Usefulness, Integrity, and Perceptions of Virtue in Voting

The Links between Young People's Online Voting Experiences, Beliefs about Voting, and Support for Online Voting in National Elections

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Declaration of Authorship

I, Nick Hatton, hereby declare that this thesis and the work presented in it is entirely my own.

Where I have consulted the work of others, this is always clearly stated.

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Abstract

Online voting is widely used for binding non-governmental elections across the United Kingdom, including in higher education student union elections. For 2.3 million 18-24 year olds, Student Union elections are their first opportunity to vote in a binding election using the internet. Despite the technology's prevalence in higher education, very little is known about the moderating effects of this experience on young peoples' attitude towards online voting in national elections. This prompts the question: Does experience of online voting in low-risk elections have an effect on support for the technology in high-risk contexts, such as national elections, where the consequences of technical failures are much greater? This project also examines the changing priorities of UK electoral law, and why it has fallen short of introducing online voting in spite of the priority given to voter convenience in the recent past.

Part one examines the compatibility of internet voting with the priorities of UK election law and the election procedures arising from the law. Through Hansard transcripts, Government statutes, and court records, part one highlights the tension between transparency, secrecy and security procedures and procedures which emphasise voter convenience and the accessibility of elections. The environment created by these conflicting procedures is not automatically conducive to the use of internet voting, despite some accommodating elements. The recent move towards greater barriers to voting and the immediate transparency of the election count pose a high bar for the introduction of internet voting. The largely additive nature of UK election legislating also serves to complicate the UK's body of election law, resulting in a chimera of incongruous procedures and priorities.

Part two explores the online voting experiences of 18-24 year olds and the role of experience as a variable which may reinforce support for online voting in national elections. Using a combination of survey and interview data, the study finds significant correlations between salient beliefs about online voting and support for online voting in national elections. However, the study does not find a significant link between the quantity of experience of online voting and increased support for the technology in national elections. This may be because 18-24 year olds are already well acclimated to the online world. Experience of online voting does not foster increased levels of trust in the technology, but there is evidence for a significant relationship between experience levels and beliefs about the usefulness of online voting. Greater levels of experience also correlate with opposition to anti-convenience beliefs.

The findings of this thesis have implications for the study of trust in voting technology and how anti-convenience beliefs may be affected by experience. Increasing trust in online voting remains a difficult task as young people remain ambivalent about online security, but reducing anti-convenience opposition to online voting may be possible with a normalisation of the technology through its regular use in low-level elections. For future studies, the indication that experience may reduce anti-voting convenience beliefs could be further explored with a larger sample size. At the level of electoral legislating, this study recommends a public consultation on whether the voting ritual has an intrinsic value and a solicitation of views on what online voting 'ought to be'. This should occur prior to the passage of any online voting legislation in order to build consensus around the technology and avoid undermining trust in the electoral system.

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Chapter 1, Introduction

Online voting is widely used for binding non-governmental elections across the United Kingdom (UK), including in higher education student union elections. For 1.6 million 18-24 year olds, Student Union (SU) elections are their first opportunity to vote in a binding election using the internet. Despite the technology's prevalence in higher education, very little is known about the moderating effects of this experience on young peoples' beliefs about voting technology and the act of voting. This leads to the research question: Does experience of online voting in small-scale and low-risk elections have an effect on support of the technology in high-risk contexts, such as national elections, where the consequences of technical failures are much greater?

This project also examines the shifting priorities of UK election law, and why it has fallen short of introducing online voting despite making concessions to the convenience of voters with measures such as postal ballots. There are four questions subsidiary to the main research question, addressing each contributes to the answering of the overarching question:

1) If experience of online voting does affect support for national-level online voting, what are the psychological components of this support and how can they be measured?
2) What are the likely causal relationships between these components?
3) How accommodating is UK electoral law of online voting technology and similar convenience innovations?
4) Does online voting reduce the perceived costs of voting, and if so, how is this explained at the individual-level?

Young people aged between 18 and 24 have the lowest participation rate of any age cohort in national elections (Birch, Gottfried and Lodge, 2013; Ipsos Mori, 2019). Introducing online

voting to reduce the costs of voting has been touted as a possible solution to this low participation (Gibson, 2001:582). Although online voting is not used in national or local elections in the UK, online voting software is used for SU elections by all of the 166 HE institutions in the UK, giving a significant number of 18-24 year-olds the opportunity to vote online. Because of the cohort's 'low participation' status, they are a significant group to engage with regarding a technology which may be more appealing to 'digital natives' born into a post-internet world, and which may reduce the direct costs and information costs of voting (Blais, 2000; Goerres and Rabuza 2014).

E-voting and RE-voting are controversial technologies which have attracted criticism on both pragmatic and normative grounds. Pragmatic criticisms concern the efficacy of RE-voting system elements such as security, secrecy, or transparency measures (Rubin, 2006; Springall et al, 2014; Dill, 2016; Orcutt, 2016). Normative criticisms question whether the cultural and political effects of RE-voting are desirable, rather than focusing on system efficacies such as security (Barber, 1988; Buchstein, 2004; Monnoyer-Smith, 2006). Judgements restricting the use of E/RE-voting by the German Constitutional Court (2009) and the Austrian Constitutional Court (2011) have reinforced the controversial reputation of these technologies, along with executive decisions to abandon electronic (E-) voting and remote electronic (RE-) voting schemes in the Netherlands (2008), Ireland (2009), and Norway (2013) (Seedorf 2016; Oswald 2016; Jacobs and Pieters, 2009; Bjørstad, 2014; McDermott, 2010). Since this European contraction of E/RE-voting usage in the late 2000s, remote electronic (RE-) voting technology is only habitually used in four national jurisdictions: Estonia, Switzerland, Australia, and Canada.

RE-voting in the UK follows the pattern of European experimentation and contraction in the 2000s; the technology was trialled in the UK between 2002 and 2007, but trials were abandoned after this period (Electoral Commission, 2007). Despite their controversial status in

national elections, RE-voting systems are a normal medium for many non-governmental organisations in the UK (Civica, 2021).

The technology is used for elections by corporations, political parties, voluntary organisations, professional associations, and student unions (Civica, 2021, Webroots Democracy, 2015; Cardiovascular Society, 2021; NUS, 2017). Trade Unions are a significant exception to this trend, as they are legally required to use postal votes when balloting members (Knight, 2016). This shift from paper to RE-voting voting systems has been gathering pace since the late 2000s (Open Rights Group, 2009). These examples are evidence of a technological sea-change occurring outside of the UK's municipal and national electoral systems which may have normalised RE-voting for a significant minority of the UK population.

Increasing usage of RE-voting in non-governmental elections prompts the question, does this experience affect attitudes towards use of the technology in high-salience elections where the consequences of system failure are much greater? It is well established that direct experience of an object has a greater effect on beliefs and attitudes than indirect experience, and a positive experience can influence the adoption of a technology (Fazio and Zanna, 1981; Davis, 1985; Fishbein and Ajzen, 2010). This individual-level rule is also seen in system-level models; Rogers' diffusion of innovations model proposes experience through 'trialability' as an important variable for determining the successful spread of a technology. If a demographic has the opportunity to try a technology with low-personal risk or cost, the technology is more likely to be adopted if it proves useful (1962:15,16). Based on these studies, sufficient numbers of 18-24 year olds with a positive experience of RE-voting could lead to popular support for the technology amongst this cohort. As this cohort matures and becomes more active in civic life, their early experiences may influence the introduction of RE-voting in future national elections.

If experience does affect support for RE-voting, what are the components of this support? The belief components are drawn from a combination of political science sources and attitude

measurement literature, and form a triad: (1) the perceived usefulness and perceived convenience of the voting technology, (2) the level of trust in it, and (3) the normative beliefs about it, such as whether its use undermines the ritualistic function of elections.

These beliefs are influenced by direct experience, but can still be held by individuals regardless of their level of experience (Davis, 1985; Fishbein and Ajzen, 2010). The strength of these beliefs may be determined by experience; individuals with direct experience of an 'attitude-object' will be more resolute in their beliefs than individuals with indirect experience, or no experience. This direct-experience manifests in greater confidence about the attitude-object, faster responses to questions about the object, and fewer ambivalent responses to questions about the object (Fazio and Regan, 1977; Fazio and Zanna, 1978, 1981; Fazio et al, 1982; Fazio, Powell and Herr, 1983; Sherman and Fazio, 1983). In summary, young people with direct experience of RE-voting systems should hold better defined and stronger beliefs about RE-voting than those without experience.

1. Thesis Structure and Themes

This thesis is structured around three key areas: (1) the priority given to different aspects of the electoral system as debated in the national legislature and in the academy; (2) the reflection of these elite debates at the level of individual beliefs about voting and technology, and how these beliefs relate to support RE-voting in national elections; (3) the relationship between direct experience of RE-voting and support for use of the technology in national elections, and whether individual beliefs about voting and technology are affected by this direct experience.

To provide a comprehensive view of the topics, chapters progress from an analysis of the national trends and priorities surrounding voting down towards the level of individual beliefs and experience. The thesis moves sequentially through elite arguments surrounding voting

technology and challenges to the norms of in-person voting, to the operationalisation of beliefs which relate to these arguments, and finally to testing the effects of direct experience of RE-voting in low-salience elections on these beliefs using a mixed methods approach. Chapters two and three establish the debate over voting modes at the level of the national legislature, and at the level of popular beliefs. They address the challenges to the norms of voting posed by technology and the relatively recent prioritisation of convenience in UK electoral law.

Chapter two addresses the third subsidiary research question: whether UK electoral law is accommodating of online voting technology and similar innovations which enhance the convenience of voting. This analysis is important for understanding the gap between the use of RE-voting technology in civil-society and its absence in government elections.

In answering this question, the chapter establishes the tensions between the different priorities of electoral system design such as security, transparency, accessibility, convenience, and secrecy. The tension between established modes of voting and relatively recent convenience innovations which transform the act of voting were also explored. The tension between these priorities is foundational for the thesis' theoretical framework, which examines beliefs about voting and technology at the level of the individual.

Using Hansard transcripts, Government statutes, and court records, the chapter explores the tension between transparency, secrecy and security procedures and procedures which emphasise voter convenience and the accessibility of elections. The environment created by these different procedures is not automatically conducive to the use of internet voting. Despite the convenience expansions of the 2000s,the recent legislative shift towards greater barriers to voting and the established transparency of the election count pose a high bar for the introduction of internet voting. The absence of an overarching strategy for election reform, and the tendency across Governments to increase the volume of election legislation serves to

complicate the UK's body of election law, resulting in co-existing election procedures with clashing priorities.

Chapter three establishes the psychological components of support for RE-voting in national elections, the likely causal relationships between these components, and the mechanisms by which direct-experience may strengthen or weaken beliefs about RE-voting. Through these objectives, the chapter addresses subsidiary questions one and two and so contributes towards answering the primary research question. A theoretical framework of beliefs concerning voting and technology was developed to answer questions one and two; identifying salient beliefs relating to RE-voting in national elections is a prerequisite for the measurement of these beliefs and the testing of these beliefs against level of experience.

The framework focuses on three belief clusters which are hypothesised to affect support for RE-voting in national elections: perceived usefulness and convenience, integrity and trust in technology, and normative beliefs about the act of voting. Relevant beliefs were drawn from the arguments established in chapter two, and from the technology acceptance and voter behaviour literature. To operationalise these items, and introduce experience as a moderating variable, they were combined with tested belief constructs from Davis's Technology Acceptance Model (1985, 1989). Like Davis's model, the framework of beliefs is grounded in the theory of reasoned action's framework of beliefs, attitudes, intentions and behaviours (Fishbein and Ajzen, 1975, 1980, 2010).

The framework predicts how these belief constructs interact with the experience of RE-voting. Level of direct-experience is treated as a moderating variable in this scenario, amplifying the strength of relevant beliefs about RE-voting, such as its usefulness or trustworthiness.

Cognition experiments points to the improved accessibility of beliefs as the driver of increased attitude strength; information gained from direct-experience is retained for longer and is more easily retrieved, which results in more accessible beliefs (Fazio and Zanna, 1978, 1981; Fazio et al, 1982; Fazio, Powell and Herr, 1983). To evaluate this cognitive approach, unconscious and behavioural theories for the effect of experience on attitude formation are also explored in this chapter (Zajonc, 1968, 2001; Festinger, 1957; Bem, 1972; Cooper, 2007; Harmon-Jones, 2019).

Chapter four details the mixed methods research design for testing the effects of RE-voting experience and the interaction of experience with beliefs established by the theoretical framework. By developing instruments to measure relevant beliefs and level of experience this chapter addresses subsidiary research question one, and so contributes to the overarching research question.

The research design combined a cross-sectional survey with individual follow-up interviews with survey respondents. A survey and interviews were used in combination to permit comparisons between responses. This cross-verification can detect discrepancies or contradictions between responses and therefore improves the validity or 'representativeness' of the results presented (Patton, 2002; Denzin, 2011).

Chapter five contains the first analysis of the survey results. This chapter addresses the first two subsidiary research questions by identifying the relationship direction and magnitude between belief items and support for RE-voting in national elections.

Using a combination of principal component analysis, rank-order correlation, and structural equation modelling, the analysis tests the expectations of the theoretical framework against the survey data (n445). Principal component analysis was used to test the internal validity of the survey attitudinal items and to confirm the belief constructs anticipated by the theoretical

framework. The constructs which emerged from variable reduction were tested against the dependent variable, support for RE-voting in national elections, in the structural equation model.

Chapter six uses the tools established by the previous chapters to answer the primary research question - whether experience of RE-voting in low-salience elections affects support for RE-voting in national elections. This analysis tests the effect of RE-voting experience as a moderator variable on the belief constructs and relationships established by chapters three, four and five.

Individuals with direct-experience of an attitude-object hold stronger beliefs about that object, relative to individuals who have only indirect experience of it (Eagly and Chaiken, 1993:194-199). The difference between experience based beliefs and informational beliefs amongst participants is expected to affect support for RE-voting (Fishbein and Ajzen, 2010:221-224).

Ordinal experience variables were created to test for differences between groups and to test for moderating effects. A combination of difference of means tests, multiple regression models with interaction effects, and average marginal effect models were used to assess the relationships between direct-experience, the belief constructs, and support for RE-voting in national elections.

Chapter seven focuses on the first-person experience of RE-voting and addresses subsidiary research questions two and four: verifying the beliefs which relate to support for RE-voting and their inter-relationships with a method which allows for open responses, and addressing how RE-voting's effect on the perceived cost of voting is felt at the individual level (Blais, 2000, 2019).

The chapter analyses the beliefs explored by the theoretical framework and the structural equation model. To assess the power of RE-voting on the perceived cost of voting, the

interviews investigate whether RE-voting acts as a motivator for participating in SU elections, how this motivation operates on a micro-level, and how beliefs about voting modes are manifested.

A combination of non-quantitative interpretation of responses and a cluster analysis of responses were used to explore the personal meanings of RE-voting elections. This mixed methods approach contextualises the scaled survey responses, and tests the validity of the belief clusters and relationships established by the survey chapter. Interviews were analysed using predetermined codes drawn from the theoretical framework and emergent codes.

Chapter eight combines the three themes of the study to address the research question and its subsidiary questions. The chapter summarises the theoretical and empirical contributions of the study to the political science literature. The limitations of the study are explored along with future directions for the attitudinal research of voting modes.

2. Contribution to the literature

This thesis contributes to the existing literature on young peoples' attitudes toward and engagement with online voting (Cammaerts et al, 2016; Solvak and Vassil, 2016; Bruter, 2019; Bruter and Harrison, 2020). Using a rubric of beliefs to rank the individual's voting technology priorities, it expands our knowledge of young people's attitudes towards online voting and their priorities when it comes to voting system design. The young people of this study were concerned with the integrity of RE-voting, followed by the normative effects of the technology on voting, and finally with the personal usefulness of online voting technology. Amongst the study's 18-24 cohort, these beliefs all correlate with support for, or rejection of online voting in national elections.

In addition to the survey data, the first-hand accounts of online voting add to our understanding of how the motivations of voters are affected by increased convenience. These

personal accounts of the decision to vote online offer insights into how turnout may be increased in typically 'low-salience' elections such as local authority elections and police and crime commissioner elections.

Through its synthesis of theories of voter turnout, attitude formation, and technology acceptance, the thesis makes interdisciplinary contributions to the areas of electoral administration, electoral law, political psychology, and the new field of electoral ergonomics.

3. Findings in summary, experience, beliefs and attitudes to RE-voting

The headline finding of this study is that experience with RE-voting is correlated with a small increase in beliefs associated with support for RE-voting in national elections, and a small decrease in beliefs which are negatively associated. However, these belief differences do not translate into a direct correlation between level of experience and support for RE-voting. There was no direct correlation or significant difference between experience groups with regard to use of the technology in national elections.

In other words, an individual's level of experience interacts with beliefs which are associated with support for RE-voting in high-salience elections. Average marginal effects testing demonstrates that experience interacts with perceived usefulness and anti-convenience beliefs, and although usefulness beliefs increase according to level of experience, they do not have a significant relationship with attitudinal support for RE-voting in national elections when interacted with experience level in a linear regression.

The interview data provides evidence that RE-voting is effective at appealing to voters who are sensitive to the direct and information costs of in-person voting in SU elections. This tallies with the survey data, where level of experience was positively correlated with an aversion to the effort of in-person voting in SU elections; the more experience a participant had, the less

they were prepared to vote in the absence of an online system. Ironically, participants with no experience at all reported the lowest level of aversion to in-person SU elections, despite having never voted in SU elections, paper based, online, or otherwise.

This apparently contrarian relationship highlights the large number of participants which RE-voting enticed into SU elections, whose participation was dependent on the extremely low direct and information costs afforded by the technology. Drawing from the interview reports, SU voting systems bypass the apathy of these voters due to a combination of a low-effort voting interface and frequent email reminders to vote. Prompted by the reminder and aware of the low-time cost associated with voting online, these interview participants reported voting despite a lack of interest. This 'bypassing of apathy' effect has potentially increased the number of voters in student union elections nationwide since the introduction of RE-voting in 2009.

Interview participants also expressed caution about the prospect of RE-voting in national elections which they did not feel towards RE-voting in SU elections. There was a clear distinction between the use of the technology in low-salience elections and use of it in high salience national elections. This distinction is likely because of the greater consequences of fraud or system failure in high-salience elections.

Alongside testing established beliefs of usefulness and trustworthiness, the study tested three new normative beliefs as predictors of support for RE-voting in national elections: belief in voting cost, belief in the publicness of voting, and belief in the uniformity of voting. The results indicated that communitarian arguments about the publicness and uniformity of voting are not related to support for RE-voting, while concerns about 'quick and easy' voting are negatively correlated with support for RE-voting. This negative relationship demonstrates that there is a significant normative dimension which interacts with experience beyond the pragmatic dimensions of usefulness and trust. Support for, or opposition to 'belief in voting cost' is a

robust predictor of attitudes towards RE-voting in national elections. This relationship also demonstrates that a significant minority of young people are not in favour of reducing the costs of voting in general elections.

Finally, the anti-convenience beliefs expressed in the survey and interviews have implications for the design of RE-voting systems if consensus on their use is to be reached. Suggested adjustments to RE-voting included virtual 'brakes', such as required candidate information pages, which could slow the process of RE-voting, with an aim to discourage 'passive' or 'thoughtless' voting. At the level of electoral legislating, there is little indication of a desire to 'slow' the voting process as the reforms of the past 150 years have prioritised reducing the costs of voting above other electoral procedures. Postal voting is the most significant of these reforms and is now used by a fifth of voters, highlighting the speed at which convenience voting systems become normalised. To build consensus and avoid undermining trust in the electoral system, this study recommends a public consultation on whether in-person voting procedures have intrinsic value, and a discussion of what voting 'ought to be' prior to the passage of any RE-voting legislation

Chapter 2, Room for online voting? Online voting and the rivalrous priorities of UK electoral law

1. Introduction

This chapter maps administrative electoral law in the United Kingdom and assesses the priorities expressed by the law, and whether these priorities accommodate remote electronic (RE) voting technology. As use of RE-voting technology increases in non-governmental elections, it is important to identify its compatibility with the existing procedures of UK elections. By providing people with fast, remote voting, the adoption of RE-voting by private organisations indirectly challenges the norms of voting in UK governmental elections. As the technology becomes further normalised, elections conducted on paper may be considered outmoded by sections of the public. The mechanics of the UK's voting system still bear their 19th century origins, although the law's treatment of voter participation has changed significantly since this period. The chapter assesses the priorities of UK Electoral Law based on whether the law is prescriptive, prohibitive, or permissive regarding key aspects of electoral administration which concern RE-voting technology: secrecy, transparency, security, accessibility and convenience (Gibbs, 1966:319).

