Too Many Options? A Meta-Analytic Review of Choice Overload. *Journal of Consumer Research*, 37(3), 409–425. <https://doi.org/10.1086/651235>
- Schmitt, H., & Holmberg, S. (1998). Political Parties in Decline? In H.-D. Klingemann & D. Fuchs (Eds.), *Citizens and the State* (pp. 95–130). Oxford University Press. Retrieved from <http://www.oxfordscholarship.com/view/10.1093/0198294735.001.0001/acprof-9780198294733-chapter-4>
- Schoen, H., & Schumann, S. (2007). Personality Traits, Partisan Attitudes, and Voting Behavior. Evidence from Germany. *Political Psychology*, 28(4), 471–498. <https://doi.org/10.1111/j.1467-9221.2007.00582.x>
- Schuck-Paim, C., Pompilio, L., & Kacelnik, A. (2004). State-Dependent Decisions Cause Apparent Violations of Rationality in Animal Choice. *PLOS Biol*, 2(12), e402. <https://doi.org/10.1371/journal.pbio.0020402>
- Schulte-Mecklenbeck, M. (2005). Tracing the decision maker. *University Fribourg, Http://e-Thesis. Unifr. Ch*. Retrieved from http://doc.rero.ch/lm.php?url=1000,40,2,20050706100218-CP/1_SchulteMecklenbeckM.pdf
- Schulte-Mecklenbeck, M., Kuehberger, A., & Ranyard, R. (2010). *A Handbook of Process Tracing Methods for Decision Research: A Critical Review and User s Guide*. Taylor & Francis.

- Schulte-Mecklenbeck, M., Kühberger, A., & Ranyard, R. (2011). The role of process data in the development and testing of process models of judgment and decision making. *Judgment and Decision Making*, 6(8), 733–739.
- Schwartz, B. (2004). *The paradox of choice: Why more is less* (Vol. xi). New York, NY, US: HarperCollins Publishers.
- Sears, D. O. (1975). Political socialization. *Handbook of Political Science*, 2, 93–153.
- Sela, A., Berger, J., & Liu, W. (2009). Variety, Vice, and Virtue: How Assortment Size Influences Option Choice. *Journal of Consumer Research*, 35(6), 941–951.
- Shafir, E., Simonson, I., & Tversky, A. (1993). Reason-based choice. *Cognition*, 49(1–2), 11–36. [https://doi.org/10.1016/0010-0277\(93\)90034-S](https://doi.org/10.1016/0010-0277(93)90034-S)
- Shafir, S., Waite, T. A., & Smith, B. H. (2002). Context-Dependent Violations of Rational Choice in Honeybees (*Apis mellifera*) and Gray Jays (*Perisoreus canadensis*). *Behavioral Ecology and Sociobiology*, 51(2), 180–187.
- Shah, A. K., & Oppenheimer, D. M. (2008). Heuristics made easy: An effort-reduction framework. *Psychological Bulletin*, 134(2), 207–222. <https://doi.org/10.1037/0033-2909.134.2.207>
- Simon, H. A. (1955). A Behavioral Model of Rational Choice. *The Quarterly Journal of Economics*, 69(1), 99–118. <https://doi.org/10.2307/1884852>
- Simon, H. A. (1956). Rational choice and the structure of the environment. *Psychological Review*, 63(2), 129–138.
- Simon, H. A. (1972). Theories of bounded rationality. *Decision and Organization*, 1(1), 161–176.
- Simon, H. A. (1982). *Models of Bounded Rationality: Empirically grounded economic reason*. MIT Press.
- Simon, H. A. (1990). Invariants of Human Behavior. *Annual Review of Psychology*, 41(1), 1–20. <https://doi.org/10.1146/annurev.ps.41.020190.000245>
- Simonson, I. (1989). Choice Based on Reasons: The Case of Attraction and Compromise Effects. *Journal of Consumer Research*, 16(2), 158–174.
- Simonson, I. (1992). The Influence of Anticipating Regret and Responsibility on Purchase Decisions. *Journal of Consumer Research*, 19(1), 105–118. <https://doi.org/10.1086/209290>
- Simonson, I. (1999). The effect of product assortment on buyer preferences⁴. *Journal of Retailing*, 75(3), 347–370. [https://doi.org/10.1016/S0022-4359\(99\)00012-3](https://doi.org/10.1016/S0022-4359(99)00012-3)

- Simonson, I. (2014). Vices and Virtues of Misguided Replications: The Case of Asymmetric Dominance. *Journal of Marketing Research (JMR)*, 51(4), 514–519.
- Simonson, I., & Tversky, A. (1992). Choice in Context: Tradeoff Contrast and Extremeness Aversion. *Journal of Marketing Research*, 29(3), 281–295. <https://doi.org/10.2307/3172740>
- Sinn, F., Milberg, S. J., Epstein, L. D., & Goodstein, R. C. (2007). Compromising the compromise effect: Brands matter. *Marketing Letters*, 18(4), 223–236. <https://doi.org/10.1007/s11002-007-9019-9>
- Slovic, P., Finucane, M. L., Peters, E., & MacGregor, D. G. (2007). The affect heuristic. *European Journal of Operational Research*, 177(3), 1333–1352. <https://doi.org/10.1016/j.ejor.2005.04.006>
- Starnes, D. S., Tabor, J., Yates, D., & Moore, D. S. (2014). *The Practice of Statistics*. W. H. Freeman.
- Steinmo, S. (2007). *Growing Apart?: America and Europe in the 21st Century*. Cambridge University Press.
- Stewart, N., Chater, N., & Brown, G. D. A. (2006). Decision by sampling. *Cognitive Psychology*, 53(1), 1–26. <https://doi.org/10.1016/j.cogpsych.2005.10.003>
- Störmer, V. S., & Alvarez, G. A. (2016). Attention Alters Perceived Attractiveness. *Psychological Science*, 27(4), 563–571. <https://doi.org/10.1177/0956797616630964>
- Street, 1615 L., NW, Washington, S. 800, & Inquiries, D. 20036 202 419 4300 | M. 202 419 4349 | F. 202 419 4372 | M. (2014, June 12). Political Polarization in the American Public. Retrieved from <http://www.people-press.org/2014/06/12/political-polarization-in-the-american-public/>
- Stuppelle, E. J. N., Ball, L. J., Evans, J. S. B. T., & Kamal-Smith, E. (2011). When logic and belief collide: Individual differences in reasoning times support a selective processing model. *Journal of Cognitive Psychology*, 23(8), 931–941. <https://doi.org/10.1080/20445911.2011.589381>
- Sundström, G. A. (1987). Information search and decision making: The effects of information displays. *Acta Psychologica*, 65(2), 165–179. [https://doi.org/10.1016/0001-6918\(87\)90025-4](https://doi.org/10.1016/0001-6918(87)90025-4)
- Svenson, O. (1979). Process descriptions of decision making. *Organizational Behavior and Human Performance*, 23(1), 86–112. [https://doi.org/10.1016/0030-5073\(79\)90048-5](https://doi.org/10.1016/0030-5073(79)90048-5)
- Swers, M. L. (2002). *The Difference Women Make: The Policy Impact of Women in Congress*. University of Chicago Press.

- Taber, C. S., & Lodge, M. (2006). Motivated Skepticism in the Evaluation of Political Beliefs. *American Journal of Political Science*, 50(3), 755–769. <https://doi.org/10.1111/j.1540-5907.2006.00214.x>
- Tan, K., Dong, S., Liu, X., Chen, W., Wang, Y., Oldroyd, B. P., & Latty, T. (2015). Phantom alternatives influence food preferences in the eastern honeybee *Apis cerana*. *Journal of Animal Ecology*, 84(2), 509–517. <https://doi.org/10.1111/1365-2656.12288>
- Timmermans, D. (1993). The impact of task complexity on information use in multi-attribute decision making. *Journal of Behavioral Decision Making*, 6(2), 95–111. <https://doi.org/10.1002/bdm.3960060203>
- Todd, P. M., & Gigerenzer, G. (2007). Environments That Make Us Smart Ecological Rationality. *Current Directions in Psychological Science*, 16(3), 167–171.
- Todorov, A., Mandisodza, A. N., Goren, A., & Hall, C. C. (2005). Inferences of Competence from Faces Predict Election Outcomes. *Science*, 308(5728), 1623–1626. <https://doi.org/10.1126/science.1110589>
- Todorov, A., Said, C. P., Engell, A. D., & Oosterhof, N. N. (2008). Understanding evaluation of faces on social dimensions. *Trends in Cognitive Sciences*, 12(12), 455–460. <https://doi.org/10.1016/j.tics.2008.10.001>
- Todorov, A., & Uleman, J. S. (2002). Spontaneous trait inferences are bound to actors' faces: Evidence from a false recognition paradigm. *Journal of Personality and Social Psychology*, 83(5), 1051–1065. <https://doi.org/10.1037/0022-3514.83.5.1051>
- Todorov, A., & Uleman, J. S. (2003). The efficiency of binding spontaneous trait inferences to actors' faces. *Journal of Experimental Social Psychology*, 39(6), 549–562. [https://doi.org/10.1016/S0022-1031\(03\)00059-3](https://doi.org/10.1016/S0022-1031(03)00059-3)
- Toffler, A. (1990). *Future Shock*. Bantam Books.
- Tomz, M., & Houweling, R. P. V. (2008). Candidate Positioning and Voter Choice. *American Political Science Review*, 102(3), 303–318. <https://doi.org/10.1017/S0003055408080301>
- Trueblood, J. S. (2012). Multialternative context effects obtained using an inference task. *Psychonomic Bulletin & Review*, 19(5), 962–968. <https://doi.org/10.3758/s13423-012-0288-9>
- Trueblood, J. S., Brown, S. D., Heathcote, A., & Bussemeyer, J. R. (2013). Not Just for Consumers Context Effects Are Fundamental to Decision Making. *Psychological Science*, 24(6), 901–908. <https://doi.org/10.1177/0956797612464241>