The categories of prescriptive, prohibitive and permissive law are defined as rules which govern the omission or commission of certain acts, or in the case of permissive law by the absence of prescriptive or prohibitive rules regarding an act (Gibbs, 1966:318). Prescriptive laws are concerned with the obligation to act; in the context of electoral law, electoral administrators have a duty to provide a secure ballot to voters (ss32-32 Representation of the People Act 1983). A failure to provide a secure ballot can lead to a sanction against the administrator. In the alternative, prohibitive laws are concerned with preventing certain acts,

such as bribery, coercion or undue influence (ss113-115 RPA 1983). Permissive laws or 'absences of law' emerge where an act is neither prescribed nor prohibited (Gibbs, 1966:318). Using this approach, it is possible to see where the legislation commits or avoids committing itself to a particular principle. A caveat to this approach is that it is difficult to ascribe intention to legislators based on omitted areas of legislation. It is possible that omitted areas of electoral law were deliberately ignored by legislators, but it is equally possible that these omissions were not made consciously. This assessment uses primary legislation, and the interpretation of this legislation by the courts as evidence of the priorities of UK Electoral Law.[1]

Concerning the administration of elections, the priorities of the law have shifted since the end of the 19th century, when most reforms focused on reducing corruption. There have been three recent notable shifts in electoral administration: the rapid expansion of convenience procedures during the early 2000s, the growth of anti-discrimination legislation since the 1990s which has slowly increased voting accessibility procedures, and the recent expansion of security legislation in the form of verification procedures. Outside of Northern Ireland, many procedural aspects remained undisturbed for years, with security, transparency, and secrecy legislation almost entirely preserved from the Corrupt and Illegal Practices Act 1883 and the Ballot Act 1872.[2]

The recent significant challenges to this stasis are the Elections Act 2022 and the Ballot Secrecy Act 2023. The Elections Act 2022 is the largest expansion of UK security procedures outside of Northern Ireland since 1883. The main plank of the act is the introduction of photo ID checks for voters attending the polling station. The act purports to increase the security of elections by reducing personation, though at the expense of accessibility. Pre-Elections Act 2022

[1] Election courts are convened in response to an electoral petition, which may allege wrongdoing from an administrator, candidate, or voter. See section 2.8 for a full description of the role of election courts.
[2] This legislation was later consolidated into the Corrupt and Illegal Practices Act 1883

verification measures posed an extremely low-barrier to entry for voters in England, Wales and Scotland. The Ballot Secrecy Act 2023 reinforces the current rules around undue influence by making it a criminal offence to influence or attempt to influence a voter inside the polling booth or near the polling station. Despite highlighting issues with group voting in polling stations, the act does not address the problem of influence for remote voters.

The body of UK election law has been added to by successive Governments, creating a 'chimera' effect where laws which pull in different normative directions coexist in statute. This is recently exemplified by the Elections Act 2022's photo ID requirement for voters attending polling stations, while maintaining access to universal postal voting, which does not require photo ID and which is arguably more convenient than attending the polling station. Since it received Royal Assent the RPA 1983 has accumulated 273 repeals, 839 insertions and 817 substitutions amongst its various 3244 amendments. This total figure is calculated from the number of textual amendments, indicated by (F), and amendments not modifying the text, indicated by (C). Metadata for the RPA 1983 across the last forty years shows the effect of this imbalance between repeals and insertions & substitutions; between 1983 and 2023 the number of lines of text in the act increased by 175% from 8959 to 24643, excluding footnotes for textual amendments (F) and amendments not modifying the text (C). This growth in the lines of text is mirrored by a 174% increase in the act's word count since 1983. This expansion has been criticised separately by the Law Commission and Electoral Commission for increasing the complexity of election law for administrators(2020;2022).

Election law procedures which indicate compatibility with RE-voting include the well-established universal postal vote, and the duty placed on returning officers to provide solutions for disabled voters to vote independently. The recent challenging of polling station accessibility provisions by judicial review, and the potential expansion of accessibility devices

by the Elections Act 2022 create avenues for the introduction of electronic voting devices in UK elections, though there is no indication that these devices would be remote to the polling station; the audio device trials of the 2021 local elections show the Government's preference for keeping accessibility provisions within the polling station, rather than pursuing remote technologies (RNIB, 2021:10,11). Taking a broader view of the UK electorate, as a voting medium, RE-voting is compatible with Vernon Bogdanor's descriptions of modern UK citizens as empowered consumers who demand a more active role in UK Government than their antecedents (2009:397).

Despite these areas of compatibility, there are a number of procedures which appear incongruous with RE-voting technology, and which indicate a challenge to the introduction of RE-voting. Alongside its accessibility provisions, the Elections Act 2022 shifted UK election law towards increasing the barriers to entry for some voters with the introduction of photo ID verification. Polling day transparency procedures also pose a high bar for RE-voting to clear. Election counts are highly transparent venues; members of the public, party members, election agents, candidates, journalists, and accredited observers may all attend the count and scrutinise the counting process, subject to the objection of the returning officer. This level of public transparency is impossible with RE-voting technology, and so has the potential to undermine confidence in the process. Transposing the election count to a computer server necessarily restricts the number of people who can understand the process and who can verify the accuracy of the count (Rubin, 2006; Springall et al, 2014).

Devolution adds another layer to the conflicting priorities of UK election law. The voters of Scotland and Wales are partially affected by the provisions of the Elections Act 2022, as photo ID requirements apply to UK parliamentary elections and police and crime commissioner elections in Wales. However, the legislative agendas of the Scottish and Welsh Governments

lean towards greater convenience and accessibility for voters compared with the electoral priorities of the Westminster Government. Both devolved governments have indicated a desire to experiment with RE-voting (Sky News 2018; BBC News, 2018). The Government of Wales' indications have not yet been realised, but the Scottish Elections (Reform) Act 2020 contains enabling legislation for the use of electronic voting mediums in local elections (S6 Scottish Elections (Reform) Act 2020). This enabling legislation may lead to a significant divergence in the administration of local elections in the UK, and further tensions between the Holyrood and Westminster Governments over the legislative competences granted by the Scotland Act 2016 (s3-s10 Scotland Act 2016).

2. UK Electoral Law: Prescription, Prohibition and Permissiveness (PPP) an analysis of UK Electoral Law

2.1 Electoral law through the lens of procedural aspects

The body of UK Electoral Law is extremely large. According to the Law Commission's estimates, it is distributed over a minimum of 25 statutes and multiple statutory instruments (2020:8). The majority of rules for the conduct of Parliamentary elections are contained in the Representation of the People Act (RPA) 1983. Subsequent statutes have tended to amend the 1983 Act rather than create new consolidating legislation. Prior to the 1983 Act, the majority of election offences were prosecuted using the RPA 1949, which was also regarded as the consolidating legislation of its time (Griffith, 1950:348).

Because of its primary legislation status, most amendments to Parliamentary election law requires approval from both Houses of Parliament and the Monarch. This arrangement is intended to involve the whole of Parliament in changing election law, and so in theory reduce

the chance for amendments which confer political advantage to the ruling party. Though a number of the more detailed provisions for Parliamentary elections are left to the Minister for the Constitution to determine using a statutory instrument (s17 Elections Act 2022). Conversely, most rules governing sub-national elections such as local authority elections have been created using statutory instruments, giving the Government of the day greater flexibility when amending the law (Law Commission, 2014:12).

The seven procedural aspects of an electoral system used in this analysis are secrecy, security, accessibility, convenience, efficiency, transparency, and accountability. These aspects are derived from the electoral administration literature and are largely self-explanatory. This chapter focuses on secrecy, transparency, security, accessibility and convenience as these aspects are most relevant to RE-voting technology. The UK's voting system has been split into these procedural aspects to allow for specific comparisons, both contemporary and historic, with other voting systems.

The seven items are referred to as procedural aspects rather than democratic principles as the democratic principles found in most constitutions and international conventions are extremely broad, 'free and fair elections' being the most frequent normative expression of democratic principle (Elklit and Svennson, 1997:33; Norris, 2013:564). Procedural aspects are intended to be descriptive rather than normative, and are identified by grouping together election procedures which are mandated by legislation. These election procedures are observable and result in measurable outcomes: stronger security procedures, such as requiring photo ID, result in lower participation rate amongst certain citizens (Renwick and Palese, 2018). Weaker transparency procedures, such as closing the election count to the public will likely result in lower levels of trust in the democratic process (Norris in Norris and Nai, 2018). Procedural

aspects are granular enough to be observed in specific legislation in lesser or greater quantities, and the outcomes of these procedures are observable.

To better understand the priorities of electoral systems electoral law needs to be examined as a subset of constitutional law. Differentiation is simple for jurisdictions with discrete written constitutions, but the UK has an unwritten constitution consisting of statute, convention, and common law, which is constantly changing (Bagehot, 1867; Bogdanor, 2009). Representative government is considered by Bogdanor to be one of the core tenets of the British Constitution (2009). Electoral law is therefore part of this shifting constitution, and a significant part since it specifies the method of selecting representative government.

Legislating for elections has gone through long periods of consensus, punctuated by intense disagreement over reforms motivated by perceived or real political advantage (James, 2012:125). The period 1830-1872 is frequently cited as the most contested era for election reform, both in terms of the franchise and election procedure, followed by the reforms of 1918, 1928 and 1948 (O'Leary, 1962; Butler, 1963; Blackburn, 1995). Beginning in the late 19th century, it was considered a convention that changes to electoral law were to be agreed through the Speaker's Conference, and agreed items would then become part of any election statute put to the house (Churchill in HC Deb 23 June 1948; Butler, 1963:121). The Labour Government's decision to abolish plural voting and the university vote in 1948 went against this convention, and though Speaker's Conferences continued to be held through the 1960s, 1970s, and most recently in 2009, subsequent Governments were not expected to bind themselves to the Speaker's report (Blackburn, 2011:49,50).

As well as abolishing the remains of plural voting under the RPA 1948, the 1945 Labour Government expanded the qualifications for postal votes and banned the use of for-hire cars

carrying voters on election day. The latter of which was considered to the advantage of the Labour Party (Butler, 1963). Moving forward 21 years, the reforms of the Wilson Government in 1969, extending polling hours and lowering the voting age to 18, were also subject to accusations of political advantage.

Sixteen years later, the 1985 expansion of the voting period for expatriates was criticised for conferring an advantage to the Conservative Party (Foot in HC Deb 29 January 1985). Another fifteen years on and the Labour Government's introduction of universal postal voting was also considered to be motivated by the desire for advantage, though the advantage granted is debatable (Denver, 2011:30,31). Twenty-two years on, the Conservative Government introduced the Elections Act 2022 requiring photo ID verification for all UK elections, a reform which was also described as conferring an advantage to the party.

These various reforms can be interpreted as part of an electoral strategy, intended to maximise the advantage of the ruling party, rather than being part of a cross-party strategy for election reform (James, 2012:15). However, there is an argument for stability in the development of the administration of elections; administrative procedures are not frequently repealed with the change of Governments. The normalisation of electoral procedures such as the use of secret ballot, postal voting, or individual voter registration, allows them to survive beyond the Government of their day. Despite the Conservative party's opposition to Labour's RPA 1948, the 1951 Conservative Government did not roll back restrictions on motorcars or restore pre-1948 postal voting qualifications. These procedures had become an assumed part of the running of elections and were left alone, highlighting the largely additive development of UK election law. Even institutions like the Electoral Commission, established by the PPERA 2000 have lasted beyond their original Government, although with some significant

contestation and recently increased Government oversight (s16,s17,s18, s19 Elections Act 2022).

2.2 Secrecy

UK electoral law is permissive of a level of compromised voter secrecy, and the law's prescription for ballot serial numbers means post-voting anonymity is not guaranteed. Both of these characteristics are compatible with the secrecy compromises required to implement RE-voting in national elections. The 1872 voter secrecy legislation remained unaltered until it was reinforced by the Ballot Secrecy Act 2023, but the notion of enforced secrecy has been eroded by legislation permitting unsupervised remote voting (1918, 1945, 1948, 1985, 2000), and by the security requirement for numbered ballot papers from which a voter can be identified (1872, 1983). With the expansion of unsupervised remote voting, election law has become tacitly permissive of non-secret voting; by moving voting from supervised public spaces to unsupervised private spaces, the law permits voters to reveal their ballots and therefore their voting choice.

Secrecy is widely considered to confer legitimacy upon elections and is an assumed procedural element for any modern democracy (Dahl, 1998:96). It has become an almost unconsciously accepted prerequisite for voting since its popularisation in the late 19th century. It is used as a measure of electoral integrity by the International institute for Democracy and Electoral Assistance (IDEA), the Organisation for Security and Cooperation in Europe (OSCE), and the Venice Commission. Election procedures are in place partly to ensure that ballots remain secret, but also to prevent a wider range of ballot fraud. In UK elections, the security

measures[3] provided by the local authority are a means to two ends: (1) preventing fraud[4] and (2) maintaining the secrecy of the ballot.

The politics of secrecy procedures were largely settled in 1872, when voter secrecy was still relatively contentious both within the Liberal party and for the Tory opposition. Since the 19th century, secrecy procedures have only been indirectly undermined by reforms which relocate voting outside of the polling station, such as universal postal voting. In the 20th century, none of the UK's leading political parties saw an electoral advantage in attacking secrecy. The principle of voter secrecy has been accepted as an unalloyed good, though the use of remote voting necessarily creates exceptions to this principle.

The secrecy of the ballot is prescribed by Section 66 RPA 1983, but it has qualifications. There are four significant exceptions to this secrecy: the serial number printed on each ballot paper, the sale of voter 'marked registers', the requirement of human assistance for some disabled voters, and the expectation that postal voters will police secrecy themselves. The 1872 Ballot Act was passed by Gladstone's Liberal Party in response to the disorder and rioting of the 1868 elections (O'Leary, 1962:68). The Act was a fulfilment of one of the Chartist movement's six demands and remains in place through RPA 1983.[5] The 1872 act moved the law from permitting public deliberation at the polling location, which we will refer to as open voting, to prohibiting public deliberation in polling locations (UK Parliament, 1872; Blackburn, 2011). To

[3] The presence of local authority staff, the use of opaque ballot boxes, the secure storing of ballot boxes, the secure transportation of boxes to the counting hall, and the chain of possession of ballot boxes.
[4] The fraudulent addition of ballots (ballot stuffing), the removal of cast ballots, or the editing of cast ballots.
[5] However, some sub-national elections such as Parish Council elections continued using open voting until as late as 1913 (Soames in Hansard, 1913).

understand why secrecy procedures were introduced in UK elections, it is necessary to explore the debates surrounding the introduction of the Ballot Act in 1872.

The priorities of the 1872 Act were clear; a high level of secrecy was prioritised over public deliberation in the polling location. The conflict between these differing priorities is evident in the Hansard records of the Bill's first reading (HC Deb 20 February 1871). Before the Act, the law was permissive of public deliberation through the public nomination and hustings system and did not prioritise secrecy despite the demands of the Chartist movement (Crook and Crook, 2007). The secret ballot was frequently charged as being "un-English" during the Parliamentary debates preceding the Ballot Act (Kinzer, 1978:243-246). Addressing the House of Commons in 1858, leader of the Tory Government, Lord Palmerston described the communitarian 'trust' case against the secret ballot:

"for an individual is invested with the power of voting, not for his own personal advantage and interest, but for the interest and advantage of the nation. If the voter had the power of voting merely for his own advantage, on what principle could you punish him for disposing of his vote?"

Palmerston's comment highlights some of the underlying values of the pre-1872 legislation. Open voting and the accountability and public deliberation which accompanied it were regarded by Palmerston and commentators such as JS Mill as essential for preventing self-interested voting (Mill, 1861). This communitarian critique of the ballot is distinct from the aristocratic arguments which condoned the influence of the propertied classes in open voting (Kinzer, 1978:239).

The secrecy of the 1872 Act weakened voters' 'embodied presence' during voting. Embodied presence as defined by Stephen Coleman describes being physically and mentally present during voting (2013). For Coleman, the Athenian agora with its direct democracy, public deliberation and voting by show of hands is the strongest form of embodied presence in a democracy (2013:37). He contrasts this Athenian direct democracy with modern representative democracy 'which is founded upon the aggregation of disembodied individuals into an imagined sovereign body' (Coleman, 2013:38).

The Ballot Act 1872 further reduces the embodied presence of voters by transforming polling day into a secret and quiet affair, with interactions between voters restricted in the polling station (Crook and Crook, 2007). Using Coleman's logic, the raucous 'town hall' hustings of the 1800s with their public debates and public voting were less mediated by technology and were therefore democratically 'purer' than the ballot system which followed them, despite the attendant problems of intimidation and bribery. The value of this 'voting purity' is difficult to assess, but the concept of embodied presence is useful to understand how technology mediates voting and can change the voting experience. The postal ballot and E/RE-voting are arguably extensions of the trend of mediating embodied presence during voting, as they increase the detachment between voters and public spaces for deliberation and voting.

The secrecy rules for parliamentary elections are listed in Section 66 of the RPA 1983 and in Section 62C as amended by the Ballot Secrecy Act 2023. Prescriptions and prohibitions relating to secrecy are split across six subsections: (1) prescriptive rules for officials, candidates and their agents at the polling station, (2,3) prescriptive and prohibitive rules for everyone attending the count, (4) prohibitive rules for anyone handling postal votes, (5) prohibitive rules for anyone assisting blind voters, and (6) a description of the imprisonment penalty for violating the rule of the section (ibid). A declaration of secrecy, where the individual swears to

abide by subsections 1,2,3 and 6 of s66 is required by the civil servants administering the polling station, as well as from anyone attending the count. Contravention of these rules is a criminal offence, with a penalty of a maximum of six months imprisonment (s66 RPA 1983).

The duration of ballot secrecy is not restricted to the act of voting; in UK polling stations, the secrecy of the ballot is protected (1) during the act of voting, and (2) at every stage of the election post-voting. We can characterise these two different types of secrecy as 'voting secrecy' and 'post-voting secrecy'. Assured voting secrecy requires voters to be present at a polling station. The supervision provided at the polling station ensures, to a reasonable degree, that voters can hide their voting choice from other voters. Opaque ballot boxes and opaque booths are used to shield the voter's choice from prying eyes. The spatial characteristics of the secret ballot are twofold: the presence of a state representative to ensure secrecy (supervision), and the use of opaque barriers to obscure the ballot from view. Legislation permitting qualified postal voting for military personnel in 1918 and 1945, and civilians in 1948 and 1985, necessarily undermined these secrecy provisions by removing voting from a supervised polling site. The reforms prioritised accessibility for voters ahead of assuring their secrecy. The introduction of the universal postal ballot by the RPA 2000 further undermined the possibility of state-supervised secrecy by permitting any eligible person to vote from a private site, rather than a polling station. The RPA 2000 normalised voting from private spaces and so has played an important role in acclimating the public to both compromised secrecy and remote voting technology.

Post-voting act secrecy is uniquely affected by the UK's ballot serial number system, whereby each ballot is marked with a serial number which can be matched against the voter's identity.

UK ballot secrecy has no expiration date; once a ballot has been cast and counted, the responsible returning officer seals and delivers the ballots to the office of the Clerk of the Crown (s55 RPA 1983). Ballots can only be unsealed in response to an electoral petition by the authority of an election court or a county court (s56(1)(b)(ii) RPA 1983).[6] The House of Commons also has the authority to request that ballots be unsealed (s56 (1)(b)(i) RPA 1983), though this has not happened since 1868 when the judiciary assumed responsibility for hearing election petitions. The UK's serial number system allows for ballots to be traced to a voter's identity, so the unsealing of ballot papers has practical implications for post-voting act secrecy.

The quasi-secrecy created by the use of identifiable ballot papers has been objected to in the House of Commons, but has never been challenged in a UK court (Dilke in HC Deb 27 March 1874). The closest legal challenge to the counterfoil system occurred in 1972 in the Supreme Court of Ireland. In the case of *McMahon v The Attorney General* [1972] IR 69, The court ruled that the counterfoil system, which had been inherited from UK election law, was unconstitutional as it violated the petitioner's right to vote in secrecy as stipulated by Article 16, Section 1, Subsection 4, of the Constitution of Ireland (1937). This ruling depended upon the court's interpretation of secrecy as an absolute rather than qualified right, described as 'a ballot in which there is complete and inviolable secrecy' by Justice Pringle (The Supreme Court of Ireland, 1972:16). A majority of the court decided that the balance between secrecy and security ought to be tipped towards greater secrecy, at the expense of ballot scrutiny. The principle underpinning the court's judgement conflicts with the secrecy compromises required

[6] This is extremely rare, occurring only in instances of voter personation where a fraudulently cast ballot may need to be recalled (Electoral Commission, 2017).

to implement a RE-voting system, where continuity between voter serial numbers and voter identities is required to deter interference with the counting server (Springall et al, 2014:712).

An additional small erosion of voter secrecy is created by the sale of voter 'marked registers'. These registers are often purchased by political parties to cross reference against their canvassing data, and by researchers to verify actual voter turnout against self-reported survey data. This cross-referencing of data allows the buyer to see who voted and who stayed at home, removing the veil of secrecy from voter participation. However, since the data concerns participation, and not voter decisions, secrecy as an instrument to reduce corruption of the vote through bribery, treating or threats remains uncompromised.

In sum, the priority of secrecy is conflicted in UK electoral law. The law emphasises the importance of secrecy with clear prescriptions for polling station design and with serious penalties for violations of secrecy. However, the liberalisation of voting from private spaces has made secrecy legislation impossible to enforce for a fifth of UK voters who vote remotely. With this development in mind, the law is tacitly permissive of compromised secrecy. When this element is combined with the prescription for identifiable ballot papers, the law appears prepared for the compromises required to introduce RE-voting technology.

2.3 Transparency

Transparency procedures are prescribed for at two key election theatres: the polling station and the election count (RPA 1983; PPERA, 2000; Electoral Administration Act, 2006). In the context of electoral administration, transparency describes the ability of members of the public to observe and scrutinise the election process, whether the election occurs by show of

hands, by ballot paper, or by electronic communication. Election transparency is obviously important beyond the administration of voting. From the recording of spending during the short campaign period, to the recording of large donations outside of the short campaign, to the requirement for imprints on political literature, the law requires a level of transparency from election participants as well as administrators. Transparency procedures are fundamental for maintaining trust between the voter and the election administrator, and ultimately for legitimising the outcome of the election (Dahl, 1998; Coleman 2013; Seedorf, 2016). This principle is expressed by sections 30 and 44 in the different iterations of the RPA 1983, but is most explicitly expressed by the Electoral Administration Act of 2006, which added accredited observers to the list of persons permitted to scrutinise polling stations and the election count. Before this legislation, observers who were not associated with a candidate could only attend at the discretion of the presiding officer, and international observers were not guaranteed access.

The black-box design of RE-voting systems pose a challenge to the transparency procedures prescribed by UK election law, particularly regarding the transparency of the vote counting process. This black-box design is important as it distinguishes RE-voting from other remote voting mediums such as postal voting; postal votes may be cast from a private space, but they are still counted in a public and highly transparent space. RE-voting ballots are counted on a computer server, a process which is inscrutable to observers unfamiliar with the programming of the server. The pool of observers who may verify an election count is extremely limited once the count is conducted on a computer, and without a paper trail. This basic incompatibility is a significant obstacle to the use of RE-voting in UK elections.

UK electoral law both permits and prescribes for transparency at the polling station and at the election count; members of the public can witness one another voting and can later observe the counting of ballots alongside election agents, candidates, and journalists. The prescriptions for a paper election count make scrutiny in both these theatres possible. Though the law does not prescribe for observers at the polling station and election count, Sections 32 and 44 of Schedule 1 of the RPA 1983 permit the presence of various observers. Orr considers transparency at both these sites an integral part of the election ritual, particularly transparency during the election count, a key part of the spectacle of election night (2014:437-439). There are two instrumental outcomes of transparency at these sites: the bonding of citizens as they vote together and ensuring that the election count is independently verified. Orr argues that In the community centres and schools where voters witness one another, they are reminded of their shared responsibility as part of a representative democracy (2014).

Transparency on polling day is qualified by two procedures: the requirements for voting secrecy, allowing voters limited seclusion in the polling station, and the transport of ballot boxes between the polling station and the election count venue. This high level of transparency poses a challenge to the use of RE-voting technology, particularly regarding public scrutiny of the election count. This section will focus on the challenges which transparency prescriptions pose for RE-voting, both at the polling station and at the election count.

The actual security procedures of a voting system become irrelevant if the public are not able to verify an election was conducted without fraud. Transparency procedures are adjacent to security procedures, but they remain distinct. For example, an election may have excellent security procedures, but, if the polling and counting processes are opaque to scrutiny, voters may find it difficult to trust the administrators and the election outcome. Transparency

procedures within the scope of this chapter encompass three areas of election day: the polling station, the opening of postal ballots, and the election count.

The Ballot Act 1872 prescribed specific transparency procedures for elections, procedures which are still recognisable today. Before the Ballot Act, Parliamentary and local elections were conducted openly in the form of hustings, where voters were witnessed by their peers and the general public (O'Leary, 1962; Crook and Crook, 2007). Under the open voting system, there was an observable chain of events between an eligible voter entering the polling place, being verified by the presiding officer against the electoral roll, and having their vote recorded by a poll clerk. The electoral and burgess rolls contained the names of all eligible voters, and all votes and voter identities were recorded in a publicly available 'poll book' (Harvey in HC Deb 8 February 1812). This system possessed an inherent transparency which could not be transferred to the secret ballot.

Out of necessity, the secret ballot cast a veil over the act of voting and fragmented open voting's observable chain of events. The ability for the public, especially individuals without the franchise, to participate in the voting process was limited under the new system; voter identities and choices were no longer easily identifiable at the time of the election, or the election count, and groups without the franchise could no longer participate vicariously as they had in the old system of public nominations and election hustings (O'Leary, 1962).

The distancing of the public under this new secret system was the subject of friction between the Liberal Government and the Tory opposition. The Tory MP Charles Newdegate lauded the value of 'face-to-face' publicity and the 'simultaneity of information' which the pre-ballot system offered (Newdegate in HC Deb 9 May 1870). Procedures such as the presence of party agents at ballot counts, and the use of serial numbers to identify ballots were used to improve

the transparency of the system, but the 1872 act only made provisions for counting agents to attend the election count, and it did not specify how many (ss35, Sch1, Ballot Act 1872). Any non-agents wishing to attend could only do so at the discretion of the returning officer (ss33, Sch1, Ballot Act 1872). The broad language of the act led to confusion over how many agents could attend the count at the 1875 elections (Dilke in HC Deb 19 March 1875)

This need for public trust is referred to as the 'principle of scrutiny' in the debates preceding the Ballot Act 1872 (The Marquess of Hartington in HC Deb 14 July 1871). Scrutiny also referred to the process of recounting ballots as part of an election petition, 'a scrutiny' (Hardy in HC Deb 14 July 1871). The tension between secrecy and scrutiny was articulated by the radical Liberal MP Edward Leatham in the debates prior to the passage of the Act. For Leatham, a loss of public scrutiny was necessary for the full benefits of voter secrecy (Leatham in HC Deb 14 February 1870). In the same speech, Leatham anticipated contemporary arguments against electronic voting in his comments on voting via telegraph machine and the effect of the telegraph's complexity on the average voter: 'the fatal demerit of all such machinery is its ingenuity, for where there is the exhibition of great ingenuity there is the inseparable suspicion and suggestion of fraud' (Leatham in HC Deb 14 February 1870). Leatham's proposal for serial numbered ballots, to be matched against voter identities by the order of a judge, was passed into law in the final bill.

Moving forward 139 years, Leatham's mistrust of 'ingenious' voting technology and the 1872 'principle of scrutiny' were respectively echoed in the 2009 judgement of the German Constitutional Court, the Bundesverfassungsgericht.[7] This judgement affected the design of E/RE-voting machines and effectively curtailed E-voting and RE-voting in Germany. While the court's decision did not explicitly ban electronic voting mediums, it placed a high bar for the

[7] Abbreviated to BverfG.

design of E-voting mediums. The court ruled that the perception of elections as democratic is as important as the fact of democratic elections (BVerfG, 2009:23). Although the court is in a different jurisdiction, the ruling is indicative of the international concerns regarding election transparency, and the link between transparency and public confidence in elections.

The BVerfG used 'the public nature of elections' as a foundation for its judgement on the legality of E-voting systems (Ibid). Elections are public events and must therefore be subject to reasonable levels of public scrutiny. Because of this principle, the voting systems used in German elections must allow voters to reliably comprehend that their votes were cast as intended (BVerfG, 2009:24). This comprehension must be possible without special knowledge of the voting system. The Supreme Court of the United Kingdom has not had to rule on this issue, since RE-voting was last experimentally trialled in 2007. The issue of public trust in the election count is not unique to Germany, as shown by the 2016 referendum pencil conspiracy theory, and will likely affect the UK should E/RE-voting be employed in national elections (Dobreva, Grinnel, Innes, 2020:151,152).

Transparency at the polling station and election count

The law governing attendance at the polling station, postal vote opening, and the count is set out in Sections 32 and 44 of Schedule 1 of RPA 1983. These rules permit attendance by a select list of groups, some of whom may attend without qualification, and some subject to the approval of the returning officer. Attendance rules[8] have been amended by eight acts since 2000.[9] The most significant of these amendments were introduced by the Elections Act of

[8] RPA 1983, Schedule 1: Admission to the Polling Station, Rule 32 & Schedule 1: Counting of Votes, Rule 44

[9] Political Parties and Referendums Act 2000, Electoral Administration Act 2006, Government of Wales Act 2006, Police Reform and Social Responsibility Act 2011, Local Electoral Administration (Scotland) Act 2011, Electoral Registration and Administration Act 2013, Policing and Crime Act 2017.

2006, which greatly expanded the number of people who may observe both in both polling stations and the count. Rules 6A, 6C and 6D confirm the expanded list of people who may observe as: 'representatives of the Commission, accredited observers, and nominated members of accredited organisations'. These rules were instrumental for increasing the transparency of the election process to the general public. Prior to the Act, journalists or other interested parties could only attend at the discretion of the returning officer, or as 'plus one' guest of an election candidate (s44(2b) RPA 1983). Candidate's agents and deputised agents are also entitled to attend the polling station, postal ballot opening and the election count, but are not entitled to 'plus one' guests (Electoral Commission, 2016:16,17).

After the polling station the next point of public transparency legislated for is the election count. Transparency at the election count is a relatively non-partisan issue, though there have been concerns over which media organisations are permitted to attend and the number of people who may attend (Lubbock in HC Deb 21 November 1963; Pickles, 2016). The earliest rules governing scrutiny of the ballot count were contained in the 1872 ballot act; candidates and their counting agents were permitted to attend to scrutinise the poll clerks. Members of the public could attend at the discretion of the returning officer, but there was no mechanism for observing the count outside of this discretion. Journalists used to the pre-1872 system were permitted to continue to attend the counts under the same discretion. Media attendance has not been codified since the 1872 Act, though the Electoral Commission encourages returning officers to engage with the media and offers guidance on admitting media to the count (Electoral Commission, 2023).

The next significant shift in transparency occurred in the 1960s when televised election counts became an expected part of election night media (Webb, 2021). This change was not due to legislation, and is an extension of the convention of journalists attending the count. Footage

from the election count remains a significant element of election night transparency, bringing the events of the night into the homes of voters (Coleman, 2013).

In the most recent reform of election day transparency procedures, the Electoral Administration Act of 2006 permitted observers accredited by the electoral commission to attend the election count. The introduction of a codified role for domestic and international election observers was proposed in 2003 by the Labour Government (Griffith in HC Deb 16 July 2003). This was likely spurred by the routine election monitoring in young democracies by groups such as the United Nations and The Organization for Security and Co-operation in Europe (OSCE).

However desirable, the continuous observation of an election is not possible. Individuals can observe the sealing of ballot packets at the polling station and the unsealing of packets at the election count, but the law makes no prescription for individuals to witness the transit of sealed ballot boxes between these locations (s43(1) RPA 1983). Trust in the responsible presiding officer and in their affixed seal is required for these brief 'opaque' sections of the process. Permitting public scrutiny of this transfer of ballot papers between locations may pose a security risk and is also impractical. For these reasons, transparency during the process is not continuous.

A large number of non-officials are permitted to observe the election count. It is not possible for all interested citizens to scrutinise the election count. To ensure an efficient process and to reduce the chance of disorder, specific groups are permitted to attend the election count: 'The returning officer and his clerks, (b) the candidates, one other person chosen by each of them,(c) the election agents, (d) the counting agents, (e) persons who are entitled to attend by virtue of any of sections 6A to 6D of the Political Parties, Elections and Referendums Act 2000'

(s44(2) RPA 1983).[10] Any additional guests to the count are at the discretion of the returning officer, but they are expected to consult the candidates' agents beforehand (Ibid).

Automation of the election count has been discussed in Parliament since the 1950s, but automated counting technology is currently only permitted in sub-national elections in Greater London and Scotland (Beamish in HC Deb 3 April 1957). Election law jurist Robert Blackburn (1994), and the Law Commission (2016), do not recommend the replacement of the hand count with electronic counting systems due to the transparency afforded by hand-counting. This scepticism is partially supported by evidence from the Open Rights Group's observation of electronic counting in the 2007 local elections; observers reported being kept away from counting servers during the English electronic counting pilots, and were not permitted to audit or scrutinise the machines in any meaningful way (Kitcat and Brown, 2008:388).

Despite these reservations, the Greater London Authority (GLA) and Scottish Local Authorities are authorised to use electronic counting systems for tallying ballot papers (Greater London Authority Act, 2007; Electoral Commission, 2007). These optical systems scan, record, and identify ambiguous or spoiled ballots without the need for human verification, as occurs in a typical count (Electoral Commission, 2014:2020). Electronic voting and electronic vote counting are not explicitly prohibited by any primary legislation, but the RPA 1983 prescribes that the count takes place by hand in UK local authorities.

These deviations from hand counts are a consequence of greater devolved powers from Westminster. When the GLA was established in 1999, the returning officer was given the independence to choose a vote counting system (Law Commission, 2020:107). Use of

[10] Observers permitted by the Political Parties, Elections, and Referendums Act: (a) representatives of the Commission, (b) accredited observers, and (c) nominated members of accredited organisations' (s6A-6D PPERA 2000 as amended by the Electoral Administration Act 2006).

electronic counting by Scottish local authorities was permitted by statute in 2011 (s42(1) Scottish Local Government Elections Order 2011). These systems accelerate the process of vote counting and remove human error from the process, but the technology is not immune to failure. A power cut at the counting centre in 2012 resulted in delays to the count, and the results of the 2016 London mayoral elections were delayed by 3 hours by a discrepancy between the number of votes cast and the votes allocated to candidates (Forster, 2016; Electoral Commission, 2019:4). While these systems automate part of the election count, optical scanning accuracy can still be verified by a hand-count of ballot papers.

Because of their dependence on paper ballots, optical scanning machines do not exclude the average member of the public from verifying the ballot-count. A ballot 'paper trail' exists, and the ballots can still be machine-counted in a setting where they can be overlooked by observers, such as in Alexandra Palace during the 2012 London Mayoral Elections (Forster, 2016). Though the speed at which the ballots are counted is less desirable for observers relative to scrutinising a count by hand (Electoral Reform Society, 2002:58.59). With these characteristics, optical scanning machines are compatible with the historic verification features of UK general election counts, and the principle of publicness espoused by the BVerfG, though they are less compatible with the tradition of counting agents directly observing the counting process.

In summary, the slow advancement of transparency procedures at the polling station and the election count poses a challenge to the use of RE-voting technology. Transparency at the polling station is partially compromised due to postal voting from private spaces, but transparency at the election count remains intact and has expanded to include broadcast media, a broader range of candidate guests, and accredited observers, since procedures were first codified in 1872. The election count holds both a symbolic and an instrumental role as the

culmination of the voting process; it requires witnesses and a secure but transparent space to complete the election and to mitigate doubts over the legitimacy of the election. The efficacy of existing transparency procedures poses a high bar for any introduction of RE-voting technology.

2.4 Security

UK security legislation has historically had highly prescriptive rules for the conduct of the poll, relatively weak prescriptions for voter verification measures, and rules relating to the coercion of voters which are prohibitive but could be regarded as permissive due to their breadth. Election security legislation is largely inherited from the 19th century reform acts, with some significant recent exceptions: the introduction of photo ID voter verification in Northern Ireland (2002), enhanced verification measures for postal voters (2006), and the recent introduction of photo ID verification for all UK elections (2022). Despite the relative sparseness of security legislating, the Parliamentary record contains points of particular conflict; as with many areas of election law, actions prescribed or prohibited by security procedures may confer an electoral advantage. The UK Government's Elections Act 2022 provides an example of conflict over perceived electoral advantage, with the Government accused of voter suppression by the opposition parties (Hosie in HC Deb November 2021; Smith in HC Deb 17 January 2022). The act was proposed to address perceived inadequacies of current security legislation, and is the largest update of security rules since the Corrupt and Illegal Practices act 1883.

Security concerns are frequently used as objections to employing RE-voting systems (UK Cabinet Office, 2018). The objections relate to the problems of conducting voting in a black-box system where the risk of count manipulation may be centralised, instead of being distributed across multiple counts as it is in a typical UK general election. The remaining security issues of voter verification and coercion also pose a significant challenge to the use of RE-voting. Verification measures are required to ensure the remote voter's identity is correct and strong prohibitions of coercion are required to prevent intimidation of the many RE-voters who will be voting from private spaces.

Security describes the extent to which the integrity of the ballot is protected. If equality of voting is a desired outcome of the election process, securing persons from coercion is just as important as securing ballot boxes and election counts. Physical security measures are in place to ensure the equality of the vote - a higher level democratic principle also expressed as 'fairness' (Venice Commission, 2013:28). A desire to ensure the equality of voting by securing physical infrastructure logically extends to a willingness to protect voters from manipulation. UK Electoral Law does not make explicit reference to democratic principles such as equality of votes, but the influence of this principle is evident in the debates surrounding security legislation, such as the Corrupt Practices Acts of 1854 and 1883. The rules established by these acts remain in legislation through the RPA 1983. The 1983 Act consolidates provisions which prohibit voting fraud, voter manipulation, and prescribes for the physical security of voting infrastructure.

The security procedures for general elections are contained in the RPA 1983. These are a combination of highly prescriptive rules for the conduct of voters, the administration of polling

stations, and the administration of the election count. The security considerations of the act have been criticised by several commentators, though the frequent criticism of undue influence rules and voter verification measures were addressed by the Elections Act 2022. Rules which dealt with coercion (ss 113, 114 and 115) were criticised for maintaining 19th century 'outmoded' language by the Law Commission, particularly the limited description of 'undue influence'. 'Light-touch' voter verification measures were also the subject of criticism from the OSCE (2010), the Electoral Commission (2014), and a Government commissioned report into electoral fraud (Pickles, 2016). Some aspects of the UK voting system are designed to deter fraud at the expense of absolute secrecy; this is the case for the ballot corresponding number system which replaced the ballot counterfoil system in 2006 discussed earlier (s31 (1)(2) Electoral Administration Act 2006). Security compromises have been made to accommodate postal voting (2000), proxy voting and the electronic voting trials of the 2000s.

Voter verification measures ensure that the prospective voter is enfranchised, that voters cannot participate multiple times, and that voters are not deprived of their vote by means of personation. The rules which relate to these integrity concerns are spread across the RPA 1983. s35 of Schedule 1 prescribes the voter verification process in England, Wales and Scotland and the stringent verification process for Northern Ireland. s60-65 of Part 1 prohibit certain actions which can be achieved if voter verification measures fail: voter personation (s60), voting while being legally incapacitated (s60 (1)), casting multiple votes in the same election (s61 (2-7)), making false declarations at the polling station or fraudulently applying for postal or proxy votes (s62,62A and 62B).

These prohibitions are designed to deter interference in the election process but are contingent upon the failure of the verification measures described in Schedule 1 of Section 35. The existence of these provisions demonstrates that electoral integrity and the principle of

equality of votes are clear priorities in UK electoral Law. Until the passage of the 2022 Elections Act requiring voters to provide photo ID to vote, this priority was potentially compromised by the comparative light-touch verification measures in England, Wales and Scotland. Under Section 35, voters in these countries only had to provide their name in a polling station. Before the 2022 act, Northern Ireland was the only country of the UK where voters could be asked their date of birth in the polling station, and which required voters to provide photo ID to vote (s13C and s35 RPA, 1983). These exceptions were introduced by the Electoral Fraud (Northern Ireland Act) 2002 in response to reports of high levels of voting fraud and to improve public confidence in the electoral system of Northern Ireland (McNamara in HC Deb 29 March 2001).