- Tsetsos, K., Chater, N., & Usher, M. (2012). Salience driven value integration explains decision biases and preference reversal. *Proceedings of the National Academy of Sciences*, *109*(24), 9659–9664. <https://doi.org/10.1073/pnas.1119569109>
- Tsetsos, K., Usher, M., & Chater, N. (2010). Preference reversal in multiattribute choice. *Psychological Review*, *117*(4), 1275–1291. <https://doi.org/10.1037/a0020580>
- Tversky, A. (1972). Elimination by aspects: A theory of choice. *Psychological Review*, *79*(4), 281–299. <https://doi.org/10.1037/h0032955>
- Tversky, A., & Kahneman, D. (1973). Availability: A heuristic for judging frequency and probability. *Cognitive Psychology*, *5*(2), 207–232.
- Tversky, A., & Kahneman, D. (1974). Judgment under Uncertainty: Heuristics and Biases. *Science*, *185*(4157), 1124–1131.
- Tversky, A., & Kahneman, D. (1991). Loss Aversion in Riskless Choice: A Reference-Dependent Model. *The Quarterly Journal of Economics*, *106*(4), 1039–1061. <https://doi.org/10.2307/2937956>
- Tversky, A., & Simonson, I. (1993). Context-Dependent Preferences. *Management Science*, *39*(10), 1179–1189.
- Uleman, J. S., Newman, L. S., & Moskowitz, G. B. (1996). People as Flexible Interpreters: Evidence and Issues from Spontaneous Trait Inference. In M. P. Zanna (Ed.), *Advances in Experimental Social Psychology* (Vol. 28, pp. 211–279). Academic Press. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0065260108602397>
- Usher, M., & McClelland, J. L. (2004). Loss Aversion and Inhibition in Dynamical Models of Multialternative Choice. *Psychological Review*, *111*(3), 757–769.
- Usher, M., & Zakay, D. (1993). A neural network model for attribute-based decision processes. *Cognitive Science*, *17*(3), 349–396. <https://doi.org/http://dx.doi.org/>
- Valentino, N. A., Brader, T., Groenendyk, E. W., Gregorowicz, K., & Hutchings, V. L. (2011). Election Night's Alright for Fighting: The Role of Emotions in Political Participation. *The Journal of Politics*, *73*(1), 156–170. <https://doi.org/10.1017/S0022381610000939>
- Valentino, N. A., Gregorowicz, K., & Groenendyk, E. W. (2008). Efficacy, Emotions and the Habit of Participation. *Political Behavior*, *31*(3), 307–330. <https://doi.org/10.1007/s11109-008-9076-7>
- Vedantam, S. (2007, April 2). The Decoy Effect, or How to Win an Election. *The Washington Post*. Retrieved from <http://www.washingtonpost.com/wp-dyn/content/article/2007/04/01/AR2007040100973.html>

- Von Neumann, J., & Morgenstern, O. (1947). *Theory of games and economic behavior, 2nd rev. ed* (Vol. xviii). Princeton, NJ, US: Princeton University Press.
- Warwick, P. V. (2009). Relative Extremism and Relative Moderation Strategic Party Positioning in Democratic Systems. *Political Research Quarterly*, *62*(2), 276–288. <https://doi.org/10.1177/1065912908320663>
- Weaver, Bruce. (2016). Assumptions/Restrictions for Chi-square Tests on Contingency Tables. Retrieved 18 August 2016, from https://sites.google.com/a/lakeheadu.ca/bweaver/Home/statistics/notes/chisqr_assumptions
- Weber, E. U., & Johnson, E. J. (2009). Mindful Judgment and Decision Making. *Annual Review of Psychology*, *60*(1), 53–85. <https://doi.org/10.1146/annurev.psych.60.110707.163633>
- Weber, T. (2015). Synergy in Spatial Models of Voting: How Critical Cases Show That Proximity, Direction and Discounting Are Friends, Not Foes. *Journal of Elections, Public Opinion and Parties*, *25*(4), 504–529. <https://doi.org/10.1080/17457289.2015.1064437>
- Weeks, L., & Quinlivan, A. (2009). *All Politics is Local: A Guide to Local Elections in Ireland*. Collins Press.
- Weisberg, H. F., & Nawara, S. P. (2010). How Sophistication Affected The 2000 Presidential Vote: Traditional Sophistication Measures Versus Conceptualization. *Political Behavior*, *32*(4), 547–565. <https://doi.org/10.1007/s11109-010-9117-x>
- Westen, D. (2008). *Political Brain: The Role of Emotion in Deciding the Fate of the Nation*. PublicAffairs.
- Whitener, E. M. (1990). Confusion of confidence intervals and credibility intervals in meta-analysis. *Journal of Applied Psychology*, *75*(3), 315–321. <https://doi.org/10.1037/0021-9010.75.3.315>
- Willis, J., & Todorov, A. (2006). First Impressions: Making up Your Mind after a 100-Ms Exposure to a Face. *Psychological Science*, *17*(7), 592–598.
- Wu, P.-L., & Chiou, W.-B. (2009). More options lead to more searching and worse choices in finding partners for romantic relationships online: an experimental study. *Cyberpsychology & Behavior: The Impact of the Internet, Multimedia and Virtual Reality on Behavior and Society*, *12*(3), 315–318. <https://doi.org/10.1089/cpb.2008.0182>
- Yang, S., & Lynn, M. (2014). More Evidence Challenging the Robustness and Usefulness of the Attraction Effect. *Journal of Marketing Research (JMR)*, *51*(4), 508–513.
- Ye, M., Li, Q., & Leiker, K. W. (2011). Evaluating Voter–Candidate Proximity in a Non-Euclidean Space. *Journal of Elections, Public Opinion & Parties*, *21*(4), 497–521. <https://doi.org/10.1080/17457289.2011.609619>

Zaller, J. (1992). *The Nature and Origins of Mass Opinion*. Cambridge University Press.

Zaller, J. (1996). The myth of massive media impact revived: New support for a discredited idea. *Political Persuasion and Attitude Change*, 17–78.

Zaller, J., & Feldman, S. (1992). A Simple Theory of the Survey Response: Answering Questions versus Revealing Preferences. *American Journal of Political Science*, 36(3), 579–616. <https://doi.org/10.2307/2111583>

Zeelenberg, M. (1999). Anticipated regret, expected feedback and behavioral decision making. *Journal of Behavioral Decision Making*, 12(2), 93–106. [https://doi.org/10.1002/\(SICI\)1099-0771\(199906\)12:2<93::AID-BDM311>3.0.CO;2-S](https://doi.org/10.1002/(SICI)1099-0771(199906)12:2<93::AID-BDM311>3.0.CO;2-S)

Appendix A

A.1. Directional Measures of Correct Voting

We have outlined our rationale for calculating a directional model measure of correct voting in Chapter 2.1.3. In our directional measure, we include only the issue stands and, where relevant, the decision weights explicitly reported by participants. Where participants report ‘Don’t Know’ on an issue stand, or assign a policy issue an importance rating of ‘0’, that dimension is discounted from calculating the utility of that candidate to the participant. In contrast to Lau and Redlawsk (2006), we do not make a distinction as to what participants *actually* accessed in our studies, as we are interested in who participants *should* have voted for if they had full information. We sum up over all policy issues to create an additive utility score for each candidate; unlike Lau and Redlawsk (2001; 2006; Lau, Anderson, & Redlawsk, 2008), we do not average utility scores by dividing by the number of items accessed, nor do we exclude issues stands where voters did not access informational items relating to that issue for any candidate (e.g. if ‘Healthcare’ was not accessed for *any* candidate).

Under normative standards, we assume they *should* access all items (at least as many as possible), as they are given adequate time and opportunity to do so. Lau and Redlawsk’s (2001; 2006) claim that their measure of correct voting is a normative ‘objective’ measure seems overly flexible, when they only calculate based on what was actually accessed, versus all possible information a voter *could* have accessed. For simple illustration: if a voter accessed a single attribute only, then under Lau and Redlawsk (2006) only that attribute matters in calculating if a vote will be ‘correct’, which seems counter to the theoretical underpinnings of correct voting. Therefore, both our Proximal and Directional measures are likely more ‘strict’ in determining a voter’s ‘correct vote’, but closer to the conception of correct voting laid out in Lau and Redlawsk’s (1997) original work.

Finally, it is important to note that Lau et al. (2008) include many issue stands where 7-point scales do not exist in the ANES (e.g. for ‘Abortion’), and policy questions that are asked in different formats (see Footnote 18, Lau et al., 2008). Lau et al. (2008) state they recode these items as to have a 7-point range, yet it is unclear how exactly they do so. As recoding scales can add subjectivity to the coding (e.g. creating assumptions about policy space where none might exist), we do not recode the issue scales we use in our studies to range between 1-7, and simply calculate a directional score for that issue by calculating an exact midpoint on that scale (eg.,

'3.5' for a 6-point scale; $1+6/2 = 3.5$); or using an obvious neutral point that may not be the mathematical midpoint (though this situation does not arise).

A.2. Proximal vs. Directional Models (Results, Chapter 2)

We followed a similar procedure as per Lau & Redlawsk (2008) who conducted simple correlations between the results of the directional and proximal measures. We expand this by firstly looking at: a) what is the degree of correlation between the classification of participants' 'best choice' between the directional and proximal measures; b) what is the degree of correlation between CV as per the proximal method (CV^{PX}) and CV as per the directional method (CV^{DR}); c) what changes in classification arise from using either method; and finally d) do the main experiments' pattern of results differ depending on which method we use. Where appropriate we also examine the degree of correlation, and if any differences arise, from using the weighted vs. unweighted versions of both the proximal and directional methods.

As per all our analyses, we exclude all participants whose 'Vote Choice' was either 'Abstain' or 'Don't Know'. Our hypotheses are:

H1a: *That there will significant agreement between the proximal and directional model accounts of which candidate in the choice set is a participant's 'best option'.*

H1b: *That there will be significant agreement between the weighted and unweighted versions of the proximal and directional accounts of participants' 'best options'*

H2: *That there will be significant agreement between the proximal Correct Voting (CV^{PX}) measure and the directional Correct Voting (CV^{DR}) measure.*

2.1. Experiment 1

Directional vs. Proximal: A chi- square analysis for the degree of agreement between the Proximal (PX) and Directional (DR) classifications was significant, $\chi^2(4, 120) = 25.15, p < .001, \phi_c = .33^{81}$, indicating the two are strongly correlated. The pattern of results is in Table 1 below.

Table 12: Experiment 1; 'Best candidate' classification by both Proximal & Directional measures. N= 120.

⁸¹ Which is a large effect size as per Cohen (1992).

		<u>Directional (DR)</u>		
		CON	LAB	LIB
<u>Proximal (PX)</u>	CON	8	5	2
	LAB	2	18	4
	LIB	6	52	23

Between 53-75% of cases remain the same when comparing the classifications of PX to DR, with the notable exception of those whose ‘best candidate’ was the Liberal Democrat option. 64.2% of these cases under the PX measure are reclassified as ‘Labour’ when using the DR measure.

CV^{PX} vs. CV^{DR} : A chi-square analysis between the CV^{PX} and CV^{DR} measures was significant, $\chi^2(1, 120) = 5.98, p = .014, \phi_c = .22$, indicating the two are strongly correlated. The pattern of results is in Table 2 below.

Table 13: Experiment 1m, Correct Vote classification by Proximal and Directional measures. N= 120.

		<u>Directional (DR)</u>	
		Incorrect	Correct
<u>Proximal (PX)</u>	Incorrect	23	35
	Correct	12	50

Of the 58 participants classed as voting ‘incorrectly’ by CV^{PX} , 23 (39.7%) remain incorrect in the CV^{DR} variable, while 35 (60.3%) are re-classed as voting ‘correctly’. Of the 63 participants classed as voting ‘correctly’ by CV^{PX} , 50 (80.6%) remain correct as per CV^{DR} , while 12 (19.4%) are re-classed as voting ‘incorrectly’. There is an overall net shift of 23 into the ‘correct vote’ category using the DR measure.

Effect on Main Analyses: We performed a binary logistic regression, using CV^{DR} as the dependent variable. The regression model containing PL & No. of Candidates was significant, $p = .002, R^2 = 13.8\%$, and predicted 70.8% of the overall cases correctly. PL did not significantly predict CV^{DR} , $\beta = -.19, p = .65$; whereas NOC significantly predicted CV^{DR} , $\beta = -1.46, p = .001$, with participants being 23.2% less likely to vote correctly when the number of candidates in the choice set increases from 2 to 3. The addition of the PL & NOC interaction term did not significantly improve the model ($p = .19$), and was non-significant, $p = .19$.

Chance Level Analysis: Using CV^{DR} , when there are 2-candidates, correct voting rates differ significantly from what would be expected by chance (50%), $p < .001$. Levels of CV^{DR} do not differ significantly from those expected by chance (33%) when there are 3 candidates in the choice set, $p = .67$.

Summary: While qualitatively the CV variables do differ from each other, depending on the method used to calculate them (Directional or Proximal), the measures of association between the two are significant. Further, the pattern of results arising from the logistic regressions, using either CV measures, are the same. While there is a minor change in the significance in the chance analysis results when looking at whether CV rates differ from chance when there are 2-candidates, both results are in the same (and predicted) direction. Therefore we consider them to be functionally equivalent.

2.2. Experiment 2:

Directional vs. Proximal: A chi-square analysis between the Proximal (PX) and Directional (DR) measures was significant, $\chi^2(4, 93) = 44.24$, $p < .001$, $\phi_c = .49^{82}$, indicating the two are strongly correlated. The pattern of results is in Table 3.

Table 3: Experiment 2, 'Best candidate' classification by both Proximal & Directional measures. N= 93.

		<u>Directional (DR)</u>		
		CON	LAB	LIB
<u>Proximal (PX)</u>	CON	8	2	1
	LAB	7	52	5
	LIB	2	7	9

Between 50-81% of cases remain the same when comparing the classifications of PX to DR, with the notable exception of those classed as closest to the 'Liberal Democrat' candidate. 38.9% of these cases under the PX measure are reclassified as 'Labour' when using the DR measure.

CV^{PX} vs. CV^{DR} : A chi-square analysis between the CV^{PX} and CV^{DR} measures was significant, $\chi^2(1, 120) = 45.85$, $p < .001$, $\phi_c = .70$, indicating the two are strongly correlated. The pattern of results is in Table 4 below.

Table 4: Experiment 2; Correct Vote classification by Proximal and Directional measures. N= 120.

⁸² Which is a large effect size as per Cohen (1992).

		<u>Correct Vote (DR)</u>	
		Incorrect	Correct
<u>Correct Vote (PX)</u>	Incorrect	34	4
	Correct	10	45

Of the 58 participants classed as voting ‘incorrectly’ by CV^{PX}, 34 (89.5%) remain incorrect in the CV^{DR} variable, while 4 (10.5%) are re-classed as voting ‘correctly’. Of the 45 participants classed as voting ‘correctly’ by CV^{PX}, 10 (81.8%) remain correct as per CV^{DR}, while 10 (18.2%) are re-classed as voting ‘incorrectly’. There is an overall net shift of 6 participants into the ‘correct vote’ category when using the DR measure.

Effect on Main Analyses: We performed a binary logistic regression, using CV^{DR} as the dependent variable. The regression model containing PL & No. of Candidates was not significant, $p = .084$, $R^2 = 6.9\%$, and predicted 60.2% of the overall cases correctly. PL did not significantly predict CV^{DR}, $\beta = .40$, $p = .34$; whereas NOC significantly predicted CV^{DR}, $\beta = -.903$, $p = .037$, with participants being 40.5% less likely to vote correctly when the number of candidates in the choice set increases from 2 to 3. The addition of the PL & NOC interaction term did not significantly improve the model ($p = .60$), and was non-significant, $p = .60$.

Chance Level Analysis: Using CV^{DR}, when there are 2-candidates, correct voting rates do not differ significantly from what would be expected by chance (50%), $p = .197$. Levels of CV^{DR} do not differ significantly from those expected by chance (33%) when there are 3 candidates in the choice set, $p = .52$.

Summary: The CV variables do differ from each other, depending on the method used to calculate them (Directional or Proximal), but these differences are minor and the measures of association between the two are significant and strongly correlated. The logistic regression results using either CV measures are the same, with the note that the logistic regression model using CV^{DR} as the dependent variable is non-significant. There is a minor change in the significance in the chance analysis results when looking at whether CV rates differ from chance when there are 2-candidates, both results are in the same (and predicted) direction, but only when considering CV^{PX} do participants choose the ‘best’ candidate above chance levels when there are 2 candidates.

2.3. Experiment 3

Comparison of Weighted vs. Unweighted measures: We compared the weighted proximal (PX^W) and unweighted proximal (PX^U) measures using a chi-square test, finding significant agreement between PX^W and PX^U, $\chi^2(4, 125) = 101.28, p < .001, \phi_c = .64$. Table 5 shows the pattern of results.

Table 5: Classification using Proximal (weighted) compared to Proximal (Unweighted). N= 125.

		<u>Proximal Unweighted (PX^U)</u>		
		CON	LAB	LIB
<u>Proximal Weighted (PX^W)</u>	CON	3	2	0
	LAB	3	72	4
	LIB	4	4	33

We also compared the weighted directional (DR^W) and unweighted directional (DR^U) measures using a chi-square test, finding significant agreement between DR^W and DR^U, $\chi^2(4, 125) = 66.96, p < .001, \phi_c = .52$. Table 6 shows the pattern of results.

Table 6: Classification using Proximal (weighted) compared to Proximal (Unweighted). N= 125.

		<u>Directional Unweighted (DR^U)</u>		
		CON	LAB	LIB
<u>Directional Weighted (DR^W)</u>	CON	16	6	4
	LAB	5	74	12
	LIB	2	0	6

Overall we can say that there are relatively few shifts in classifications between the weighted and unweighted versions of either the proximal or the directional measures. From this point on we consider only the weighted versions in our analyses.

Directional vs. Proximal: A chi-square analysis between the Proximal (PX^W) and Directional (DR^W) measures was significant, $\chi^2(4, 125) = 32.85, p < .001, \phi_c = .36$, indicating the two are strongly correlated. The pattern of results is in Table 7 below.

Table 7: Experiment 3; 'Best candidate' classification by both Proximal & Directional measures. N= 125.

<u>Proximal (PX^W)</u>	<u>Directional (DR^W)</u>		
	CON	LAB	LIB

CON	5	0	0
LAB	12	66	1
LIB	9	25	7

Most cases remain the same when comparing the classifications of PX^W to DR^W, with the notable exception of those classed as closest to the ‘Liberal Democrat’ candidate; 60% of those classed as closest to the Liberal Democrat candidate are reclassified as ‘Labour’ when using DR^W.

CV^{PX} vs. CV^{DR}: A chi-square analysis between the CV^{PX} and CV^{DR} measures was significant, $\chi^2(1, 125) = 37.73, p < .001, \phi_c = .55$, indicating the two are strongly correlated. The pattern of results is in Table 8.

Table 8: Experiment 3, Correct Vote classification by Proximal and Directional measures. N= 125.

		Correct Vote (DR)	
		Incorrect	Correct
Correct Vote (PX)	Incorrect	36	15
	Correct	12	62

Of the 51 participants classed as voting ‘incorrectly’ by CV^{PX}, 36 (70.5%) remain incorrect in the CV^{DR} variable, while 15 (29.5%) are re-classed as voting ‘correctly’. Of the 74 participants classed as voting ‘correctly’ by CV^{PX}, 62 (83.8%) remain correct as per CV^{DR}, while 10 (16.2%) are re-classed as voting ‘incorrectly’. There is an overall net shift of 3 participants into the ‘correct vote’ category when using the DR measure.

Effect on Main Analyses: We performed a stepwise binary logistic regression on CV^{PX}, with the group variables Party Label (PL) and Number of Candidates (NOC) entered in Block 1, and their interaction term in Block 2. The regression model containing PL & No. of Candidates was significant, $p < .001, R^2 = 22.6%$, and predicted 71.2% of the overall cases correctly. PL did not significantly predict CV^{PX}, $\beta = .08, p = .82$; whereas NOC significantly predicted CV^{PX}, $\beta = -1.83, p < .001$, with participants being 15.9% less likely to vote correctly when the number of candidates in the choice set increases from 2 to 3. The addition of the PL & NOC interaction term did not significantly improve the model ($p = .98$), and was non-significant, $p = .98$.

We repeated the previous binary logistic regression, using CV^{DR} as the dependent variable. The regression model containing PL & No. of Candidates was significant, $p = .001, R^2 = 15.2%$, and predicted 67.2% of the

overall cases correctly. PL did not significantly predict CV^{DR} , $\beta = .12$, $p = .76$; whereas NOC significantly predicted CV^{DR} , $\beta = -1.47$, $p < .001$, with participants being 23.0% less likely to vote correctly when the number of candidates in the choice set increases from 2 to 3. The addition of the PL & NOC interaction term did not significantly improve the model ($p = .20$), and was non-significant, $p = .20$.

Chance Level Analysis: Using CV^{DR} , when there are 2-candidates, correct voting rates do differ significantly from what would be expected by chance (50%), $p = .001$. Levels of CV^{DR} do not differ significantly from those expected by chance (33%) when there are 3 candidates in the choice set, $p = .56$.