The Elections Act 2022 and the Electoral Fraud Act relate to in-person verification, but remote voting measures were strengthened in response to a rise in postal vote fraud in the 2000s. Under Section 14 of the Election Administration Act 2006, voters must now provide their address, date of birth and a signature to register for a postal or proxy vote. Sections 14 of the Act was intended as a response to the increase in postal vote fraud in the early 2000s, and the *Afzal, R (on the application of) v Election Court & Ors [2005] EWCA Civ 647* case in particular. This case and Richard Mawrey's summary comments were widely reported and represent a high-water mark for postal voting fraud in the UK.

In advance of the 2022 Act, photo ID verification was tested in a series of controversial trials during the 2018 local elections. Across the participating local authorities, 1036 voters without photo ID were turned away, and 350 did not return (Palese and Terry, 2018:25). In comparison to other European jurisdictions, England, Wales and Scotland were exceptional for not using photo ID verification in polling stations (Electoral Commission 2014:44,45). Though this exception is largely explained by absence of ID cards in the UK which could be used for voter verification. Proof of identity for voter verification at polling stations is endorsed by the

Electoral Commission on the basis that it would be likely to deter personation and would be unlikely to depress voter participation as evidenced by the case of Northern Ireland (2014:24-26). A reluctance to reduce access to the polls and the UK's institutional suspicion of ID cards are the likely explanations for why this 'light touch' verification process retained its 19th century character for so long.

Legislating for the behaviour of voters as means of ensuring the equality of the vote, sections 113-115 RPA 1983 identify and prohibit the behaviours of bribery, treating and undue influence. These rules make it an offence to coerce someone to vote against their will, or to refrain from voting against their will. These behaviours are defined as corrupt practices which carry a stronger sanction than illegal practices, which in electoral law is a maximum imprisonment of two years (ss168 RPA 1983). The language of these sections is taken directly from the Corrupt and Illegal Practices Act 1883, which is credited with dislodging well established election traditions of bribery and treating (O'Leary, 1962:229,230).[11] Because it remains unaltered, it is described as 'classical' law by the Law Commission (2014, 2016, 2020). The language of the sections has remained intact despite significant social changes since the 1880s, when polling days had a dramatically different atmosphere (Crook & Crook, 2007:456; Orr, 2016:20).

Bribery and treating are clearly defined and prohibited in sections 113 and 114, but undue influence, section 115, was criticised as overly complex and broad in its wording by the Law Commission, but also for setting too high a bar for prosecuting intimidating behaviour by Richard Mawrey QC (2016:141; 2014). Mawrey's remarks were made during the Tower Hamlets mayoral election petition *Erlam v Rahman* [2014] EWHC 2767 (QB). Some Tower

[11] The 1883 act has deep roots as it consolidated the rules from the Corrupt Practices Act 1854 and the Ballot Act 1872.

Hamlets voters were subject to intimidation by supporters of Luftar Rahman outside of polling stations, but without the violence or the threat of violence required for a criminal prosecution using section 115. The Commission recommended that any future redrafting of the election offences should replace undue influence with three specific offences: pressure, duress and trickery (2016:142). The Commission's subdividing of undue influence was addressed by the Conservative Government's Elections Act 2022 which expanded the definition of undue influence to cover seven behaviours including 'damaging or threatening to damage a person's reputation', 'damaging or destroying, or threatening to damage or destroy, a person's property', and 'any other act designed to intimidate a person'(ss8 Elections Act 2022). The lack of successful petitions to the election courts and the small number of successful prosecutions for undue influence undoubtedly played a role in the demand for a redrafting of the law (Pickles, 2016:43,44).

In summary, the security procedures in the RPA 1983 do not conflict with the requirements of RE-voting. While the law pre-2022 prohibited personation, voter verification measures at polling stations were comparatively light-touch. This lightness was an important concession to accessibility and appropriate to the low levels of reported personation, another example of the compromises which legislating for elections necessitates. Returning to compatibility issues, the Government's decision to introduce photo ID verification for voting falls short of the identity card system used in the Estonian iVote system, but this does not preclude the introduction of a RE-voting system using national insurance numbers or similar personal codes for identity verification in the future. The Government's 2022 update to the description of undue influence acknowledges that many people vote from private environments, and so cannot rely on the state to protect the secrecy of their ballot. The broadening of intimidating actions which can be prosecuted may benefit remote-voters who are facing coercion falling short of threats of

violence, and is therefore more accommodating of remote voting systems than the previous law.

2.5 Accessibility

Since 1983 there has been an increase in legislation specifically designed to improve access to elections for disabled voters. Anti-discrimination legislation and remote voting legislation have had the greatest impact on improving access to the ballot for UK voters; voters whose disabilities prevent them from accessing the polling station can participate from home, and polling stations now have some procedures to accommodate voters with disabilities. However, the UK Government's 2018 refusal to consider RE-voting trials for disabled voters, the photo ID trials of the 2019 local elections, and Section 13BD of the Elections Act 2022 represent challenges to accessibility in favour of greater security (UK Cabinet Office, 2018; Palese, 2019; UK Parliament 2021). In each of these instances barriers to accessing the vote have been raised for certain groups of voters, highlighting a zero-sum trade between accessibility procedures and security procedures.

Accessibility describes the extent to which enfranchised voters have the capability and capacity to access their voting system. In the context of voting systems, accessibility is concerned with the design of voting tools, the design of polling stations and the behaviour of polling station administrators. Accessibility can be expanded or restricted for certain enfranchised groups depending on design decisions and the instructions given to administrators. Identity requirements, complex ballot paper designs, and poll taxes are designs which restrict the accessibility of the ballot to certain enfranchised groups.

Accessibility is related to suffrage, but it is not concerned with explicit suffrage legislation such as the RPA 1928 which extended the vote to all women over the age of 21. The study of accessibility in voting systems is concerned with the implicit rather than explicit barriers for enfranchised voters. Bell, Mckay and Phillips (2001) also make the distinction between explicit and implicit voting barriers in their work. The concept of implicit barriers is referred to as 'expanded instrumentalism' by Waterstone (2004:106,107). Waterstone argues that instrumentalism in the context of voting rights is concerned with the explicit denial of suffrage, while expanded instrumentalism goes beyond explicit suffrage by examining the procedures that 'appreciably affect the effectiveness, accuracy, or informed nature of the vote' (2004:106). The RPA 1969 which extended suffrage to 18-20 year olds is an example of group enfranchisement through the removal of an explicit barrier, an age restriction. In comparison to this, the identity card trials of 2018 and 2019 created an implicit barrier to voting for anyone without a photo ID. By Waterstone's definition the 1969 reform is in the domain of instrumentalism, while the 2018/19 trials belong to expanded instrumentalism. Accessibility is not manifested purely by the absence of barriers such as photo ID checks, but by a combination of this absence with the proactive mitigation of any barriers to voting.

Accessibility was not prioritised in UK electoral law for the 19th century and for much of the 20th century. In the drafting of the 1872 ballot act, blind and illiterate voters were expected to instruct the returning officer to mark their ballot paper (Marquess of Hartington, in HC Deb, May 9 1870). This option for instruction remains in place today, but is augmented by accessibility devices added in the late 20th century. In the second significant milestone for accessibility, Postal voting was extended to disabled voters referred to as 'invalids' by the RPA 1948. Although it had been discussed in debates surrounding the RPA 1918 and in the inter-war years, it was not until the recommendation of the 1944 Speaker's Conference that postal voting for disabled voters returned to the reform agenda (Butler, 1967:95).

Voting system accessibility has been expanded since 1983 by a combination of prescriptive electoral legislation and anti-discrimination legislation. Electoral rules which specifically expand accessibility are contained in the RPA 1983, RPA 1985, RPA 2000, the Electoral Administration Act 2006 and the Elections Act 2022. These prescriptive rules encompass reasonable adjustments to polling stations, options for proxy and remote voting, assistance for visually impaired voters, individual voter registration, and consulting disabled voters on the design and placement of polling stations. While accessibility procedures concern every voter, the largest enfranchised group affected by the procedural aspect of accessibility are disabled voters.

There have been three pieces of legislation which broadly deal with anti-discrimination which have had a significant effect UK electoral legislation in the past 30 years: The Disability Discrimination Act 1995, which was superseded by the Equality Act 2010, the Human Rights Act 1998, and the Mental Capacity Act 2005. The Mental Capacity Act 2005 is included here to help contextualise the other anti-discrimination legislation. The Act does not remove any implicit barriers for enfranchised groups, instead Section 29 of the Act overruled the common law presumption of capacity/incapacity to vote. Under the Common Law, the historic labels of idiot or lunatic could be used to prevent individuals from voting (Blackburn 1992:83). Shortly after the Mental Capacity Act 2005, the common law position was expressly abolished by sections 73(1), (2) and (3)of the Electoral Administration Act 2006. This legislation does not contain prescriptive rules for voting, but places broad requirements on returning officers and local authorities to accommodate disabled voters (Electoral Commission, 2017:20).

UK electoral procedures have changed to better accommodate the needs of voters since the RPA 1983. In the last quarter of the 20th century, more concessions were made to the needs

of British voters. Much of this legislation was arguably initiated by the Human Rights Act 1998. Historically, remote and proxy voting measures have been permitted based on need such as in the RPA 1985, but this gave way to universalism with the RPA 2000. Remote voting and proxy voting are now universally available in the UK.

The UK's 350,000 blind or partially sighted voters can choose from a limited combination of voting aids: voting with human assistance, with the assistance of a tactile voting device, with a large print ballot paper as a guide, or with both. There is not yet provision for Braille ballot papers, digital text-to-speech audio, or digital image magnification. However, the Elections Act 2022 amends Section 29 (3)(A) of the RPA 1983 to place a broad requirement on returning officers to make reasonable accommodations for disabled voters, so that they may vote independently.

The amendment also places a duty on the Electoral Commission to provide guidance on reasonable accommodations, but it is ultimately the returning officer's responsibility to determine the reasonable accommodations they will use. The Commission has published its guidance document, listing nine expected accommodations including Tactile voting devices, polling booths at wheelchair level, pencil grips, and wheelchair ramps (Electoral Commission, 2022). Beyond these expected accommodations, returning officers must use their judgement. The lack of specifications and lack of uniformity in the statute amendment means that accommodations provided may differ across the country. While there is funding available from the Department for Levelling Up, Housing and Communities, there is no mention of how much can be spent on reasonable accommodations other than that returning officers must be conscious of cost when purchasing equipment (Electoral Commission, 2022).

Prior to the Elections Act 2022, the law made two provisions for visually impaired voters who wished to vote without human assistance. Section 29 (3)(A) of the RPA 1983 prescribes that the returning officer must provide (a) 'an enlarged hand-held sample copy of the ballot paper', and (b) 'a device of such description as may be prescribed for enabling voters who are blind or partially-sighted to vote without any need for assistance from the presiding officer or any companion'. This device was later specified by reg 12 of the RPA 2001 which stipulates that polling stations must provide a 'tactile voting device' which uses a Braille numbering system. While these measures have been critiqued by disability charities for years, the adequacy of these provisions were only challenged in 2019 in the High Court of Justice's Administrative Court (RNIB, 2015, 2017; Stanford, 2019).

Despite these accommodations, surveys conducted by the Electoral Commission and the Royal National Institute of Blind People (RNIB) show a satisfaction gap between non-disabled voters and registered disabled voters. 72% of disabled voters believed that UK elections were well run compared to 80% of non-disabled voters (Electoral Commission, 2017:11). Only 25% of blind or partially sighted voters surveyed by the RNSIB felt they were able to vote independently, 80% voted with human assistance in the most recent election, and 45% felt they were not able to vote secretly with this assistance (RNIB Campaigns Team, 2017:1).

The Case of *R. (on the application of Andrews) v Minister for the Cabinet Office* [2019] EWHC 1126 is the first judicial review to challenge polling station accessibility provision. The Andrews case is only preceded by Adam Lotun's successful settlement against Kingston Council in 2015 for failing to accommodate wheelchair users, but Lotun's case was not a case of judicial review (Pring, 2017). The complainant, Andrews, is partially sighted and had to seek assistance during the 2015 and 2017 general elections because she could not identify her preferred candidate

using the tactile voting device provided by the polling station. She argued that it was humiliating to be unable to vote independently and in secret.

The court ruled that the tactile voting device, described by reg. 12 of the RPA 2001, was inadequate for the purposes of independent and secret voting. The court's decision pivoted on the definition of 'to vote': Whether 'to vote' is defined as the ability to mark a ballot paper independently, or whether 'to vote' means the ability to place a mark against an identifiable preferred candidate independently. In deciding in favour of the expansive definition of 'to vote', Judge Swift preferred a different view to that of Judge Hickinbottom, who preferred the textual definition, in the case of *R (Kolendowicz) v Proper Officer of the Greater London Authority (CO/1672/2016)*. The use of the expansive definition of voting in the context of disability and voting is significant.

Andrews' application for judicial review did not seek to quash Section 29 of the RPA 1983, but instead sought a declaration that Section 29(3A) was unlawful which was granted by the court. The granting of this declaration does not force the government to quash or amend Section 29, but it increases the likelihood that the law will be changed, either through future judicial review application or through amendments to the legislation.

The applicant's case in *Andrews v Minister for the Cabinet Office* bears close resemblance to the Australian case of *Fittler v New South Wales Electoral Commission* [2008] NSWADT 116.[12] Fittler also argued that he was not able to vote independently, and therefore in secrecy, due to a lack of provision at his polling station. The court agreed with Fittler that his right to vote in secrecy had not been upheld, and the expectation for an unassisted voting solution was placed on the New South Wales Electoral Commission (Taylor, 2016:18,19). The 2008 case is credited

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for the introduction of the iVote RE-voting system in New South Wales in 2011 (Orr, 2016:145). The Andrews case resulted in the trialling of audio devices to assist visually impaired voters during the 2021 local elections, but no changes to the UK Government's position on RE-voting (RNIB, 2021:10,11).

In summary, accessibility procedures have expanded in the past 40 years. Registration qualifications have been broadened by the RPA 1983 and RPA 2000, and measures to better accommodate disabled voters at polling stations and at home were introduced in successive legislation (RPA 1985, RPA 2000, Elections Act 2022). Despite this gradual expansion of accessibility legislation, the laws introduced since 1983 have proven insufficient for the needs of some disabled voters (RNIB 2017, 2021). In this sense, the law is still permissive of groups of disabled voters being denied the ability to fully participate in elections. The broad requirements prescribed by the Elections Act 2022 may usher in a wave of technological innovations to accommodate disabled voters inside the polling station, but this will not be tested until the May 2023 local elections. RE-voting technology would address issues such as compromised secrecy due to assistance and accessing remote polling station, but a solution which involves sequestering voters in their homes may only further isolate disabled voters from civic life. Polling day is recognised as a civic event, and an event which some voters identify as a marker of citizenship (Orr, 2016). More voting from home may not address the issue of isolation from civic life.

2.6 Convenience

UK electoral law changed rapidly during the period 2000-2010 to place a high value on voter convenience and encouraging participation. Legislation now permits universal postal voting and proxy voting, eliminating the need to attend the polling station in-person. This prioritising of convenience is radical in relation to the broader history of UK election law, which, with the exceptions of 1913 and 1969, placed little importance on expanding voter convenience. This movement towards expanded convenience procedures is concordant with the use of RE-voting, a technology which reduces the time required for voting (Solvak and Vassil, 2016).

Convenience in electoral law can be defined as any measure which reduces the effort required to register to vote and to cast a vote. It can be distinguished from accessibility by testing whether an individual would still be able to vote without a convenience measure in place. For example, postal voting is referred to as a 'convenience voting' mode because it can reduce the direct costs of voting such as time and physical effort (Germann and Serdült, 2017).

Expansions of voting convenience may have had little to do with beliefs about the intrinsic value of convenience. The history of convenience reforms suggests motivations of electoral advantage for the Government of the day; extending polling hours in 1969 was considered to be advantageous to the Labour Government since it granted an extra voting-hour to workers who finished their shifts during the evening (Hogg in HC Deb 18 November 1968). Likewise, the extension of the postal and proxy vote to expatriate voters in 1985 was considered to be to the advantage of the Conservative Government, in addition to breaking the constitutional link between constituency residence and Parliamentary representation (Foot in HC Deb 29 January 1985).

Moving into the New Labour era, James' interviews with party insiders suggest that Labour elites believed they would benefit from any increase in turnout created by the universal postal

ballot in 2000 (2012:22). Although the electoral gains from postal voting failed to materialise for Labour, the political explanation for the RPA 2000 is plausible (Denver, 2011:30,31). In another electorally motivated reform, New Labour decreased overseas voters' eligibility period from 20 to 15 years, but did not eliminate the procedure or return the eligibility period to the 1985 level of 5 years (s141, PPERA, 2000). The repeal of the 1949 restriction on the use of for-hire automobiles is an interesting example of a restriction on convenience being removed by the same party which passed the legislation. Though this repeal can be explained by the quintupling of private cars between the 1950s and the 2000s (Department for Transport, 2011). By 2000, car or carriage ownership was no longer the asymmetric tactical issue which it had been during the early and mid-20th century.

The 2010 Coalition Government's reforms made advances to convenience procedures, ensuring queuing voters could still vote after 10pm and introducing an online system for individual electoral registration in Great Britain (Electoral Registration and Administration Act 2013). Registration reform was arguably a continuation of the work started by the 2005 Labour Government – the foundations of the 2013 reforms were laid by the Political Parties and Elections Act 2009. This lends a sense of continuity to this era, despite the change in governments. Across these governments, the net-result of each wave of reforms was greater voter choice and convenience - an unintended 'ratcheting up' of convenience. Voters ended up with more options than they had before.

In a break with the recent past, reforms by the 2019 Conservative government have ceased the expansion of convenience procedures, and have focused on restricting elements of postal voting. Schedule 3 of the Elections Act 2022 removes the option of postal vote enrolment for an indefinite period, enrolment will now expire on the 31st of January three years from the application date.

Legislation which expands the convenience of vote casting and voter registration is relatively new to UK Electoral Law. This development can be understood as part of a broader shift from the 'traditional constitution' of unassailable Parliamentary sovereignty as described by Walter Bagehot (1867) and AV Dicey (1915), to the 'new constitution' where informed citizens expect a greater role in self-government (Bogdanor, 2009). The most relevant constitutional change which Bogdanor describes is the increase in devolved power downwards, but he stops short of claiming that New Labour met the demands of an increasingly individualised population of 'empowered consumers' (Bogdanor, 2009:397). However, On-demand postal votes (2000) and the e-voting pilots instigated by the RPA 2000 demonstrate that the Labour Government attempted to meet the demands of the consumer citizens Bogdanor describes. Driving participation in the voting system is implicit to convenience voting reforms of the 2000s, but driving participation, for its own sake, was not part of the values of the traditional constitution (King, 2009:54,55).

Historically, this lack of interest in increased participation is linked to 19th century beliefs about qualified voting and a suspicion of mass participation. This principle is present in the Hansard record of the Reform Act debates from the 19th and 20th century, as well as from authorities on the traditional Constitution. Both Walter Bagehot and AV Dicey, writing 40 years apart, share a scepticism of mass participation. Bagehot predicted that universal male suffrage would result in an 'unintelligible' Parliament, and that county electors would be manipulated by the 'parson and the squire' (1867:133,134).

Dicey dismisses mass participation by its association with the 'confuted' natural rights philosophies of John Locke and Thomas Paine (1915:lxxix). Despite his opposition to increased participation, he acknowledged the revival of 'The singular superstition embodied in the

maxim vox populi vox Dei' in the early 20th century (1915:lxxix). Universal male suffrage would be introduced three years later in 1918, followed by universal female suffrage in 1928. These reforms created the UK's first 'mass electorate' where much of the adult population were enfranchised. Political parties now had to compete for the votes of this electorate, forcing them to adapt their policy positions or risk defeat. King argues that descriptions of democracy and mass participation as virtues to be further encouraged entered party political discourse in the 1960s and are now mainstream political virtues (2007:250-252).