Summary: The weighted and unweighted versions of both the proximal and directional variables are strongly and significantly correlated with each other. Further, the classifications of participants' 'best option' using either the directional (weighted/unweighted) or proximal (weighted/unweighted) methods of calculation are strongly and significantly correlated with each other. Similarly, the resulting CV variables, using either directional or proximal methods, are also strongly and significantly correlated with each other. We use the weighted versions of each in a series of stepwise binary logistic regressions.

The logistic regression results using either CV measures are the same, with the note that the logistic regression model using weighted CV^{PX} as the dependant variable explains a larger degree of the variance ($R^2 = 22.6\%$) compared to the model using weighted CV^{DR} ($R^2 = 15.2\%$). There are no meaningful differences in the chance analysis results when looking at whether CV rates differ from chance when there are 2 or 3 candidates in the choice set; participants seem to be choosing correctly at rates above chance when there are 2 candidates (50%), but at rates no better than chance (33%) when the number of candidates in the choice set increases to 3.

2.4. Experiment 4

Comparison of Weighted vs. Unweighted measures: We compared the weighted proximal (PX^W) and unweighted proximal (PX^U) measures using a chi-square test⁸³, finding significant agreement between PX^W and PX^U , $\chi^2(1, 130) = 15.32$, $p < .001$, $\phi_c = .38$. Table 9 shows the pattern of results.

⁸³ We note 72% of the expected cell counts are less than 5, which is a basic assumption of the Pearson chi-square (Yates, Moore & McCabe, 1999, p. 734). We use an $N-1$ chi-square on recommendations by Campbell (2007), which is equivalent to the Linear-by-Linear chi-square in SPSS (Weaver, 2013).

Table 9: Experiment 4; Comparison of Proximal (weighted) vs. Proximal (unweighted), N= 130.

		<u>Proximal (PX^U)</u>				
		CON	LAB	LIB	GREEN	UKIP
<u>Proximal (PX^W)</u>	CON	2	1	2	0	0
	LAB	0	44	13	5	1
	LIB	1	15	25	5	0
	GREEN	0	4	3	8	0
	UKIP	0	1	0	0	1

Next, we compared the weighted directional (DR^W) and unweighted directional (DR^U) measures using a chi-square test, finding significant agreement between DR^W and DR^U, $\chi^2(1, 130) = 89.98, p < .001, \phi_c = .83$. Table 10 shows the pattern of results.

Table 10: Experiment 4; Comparison of Directional (weighted) vs. Directional (unweighted), N= 130.

		<u>Directional (DR^U)</u>				
		CON	LAB	LIB	GREEN	UKIP
<u>Directional (DR^W)</u>	CON	12	1	1	0	1
	LAB	1	29	0	0	0
	LIB	1	2	19	4	0
	GREEN	0	5	2	48	0
	UKIP	0	0	0	0	4

Overall there seems to be strong and significant degree of agreement between the weighted and unweighted versions of both the proximal and the directional measures in classifying which candidate is the ‘best option’ for participants.

Directional vs. Proximal: A chi-square analysis between the Proximal (PX^U) and Directional (DR^U) measures was significant, $\chi^2(1, 130) = 14.92, p < .001, \phi_c = .51$, indicating strong agreement between them. The pattern of results is in Table 11.

Table 11: Experiment 4; Comparison of Proximal (unweighted) vs. Directional (unweighted), N= 130.

<u>Proximal (PX^U)</u>	<u>Directional (DR^U)</u>				
	CON	LAB	LIB	GREEN	UKIP

CON	2	0	0	0	1
LAB	2	35	3	25	0
LIB	10	2	19	9	3
GREEN	0	0	0	18	0
UKIP	0	0	0	0	1

A chi-square analysis between the Proximal (PX^W) and Directional (DR^W) measures was significant, $\chi^2(1, 130) = 6.58, p = .010, \phi_c = .24$, indicating medium to strong agreement between them. The pattern of results is in Table 12.

Table 12: Experiment 4; Comparison of Proximal (weighted) vs. Directional (weighted). N= 130.

		<u>Directional (DR^W)</u>				
		CON	LAB	LIB	GREEN	UKIP
<u>Proximal (PX^W)</u>	CON	3	1	1	0	0
	LAB	6	21	9	25	2
	LIB	6	5	13	20	2
	GREEN	0	2	3	10	0
	UKIP	0	1	0	0	0

There are notable differences in the classifications in the weighted versions of the proximal and directional measures. In particular, using PX^W only 11.5% of participants are classed as having the Green candidate as their 'best option, whereas using DR^W this figure increases to 42.3% of participants. This increase comes primarily from a reclassification of 39.7% of those classed as Labour and 43.5% of those classed as 'Liberal Democrat'. The totals are reproduced in Table 13.

Table 13: Total number of cases classified as 'best candidate', for both Proximal and Directional measures (weighted). N=130.

	CON	LAB	LIB	GREEN	UKIP
PX^W	5	63	46	15	1
DR^W	15	30	26	55	4

CV^{PX} vs. CV^{DR} : A chi-square analysis between the unweighted CV^{PX} and CV^{DR} measures was significant, $\chi^2(1, 130) = 31.77, p < .001, \phi_c = .49$, indicating the two are strongly correlated. The pattern of results is in Table 14.

Table 14: Experiment 4, Correct Vote classification by Proximal and Directional measures. N= 130.

		<u>Correct Vote (DR)</u>	
		Incorrect	Correct
<u>Correct Vote (PX)</u>	Incorrect	72	9
	Correct	21	28

More participants are classed as voting ‘incorrectly’ using the DR^U measure than using PX^U (N= 93 vs. N= 81), with a net shift of 12 fewer participants voting ‘correctly’ (N= 37 vs. N= 49) when using DR^U.

A chi- square analysis between the weighted CV^{PX} and CV^{DR} measures was not significant at the $p= .05$ level, $\chi^2(1, 130)= 2.95, p=.086, \phi_c= .15$, indicating the two are somewhat correlated at the $p= .10$ level. The pattern of results is in Table 15.

Table 15: Experiment 4; Correct Vote classification by Proximal and Directional measures. N= 130.

		<u>Correct Vote (DR^W)</u>	
		Incorrect	Correct
<u>Correct Vote (PX^W)</u>	Incorrect	59	19
	Correct	32	20

Similarly to the trend for the unweighted CV measures, more participants are classed as having voted incorrectly using the weighted directional method (N= 91), compared to the weighted proximal method (N=78), a net increase of N=13 participants.

CV^{PX} vs. CV^{DR} (unweighted): We performed a stepwise binary logistic regression on unweighted CV_{PX}, with the group variables Party Label (PL) and Number of Candidates (NOC) entered in Block 1, and their interaction term in Block 2. The regression model containing PL & No. of Candidates was significant, $p< .001$, $R^2= 22.6%$, and predicted 71.2% of the overall cases correctly. PL did not significantly predict CV^{PX}, $\beta= .08, p= .82$; whereas NOC significantly predicted CV^{PX}, $\beta= -1.83, p< .001$, with participants being 15.9% less likely to vote correctly when the number of candidates in the choice set increases from 2 to 3. The addition of the PL & NOC interaction term did not significantly improve the model ($p= .98$), and was non-significant, $p= .98$.

We repeated the previous binary logistic regression, using CV^{DR} as the dependent variable. The regression model containing PL & No. of Candidates was significant, $p = .001$, $R^2 = 15.2\%$, and predicted 67.2% of the overall cases correctly. PL did not significantly predict CV^{DR} , $\beta = .12$, $p = .76$; whereas NOC significantly predicted CV^{DR} , $\beta = -1.47$, $p < .001$, with participants being 23.0% less likely to vote correctly when the number of candidates in the choice set increases from 2 to 3. The addition of the PL & NOC interaction term did not significantly improve the model ($p = .20$), and was non-significant, $p = .20$.

CV^{PX} vs. CV^{DR} (weighted): We repeated binary logistic regression, using CV^{DR} as the dependent variable. The regression model containing PL & No. of Candidates was significant, $p = .012$, $R^2 = 9.4\%$, and predicted 70% of the overall cases correctly. PL did not significantly predict CV^{DR} , $\beta = -.11$, $p = .76$; whereas NOC significantly predicted CV^{DR} , $\beta = 1.15$, $p = .004$, with participants being 3.17 times *more* likely to vote correctly when the number of candidates in the choice set increases from 3 to 5. The addition of the PL & NOC interaction term did not significantly improve the model ($p = .32$), and was non-significant, $p = .32$.

CV^{PX} (layered by PL): We were curious about the non-significance of the NOC term for CV^{PX} in light our previous results. We followed up using a layered chi-square test, looking at the differences in correct voting between the 3 and 5 candidate conditions in the presence or absence of Party Label separately. We found a significant decrease in the rates of correct voting when choice set increased from 3 to 5 candidates when PL^A , $\chi^2(1, 130) = 3.90$, $p = .049$, $\phi_c = .26$, but not when PL^P , $\chi^2(1, 130) = .027$, $p = .86$, $\phi_c = .02$. We did the same for CV^{DR} , finding the opposite that rates of correct voting significantly increase when PL^P , $\chi^2(1, 130) = 7.85$, $p = .005$, $\phi_c = .33$, but no significant change in correct voting between conditions when PL^A , $\chi^2(1, 130) = 1.70$, $p = .19$, $\phi_c = .17$.

Chance Level Analysis: Using CV^{PX} , when there are 3 candidates, correct voting rates do not differ significantly from what would be expected by chance (33%), $p = .59$. Levels of CV^{PX} do not differ significantly from those expected by chance (20%) when there are 5 candidates in the choice set, $p = .17$.

Using CV^{DR} , when there are 3 candidates, correct voting rates do differ significantly from what would be expected by chance (33%), $p < .001$, with more people incorrectly voting a rate higher than at chance. Levels of CV^{DR} do not differ significantly from those expected by chance (20%) when there are 5 candidates in the choice set, $p = .52$.

Summary: All comparisons of the weighted and unweighted directional and proximal measures are significantly and strongly in agreement with each other. The unweighted directional and proximal measures used to assess participants' correct voting show significant and good agreement; however, to the weighted versions provide different patterns of classifications, and the resulting CV measures arising from both only show medium levels of agreement at the $p = .10$ level.

This also marks the only instance where our binary logistic model does not significantly explain the variance in proximal accounts of correct voting, and where the number of candidates in the model does not significantly predict decreased levels of correct voting as the number of candidates in the choice set increases; however the trend for decreasing levels of correct voting as choice set size increases is still observed.