Whether the vote was a public trust, or a private right, was a significant source of conflict during the Reform Acts of the 19th century, particularly the Secret Ballot Act of 1872. Proponents of voting as a public trust were largely opposed to the secret ballot. The distinction between voting as a public trust and a private right is important since it is often indicative of attitudes towards the effort required for voting, and the personal cost which voting ought to extract. The argument for voting as a private right which one may take or leave appears in the Hansard records and is articulated by Sir Henry Ward, the Whig aligned MP for Sheffield, who rejected the idea that voting was a public trust or duty. Despite heading the government which passed the 1872 Ballot Act, William Gladstone's description of the vote as a public trust, to be exercised out of duty and in consideration of others, remains an exemplar of the argument. Sir Henry's description of the vote as a right to be exercised privately is represented today in UK law by Article 3 of the 1st Protocol of the Human Rights Act (1998) transposed from the ECHR (1952), while Gladstone and JS Mill's trust description holds no legal status. Establishing the vote as a private right in the 20th century has undoubtedly undermined arguments that voting should not be made easy, that it should require 'effort' and 'sacrifice' from the enfranchised.

Though the cost of transportation to the polls has been debated since the 19th century, reform to voting hours are the earliest instances of legislation explicitly considering voter

convenience. There have been two significant changes to voting hours in the past 110 years: the expansion from 12 to 14 hours in 1913 (7pm-9pm) and the further expansion from 14 to 15 hours in 1969 (9pm-10pm). (HL Deb 11 February, 1969. Vol 299). Convenience and 'ease of voting' were directly referenced during the Parliamentary debates for these Bills. The hours of working people were also referenced during these debates. These terms and considerations were novel for Parliamentary discussions of voting, since they do not appear in the Hansard record during the reform debates of the 19th century.

Crossing into the new millennium, legislation which permitted postal voting and E/RE-voting trials was passed during the Labour government's period of electoral modernisation (1997-2010) (Wilks-Heeg, 2009; James, 2010). The expansion during this period has had a significant effect on voter behaviour; a fifth of votes were cast using postal ballots in the 2017 general election (HoC Library, 2017). However, general election participation in the UK decreased during the 2000s and 2010s relative to the participation of the 1990s, 1980s and 1970s. This aggregate decline occurred despite a continued increase in the number of postal voters since 2000 (HoC Library, 2017). Echoing Berinsky's (2005) postal voter research, postal voting does not appear to have added any section of the population who were not able to vote before, instead it has made voting easier for a large section of voters who would have likely voted anyway (HoC Library, 2017).

Despite the Government's experiments with E-voting and RE-voting technologies in the recent past, there is no explicit legal framework to regulate the use of this technology. The RPA 2000 enabled the Government to conduct pilot studies using remote voting technologies (ss10-11 RPA 2000). Lardy notes that the Chair of the Electoral Commission described the purpose of these pilots as making the electoral system more "customer focused" (2003:1). Hazell (2006) considers the RPA 2000 a significant change to the UK Constitution due to the precedent it sets

for the executive to alter the 1872 ballot system, which had remained largely unchanged since its inception.

E-voting and RE-voting trials were conducted during the 2002, 2003, 2004 and 2007 local elections, but no legislation was introduced to cover their use and no subsequent case law considered to review their implementation (Schwartz and Grice, 2012:337). In 2003 and 2007, the UK Electoral Commission recommended a formal legal framework for E/RE-voting systems, and since 2007 the Commission has refused to support any further E/RE-voting trials which lacked a legal framework (Electoral Commission, 2007:10). Its legal recommendations were threefold: the establishment of a legal framework specific to E/RE-voting which addressed security and transparency concerns; a centralised quality control and provisioning service for E/RE-voting mediums; a minimum six-month period between the provisioning of E/RE-voting medium and the intended election (Ibid). These recommendations were first made in 2003 and have not been pursued by any government since the Commission published the report. The lack of activity since 2007 suggests that E/RE-voting technology was not a priority for subsequent governments. The UK's RE-voting trials were spread across the first, second and third Blair Labour governments. A combination of disappointing e-voting trial results, the 2007 change in Labour leadership, and the 2008 financial crash may have removed RE-voting from the UK's political agenda.

The reasons for the hesitation to progress E/RE-voting primary legislation is unclear, though the political dimension offers some indications. King speculates that the global financial crash of 2008 derailed the Brown government's plans for a codified constitution, and the crash may have directed the Government's attention away from the electoral reform agenda (2009:366). The subsequent Coalition and Conservative governments did not pursue any E/RE-voting trials, and in 2018 the Conservative Government formally rejected calls for the introduction of RE-

voting for disabled voters. Citing security concerns, the government declined to adopt the RE-voting proposals made by the charities and organisations who contributed to its call for evidence (UK Cabinet Office, 2018:13). The political will for experimenting with E/RE-voting appears to have declined since 2007, leaving the Electoral Commission's recommendations unfulfilled.

Recent exceptions to this decline are found outside of Westminster, in the devolved Governments of the UK; the Scottish Elections Act 2020 which created enabling legislation for the use of electronic voting systems in Scottish Local Elections is the most significant step towards RE-voting in the UK (s6 Scottish Elections Act 2020). The Welsh Government declared its intention to pilot RE-voting technology in 2018, though no legislation has been passed yet (Sky News, 2018). This openness to experimentation is likely to increase the administrative gap between England and Northern Ireland and the rest of Great Britain.

Meanwhile, between 2000 and 2010 the number of convenience procedures increased. Section 3 of Schedule 4 of the RPA 2000 which permits universal on-demand postal voting is the most relevant legislation relating to increased voting convenience (Wilks-Heeg, 2009:103). The 2000 amendment is significant because it made a convenience voting medium universally available. These convenience reforms may have been part of a political legislative agenda, but they have changed the character of UK elections and they have public acceptance. With one fifth of the voting population using postal votes, the convenience reforms of the 2000s will be challenging for any future government to challenge.

Taken in isolation, reforms permitting a greater choice of voting mediums indicate a prioritising of voter convenience and a more compatible environment for RE-voting technology. However, the reforms of the 2000s have been countered by the recent legislative

shift towards expanded security and secrecy procedures; remaining a postal voter, or voting in the polling station are not as easy as they were pre-2022. The 2019 Conservative Government have retained the reforms of the 2000s, but have superimposed their own security priorities, making voting in-person less convenient than it was before. Whether selflessly motivated or not, the many administrative reforms of the 1997-2010 Labour Government created a more 'customer focused' election system, with the creation of the Electoral Commission and offering the choice between postal, proxy, or in-person voting. This focus on choice and voter engagement was a significant break from the indifference of the traditional constitution to these matters, and, during the mid-2000s, it appeared to offer a route for the introduction of RE-voting.

3. Conclusion

As the UK population becomes increasingly acclimated to online experiences, and voting online in non-governmental elections, government elections risk being procedurally 'left behind'. In this context, the desirability and practicality of using RE-voting in UK elections becomes highly relevant. Are the procedural priorities of UK election law compatible with RE-voting technology?

The procedural priorities of UK election law resemble a 'chimera', an incongruous mix which poses challenges and opportunities for the introduction of RE-voting. This mix is due to the lack of an overarching strategy or long term plan for election law. Successive governments have shaped election law according to their own electoral priorities and in direct response to dysfunctional election events such as rioting (1868), personation (2001), postal vote fraud (2004), and cases of undue influence (2014). The creation of the Electoral Commission (2001) has not changed this parcelled approach, since the commission can only make

recommendations to the Government on electoral administration. This process has been largely additive, with new procedures added by the Government of the day to legislation established by previous Governments, rather completely undoing the work of previous Governments. Relatively recent examples of this are the retention, with modest alterations, of Conservative expatriate voting legislation (1985, 1989) by the 1997 Labour Government, and the retention of universal postal voting (2000) and photo ID verification in Northern Ireland (2003) by the Coalition Government of 2010 and subsequent Conservative Government of 2015. Historic examples of the additive process are the retention of the secret ballot (1872), qualified postal voting for disabled voters (1948), and polling hours extensions (1912, 1969). The shift from household registration to individual registration (2013) is a recent exception to this trend, where a registration option was removed entirely, rather than added to. The 2022 repeal of the Fixed Term Parliaments Act (2011) is another example of election legislation being undone entirely, rather than augmented. This largely additive process has so far leant in the direction of increasing the convenience of some voters, slowly expanding accessibility provisions for disabled voters, while also raising barriers to participation through enhanced security measures.

At this point in time, a combination of election procedures exist in tension with one another, with ideologically conflicting procedures existing concurrently. Convenience reforms permitting voting from private spaces are concordant with the use of RE-voting, as are reforms which place a duty on presiding officers to accommodate voters with disabilities. Recent reforms which at first appear irrelevant to accommodating RE-voting, such as the introduction of photo ID verification, may contribute towards normalising the use of ID cards, which would in turn make administering RE-voting an easier task. However, in their current state, photo ID reforms only demonstrate the Government's willingness to increase the barriers to voting, though postal voters are excepted from this as their application does not require photo ID.

The remaining areas of RE-voting incompatibility are occupied by transparency procedures; the tradition of inviting the media, certain members of the public, candidates and agents to the election count was expanded in 2006 to accommodate accredited observers. This relatively recent introduction emphasises the importance of election transparency, and public participation in that transparency. This same procedure is extremely challenging to implement using a black-box RE-voting system, as demonstrated by the 2007 electronic counting trials (Kitcat and Brown, 2008). This is the nub of the election law 'chimera'; expansions of convenience and accessibility procedures clash with security and transparency procedures, pulling in different normative directions. When these election procedures are collected together, the tension between the law's priorities becomes apparent.

Taking a view of recent history, the priorities of election administration have swung back and forth; first towards greater participation and then against greater participation. The election law changes of the 1997-2010 Labour Governments shifted the UK's constitution closer towards a principle of encouraging mass participation in elections. This principle is compatible with the voting convenience offered by RE-voting technology. The Equality Act (2010) opened up election procedures to judicial review, as evidenced by the Andrews Case (2019), creating the potential for further advances for RE-voting under accessibility procedures. However, the recent expansion of security legislation indicates a reversal of the trend of the 2000s of lowering the barriers to voting outside of Northern Ireland. Transparency is also a key part of this argument; the high levels of transparency permitted by law for both the polling station and the election count cannot easily be replicated by a RE-voting system. This transparency or 'publicness' problem poses a greater problem for RE-voting than the recreation of any secrecy or security procedure, as it concerns public trust in the process. Despite the potential for human error, the current election count is a transparent and reliable process: counting

mistakes can be observed and corrected, and observers can be satisfied first-hand that the count was conducted correctly. This transparency, combined with the 2022 shift towards increasing the barriers to voting present a high bar for the use RE-voting technology despite its frequent use in non-governmental elections.

Chapter 3, Virtue, Integrity and Usefulness: A Theoretical Framework for Attitudes to Online Voting

1. Introduction

Since the majority of the UK population are now active internet users, why has voting not yet moved into the online theatre? The 2002-2007 RE-voting trials had disappointing results, but these trials began when only 49% of UK households had an internet connection (Norris, 2003; European Commission, 2002). Online banking and shopping were still novel activities for the majority of the population. However, online activity has changed significantly over the past 20 years.

The online milieu of the 2020s could not be more different from the early 2000s. In 2020 92% of adults had some experience of using the internet and 96% of households were connected to the internet (ONS, 2021). Internet based commerce, communication, and entertainment are no longer novelties. Instead, these technologies are now an everyday part of life in the UK. Familiarity with email and web browsers, a basic requirement for internet voting, is at an all-time high with 85% and 81% of adults reporting using these applications (ONS, 2021). These changes indicate that the UK's infrastructure and culture can now accommodate online voting. However, outside of think tanks and disability rights groups, there is little call for online voting.

So, what are the psychological barriers to introducing RE-voting in UK elections, and how might experience of these technologies undermine or reinforce these barriers? This theoretical framework examines young people's beliefs about RE-voting and whether their experiences of RE-voting affect their support for use of the technology in national elections. The framework

focuses on RE-voting as practiced in small scale, low-risk elections such as SU and course representative elections since 1.6 million 18-24 year olds have the opportunity to participate in these each year (HESA, 2019). The framework's aims are to establish (i) student beliefs about voting and RE-voting systems, (ii) the motives for individual support or rejection of RE-voting technology, and (iii) whether experience of RE-voting in SU elections affects support for the extension of RE-voting to national elections where the risks of technology failure are much greater. This chapter provides a theoretical framework to underpin the study's survey and interview design, establishing the study's variables, their expected causal directions, and the overarching themes of the study.

The framework is derived from Fishbein and Ajzen's theory of reasoned action (1975, 1980, 2010), and uses elements of Davis's technology adoption model (1985, 1989), which is also derived from the theory of reasoned action. Student support for RE-voting and the extension of RE-voting to national elections is likely to be influenced by a combination of pre-existing normative beliefs about voting and technology, and beliefs about the voting technology formed from either direct experience of RE-voting technology in student elections or indirectly from information about RE-voting (Davis, 1985; Fishbein and Ajzen, 2010).

These beliefs can be differentiated into three broad categories: (i) virtue of voting beliefs, (ii) integrity of voting beliefs, and (iii) beliefs about the usefulness and convenience of RE-voting. It is anticipated that these beliefs determine attitudes towards the use of RE-voting technology in national elections. Virtue and integrity beliefs are likely to pre-date the experience of online voting and be largely normative, though they may be affected by experience of RE-voting, while beliefs about the usefulness of RE-voting are expected to be influenced by direct experience of the technology.

Section two of this chapter examines theories of attitude formation and the effect of experience in relation to the dependent variable: support for RE-voting in national elections. The affective, behavioural and cognitive explanations of experience and attitude formation are explored in order to contextualise the cognitive approach of this theoretical framework.

Sections three and four of this chapter examine belief clusters which pose a significant barrier to the adoption of RE-voting: the virtue of voting and the integrity of voting. Virtue of voting beliefs concern normative beliefs about what voting should involve and the level of commitment required by an individual, while integrity of voting beliefs are more pragmatic in scope. They concern the security, transparency and accountability of RE-voting systems. Trust in technology is a theme which runs through integrity studies (Shamos, 2004; Dill, 2008; Springall, 2014).

The fifth section is concerned with beliefs about the usefulness and convenience of RE-voting technology. These are the beliefs which 'pull' people towards RE-voting. This section is grounded in Davis' Technology Acceptance Model (TAM) (1985). Beliefs about usefulness, ease of use, and the perceived cost of RE-voting are expected to strongly influence support for the extension of RE-voting general elections. Beliefs formed through direct experience are anticipated to be key determinants of support for extension (Fazio and Zanna, 1978; Fishbein and Ajzen, 2010). Users with positive experiences of SU RE-voting are expected to be more supportive of extension, while users who have experienced SU voting system errors such as crashes, failure to register votes, or denial of service, are expected to show reduced support for the extension of RE-voting.

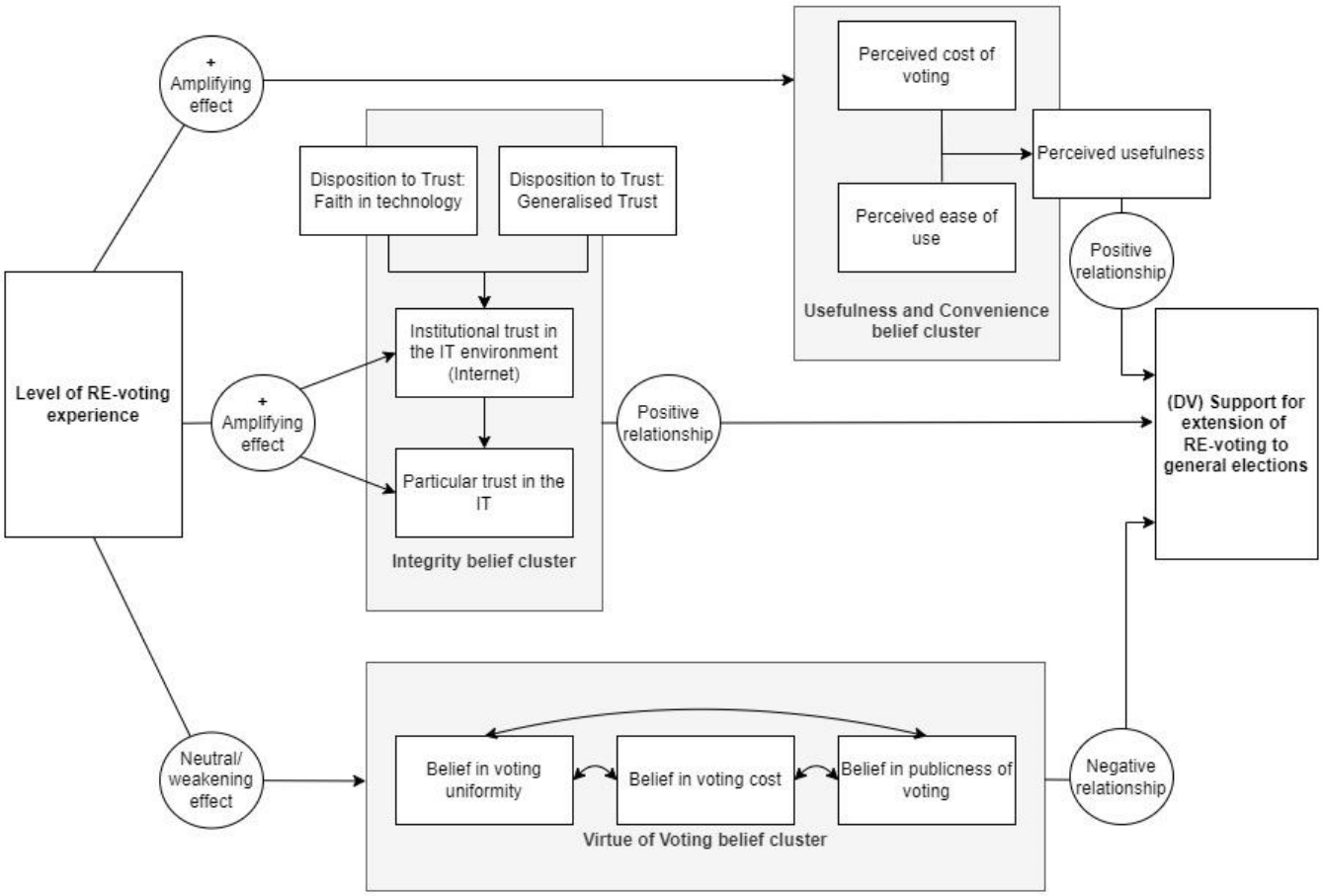
The three belief clusters constitute the three elements of this project's model. This model is expected to provide a parsimonious explanation for student support or rejection of the

extension of RE-voting to national elections. Figure 3.1 maps the expected relationships between the independent variables and the dependent variable, support for the extension of RE-voting to national elections. Each of the three conceptual areas contain three variables which are expected to have a causal effect on the dependent variable, either by reducing support or increasing support.

Some variables are expected to have a causal effect on other variables within their conceptual areas. For example, each layer of trust is expected to have a positive causal relationship with the subsequent layer (Disposition to trust technology→Institutional trust in the IT environment→Particular trust in the IT). Additional to this internal relationship, they are expected to have a positive relationship to the dependent variable (Mcknight et al, 2015). Virtue of voting constructs do not have any predictable internal relationship to one another, and there is no empirical work to point to a structure. Their relationship to one another is an unknown quantity.

Perceived usefulness and perceived ease of use are expected to have a positive unidirectional relationship, where perceived ease of use improves an individual's perception of RE-voting's usefulness (Davis, 1989; Gefen and Straub, 2000). Perceived cost of voting is expected to have a positive unidirectional relationship with perceived usefulness as well as an independent positive unidirectional relationship with the dependent variable.

Figure 3.1, Relationship map, experience, beliefs, and attitude to RE-voting in national elections



2. Attitude formation and the dependent variable

Attitude towards the use of RE-voting in national elections is the dependent variable of this study. Understanding the components of this attitude, and whether direct experience of RE-voting in low-risk elections has an influence on attitude towards RE-voting in national elections, is a key aim of this project. Experience with RE-voting technology was anticipated to be important moderator variable due to the volume of evidence for direct experience's effects on belief formation and the strengthening of beliefs, relative to non-behavioural forms of

belief formation such as informational effects (Fazio and Zanna, 1978, 1981; Wright and Lynch, 1995; Dishaw and Strong, 1998; Fishbein and Ajzen, 2010; Eriksson, Sandström, Ericsson, 2015).