By contrast, the binary logistic regression model for directional accounts of correct voting was significant, with numbers of candidates being a significant predictor of *increasing* likelihood of correct voting as the choice set increases from 3 to 5 candidates.

Rates of correct voting do not differ from what would be expected if participants were simply voting by chance, except in the case of the directional account of correct voting when there was 3 candidates in the choice set; participants voted incorrectly at rates higher than expected by chance.

Conclusion:

Our hypotheses were:

H1a: *That there will significant agreement between the proximal and directional model accounts of which candidate in the choice set is a participant's 'best option'.*

H1b: *That there will be significant agreement between the weighted and unweighted versions of the proximal and directional accounts of participants' 'best options'*

H2: *That there will be significant agreement between the proximal Correct Voting (CV^{PX}) measure and the directional Correct Voting (CV^{DR}) measure.*

Across Experiments 1-3 there seems strong evidence for the belief that there are no statistically significant, or meaningful, differences in using either the proximal or directional accounts of calculating a participant's

‘correct vote’ for candidates in the choice set. All measures were strongly in agreement with each other. In Experiment 4 we note similar results, with unweighted versions of the proximal and directional accounts of correct voting strongly in agreement. However the weighted versions only significantly agree at the $p = .10$ level, with far more participants being classified as the Green candidate being the ‘best option’ using the directional account of correct voting.

In general, we note that the use of decision-weights to calculate the correct voting measures does seem to improve the proportion of the variance (Nagelkerke’s R^2) accounted for by our regression model.

H3: That there will be no meaningful difference in the pattern of results obtained using either CV^{PX} CV^{DR} .

Using either the proximal or directional account of calculating correct voting led to no meaningful differences in the analyses used to test our original hypotheses (except in the case of Experiment 4, see below). There is a consistent trend across all three experiments for i) correct voting rates to decrease as the choice set increases from 2 to 3 candidates, and ii) participants to vote correctly at rates greater than chance where there are 2 candidates, and to vote at rates no different from those expected by chance when there are 3 candidates.

In Experiment 4, the number of candidates was not a significant predictor of decreasing likelihood of correct voting, as per Experiments 1-3; in fact under the directional account of correct voting, increasing the number of candidates in the choice set from 3 to 5 was significantly associated with *increasing* rates of correct voting. Only using the directional account was there a significantly higher rate of *incorrect* voting than what would be expected by chance when there were 3 candidates in the choice set. However, in follow-up analyses of these results we observe that under the proximal account when party label is absent, increasing the choice set size *decreases* rates of correct voting, while correct voting rates remain relatively unchanged when party label is present. Under the directional account the opposite is observed; when party label is absent there are no significant differences in correct voting rates regardless of the choice set size, however when party label is present, rates of correct voting *increase* as the choice set increases to 5 candidates.

While both of these measures result in different patterns of significant results, it suggests a possibility that the presence of party identifying information in expanding choice sets is being utilised in some way to increase correct voting by participants.

In general, there are a few possible explanations possible for the differing results of Experiment 4 to Experiment 1-3. The major differences between Experiments 1-3 and Experiment 4 are as follows: i) Experiment 4 uses updated materials from the 2015 General Election manifestos, compared to the 2010 GE election manifestos used in Experiments 1-3; ii) Experiment 4 was carried out in early 2015, whereas Experiments 1-3 were carried out in 2013 and early 2014; and finally, iii) Experiment 4 included two additional parties representing the ‘extreme’ ends of the UK political spectrum (Green Party, and the UK Independence Party).

Firstly, under the proximity model accounts of correct voting we observe the continuing trend for participants to vote less correctly when we increase the choice set of candidates (44.9% when 3 candidates -> 34.4% when 5 candidates), albeit this trend is no longer significant. This may be as a result of the new materials being more relevant to participants, or being better indicators of candidates’ positions at that time (given their aim was to be real world relevant), which may allow for better matching by participants to their ‘ideal’ candidate at the experimental ‘ballot box’.

Secondly, increasing the number of candidates to include the 2 other main parties in the UK may allow for better identification of candidate’s positions by virtue of comparison in that participants may be able to identify the differences between all the candidates by virtue of having more points of reference on an issue scale. Further, increasing the choice set size in political choices is generally considered a good thing, as it increases the possibility of a political option arising that is more in line with a voter’s preferences. Therefore simply increasing the differing options available may result in participants being able to better identify their ‘best’ option in the expanded choice set, rather than trying to decide between the smaller choice set of three (arguably) similar options (Labour Party, Liberal Democrats, and Conservative Party).

We suggest the results arising out of the directional account of correct voting in Experiment 4 arise from issues with its calculation, as detailed in Appendix A.1. The directional model assigns candidates who are on the ‘same side’ of the neutral point of an issue stand (sic: ‘issue scale’) far greater utility if that candidate is *even further* toward the extreme end of that issue stand. Looking at our sample of participants, many can be considered (or self-identify in our experiments) as ‘left of centre’, that is, on average, ‘left of the neutral point’ on most issues. Thus the Green candidate in our study will be assigned higher utility for those participants

than, say, the Labour candidate, for all issues where they are on the same side of the neutral point, simply by virtue of being placed further away on each issue; even if the participant occupies the same stance as the Labour candidate on that given issue. Indeed this seems to play out in the actual patterns of classification of participants' 'best option' in Experiment 4, with many participants originally 'Labour' or 'Liberal Democrat' (the traditional 'centrist' option) under the proximal model account, being reclassified as having the Green candidates as their 'best option' under the directional model account. Therefore we refer back to arguments made in Chapter 2, with supporting references, that the proximal model and method of calculation is the more reliable of the two with regards to calculating correct voting.

A.3. Questionnaires: Experiments 1-3

1) National Deficit

A lot of talk about the economy concerns the national deficit (i.e. the gap between what the government spends and what it gets in income). Some people feel we should spend more to stimulate the economy, with growth lowering the deficit. Others feel we should cut public spending 'hard & fast' to bring down the deficit. Others favour a mix of the two.

Where would you place yourself on the below scale?

- Only additional spending, no cuts [1.0]
- Mostly additional spending, some cuts [2.0]
- Balance of cuts and spending [3.0]
- Mostly cuts, some additional spending [4.0]
- Only cuts, no additional spending [5.0]
- Don't know, haven't thought much about this [8.0]

2) Healthcare/NHS Spending

National healthcare spending in recent years has been heavily debated due to rising costs.

Some believe the NHS budget should not be reduced at all, as it will affect front-line staff & services (i.e. nurses & ambulances). Others believe savings can be made without affecting frontline staff & services (i.e. by reducing waste & middle-management). Some believe that some cuts to frontline staff are necessary (i.e. too much staff in some areas), while others believe the government should just privatize healthcare.

If you had to, where would you place yourself on the below scale?

- No cuts at all [1.0]
- Savings & no front-line cuts [2.0]
- Savings & some frontline cuts [3.0]
- Balance of frontline cuts & Savings [4.0]
- Mostly frontline cuts & Savings [5.0]

- Entirely frontline cuts & Savings [6.0]
- Privatised healthcare [7.0]
- Don't know, haven't thought much about this. [8.0]

3) Elderly Care

Society has often considered how to best care for the elderly, especially considering the growing elderly population and the costs involved.

Some people think it is important for the government to care for the elderly regardless of the cost, i.e. through taxation. Others think it is up to each person themselves to pay for their own care costs, i.e. through savings or selling assets.

Where would you put yourself on the below scale?

- Government should always care for elderly, regardless of circumstance [1.0]
- ... [2.0]
- ... [3.0]
- ... [4.0]
- ... [5.0]
- ... [6.0]
- Government should let people provide for themselves [7.0]
- Don't know, haven't thought much about this [8.0]

4) Immigration Restrictions

Restrictions on the level of people migrating to the UK were introduced in previous years, with a points-based system being created and some universities' ability to issue student visas reduced.

Some feel immigration levels need to be further restricted; some feel the immigration restrictions as exist are adequate; while some people feel immigration restrictions need to be relaxed.

Where would you place yourself on the below scale?

- Restrictions need to be increased a lot [5.0]

- Restrictions need to be increased a little [4.0]
- Limits are fine as they are [3.0]
- Restrictions need to be decreased a little [2.0]
- Restrictions need to be decreased a lot [1.0]
- Don't know, haven't thought much about this [8.0]

5) EU Membership

How strongly do you oppose, or support, the UK's continuing membership of the EU?

- Strongly Oppose, and the UK should leave the EU [6.0]
- Strongly Oppose [5.0]
- Oppose [4.0]
- Support [3.0]
- Strongly Support [2.0]
- Strongly Support, and the UK should join the Euro currency [1.0]
- Don't know, haven't thought much about this [8.0]

6) Schools/Academies

Historically the UK has state schools, private schools and fee-paying schools, all of which are subject to the control of local council authorities (i.e. on student selection criteria). The current Government has established 'Academies', which are state-funded schools, but run by charities, parent & teacher groups & co-operatives; and are independent from local authorities' control.

Would you say you support, or oppose, the continuing roll-out of academies?

- Strongly Support [6.0]
- Support [5.0]
- Support, if under some local authority control [4.0]
- Oppose, if under some local authority control [3.0]

- Oppose [2.0]
- Strongly Oppose [1.0]
- Don't know, have not thought about the question [8.0]

7) Council Tax Rates

The money the government gives to local council authorities has decreased in recent years, making council budgets smaller and causing councils to reduce services. One way of restoring, or increasing, council budgets is to increase local Council Tax rates. Do you think councils should:

- Increase council rates if needed [1.0]
- Cap council tax rates at a certain level [2.0]
- Freeze council tax rates for a while [3.0]
- Cut council tax rates [4.0]
- Abolish council tax [5.0]
- Don't know, haven't thought much about this [8.0]

8) Wealth Taxes

Do you support, or oppose, levying certain taxes on 'wealth' to aid the economy? For instance: a mansion tax, a levy on bank profits, or a 'Robin Hood' tax on large financial transactions.

- Strongly Support [1.0]
- Support [2.0]
- Depends on the tax [3.0]
- Oppose [4.0]
- Strongly Oppose [5.0]
- Don't know, haven't thought much about this [8.0]

9) Police Spending

The government recently introduced Police and Crime Commissioners (PCCs) with the power over local police budgets, much like the London Mayor. It is argued increased spending on police budgets means more police on the streets, while decreases mean less.

Do you feel the police spending should:

- Greatly increase [1.0]
- Increase a bit [2.0]
- Stay the same [3.0]
- Decrease a bit [4.0]
- Greatly Decrease [5.0]
- Allow PCCs to decide per area [6.0]
- Dont know, haven't thought much about this [8.0]

10) Prison Overcrowding

Prisons in the UK are overcrowded. Currently, those convicted of small offenses are released early in order to relieve over-crowding, but worries exist over releasing criminals early. Some people believe those convicted of small crimes should never go to prison to start with, and believe community service should replace shorter sentences, Others say the government should build more prisons to solve over-crowding, Some are completely against the early release of criminals

Which do you feel best solves the overcrowding problem?

- Continue Early Release only [1.0]
- Introduce more Community Service [2.0]
- Build new prisons [3.0]
- Build new prisons and abolish early release programs [4.0]
- No new prisons, let over-crowding continue [5.0]
- Don't know, haven't thought much about this [8.0]

11) Tuition Fees (University)

University Tuition Fees have increased to 9,000 pounds per year under the current government. Do you feel that Tuition Fees should be lowered, stay the same, or increased? Please indicate on the scale below how you feel about this.

- Fees should be abolished [1.0]
- Fees should be lowered [2.0]
- Fees should remain as they are [3.0]
- Fees should be increased [4.0]
- Fees should be uncapped [5.0]
- Don't know, haven't thought much about this [8.0]

12) Nursery Places /Childcare

With many of today's parents expected to work, affordable childcare has become an important issue. Some people believe the government should help parents with children under 5 years old as much as possible, while others believe the government should not step in to help.

Generally, how important do you feel it is for the government to provide public nursery places for children?

- Very Important [1.0]
- ... [2.0]
- ... [3.0]
- ... [4.0]
- ... [5.0]
- ... [6.0]
- Not at all important [7.0]
- Don't know, haven't thought much about this [8.0]

13) Greenhouse Gases

How important is it to you for the government to quickly reduce greenhouse gas emissions over the coming years?

- Not at all important [0.0]
- A little important [1.0]
- Somewhat important [2.0]
- Fairly important [3.0]
- Very important [4.0]
- Extremely important [5.0]
- Don't know, haven't thought much about this [8.0]

14) Child Tax Credits

The government awards parents tax credits for each child they have. How strongly do you support, or oppose, the idea that families should receive Child Tax Credits?

- All families should definitely receive child tax credits, regardless of their income [1.0]
- Most families should receive tax credits, but the richest should not [2.0]
- About half of families should receive child tax credits [3.0]
- Some families should receive tax credits, depending on their income [4.0]
- No family should receive Child Tax Credits, regardless of their income [5.0]
- Don't Know, have not really thought about it [8.0]

15) Nuclear Power

Energy is a constant concern for the UK. Some believe building more nuclear power stations is the solution, while others disagree. How strongly do you support or oppose the creation of new nuclear stations in the UK?

- Strongly Support [1.0]
- Support [2.0]
- Oppose [3.0]
- Strongly Oppose [4.0]
- Don't know, haven't thought much about this [8.0]

16) High Speed Rail 2

The government plans to build and extend High Speed Rail services across Britain, commonly known as HS2.

On the scale below, how much would you agree or disagree with their plans?

- Strongly Agree [1.0]
- Somewhat Agree [2.0]
- Neither Agree, nor Disagree [3.0]
- Somewhat Disagree [4.0]
- Strongly Disagree [5.0]
- Don't know, haven't thought much about this [8.0]

17) 3rd Heathrow Runway

Transport is vital to London and the UK. There has been a lot of debate over the merits of building 3rd runways at airports like Heathrow, Gatwick, etc. Some people have suggested building a new airport in the Thames Estuary to solve the problem. If you had to state your own opinion, would you support or oppose proposals to expand airport travel capacity?

- Agree with 3rd runway AND a new airport in the Thames Estuary [7.0]
- Agree with 3rd runway at Heathrow only [6.0]
- Disagree with third runway, but support a new airport in the Thames Estuary [5.0]
- Disagree with third runway, and oppose a new airport in the Thames Estuary [4.0]
- Oppose extra runways at any London airport [3.0]
- Oppose extra runways at any UK airport [2.0]
- Oppose extra runways at any UK airport AND any new Airports [1.0]
- Don't know, haven't thought much about this [8.0]

18) Trident/ Nuclear Defence

Trident is the UK's sea-based ballistic missile system that comprises the UK's nuclear deterrent. It is due for renewal over the next 30 years at an estimated cost of 97billion British pounds. If you had to say, where would you stand on Trident?

- Should replace Trident to maintain nuclear deterrent [4.0]
- Should decrease the size of the Trident system [3.0]
- Should scrap Trident [2.0]
- Remove the UK's nuclear arsenal entirely [1.0]
- Don't know, haven't thought much about this [8.0]

19) Pension Age

The government provides a state pension to those who do retire, at the age of 65 for men and 60 for women. Due to the increasing proportion of people living longer, the cost of providing a state pension is increasing. The current government has proposed to link the age you can receive a state pension to life expectancy. The age will start rising to 66 for both men and women in 2020, and 67 in 2026.

Some people feel the age is rising too quickly for women, as men only wait 1 year while women need to wait for 5 extra years. Others think it is fine, and the ages should be raised quickly.

What age do you think people should be able to receive a state pension at?

- Pension Age should be kept at current levels [1.0]
- Pension Age should rise slower for women, then equal out [2.0]
- Pension Age should be equalled sooner for men and women, as proposed [3.0]
- Don't know, haven't thought much about this [8.0]

20) European Single Currency (Euro)

Do you feel that you support, or oppose, the UK joining the European single currency (i.e. the Euro)?

- Strongly Support [1.0]
- Support [2.0]

- Support, but shouldn't join right now [2.0]
- No feeling either way, but hold a Referendum on joining the Euro [4.0]
- Oppose, shouldn't join right now [5.0]
- Oppose [6.0]
- Strongly Oppose [7.0]
- Don't Know, have not thought about it [8.0]

A.4. Questionnaire: Experiment 4

1) National Deficit

Discussions on the economy often are about the national deficit (i.e. the gap between what the government spends and what it gets in income). Some people feel we should raise taxes to reduce the deficit, and we should increase public spending to encourage economic growth to reduce the deficit. Others feel we should cut public spending 'hard & fast' to bring down the deficit, and give tax cuts to encourage growth. Some people favour a mix of taxes or cuts.

Overall, where would you place your opinion on the below scale?

- Lots of tax increases, and lots of public spending [1.0]
- Mostly increase tax, and some increase in public spending [2.0]
- Some increases in tax, no increase in public spending [3.0]
- Balance of tax increases, and efficiency savings [4.0]
- Some cuts in public spending, no tax increases [5.0]
- Mostly public spending cuts, and some tax cuts [6.0]
- Lots of public spending cuts, and lots of tax cuts [7.0]
- Don't Kow, have not thought much about it [0.0]

2) Healthcare Spending

The UK public healthcare budget is increasing yearly, due to rising costs and a growing population. Some people believe we don't spend enough on the National Healthcare Service (NHS)- that it is underfunded and the budget should not be reduced as it will affect front-line staff & services (i.e. nurses & ambulances).

Others believe savings can be made without affecting frontline staff & services (i.e. by reducing waste & middle-management). Some believe that some cuts to frontline staff are necessary (i.e. too much staff in some areas), while others believe the government should just privatize healthcare.

What do you think the government should do on the NHS?

- Greatly increase spending [1.0]
- Increase Spending [2.0]
- Save money via 'efficiency savings' [3.0]
- Decrease spending [4.0]
- Greatly decrease spending [5.0]
- Privatise healthcare [6.0]
- Don't know, haven't thought much about this. [0.0]

3) Elderly Care

Society has often considered how to best care for the elderly, especially considering the growing elderly population and the costs involved. Some people think it is important for the government to care for the elderly regardless of the cost, i.e. through taxation. Others think it is up to each person themselves to pay for their own care costs, i.e. through savings or selling assets (i.e. their house).

How much do you think Government should increase, or decrease, public funding for elderly care?

- Government should provide all elderly with free care [1.0]
- Increase funding a lot [2.0]
- Increase funding a little [3.0]
- No change in funding (things are fine right now) [4.0]
- Decrease funding a little [5.0]

- Decrease funding a lot [6.0]
- Government should let people provide for themselves [7.0]
- Don't know, haven't thought much about this [0.0]

4) Immigration

Immigration is a hot topic at the moment in the UK. Mostly debates are concerned with the number and ease of immigrants entering the UK, and what restrictions there should be on immigrants in getting welfare benefits (i.e. unemployment benefits, healthcare etc.). Some people think we should increase restrictions (less immigration), and allow less access to benefits for immigrants. Some think we should ease restrictions (more immigration), and allow more access to benefits for immigrants.

Generally, would you say you want:

- A lot more restrictions on immigration & benefits [5.0]
- Some increase in restrictions on immigration & benefits [4.0]
- No change (things are fine as they are) [3.0]
- Some decrease in restrictions on immigration & benefits [2.0]
- A lot fewer restrictions on immigration & benefits [1.0]
- Don't know, haven't thought much about this [0.0]

5) Membership of the European Union

How strongly do you oppose, or support, the UK's continuing membership of the EU?

- Strongly Oppose, the UK should leave the EU [7.0]
- Strongly Oppose [6.0]
- Oppose [5.0]
- Neither Support nor Oppse [4.0]
- Support [3.0]
- Strongly Support [2.0]

- Strongly Support, and the UK should join the Euro currency [1.0]
- Dont know, havent thought much about this [0.0]

6) Academies

Historically the UK had 'state schools' (accepted all students), and 'grammar schools' (could select students), which were overseen by local councils (i.e. to ensure quality teaching) and followed a national curriculum. The current Government controversially established 'Academies' and free-schools, which are state-funded schools, but are run by charities, businesses, universities, parent-teacher groups, & co-operatives. Academies are also independent from local authorities' control, and can set their own curriculum.

Would you say you support, or oppose, the continuing roll-out of academies and free-schools?

- Strongly Support [7.0]
- Support [6.0]
- Support, if under Local Authority control [5.0]
- Neither Support nor Oppose (fine either way) [4.0]
- Oppose, even if under local authority control [3.0]
- Oppose [2.0]
- Strongly Oppose [1.0]
- Don't Know, have not thought about it [0.0]

7) Income Taxes

Income tax is one of the main ways Governments can raise money in order to spend on public services. Generally debates are around whether Government should increase, or decrease, income tax (i.e. on wages, profits, dividends, shares, etc.), and if we should increase or decrease taxes on the wealthy and the poor. Currently the highest rate of income tax is 40% for those earning over 41,900Pounds. Currently in the UK those earning 10,500Pounds or less do not have to pay any income tax, their 'personal allowance'. Increases in personal allowance are the same as 'tax cuts' for low earners.