While there is consensus that attitudes can be defined as positive or negative evaluations of an object, such as a voting system, the structure of attitudes are the subject of multiple models (Thurstone, 1928; Likert, 1932; Rokeach, 1968; Fazio et al, 1983; Eagly and Chaiken, 1992; Krosnick and Petty, 1995; Fishbein and Ajzen, 1975, 1980, 2010). Allport's (1935) early proposition that attitude is multi-dimensional, and so requires different measurement approaches, has been elaborated upon by eighty years' worth of attitude formation studies (Zajonc, 1968; Bem, 1972; Eagly and Chaiken, 1993; Fishbein and Ajzen, 1975, 1980, 2010). These studies provide evidence for a multi-component view of attitude formation, with affective, behavioural and cognitive components (Eagly and Chaiken, 1993:14-16; Haddock and Maio, 2018:114-117). This view can be distinguished from Rosenberg and Hovland's multi-component 'output' model of attitudes (1960) by its focus on the influence of the three components on attitudes, rather than using the components to identify the manifestations of attitude (Eagly and Chaiken, 1992:16). This study focuses on the cognitive components of attitude formation, but the contributions of affective and behavioural studies are included to contextualise and evaluate the cognitive perspective.

Affective components of attitude formation include emotional and subliminal responses to objects which the individual may find difficult to express or knowingly access (Zajonc, 1968). Similarly, behavioural components of attitude formation may also be difficult for individuals to knowingly access and describe. Behavioural components refer to the influence of previous behaviours on the formation of attitudes; when prompted to express an attitude, past behaviour influences evaluations (Bem, 1972:9). This study references some behavioural

elements, but concentrates on the cognitive components of attitude. This is because cognitive components occur at a conscious level and are therefore able to be expressed by participants (Fishbein and Ajzen, 2010). They are assessed using explicit measures which participants knowingly engage with, such as giving a numeric score on a Likert scale.

Attitudes as understood cognitively exist in networks. There is evidence for the inter-relationship between values, beliefs and attitudes (Rokeach, 1973; Eagly and Chaiken, 1992:132). An individual's values offer a guide for congruent behaviour, such as behaving in a conscientious, moral, or imaginative way (Rokeach, 1973). Values may not reliably predict attitudes as an individual may have multiple competing values in any given evaluation-scenario, but values offer the individual a guide for how to evaluate an attitude object (Rokeach, 1973). Beliefs and knowledge about the attitude object are independent of these values and form another attitude component. This project adopts Fishbein and Ajzen's (2010) three level framework of salient beliefs, attitudes, and behaviour, since it is both parsimonious and has been tested in cognitive experiments for more than forty years (Eagly and Chaiken, 1992:103; Fishbein and Ajzen, 2010;xvii).

2.1 Experience and attitude formation

The effect of direct experience on attitude formation is tentatively established (Watts, 1967; Zajonc, 1968; Fazio and Zanna, 1978; Fazio and Zanna, 1981). The influence of direct experience has been explored at the sub-cognitive level, where participants are not conscious of experiencing stimuli, as well as at the level of behavioural and cognitive responses where experience stimuli are often consciously acknowledged by research participants. Participants exposed to neutral stimuli, such as a set of nonsense words, display a preference towards the stimuli when encountering it in future (Zajonc, 1968). Individuals with direct experience of a product are more likely to buy that product than individuals exposed to product advertising

(Smith and Swinyard, 1986:265). Individuals with direct experience of an event display a greater consistency between their attitudes towards the event and their behaviour, such as signing a petition or writing to an authority, than individuals without experience who hold similar attitudes (Fazio and Regan, 1977:41,42). Explanations for the influence of direct experience on attitude formation are offered by subconscious, behavioural and cognitive stimulus studies.

The subconscious influence of direct experience was proposed by Robert Zajonc's exposure studies (1968) and later linked with the study of processing fluency (Bornstein and D'Agostino, 1992). Both theories can be summarised by the following: repetition leads to increased fluency which drives preferences. Zajonc's exposure experiments demonstrated that repeated direct exposure to a stimulus increases the attractiveness, or positive valence, of that stimulus (Zajonc, 1968, 2001). Zajonc's experiments echoed B.F Skinner's operant conditioning studies, though without the inclusion of a positive/negative reinforcement. 'Mere repeated exposure' was sufficient to increase attractiveness of a set of male faces without the need for positive conditioning (Zajonc, 2001:225). Because the effect occurs at an affective, subliminal level, it is not possible for participants to self-report the process (Zajonc, 1968). The exposure effect has competing explanations, but the most frequently cited explanation for the effect is Jacoby and Whitehouse's theory of processing fluency (Moreland and Topolinksi, 2010:334).

Processing fluency describes the subconscious fluency which arises from repeatedly engaging in an activity. This fluency, or proficiency, then drives preference for that activity (Jacoby and Whitehouse, 1989; Bornstein and D'Agostino, 1992). This psychological heuristic concisely explains why people prefer activities which they are fluent, or proficient at, over activities which they have little fluency. In the context of RE-voting system experience, unconscious

processing fluency could explain a participant's repeated use of a voting platform after gaining experience with that system.

Past behaviour has also been proposed as an explanation for attitude reinforcement. Cognitive dissonance theory and self-perception theory are the foremost explanations for the influence of past behaviour on attitude formation (Festinger, 1957; Bem, 1972; Eagly and Chaiken, 1993; Cooper, 2007). Cognitive dissonance stresses the human drive to maintain consistency between behaviour and attitudes, while self-perception theory stresses the role of previous behaviour as a heuristic for expressing attitudes when questioned (Festinger, 1957; Bem, 1972). Both theories can be applied to explain the role of direct experience in the formation of attitudes towards online voting in national elections.

Cognitive dissonance theory was developed to explain the effectiveness of role-play for challenging participant attitudes (Festinger, 1957:112). Participants of a persuasive role-play task were more likely to report changes in their attitudes than participants who silently read the same persuasive arguments, or who read the arguments out loud (Festinger, 1957:108). This simple finding underlines the power of dissonance reduction; individuals engaged in role-play were more likely to experience a dissonance between their own attitudes and the attitudes required for the role-play, and so were motivated to adapt their previously held attitudes to reduce this dissonance. This change in attitude was strongest amongst participants who felt they had done a convincing job in the role-play task.

While bearing similarities to cognitive dissonance theory, self-perception theory differs by its omission of cognitive processes. With a focus on observable behaviour, Bem's analysis of cognitive dissonance experiments found that individuals' prior experience of stimuli were often used to inform their attitudes towards those stimuli, especially when the attitude may

have been weak or partially formed (Bem, 1972:8,9). This can be regarded as a heuristic process, similar to Fazio and Zanna's description of the links between experience and attitude accessibility. When attitudes are vague, individuals will rely on external cues such as past experiences to form attitudes when prompted by an interviewer (Bem, 1972:5).

An early cognitive dissonance experiment was interpreted as evidence for self-perception theory; individuals who participated in a monotonous task turning pegs and who received a small remuneration ($1) for the task were more likely to positively evaluate the task, relative to participants who were generously compensated for their time with $20 (Festinger and Carlsmith, 1959:207). Both groups were instructed to describe the peg task persuasively to a confederate before receiving their compensation. Bem interpreted the gap between groups as evidence of a difference in personal attributions of motivation. Just as an observing third party would attribute participants' behaviour to internal or external motivators, individuals did the same when evaluating their own behaviour (Bem, 1972:8,9; Malle, 2011).

The perspective of the third-person observer is significant for self-perception theory's explanation of behaviour. Individuals' self-examination of their motivations occurs in the same manner as a third party observer would (Bem, 1967:7). This approach to perspective is rooted in the behaviourism of B.F. Skinner, which excluded unobservable processes from examination. Bem's interpretation of Festinger and Carlsmith's experiment proposed that well compensated individuals were more likely to ignore their behaviour and instead focus on the financial incentive as their motivation for completing the task; they based their evaluation of the task on an external motivator, $20, which resulted in a lower-level of reported satisfaction with the task. Individuals in the lowly compensated group focused on their behaviour as a guide to evaluate the task, rather than the small compensation they received. They had completed a monotonous task for a small amount of money, and therefore they felt there must have been

something satisfying about the task (Bem, 1972:7). Past behaviour influences the expression of attitudes when attitudes towards the object are poorly formed.

Support for RE-voting in national elections could be explained by a desire to maintain consistency between experience of voting online and non-critical attitudes towards the technology. Similarly, self-perception theory could explain support for RE-voting as a manifestation of previous experience of RE-voting, especially amongst individuals who had not given RE-voting much consideration before they were surveyed.

Cognitive models have attempted to explain the influence of direct experience on attitude formation through enhanced knowledge of the attitude object (Fazio and Zanna, 1978;1981), attitude stability (Fishbein and Ajzen, 1980), and memory and accessibility of attitudes (Fazio, Powell and Herr, 1983). Unlike the behaviourism of self-perception theory, cognitive models attempt to measure internal psychological processes such as attitude strength and memory formation.

These explanations are underpinned by the belief that direct experience imparts more information about the attitude object than indirect experience and that this information is retained for longer. For measurement, these models rely on the concept of 'attitude strength' to assess the effects of direct experience (Raden, 1985; Eagly and Chaiken, 1993). Evidence from 40 years of experiments shows a weak to moderate correlation between direct experience and attitude strength, though the indicators of attitude strength are not consistent across experiments (Fishbein and Ajzen, 2010).

Russell Fazio's experiments into 'attitude accessibility' provide the foremost explanation of the link between experience and attitude strength (Fazio et al, 1982; Fazio, Powell and Herr, 1983;

Fazio et al, 1986). Accessibility in this context describes the speed at which beliefs relating to the attitude-object can be recalled and used to make an evaluation. The speed of accessibility is dependent upon memories of the object, and direct-experience, rather than secondary information is more likely to result in strong memories which are more easily recalled (Fazio et al, 1982:343,344). Fazio proposes that past behaviour can guide attitudes in an automatic manner, bypassing internal deliberation and shortcutting to an evaluation (Ibid). If the individual has engaged in the behaviour in the past, they are more likely to provide a confident and positive evaluation of it. This echoes the behaviour-led attitude formation of self-perception theory (Bem, 1972). Past behaviour drives the evaluations of an attitude object in an automatic manner.

In summary, cognitive experiments suggest that direct experience of an attitude object results in fewer ambivalent attitudes and greater consistency between attitudes and behaviour (Fazio and Regan, 1977; Fazio and Zanna, 1978, 1981; Fazio et al, 1982; Fazio, Powell and Herr, 1983; Sherman and Fazio, 1983; Fazio et al, 1986). Higher quality information about the attitude-object was originally used to explain this effect, but later studies linked direct experience to memory and specifically the faster recall of attitudes (Fazio et al, 1982; Fazio, Powell and Herr, 1983) Memories of the attitude object are stronger when formed through direct experience, which leads to attitudes which are quickly accessed when prompted (Fazio et al, 1983). In contrast to this, indirect knowledge of an attitude object results in weaker memory formation, and less readily accessible attitudes (Fazio, Powell and Herr, 1983). In light of this, individuals with no RE-voting experience will be more likely to respond with ambivalence to the use of RE-voting in national elections. Individuals with a positive experience will be more likely to respond positively and with greater confidence to the topic of RE-voting in national elections.

Experience Hypothesis H1: Individuals with RE-voting experience will be more likely to support the extension of RE-voting to general elections than respondents with no experience of RE-voting.

2.2 Beliefs as a component of attitude towards RE-voting in national elections

Fishbein and Ajzens's Theory of Reasoned Action (TRA) provides a widely tested schema for explaining the interaction of beliefs, attitude formation and behaviour (1975, 1980, 2010). Within the model, attitude is defined as 'a latent disposition or tendency to respond with some degree of favourableness or unfavourableness to a psychological object' (Fishbein and Ajzen, 2010:76). The attitude object referred to can be 'any discriminable aspect of an individual's world, including a behaviour' (Fishbein and Ajzen, 2010:76). Attitudes can be identified by their focus on evaluation; for example, whether the internet is more or less beneficial for society, and therefore meriting of behaviour in support of it such as signing a petition. Beliefs are the more granular aspects of the object being evaluated, such as whether RE-voting takes very little time, or whether it makes voting too easy, too difficult, or too insecure. These beliefs and their adjectives are described as the 'attributes' of the evaluation object, which in this case is a RE-voting system (Fishbein and Ajzen, 2010:97). It is the aggregate strength of beliefs about an attitude-object which influences the direction of the evaluation (Fishbein and Ajzen, 2010:96,97). The hierarchical relationship of belief, attitude and behaviour is summarised below:

1) Beliefs relating to the object: 'Online voting is secure'/'Online voting is too easy'/'Online voting is too difficult'.

2) Attitude as an evaluation of the object. Positive/negative evaluation of an object such as online voting in national elections: 'All elections should be held online'

3) Intention or Behaviour resulting from the attitude: Voting for online voting in a referendum, or writing to an MP to demand online voting be introduced.

Typologies of beliefs which contribute to attitude formation abound in the social psychology literature, but the distinction between beliefs formed from direct experience and beliefs formed from secondary information is a constant feature of the literature (Rokeach, 1968; Zajonc, 1968, 2001; Fazio and Zanna, 1978; Fazio et al, 1983; Fishbein and Ajzen, 2010). This binary distinction is expanded by Fishbein and Ajzen who identify three categories of beliefs responsible for attitude formation: direct observational beliefs, informational beliefs and inferential beliefs (Fishbein and Ajzen, 2010:221-224). These three belief categories are significant for explaining the effect of experience on participants' attitudes towards using RE-voting technology and its deployment in national elections.

From direct involvement, a positive experience will likely result in strong positive beliefs about the technology, while a negative experience will result in strong negative beliefs (Fishbein and Ajzen, 2010:222). During the voting experience a slew of other beliefs about RE-voting may be generated: the individual may find the interface very easy to use (control beliefs); they may have witnessed their friends voting online earlier in the week and been encouraged by them (descriptive normative beliefs); and they may miss the social element of elections when they vote online alone (behavioural beliefs) (Fishbein and Ajzen, 2010:221-223). Of these belief subcategories, control beliefs are the most relevant to RE-voting, followed by descriptive normative beliefs. Control beliefs are significant in this context because developing competence with a technology is crucial for its adoption (Davis, 1985:25,26).

The act of voting itself is subject to descriptive normative beliefs which compel people to vote (Faucher, Hay and Throssel, 2015; Orr, 2016). Voting has become a mark of citizenship and to participate or withdraw one’s vote is subject to group-dependent normative pressures (Campbell et al, 1960; Blais, 2000). The way in which we vote is also subject to normative

beliefs, and these beliefs are likely to influence support for RE-voting in national elections. These normative beliefs about how voting ought to be conducted are referred to as 'virtue of voting' or 'virtue' beliefs and are explored in section three of this chapter.

Beliefs formed from secondary information or inference are acknowledged to be less stable and more prone to being overwritten than beliefs formed through direct experience (Fazio and Zanna, 1981:184,185; Fazio et al, 1983: 731,732). Despite this fragility, both informational and inferential beliefs act as weak guides in the absence of direct experience. Information on electronic voting ranges from proselytising sales pitches to technical examinations of system security, and everything in between (Smartmatic, 2019; Rubin, 2006). RE-voting is not necessarily a polarising technology, but its status as a voting medium is not uncontested (Springall et al, 2014; Verified Voting, 2019). Because of this status, it may be difficult to form stable informational beliefs about the technology in the absence of direct experience. In comparison, individuals with RE-voting experience will be more likely to hold stable beliefs about the usefulness and integrity of RE-voting as used in contexts beyond their original experience. This direct-experience effect bears strong similarities to a heuristic, a low-effort shortcut for assessing the trustworthiness or credibility of an attitude-object (Eagly and Chaiken, 1993:317; Bohner, Erb and Siebler in Crano and Prislin, 2008:167).

3. Virtue of voting beliefs

'Virtue of voting' beliefs constitute the largest cluster of symbolic/ritualistic beliefs concerning voting and voting technology. The theorists referenced in this section are not uniformly opposed to advanced voting technologies such as RE-voting. Instead, they ascribe importance to certain aspects of voting such as committing time to the act, engaging in a collective activity in a public space, and witnessing others in one's community. These aspects of voting are

knowingly or unknowingly transformed by the use of remote electronic voting technology: the costs of voting are greatly reduced by voting over the internet; election day ceases to be a uniform event as in the case of Estonian online elections; when voting online at home, voting no longer occurs in public space in view of one's community. The potential erosion of these 'virtues' of voting creates a tension between their proponents and RE-voting technology.

The ability of new media to transform human culture has been recorded since 370 BCE, with Socrates' story of King Thamous' comparison between oral cultures and literate cultures (2002: 68,69). Mcluhan (1994), Postman (1985, 1993), and Carr (2011) have followed the line of inquiry established by Socrates' tale, examining how changes in technology create new forms of media, which trigger changes in culture, which ultimately changes how individuals perceive the world. Postman's description of the 'Technopoly', a society where human progress becomes synonymous with technological efficiency at the expense of traditional values, best summarises the clash between traditional 'voting virtues' and the speed and efficiency of RE-voting technology (1993). Just as the introduction of the ballot box in Britain quietened rowdy elections and sobered the rambunctious political culture of 1870s UK, the introduction of RE-voting in the 21st century UK would have consequences for the election ritual and the UK's political culture (Crook and Crook, 2007).

Contemporary critics of RE-voting inherit many of their arguments from the 20th century debates over television and democracy. Television granted politicians the ability to communicate directly with the public, bypassing traditional intermediaries, and in some instances to receive instant audience feedback (Grossman, 1996:15-17). These communication and feedback abilities were further enhanced by the arrival of mobile devices and social media platforms in the 21st century.

With the potential to transform the individual's experience of election day and the personal meaning of the day itself, Marshall McLuhan's adage 'the medium is the message' is as relevant to RE-voting technology as it was to 1960s network television (1994:7-9). Voting remotely via an electronic terminal comports with McLuhan's description of the 20th century as the 'electric age', where the telephone and television act as extensions of the human senses - eliminating the obstacles of time and distance which previous mediums of communication had to contend with (1994:5). In the same fashion, RE-voting technology is an extension of the citizen's decision making power, allowing them to cast their vote without the typical barriers to the polling station such as long queues or bad weather. The effects of RE-voting on political culture are unknown, having gone without investigation in Estonia, Switzerland or New South Wales, but following McLuhan's argument that each new medium changes behaviour there is likely to be an effect on political culture (1994:20).

The virtue of voting cluster is split into three areas for this analysis: (i) a belief that voting should carry a cost (Buchstein, 2004), (ii) a belief that voting should be uniform (Orr, 2014, 2016), and (iii) a belief that voting should be conducted in a public space and that 'publicness' is an important aspect of voting (Barber, 1984; Buchstein, 2004).

Concerned with the quality of voting and preventing 'thoughtless' voting[13] from occurring, virtue of voting beliefs are concerned with (i) reducing the amount of time it takes to vote, inferring a relationship between quality of voting and time taken to vote or cost of voting to the individual (Barber, 1984; Buchstein, 2004), (ii) making voting a non-uniform experience which may be spread out over a number of days where people are not able to experience a discrete 'polling day', and (iii) moving voting from a public space to a private space, 'privatising' the experience of voting (Barber, 1984; Buchstein, 2004).

[13] Also referred to as 'Junk Votes' (Buchstein, 2004).

In summary, proponents of virtue of voting beliefs believe that voters have a duty to participate in elections and that traditional polling methods have a virtue which is undermined by convenient voting modes such as RE-voting and postal voting. Increasing the convenience of voting damages the public ritual of voting by privatising the voting process, while also weakening the significance of the voting decision by making it too hasty. For Buchstein, The worst case scenario of RE-voting's introduction is the transformation of established representative democracy into government by a series of internet enabled plebiscites (2004:54).

It is anticipated that experience with RE-voting will have a neutral or weakening effect on the virtue of voting belief cluster. There is a cognitive dissonance argument to be made for a weakening effect; participants who hold virtue beliefs and vote in low-salience online elections are engaging in a counter-attitudinal behaviour. Counter-attitudinal behaviours such as engaging in a role-play exercise which challenges existing beliefs are identified as the most common trigger for cognitive dissonance, the unpleasant state of holding two conflicting beliefs simultaneously (Festinger, 1957; Festinger and Carlsmith, 1959; Greenwald and Ronis, 1978; Cooper, 2007; Harmon-Jones, 2019).

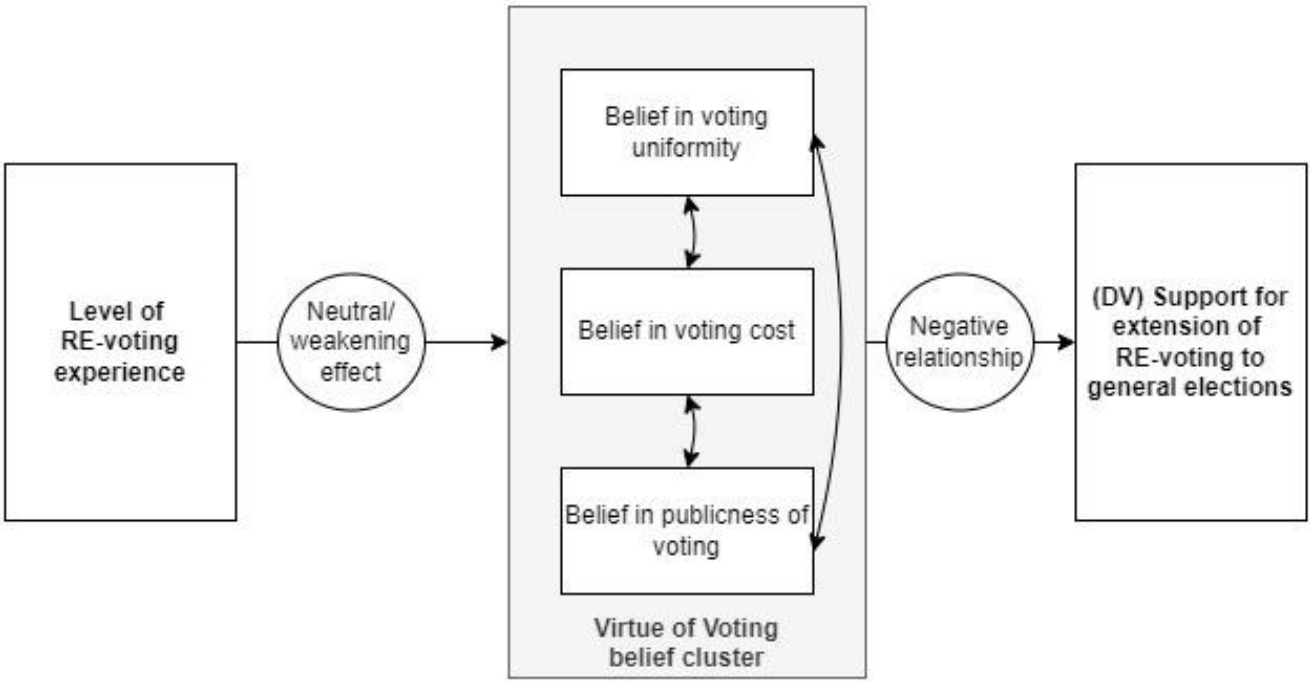
The effect of any belief-dissonance is anticipated to be small due to the lack of 'aversive consequences' for holding conflicting beliefs relating to voting and technology (Cooper and Fazio, 1984: 232-236; Cooper, 2007:74,75). In this study, participants are not accountable for their responses. They will not have to justify, or revisit their answers and so are free from any aversive consequences of any possible conflicts between the beliefs they espouse. Because of this, any unpleasant feelings aroused by holding dissonant beliefs about the different aspects of RE-voting are unlikely to cause participants to alter their view on RE-voting in national

elections. It is more likely that RE-voting experience will accentuate the integrity and usefulness of belief clusters.

However, there is evidence for the attitude-changing effects of cognitive dissonance in scenarios without aversive consequences (Harmon-Jones et al, 1996; Harmon-Jones, 2019). In aversive consequence-free experiments, changes in beliefs due to dissonance are explained solely by the desire to maintain a congruent worldview and a congruent self-concept (Harmon-Jones et al, 1996:14-15). These findings recall Leon Festinger's original explanation of dissonance; inconsistency of worldview is unpleasant and arousing in itself (1957). Any weakening of virtue beliefs alongside a positive RE-voting experience may be explained by this theory. See figure 3.2 for a map of the anticipated relationships between experience, the virtue belief cluster, and support for RE-voting in national elections.

Experience Hypothesis H1.1: Individuals with RE-voting experience will hold weaker virtue of voting beliefs than participants with no experience..

Figure 3.2, Virtue of Voting beliefs map



3.1 Belief in Voting Cost (BVC) (IV)

Belief in voting cost (BVC) is a normative view which the author associates with the work of Barber (1984), Buchstein (2004) and Orr (2015). It describes the belief that voting should not be cost free, and that it should involve some level of sacrifice where the individual must expend effort, and time, to vote. It is well established that the direct costs of voting are minimal (Niemi, 1976; Blais, 2000; Berinsky, 2005; Giammo and Brox, 2010). Arguments about voting cost begin from a position of acknowledging that the cost of voting is already minimal, and that anyone who wishes to vote ought to commit to paying this minimal cost.

Elections serve as a 'census of the interested'. Those interested enough to walk to the polling station are registering a minimum level of interest in democracy and making the minimal commitment to do so (Buchstein, 2004:55). RE-voting mediums like Estonia's iVote allow users to vote within fewer than five minutes from the comfort of their own home (Solvak and Vassil, 2016). The low time and effort costs of RE-voting remove the barriers of registering for a postal

vote or taking the trip to the polling station. For proponents of traditional democracy, this new level of access makes it easier for individuals to 'junk vote', to vote without giving any thought or debate to the issue at hand (Buchstein, 2004:55). This perspective emphasises the quality of voting rather than the quantity of voting measured by studies of voter turnout.

Voting cost can be measured by the time, finance and energy costs an individual incurs to access the ballot. These costs can be broken into two categories: direct costs and information/decision costs (Blais, 2000; Goerres and Rabuza, 2014:3). Individuals who are interested in politics will have an intrinsic motivation to vote in most elections. For individuals who score highly for indicators of duty, the costs of voting are outweighed by the expressive benefits of performing their civic duty (Riker and Ordeshook, 1968:37). The perception of voting as a costly task is also entirely absent in individuals who score highly for duty indicators (Riker and Ordeshook, 1968; Blais and Young, 1999). However, for individuals who are not interested in politics and who have little interest in civic duty the direct costs of voting act as a small disincentive to not vote (Blais, 2019). This is best illustrated by considering what the individual could have done otherwise with their time, money and mental energy. Instead of walking to the polling station, they could have visited a loved one, or stayed at home to watch Netflix. Their travel money could have been saved, and their mental energies could have been spent elsewhere, rather than on deciding which candidate to vote for.

Changing the mode of voting can marginally reduce the costs involved in voting. Postal voting extracts fewer costs than attending the polling station does, and, for technologically savvy voters, RE-voting extracts fewer costs than postal voting (Solvak and Vassil, 2016:77,91). RE-voting changes this direct cost calculation as it removes the majority of time and effort from the voting process, leaving only the information/decision cost of deciding who to vote for. As votes becomes relatively ‘costless’, does this lessen the significance of the individual’s decision

to vote? (Buchstein, 2004:55). It is worth investigating whether this belief is prevalent in the student population, and whether it affects support for the extension of RE-voting to national elections.

Individuals who score highly for beliefs about voting duty are expected to believe that voting should have a cost. This is because of the association between duty citizenship beliefs and support for tradition and ritual (Dalton, 2008). Support for belief in voting cost is expected to be negatively related to support for RE-voting extension and RE-voting in general.

Belief Hypothesis H2: Support for the belief that voting should carry a cost will be negatively related to support for the extension of RE-voting to national elections.

3.2 Belief in Voting Uniformity (BVU) (IV)

Belief in voting uniformity (BVU) emphasises an intrinsic value in the equality of the voting experience. The ritual and symbolic importance of a uniform polling day is stressed by Lukes (1975) and Orr (2016). Uniform polling days contribute to the 'symbolic bonding of the polity' where citizens are reminded of their individual democratic responsibility and their communal responsibility for selecting a government with their peers (Orr, 2016:4).

Convenience forms of voting such as postal voting or RE-voting represent a challenge to the 20th century tradition of uniform polling days, as voting becomes diffused over weeks or months (Walia and Kumar, 2011; Solvak and Vassil, 2016). In the RE-voting polity of Estonia, it is possible for voters to repeatedly update their voting preference during the polling period; voting decisions remain 'editable' until the time that physical polls close, allowing for the possibility of voters changing their minds and updating their candidate/party choice in person (Alvarez et al, 2009:500). This transforms voting from a discrete day into a 168 hour event,

offering a greater choice of times during which a busy voter can cast their electronic ballot (Ibid). In comparison, physical UK polling stations operate a 15 hour voting window from 7am to 10pm (Electoral Commission, 2017). UK voters are not able to amend their votes, making the moment of voting a discrete event (Ibid). The belief that voting ought to be a uniform and 'discrete event', in which there is uniformity of voter experience, has been debated by the Estonian Supreme Court, but this argument has not been successful in altering RE-voting (Jordi and Maurer, 2016).

Respondents who have high levels of duty citizenship indicators are expected to believe that voting should be uniform. This is because of the association between duty citizenship beliefs about the obligation to vote and support for tradition and ritual (Dalton, 2008). Support for belief in voting uniformity is expected to be negatively related to support for RE-voting extension and RE-voting in general.

Belief Hypothesis H3: Support for the belief that the voting experience should be uniform will be negatively related to support for the extension of RE-voting to national elections.

3.3 Belief in Publicness of Voting (BPV) (IV)

Belief in the publicness of voting (BPV) emphasises the importance of voting in a public space. Publicness is considered to be an important part of the civic ritual of voting (Barber, 1984; Buchstein, 2004; Orr, 2015, 2016). The publicness of voting is determined by the voting location, and is distinct from voting secrecy. For example, voters who attended polling stations during the 2017 UK general election voted from a public space and were witnessed by their community, but their vote choice remained secret. When compared to private spaces, such as bedrooms, kitchens and offices, polling stations spaces are highly visible. The publicness of these spaces can also be mediated. As Coleman (2013) and Orr (2016) argue, the news media

play a crucial role in creating the sense of a single polling day. The visibility of polling stations allows for the 'media to capture and reflect back to us ... the sense that election day is a moment when the parts come together to form the whole' (Orr, 2016:154).

Belief in the publicness of voting has multiple expressive and instrumental justifications. This framework will focus on two of the instrumental justifications. The first instrumental publicness argument focuses on the ritual of election day and its role in the 'bonding' of the polity through the collective expression of preferences, and the public legitimation of the political system (Lukes, 1975:304; Barber, 1984; Monnoyer-Smith, 2006). This argument is described by Hubertus Buchstein as the 'dramaturgic model', most closely associated with the work of Emile Durkheim (2015:40). The introduction of the secret ballot removed the ability to witness deliberation and voter choice in the polling location, but it retained the ability for voters to witness one another participating in the act of voting. Moving the voting act from a public space to a private space removes the opportunity for citizens to witness one another voting, and so removes the possibility of publicly reaffirming their support for the political system and their roles as citizens with common preferences, even if these preferences cannot be discussed in the polling location. This public witnessing brings with it a degree of accountability which leads into the next argument.

The second instrumental argument focuses on the psychological effects of publicness on voter behaviour; voting does not occur in a vacuum. It affects other citizens directly and therefore ought to be conducted with a degree of accountability in a public space. The antecedent of this argument can be traced back to the 19th century and JS Mill's arguments against the secret ballot outlined in Considerations on Representative Government (1861). For Mill, voting was a social act, and an act for which individuals should be publicly accountable for, since their voting decisions affect their peers and the wider community (1861:191-193). Mill believed that

the secret ballot encouraged voters to think of voting as a right rather than as a 'trust': ‘the spirit of vote by ballot – the interpretation likely to be put on it in the mind of an elector – is that the suffrage is given to him for himself; for his particular use and benefit, and not as a trust for the public’ (Mill, 1861:192). Although the debate over the secret ballot has waned since the 19th century, Mill’s discussion of voting as an accountable social act, to be carried out publicly, persists in the work of Brennan and Petit (1990), Engelen and Nys (2013) and Seglow (2020). Bruter and Harrison’s description of voter sociotropism, the consideration of others when voting, also echoes Mill’s conception of voting as a public trust (2020).

While modern voting is a secret and isolated experience, the deliberation and discussions surrounding polling day remain social experiences. Voters are often accompanied by partners and family members and discuss political issues in the same groups (Unt, Solvak and Vassil, 2017:13). Although these social experiences are limited to small groups, the social experiences surrounding the act of voting are regarded as healthy for a participatory democracy, and there is evidence that the social aspect of voting increases turnout and has an effect on voter decision making (Unt, Solvak and Vassil, 2016). Remote voting methods such as postal ballots and RE-voting have the potential to undermine the social aspects of polling day by isolating voters in the privacy of their homes, where they are not able to witness or be witnessed by people outside of their private household.

Some of this sense of publicness can be conveyed with RE-voting technologies. A public ‘live’ tally of election results is possible with RE-voting; public bulletin board screens can display live voting tallies from each electoral ward or polling district, publicly accessible websites can also display these updates (Diehl and Weddeling, 2006:213). However, the reporting of election results before the end of the poll is currently illegal in the United Kingdom (Electoral Commission, 2017), and the reporting of live election results by ward/polling district is unlikely

to alter the fact that many RE-voters vote from private spaces and so are unable to 'witness' one another voting (Solvak and Vassil, 2016).

The postal vote is an existing electoral tool which privatises the voting space in the same manner as RE-voting. This privatisation of the voting space has already occurred in the UK, where approximately one fifth of the population voted via post in the 2017 general election (White and Johnston, 2017). Postal voting's 'remoteness' and lack of supervision makes up half of the hybridity which RE-voting is characterised by. The other half is the 'black box' nature of RE-voting which is a characteristic shared with E-voting machines.

Individuals who support the principle that voting ought to be a public act are expected to also score highly for duty citizenship indicators about the obligation to vote. Since publicness of voting is a dimension of the virtue of voting, strong covariation is expected between the other two virtue of voting dimensions: voting uniformity and cost of voting. If this covariation is not present, this would point to either an error with indicator design, or a problem with the underpinning virtue of voting construct. Regarding support for RE-voting extension and RE-voting in general, support for the publicness of voting is expected to be negatively related to this belief; the stronger an individual's support for publicness, the less likely they are to support the extension of RE-voting to national elections.

Belief Hypothesis H4: Support for the belief that voting should be a public act will be negatively related to support for the extension of RE-voting to national elections.

Since student elections are regarded as low-salience contests, it is unlikely that the presence of duty citizenship and virtue of voting beliefs would preclude participation. However, the presence of these beliefs are likely to deter an individual from supporting the extension of RE-

voting to higher salience elections such a UK general election. This difference is due to the symbolic importance of national elections and their role as a civic ritual in modern society (Lukes, 1975; Orr, 2014). Student elections arguably do not carry the same psychological authority as national elections. Currently it is unclear whether these beliefs are unique to pre-generation X age cohorts who have a greater sense of duty citizenship and who reached maturity in a pre-internet era, or whether they are prevalent at all in younger generations who have higher levels of engaged/actualised citizenship, and who have been socialised with the internet and internet voting in non-binding elections.

None of the three virtue variables are expected to correlate with the trust in technology variables. A strong negative relationship is expected between the three variables and perceived cost of voting, but no relationship is expected to be found with perceived usefulness and perceived ease of use. Beliefs towards the technology adoption variables are expected to be mutually exclusive to virtue of voting.

4. Integrity beliefs: Trust in voting technology

The RE-voting literature contains a number of objections to RE-voting on the grounds that it may threaten the integrity of elections (Jones, 2001; Springall et al, 2014; Barratt and Maurer, 2015; Dill, 2016). Integrity concerns can be broken into two categories: trust in RE-voting technology and trust in the authority administering the RE-voting technology (Schaupp and Carter, 2005:591). These concerns can be mitigated by the amount of trust an individual has in the RE-voting system, also referred to as an information technology (IT). Using Mcknight's three tier typology of trust, trust in information technology systems is affected by (1) the disposition of the user to trust technology, (2) trust in the context of the system, and (3) the

characteristics of the system itself (Mcknight and Chervany, 2001:42-44; Mcknight, 2005: 331; Mcknight et al, 2015:885).

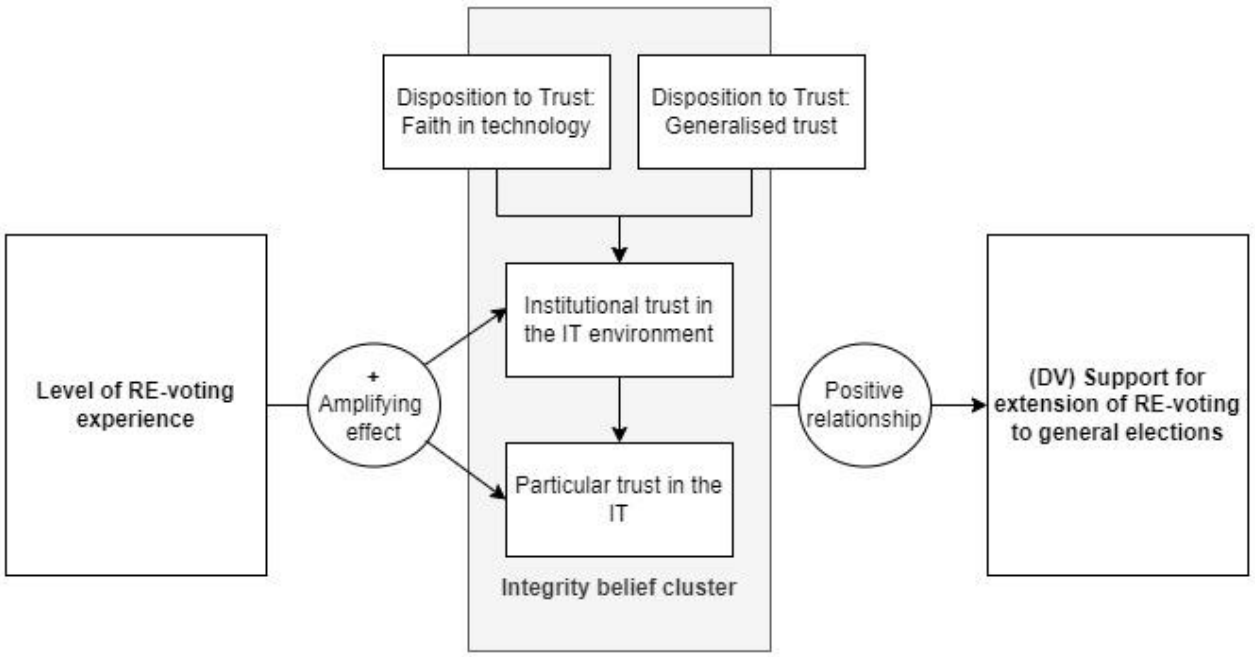
Levels of support for RE-voting in national elections are expected to be contingent upon the user's general beliefs about technology, their level of institutional trust in the internet which provides the context of the voting system, and their experience of the RE-voting system itself. It is expected that these three levels of trust will affect support for the extension of RE-voting to national elections: (1) If students have a low disposition to trust technology, they are unlikely to support the extension of RE-voting technology to first order elections. (2) If students do not believe the context of the voting system, the internet, is a secure space to vote over, they will be less likely to support the extension of RE-voting. (3) If students with experience of SU RE-voting find the system to be unreliable, they will be less likely to support the extension of RE-voting.

It is anticipated that experience with RE-voting will have an amplifying effect on specific beliefs within the integrity belief cluster. Trust in the RE-voting system environment and particular trust in the RE-voting system are expected to be amplified by prior positive experience of RE-voting. This amplification can be explained by the improved attitude accessibility caused by direct experience (Fazio, Powell and Herr, 1981). Individuals with a secure experience of RE-voting will have prevalent positive beliefs about the security of RE-voting, and are likely to associate those memories with RE-voting technology in general (Fishbein and Ajzen, 2010:222). It is also possible for individuals to form inferential beliefs about the security of the technology employed in a different context, such as in a national election (Fishbein and Ajzen, 1975:143-145). Beliefs about the security and trustworthiness of RE-voting in national elections are likely to be influenced by direct experience.

Positive reinforcement is also key to explaining the amplifying effect of direct experience on trusting beliefs; participating in an election involves a small amount of risk (Lauer, 2004). Voters risk losing their vote to a system error, or having their vote stolen. Direct-experience of an online election without significant errors or fraud will reinforce beliefs that the internet is a secure environment to vote over, and that RE-voting systems are secure. See figure 3.3 below for a map of experience, integrity beliefs, and support for RE-voting in national elections.

Experience Hypothesis H1.2: Individuals with RE-voting experience will hold stronger trusting beliefs about the IT environment (the internet) than participants with no experience.