Generally speaking, would you say you are in favour of:

- Higher taxes on people earning over 100,000Pounds [1.0]
- Higher taxes on people earning over 150,000Pounds [2.0]
- No changes to income taxes [3.0]
- Increasing the personal allowance to 12,500Pounds [4.0]
- Increasing the personal allowance to 13,500Pounds [5.0]
- Starting the 40% income tax level at 50,000Pounds [6.0]
- Don't know, haven't thought much about this [0.0]

8) Mansion Tax

Various parties have proposed some form of property tax on high-value properties, nicknamed a '*mansion tax*'; stating it would bring in valuable revenue from the wealthy. Some have suggested it could be a direct tax, some have suggested higher council tax bands for high-value properties; while others are completely against any form of property taxes.

Would you support, or oppose, the idea of additional taxes on high-value properties?

- Strongly Support [1.0]
- Support [2.0]
- Neither support or oppose (no strong feelings either way) [3.0]
- Oppose [4.0]
- Strongly Oppose [5.0]
- Don't know, haven't thought much about this [0.0]

9) Police Spending

The government recently introduced Police and Crime Commissioners (PCCs) with the power over local police budgets, much like the London Mayor, at a cost of 50million pounds. It is argued increased spending on police budgets means more police on the streets, while decreases mean less.

Do you feel the police spending should:

- Increase police budgets [1.0]

- Scrap the PCCs to save money in police budgets [2.0]
- Scrap the PCCs and put Local Police Boards in charge of budgets [3.0]
- Keep budgets the same [4.0]
- Allow PCCs to decide per area [5.0]
- Decrease police budgets [6.0]
- Abolish public police & replace with private police [7.0]
- Don't know, haven't thought much about this [0.0]

10) Prison Overcrowding

Prisons in the UK are overcrowded. Currently, those convicted of small offenses are released early in order to relieve over-crowding, but worries exist over releasing criminals early. Some people believe those convicted of small crimes should never go to prison to start with, and believe community service should replace shorter sentences; some are completely against the early release of criminals under any circumstances. Others say the government should build more prisons to solve over-crowding, others are happy for the situation to remain unchanged.

Which do you feel best solves the overcrowding problem?

- Decriminalising certain minor offences (i.e. cannabis possession) [1.0]
- Continue Early Release for small offenses [2.0]
- Community service instead of prison for minor crimes (i.e. drugs possession) [3.0]
- Build new prisons & keep early release [4.0]
- Build new prisons and abolish early release programs [5.0]
- No new prisons, let over-crowding continue [6.0]
- Privatise the prison system [7.0]
- Don't know, haven't thought much about this [0.0]

11) Tuition Fees

University Tuition Fees have increased to 9,000 pounds per year under the current government. Do you feel that Tuition Fees should be lowered, stay the same, or increased? Please indicate on the scale below how you feel about this.

- Fees should be abolished [1.0]
- Fees should be lowered [2.0]
- Fees should remain as they are [3.0]
- Fees should be increased [4.0]
- Fees should be uncapped [5.0]
- Dont know, havent thought much about this [0.0]

12) Childcare

With many of todays parents expected to work, affordable childcare has become an important issue. Currently working parents receive 15 hours free child care for children aged 3 & 4 years old. Some people think we should extend the amount of free hours, some people think we should extend the 15 free hours to children aged 2 and younger. Others think we should reduce the amount of free childcare the Government provides.

Do you think that we should extend, or decrease, the amount of free childcare provided to working parents?

- Increase free childcare a lot [1.0]
- Increase free childcare a little [2.0]
- Keep childcare the same (things are fine as they are) [3.0]
- Reduce free childcare a little [4.0]
- Reduce free childcare a lot [5.0]
- Don't know, haven't thought much about this [0.0]

13) Greenhouse Gases

How urgent is it to you for the government to quickly reduce greenhouse gas emissions over the coming years?

- Not at all urgent [1.0]
- A little urgent [2.0]

- Somewhat urgent [3.0]
- Fairly urgent [4.0]
- Very urgent [5.0]
- Extremely urgent [6.0]
- The most urgent issue [7.0]
- Don't know, haven't thought much about this [0.0]

14) Nuclear Power

Energy is a constant concern for the UK. Some believe building more nuclear power stations is the solution, while others disagree. How strongly do you support the creation of new nuclear stations in the UK?

- Strongly Support [5.0]
- Support [4.0]
- Neither support nor oppose [3.0]
- Oppose [2.0]
- Strongly Oppose [1.0]
- Don't know, haven't thought much about this [0.0]

15) Trident/Nuclear Defence

Trident is the UK's sea-based ballistic missile system that comprises the UK's nuclear deterrent. It is due for renewal over the next 30 years at an estimated cost of 97billion British pounds.

If you had to say, where would you stand on Trident?

- Replace Trident to maintain nuclear deterrent [4.0]
- Decrease the size of the Trident program [3.0]
- Scrap Trident, but have a nuclear deterrent alliance [2.0]
- Have no nuclear deterrent in any form [1.0]
- Don't know, haven't thought much about this [0.0]

16) State Pension Age

The state pension currently stands at 113 Pounds per week for elderly people, and is guaranteed to rise 150Pounds every year (or 3Pounds a week) at a minimum of 2.5%. Some parties feel that is not enough, others think it is fine.

Do you think pensions should:

- Increase a lot [1.0]
- Increase a small bit [2.0]
- Remain the same (things are fine as they are) [3.0]
- Decrease a small bit [4.0]
- Decrease a lot [5.0]
- Don't know, haven't thought much about this [0.0]

17) Jobs & Employment

There is a lot of discussion on how to best tackle the jobs crisis in the UK. Some people think government should create and provide more jobs, some people think we should let the market decide employment. Others think we should increase the minimum wage to help those already employed and to encourage people off welfare benefits. Some people think we should try to create more apprentice schemes & let the market decide who to hire, and others think we need to relax employment laws to encourage the market.

If you had to choose, what option below best fits what you think Government should do about the jobs crisis:

- Ensure jobs for everyone [1.0]
- Create a lot more jobs [2.0]
- Ensure jobs for those unemployed for 2 year or more [3.0]
- Raise the minimum wage [4.0]
- Create more apprenticeships [5.0]
- Relax employment laws for businesses [6.0]
- Let the free-market decide who gets a job [7.0]

- Don't know, haven't thought much about this [0.0]

Appendix B

B.1. Calculating the estimated population variance $\hat{\sigma}_p^2$ for credibility intervals.

We correct the population effect for ‘artefacts’, as credibility intervals are based on the variance of effect sizes in the population (Hunter & Schmidt, 2004). The variance across sample effect sizes consists of the variance of effect sizes in the population and the sampling error, thus the variance in population effect sizes is estimated by correcting the variance in sample effect sizes by the sampling error (Hunter & Schmidt (2004). The variance of sample effect sizes ($\hat{\sigma}_r^2$) is the frequency-weighted average squared error:

$$\hat{\sigma}_r^2 = \frac{\sum_{i=1}^k n_i (r_i - \bar{r})^2}{\sum_{i=1}^k n_i}$$

Where the population effect \bar{r} is subtracted from the sample effect size r for each study i for k studies, and divided by the total number of participants n across k studies.

It is also necessary to estimate the sampling error variance ($\hat{\sigma}_e^2$) using the population correlation estimate \bar{r} , and the average sample size, \bar{n} (n divided by k studies; Hunter & Schmidt, 2004, p. 88)

$$\hat{\sigma}_e^2 = \frac{(1 - \bar{r}^2)^2}{\bar{n} - 1}$$

To estimate the residual variance in population correlations ($\hat{\sigma}_p^2$), we subtract the sampling error variance from the variance in sample correlations (Hunter & Schmidt, 2004, p. 88):

$$\hat{\sigma}_p^2 = \hat{\sigma}_r^2 - \hat{\sigma}_e^2$$

If the corrected population variance equals zero, then it indicates only one population may be involved.

B.2. Meta-Analysis

Effect Sizes averaged across variables (RM MANOVA)

We carried out a repeated measures MANOVA on Total Items Accessed and Averaged Duration, and report the overall effect sizes averaged across the two dependent variables for Experiments 1-3. Table 1 contains the

effect sizes, sample effect size variance, sampling error variance, variance in population correlations, and the 95% Credibility Intervals, for all the main effects and within-subjects factors and their interactions.

Table 1: Effect sizes for full factorial repeated measures ANOVA across TIA and AD. (K=3, N=308)

factor	\bar{r}	$\hat{\sigma}_r^2$	$\hat{\sigma}_c^2$	$\hat{\sigma}_p^2$	95% Cr.I
Party Label	.155	<.001	.012	.012	-.060, .373
Number Cand.	.320	.002	.010	.007	.148, .492
PL*NOC	.106	<.001	.013	.012	-.010, .321
Timebin	.321	.008	.010	.002	.226, .416
Timebin*PL	.303	.010	.011	<.001	.253, .352
Timebin*NOC	.119	.001	.012	.011	-.095, .333
Timebin*PL*NOC	.156	<.001	.012	.012	-.061, .373

Note: 95% credibility intervals in parentheses (2.5%, 97.5%). CIs not containing zero in bold.

Table 2 contains the effect sizes and the adjusted 95% Confidence Intervals, based on the presence of homogeneous or heterogeneous subpopulations, for all the main effects and within-subjects factors and their interactions.

Table 2: 95% confidence intervals for the averaged effect size in the full-factorial RM MANOVA (N=308).

	PL	NOC	PL*NOC	TB	TB*PL	TB* NOC	TB*PL*NOC
\bar{r}	.155	.320	.106	.32 1	.303	.119	.156
Upper	.271	.421	.223	.42 2	.405	.236	.271
Lower	.001	.219	-.048	.22 1	.201	-.034	.001

Effect Sizes for Total Items and Averaged Duration

Table 3 contains the values for each of the terms mention previously, but for the univariate analyses of TIA across Experiments 1-3.

Table 3: Effect sizes for the main effects and interactions on TIA. (K=3, N=308)

factor	\bar{r}	$\hat{\sigma}_r^2$	$\hat{\sigma}_c^2$	$\hat{\sigma}_p^2$	95% Cr.I
Party Label	.026	<.001	.013	.012	-.190, .244
Number Cand.	.298	.005	.011	.005	.157, .438

PL*NOC	.038	.001	.013	.012	-0.176, .253
Timebin	.159	.002	.012	.010	-0.040, .360
Timebin*PL	.211	.023	.012	.011	<.001, .442
Timebin*NOC	.058	<.001	.013	.012	-0.164, .280
Timebin*PL*NOC	.049	<.001	.013	.013	-0.174, .273

Note: 95% credibility intervals in parentheses (2.5%, 97.5%). CIs not containing zero in bold.

Table 4 contains the effect sizes and the adjusted 95% Confidence Intervals, for all the main effects and within-subjects factors and their interactions, for TIA.

Table 4: 95% confidence intervals for the main effects and interactions on TIA (N=308).

	PL	NOC	PL*NOC	TB	TB*PL	TB* NOC	TB*PL*NO C
\bar{r}	.026	.298	.038	.159	.211	.058	.049
Upper	.136	.400	.150	.266	.319	.170	.161
Lower	-.088	.195	-.073	.050	.104	-.053	-.062

Table 5 contains the values for each of the terms mention previously, but for the univariate analyses of AD across Experiments 1-3.

Table 5: Effect sizes for the main effects and interactions on AD. (K=3, N=308)

factor	\bar{r}	$\hat{\sigma}_r^2$	$\hat{\sigma}_c^2$	$\hat{\sigma}_p^2$	95% Cr.I
Party Label	.151	<.001	.012	.011	-0.066, .369
Number Cand.	.070	<.001	.013	.012	-0.015, .291
PL*NOC	.090	.002	.013	.010	-0.010, .332
Timebin	.111	<.001	.012	.012	-0.105, .354
Timebin*PL	.102	.001	.013	.012	-0.119, .320
Timebin*NOC	.099	.001	.013	.012	-0.007, .276
Timebin*PL*NOC	.109	<.001	.013	.012	-0.098, .316

Note: 95% credibility intervals in parentheses (2.5%, 97.5%). CIs not containing zero in bold.

Table 6 contains the effect sizes and the adjusted 95% Confidence Intervals, for all the main effects and within-subjects factors and their interactions, for AD.

Table 6: 95% confidence intervals for sizes for the main effects and interactions on AD. (N=308).

	PL	NO C	PL*NO C	TB	TB* PL	TB*NO C	TB*PL*NO C
\bar{r}	.151	.070	.090	.111	.102	.099	.109

Upper	.260	.182	.291	.224	.213	.210	.219
Lower	.041	-.041	-.021	.002	-.008	-.011	-.001

Effect Sizes for ‘supressing’ measures of TI and AD

Table 7 contains the values for each of the terms mention previously, but for the univariate analyses of our calculated measure of TIA ‘supressing’, TIA(S), across Experiments 1-3.

Table 7: Effect sizes for the main effects and interactions on TIA(S). (K=3, N=308)

factor	\bar{r}	$\hat{\sigma}_r^2$	$\hat{\sigma}_c^2$	$\hat{\sigma}_p^2$	95% Cr.I
Party Label	.203	.009	.012	.003	.096, .311
Number Cand.	.310	.010	.010	<.001	.268, .353
PL*NOC	.171	<.001	.012	.011	-.043, .386
Timebin	.134	.002	.012	.010	-.065, .333
Timebin*PL	.159	.008	.012	.003	.037, .281
Timebin*NOC	.117	.002	.012	.010	-.087, .322
Timebin*PL*NOC	.095	.001	.013	.011	.114, .305

Note: 95% credibility intervals in parentheses (2.5%, 97.5%). CIs not containing zero in bold.

Table 8 contains the effect sizes and the adjusted 95% Confidence Intervals, for all the main effects and within-subjects factors and their interactions, for TIA(S).

Table 8: 95% confidence intervals for the main effects and interactions on TIA(S). (N=308).

	PL	NO C	PL*NO C	TB	TB*P L	TB*NOC	TB*PL *NOC
\bar{r}	.203	.31	.171	.134	.159	.117	.095
Upper	.311	.412	.286	.244	.268	.228	.206
Lower	.095	.209	.062	.024	.050	.007	-.015

Table 9 contains the values for each of the terms mention previously, but for the univariate analyses of our calculated measure of AD ‘supressing’, AD(S), across Experiments 1-3.

Table 9: Effect sizes for the main effects and interactions on AD(S). (K=3, N=308)

factor	\bar{r}	$\hat{\sigma}_r^2$	$\hat{\sigma}_c^2$	$\hat{\sigma}_p^2$	95% Cr.I
Party Label	.048	.003	.012	.011	-.173, .269
Number Cand.	.270	.010	.012	.011	.091, .449
PL*NOC	.055	.002	.013	.011	-.150, .261

Timebin	.088	.001	.012	.011	-.107, .285
Timebin*PL	.111	<.001	.012	.011	-.093, .315
Timebin*NOC	.121	<.001	.013	.013	-.098, .344
Timebin*PL*NOC	.123	<.001	.013	.013	-.097, .344

Note: 95% credibility intervals in parentheses (2.5%, 97.5%). CIs not containing zero in bold.

Table 10 contains the effect sizes and the adjusted 95% Confidence Intervals, for all the main effects and within-subjects factors and their interactions, for AD(S).

Table 10: 95% confidence intervals for the main effects and interactions on AD(S). (N=308).

	PL	NOC	PL* NOC	TB	TB*PL	TB*NOC	TB*PL *NOC
\bar{r}	.048	.270	.055	.088	.111	.121	.123
Upper	.160	.374	.167	.201	.221	.231	.234
Lower	.063	.166	-.056	-.022	<.001	.010	.013

Effect Sizes for ‘focussing’ measures of TI and AD

Table 11 contains the values for each of the terms mention previously, but for the univariate analyses of our calculated measure of TIA ‘focussing’, TIA(F), across Experiments 1-3.

Table 11: Effect sizes for the main effects and interactions on TIA(F). (K=3, N=308)

factor	\bar{r}	$\hat{\sigma}_r^2$	$\hat{\sigma}_c^2$	$\hat{\sigma}_p^2$	95% Cr.I
Party Label	.175	.013	.012	.001	.112, .238
Number Cand.	.160	.004	.012	.008	-.018, .337
PL*NOC	.145	.001	.012	.011	-.063, .353
Timebin	.096	.002	.012	.009	-.098, .292
Timebin*PL	.130	.003	.012	.009	-.059, .319
Timebin*NOC	.094	.004	.013	.008	-.084, .274
Timebin*PL*NOC	.089	.002	.013	.010	-.110, .290

Note: 95% credibility intervals in parentheses (2.5%, 97.5%). CIs not containing zero in bold.

Table 12 contains the effect sizes and the adjusted 95% Confidence Intervals, for all the main effects and within-subjects factors and their interactions, for TIA(F).

Table 12: 95% confidence intervals for the main effects and interactions on TIA(F). (N=308).

	PL	NO C	PL*NO C	TB	TB* PL	TB*NO C	TB*PL*NO C
\bar{r}	.175	.160	.145	.096	.130	.094	.089
Upper	.284	.268	.254	.207	.240	.205	.201
Lower	.066	.050	.035	-.014	.020	-.016	-.021

Table 13 contains the values for each of the terms mention previously, but for the univariate analyses of our calculated measure of TIA ‘focussing’, TIA(F), across Experiments 1-3.

Table 13: Effect sizes for the main effects and interactions on AD(F). (K=3, N=308)

factor	\bar{r}	$\hat{\sigma}_r^2$	$\hat{\sigma}_c^2$	$\hat{\sigma}_p^2$	95% Cr.I
Party Label	.135	.002	.013	.009	-.073, .344
Number Cand.	.290	.039	.012	.027	.095, .485
PL*NOC	.080	.001	.013	.011	-.127, .298
Timebin	.085	.001	.013	.011	-.115, .280
Timebin*PL	.096	.002	.013	.011	-.11, .303
Timebin*NOC	.118	<.001	.012	.012	-.101, .338
Timebin*PL*NOC	.131	.001	.013	.011	-.082, .346

Note: 95% credibility intervals in parentheses (2.5%, 97.5%). CIs not containing zero in bold.

Table 14 contains the effect sizes and the adjusted 95% Confidence Intervals, for all the main effects and within-subjects factors and their interactions, for AD(F).

Table 14: 95% confidence intervals for the main effects and interactions on AD(F). (N=308).

	PL	NOC	PL* NOC	TB	TB*PL	TB*NOC	TB*PL* NOC
\bar{r}	.135	.290	.085	.085	.096	.118	.131
Upper	.245	.393	.191	.197	.207	.229	.242
Lower	.024	.028	-.031	-.025	-.010	.007	.021

Appendix C

C.1 Experiment 8: Questionnaire



Q1: Thinking about how they stand on **the NHS**, please rate the desirability of each of the parties (*Please Circle*).

Labour Party

Undesirable

Very Desirable

1 2 3 4 5 6 7

Conservative Party

Undesirable

Very Desirable

1 2 3 4 5 6 7

Liberal Democrats

Undesirable

Very Desirable

1 2 3 4 5 6 7

Q2: Thinking about how they stand on **the Economy**, please rate the desirability of each of the parties (*Please Circle*).

Labour Party

Undesirable

Very Desirable

1 2 3 4 5 6 7

Conservative Party

Undesirable

Very Desirable

1 2 3 4 5 6 7

Liberal Democrats

Undesirable

Very Desirable

1 2 3 4 5 6 7

Q3: If you were to base your decision on **just** these two issues, of the **three** parties above, would you be most likely to vote for? (*Please Circle*).

Q4: How important is the issue of (**The NHS**) to you in this election, on a scale of 0-10.

- 0 being 'Not at all Important', 10 being 'Extremely Important'.

Q5: How important is the issue of (**The Economy**) to you in this election, on a scale of 0-10.

Q6: Please rate how desirable each party below is on the NHS (*Please Circle*).

Green Party

Undesirable

Very Desirable

1 2 3 4 5 6 7

UK Independence Party (UKIP)

Undesirable

Very Desirable

1 2 3 4 5 6 7

Q7: Please rate how desirable each party below is on the Economy (*Please Circle*).

Green Party

Undesirable

Very Desirable

1 2 3 4 5 6 7

UK Independence Party (UKIP)

Undesirable

Very Desirable

1 2 3 4 5 6 7

Q8: If you were to base your decision on **just** these two issues, which party of the five UK parties would you be most likely to vote for?

Q10: What is your age (in years)?

Q11: What is your gender (**Please Circle**)?

Male

Female

Other

Q12: Please circle what best describes your occupation from the following:

- Student
- Self Employed
- Private Sector
- Public Sector
- Unemployed
- Other