Figure 3.3, Integrity beliefs map



The design of RE-voting and E-voting systems is significant for the issue of trust. RE-voting and E-voting mediums are distinct from physical voting mediums due to their complex 'black box' construction (Bishop, Peisart and Hope et al, 2009). The internal workings of a DRE machine or

a voting server are opaque to voters without experience in electronic engineering and computer programming. This black box problem is compounded when RE-voting systems or DRE Machines are compared against 'cognitively accessible' voting mediums such as the Australian secret ballot, or the open ballot. This cognitive accessibility criterion was established by the 'public nature of elections' principle, created by the Constitutional Court of Germany in 2009 (Seedorf in Barrat and Maurer, 2016:69). The court ruled that German voters without any technical expertise must be able to understand the significant stages of the electronic voting process (Ibid). Applied to other E-voting countries, this cognitive accessibility criterion would exclude the majority of the populations of India, Brazil and the USA.

When compared to paper ballot systems, Scrutinising RE-voting results and detecting RE-voting fraud is challenging for the average voter (Seedorf, 2016:11). RE-voting also concentrates trust around a much smaller number of elements compared to paper ballot systems (Willemson, 2018:127). These elements are typically host servers and server administrators housed in a central location (Springall et al, 2014). Willemson posits that due to the centralisation of RE-voting systems, risk of interference is not distributed across multiple elections. Corrupt officials or state-sponsored hackers can expect to have a much greater impact on a centralised RE-voting election if their interference is successful (2018:127). In comparison to this, the UK's paper ballot system involves thousands of workers dispersed across 650 constituencies. This labour intensive system has opportunities for human error and corruption on a micro-level, but it distributes the risk of interference across 650 'local elections', avoiding the problems of RE-voting centralisation (Electoral Commission, 2017).

Neither system is totally robust to corruption or error. Even without outside interference, vote counting programs can be unreliable. Poorly written software code can result in counting errors on the host server (OSCE, 2013:35). Transparency in both the RE-voting network design

and the counting software are important for detecting errors and manipulation. This transparency has a symbolic importance for the building of user trust as well as allowing for the correction of coding errors by third parties (OSCE, 2013:35). When it comes to maintaining trust, the perception of security may be as important as actual security for the success of a RE-voting system.

Trust in an IT context

Trust is required in environments where interdependence, uncertainty, or risk exist (Mcknight and Chervany, 2001:6). Voting is a transaction which involves risk, just as the transfer of goods or services involves risk between customer and vendor. Unlike the commercial examples, the voter has no financial risk, instead the voter is risking the loss or corruption of their ballot. Mayer, Davis and Schoorman define trust as a willingness to make oneself vulnerable to another actor, on the basis that the actor will perform a service of importance to the vulnerable party (1995:712). This definition refers to trust in a business environment, but it is equally applicable to RE-voting.

In customer-vendor interactions, the characteristics of the vendor affect trust as does the disposition of the customer. In studies of trust in traditional commercial environments, business interactions occur face-to-face allowing the customer to assess the vendor's trustworthiness (Sasse, 2005:12). The same is true of interactions in polling stations; voters are able to assess the trustworthiness of the voting transaction through their interaction with the staff and the appearance of the polling station itself. The physical appearance of the polling station serves as a heuristic for the voter, giving them enough information to determine its legitimacy.

Use of the internet for commerce in the late 1990s removed this physical heuristic. Online vendors were veiled behind computer terminals and servers; this technology acted as an intermediary for traditional retail interactions (Li, Hess and Valacich, 2005:42). Computer mediated retail transactions created two hurdles for user trust; trust in the integrity of the human vendor on the other side of the e-commerce server, and trust in the reliability of the e-commerce server itself (Sasse, 2005:12). Information systems which do not mediate between a user and a vendor, such as Amazon's recommendation agents or Scytl's RE-voting platforms, alter this interaction further by removing the human vendor and encouraging users to trust the information system itself (Mcknight, 2005:3).

The example of the user directly interacting with an information system, rather than with a human vendor mediated by an information system, applies to the RE-voting systems used by student unions in the UK. Arrkgroup's Unioncloud voting application used by Royal Holloway guides the user from the landing page to a voting page where they choose their preferred candidates using the single transferable vote system (STV). Votes are sent from the user's device to UnionCloud's servers where they are counted. Server-side administrators maintain the system and are able to access the UnionCloud servers, but otherwise the process is superficially free of human interactions.

4.1 Disposition to trust technology (DT) (IV)

'Disposition to trust', is arguably the most significant belief involved in the decision to rely on a technology or person where risk of loss is involved, such as the loss of goods, services or votes (Mayer et al, 1995:714-716; Mcknight and Chervany, 2001:45). Disposition to trust describes the level of trust which a trustee has in another individual, technology or situation without any detailed knowledge of their characteristics, such as benevolence, integrity or competence (Mayer et al, 1995:715; Brjnskov, 2007:2). This characteristic is determined by a combination

of life experience and cultural socialisation (Hofestede, 1980). It is synonymous with generalised interpersonal trust which is frequently measured using the question “In general, do you think that most people can be trusted?”. This question has been used as a measure of interpersonal trust most notably in Inglehart’s World Values Survey (WVS) since 1981 (Inglehart, 1997).

The other element of disposition to trust technology is the individual’s level of faith in science and technology. Whether the individual regards technological progress as positive will have an influence on their disposition to trust technology. This outlook on technological progress has been measured by the WVS 2010-2012 item used to tap post-materialist values: ‘Science and technology are making our lives healthier, easier, and more comfortable’.

When applied to trust in information systems or technology, this disposition to trust is described by Mcknight as ‘disposition to trust IT’ (2005:331). He describes this as ‘the general tendency to be willing to depend on technologies across a broad spectrum of situations and specific ITs’ (Ibid). A trusting disposition is expected to have a cascade effect on levels of institutional trust and trust in the technology itself, the RE-voting system (Mayer et al, 1995:715). Layers of trust below the level of disposition to trust can still be affected by negative experiences, for example experience of internet fraud, or use of an information system which frequently crashes. It is not guaranteed that an individual with a trusting disposition will automatically trust RE-voting systems, or the online context in which they are used.

4.2 Trust in context of the of the system (Institutional Trust) (IT) (IV)

The context in which the RE-voting system is embedded is important for developing trust (Mcknight and Chervany, 2001:45). If the user does not trust the context, or environment, in which the information system is encountered, they will be less likely to trust the information system itself. A defining characteristic of modernity is the disembedding of human interactions from their traditional contexts (Giddens, 1991:108). The internet plays a significant role in this disembedding, taking traditional forms of interaction such as shopping, socialising and voting and recreating them outside of their original context. For voting, this change in institutional context is significant. The safeguards which create institutional trust during interactions at the polling station are not the same as the safeguards which exist on the internet.

Institutional trust is affected by the user's perception of the 'favourability' of the environment in which they are using the information systems (Mcknight and Chervany, 2001:45). 'Favourability' is created by the presence of structural assurances and situational normality: structural assurances refer to the combination of technical and legal safeguards which reduce risk to the user, and situational normality to the appearance and apparent competence of the vendors in the environment where the transaction is taking place (Ibid).

Situational normality and structural assurances are both realised by UK electoral procedures (Mcknight, 2002). In the brick and mortar context of the UK polling station, voters enter a public building controlled by the local government (Electoral Commission, 2017). There are identifiable authority figures present who the voter may consult if they are unsure of the voting procedure (Ibid). The right to a free and fair vote in the UK is protected by a number of statutes which establish the norms of behaviour within the polling station (RPA, 1983; RPA, 2000). Because of structural assurances and situational normality established by laws and norms, citizens are able to vote in an environment where risk has been mitigated, and where

their expectations of a normal trustworthy environment are met. These facts constitute a favourable environment according to Mcknight and Chervany's definition (2001:45).

The individual's prior experience of the internet will also affect their level of institutional trust when using an online service (Mcknight, Choudhury and Kacmar, 2000:533). The link between internet experience and willingness to vote online was confirmed by Fisher and Savani; daily internet usage and frequent exposure to online risks, such as online money transfers, were strongly correlated with willingness to vote online (2022:16,17). Unlike the subjects of internet trust studies in the 2000s, All current 18-24 students grew up with the internet and would have experienced the internet to a lesser or greater extent during their primary, secondary or undergraduate years. 99% of 18-24 year olds in the UK were recent internet users, classed by the ONS as having used the internet within the last 3 months (2018). Since e-commerce and social media platforms are used habitually by many in the UK, it is expected that levels of institutional trust in the internet will be extremely high amongst the 18-24 cohort.

4.3 Particular trust in the system (PT) (IV)

The characteristics of the information system itself are significant for building user trust. Frequently used characteristics of human trust are benevolence, integrity and competence (BIC) (Mayer, Davis and Schoorman, 1995:718-720). These indicators emerged from social psychology and relate to trust between people, but have been applied to human-machine interactions in studies of e-commerce recommendation agents and mobile phone commerce platforms (Wang and Benbasat, 2005; Vance et al, 2008). Whether human traits should be ascribed to a machine is the subject of ongoing debate within the information systems community (Lankton, Mcknight and Tripp, 2015:881).

Mcknight et al distinguish between 'human-like' trusting beliefs and 'system-like' trusting beliefs (2015). Information systems which are more human-like are characterised by animation and voice features. Artificial intelligences such as Amazon's Alexa and Google's Google Assistant sit in this human-like category. Common information systems such as the Outlook email client, the SugarCRM customer relationship manager and Microsoft Excel fall into the system-like category due to their lack of obvious human characteristics. These systems are more likely to be judged on system-like characteristics such as their reliability, functionality and helpfulness (Lankton, Mcknight and Tripp, 2015:882). SU online voting platforms such as Arrk Group's UnionCloud do not imitate human characteristics using animation or speech and so fall into the system-like category of information systems where they will be assessed on their reliability, functionality and helpfulness (Mcknight et al, 2015; Arrk Group, 2019).

Conclusion

Users of RE-voting systems necessarily have to make themselves vulnerable during the voting transaction (Mcknight et al, 2015). As with interpersonal trust, the ability to forecast behaviour and reputation for reliability are important for building trust in information systems (ibid). A combination of (1) disposition to trust technology, (2) trust in the institutional context of the RE-voting system, and (3) trust in the reliability of the RE-voting system itself will determine whether student voters will support the extension of RE-voting to higher level elections. Disposition to trust technology will determine how open an individual is to RE-voting in an SU election, and how supportive they will be of extending RE-voting to first and second order levels of elections. RE-voting systems which are error-prone or frequently crash will be considered unreliable and therefore less trustworthy; this will impact support for the extension of RE-voting technology to national elections.

It is expected that trust in technology will have a positive correlation with perceived usefulness and perceived ease of use variables, since the reliability of an IT system affects the perception of its usefulness (Schaupp and Carter, 2005). Though it is expected to relate to the first two variables in the technology adoption model, it is expected to have no correlation with perceived cost of voting. With regard to the virtue of voting variables, Trust in technology is not anticipated to have any relationship with belief in voting cost, belief in voting uniformity or belief in publicness of voting. This absence of relationship is expected because they are mutually exclusive concepts in the literature and there is no evidence to suggest they are related. There is no apparent overlap between any aspect of trust in technology and the concepts of symbolic value, civic ritual, commitment and duty which are present in the virtue of voting literature.

Belief Hypothesis H5: Individuals who score highly for the belief construct 'trust in technology' will be more likely to support the extension of RE-voting to national elections.

5. Usefulness and convenience beliefs: motivations for RE-voting

Models which explain the contextual variables for voting participation, such as age and education, are not sufficient alone to explain the variation in adoption and support for different voting modes. Voting systems like the Australian Secret Ballot, the postal ballot, the DRE machine, and RE-voting software packages are distinct tools. Some of these voting tools are relatively simple, such as the ballot paper and pencil, and some are extremely complex, such as the Estonian iVote RE-voting system. Models which explain why some technologies are adopted, and some are abandoned, and the role which convenience plays are required to understand students' usage of and attitude towards RE-voting systems. An interaction

between models of political participation and models of technology adoption is necessary for expanding our understanding of attitudes towards RE-voting.

The Technology Acceptance Model (TAM) is the most frequently used model for explaining the adoption of new computing technologies, also described as information systems (IS) (Davis, 1985; Lee, Kozar and Larsen, 2003:752-753). The model has been widely adopted due to its parsimony and its success at predicting the adoption of technology (Bagozzi and Warshaw, 1989). The technology acceptance model has been applied to explain the adoption of information technology (IT) artefacts such as internet browsers, email, word processors, and statistical software, and has been used in over 400 studies since its introduction in 1986 (Gefen and Straub, 2000). Davis's model was developed from Ajzen and Fishbein's theory of reasoned action (TRA), which modelled the relationship between beliefs about the object, evaluations of the object, and subsequent behavioural intentions (Fishbein and Ajzen, 1975, 1980, 2010). The model was proceeded by Viswanath Venkatesh's Unified Theory of Acceptance and Use of Technology (UTAUT) model (2003), but it still enjoys wider use in technology adoption studies than UTAUT (Venkatesh, 2008:274).

In its original form, the technology acceptance model uses two constructs to explain technology adoption: (i) Perceived Usefulness (PU), 'defined as the extent to which a person believes that using an IT will enhance his or her job performance', and (ii) Perceived Ease of Use (PEOU), 'defined as the degree to which a person believes that using an IT will be free of effort' (Davis, 1989:26). Davis posits that both of these variables affect the dependent variable, the behavioural intention to use the technology (BI) (Davis, Bagozzi and Warshaw, 1989:985).

Davis's technology acceptance model is suited for the analysis of RE-voting systems since they can be categorised as information systems designed to improve the efficiency of an existing

process. Technology acceptance has been applied to the area of e-government and RE-voting in the recent past; Carter and Bélanger (2005) applied Davis's model to predict US citizens' intention to use new e-government services. Building upon this study, Schaupp and Carter applied the model to predict the intention to use RE-voting systems in a population which had not been exposed to RE-voting technology (2005:586). Both studies found that the Perceived Usefulness had a significant predictive effect on an individual's intention to use e-government services and e-voting systems (Carter and Bélanger, 2005:17; Schaupp and Carter, 2005:595). This study will apply the technology acceptance model to a student population which has been exposed to RE-voting to assess their support for its use in higher salience elections such as a general election. The dependent variable for this study is 'support for the extension of RE-voting to national elections', this variable is sufficiently similar to intention to use, since support for the extension of RE-voting to national elections demonstrates the individual's support for the technology and their intention to use it if offered. Individuals who do not have an intention to use RE-voting in national elections are unlikely to support the extension.

For this study, the construct Perceived Cost (PC) has been added as an attempt to measure the respondents' perceived costs of traditional voting systems, and whether the perception of these costs motivates them to support the extension of RE-voting to national elections (Blais, 2000). It is well established that the direct costs of voting are small, so this section is designed to assess whether the perception of traditional voting as costly has any marginal effect on support for the extension of RE-voting.

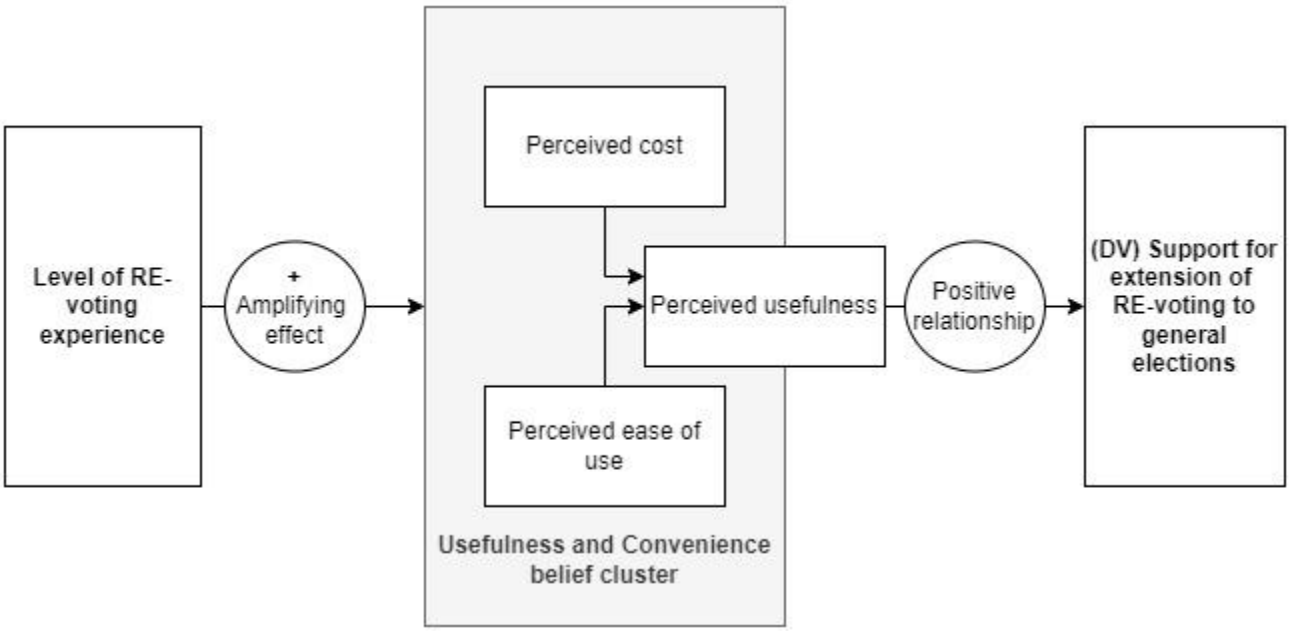
With regard to direct-experience, the usefulness and convenience belief cluster is expected to be amplified by experience of RE-voting. Individuals with experience are more likely to view the technology as personally useful and hold stronger beliefs about the time-saving convenience of the technology. Beliefs formed from direct observation or experience are

longer-lasting and are more resistant to challenge (Fazio and Zanna, 1977,1978). Attitudes influenced by experience will contain less ambivalence, or 'fence sitting', and greater clarity (Fazio and Zanna, 1978).

Just like integrity beliefs, Individuals are expected to use beliefs formed from direct experience as a heuristic beyond the context of the original experience. These heuristics, or inferential beliefs, will have an influence on evaluations of RE-voting in national elections (Fishbein and Ajzen, 1975: 143-145). See figure 3.4 for an illustration of the effect of experience on the usefulness and convenience belief cluster.

Experience Hypothesis H1.3: Individuals with RE-voting experience will hold stronger beliefs about the usefulness and convenience of RE-voting than participants with no experience.

Figure 3.4, Usefulness and Convenience beliefs map



5.1 Perceived Ease of Use (PEU) and Perceived Usefulness (PU) (IV)

Perceived ease of use is defined as 'the degree to which an individual believes that using a particular system would be free of physical and mental effort' (Davis, 1989:26). Davis defined perceived usefulness as 'the degree to which an individual believes that using a particular system would enhance his or her job performance' (ibid).

In terms of motivation, perceived usefulness and perceived ease of use are categorised as extrinsic motivators rather than intrinsic motivators (Davis et al, 1992). Davis et al define an extrinsic motivator as the performance of an activity which is instrumental to the accomplishment of a task distinct from the activity itself (1992:1112). If the user were intrinsically motivated to engage with the IT, they would engage for no other purpose than the enjoyment of using the IT (Davis et al, 1992). Use of an IT to vote follows Davis's description of using an IT which is instrumental to accomplishing a task distinct from the activity itself (Ibid).

The two constructs are closely related, but distinct. Davis proposes that there is a causal relationship between perceived ease of use and perceived usefulness; perceived ease of use has an enhancing effect on perceived usefulness (1985:32). The perception of mental and physical effort required by a system will affect the user's decision to adopt the system and again proficiency with it. An IT system which is easy to become proficient with is likely to be used more, and will result in increased worker efficiency in the task targeted by the IT system, which in this case is voting (Davis, 1985:26). Conversely, if an IT system is perceived as having a steep learning curve, users are more likely to abandon the system and never gain proficiency regardless of the 'perceived usefulness' of the system.

The construct of perceived usefulness is related to the future benefits which the IT system may provide the user (Davis et al, 1992). It is described as an inferential belief rather than a

descriptive belief because it requires the user to estimate the effects of the system on their ability to accomplish a task without any experience of it (1985:32). In contrast, perceived ease of use relates to the mental and physical costs which the IT system will exact. Davis categorises this as a descriptive belief since it is formed based on the user's initial experience with the system. Unlike an inferential belief, it requires no speculation on the future benefits of using the system (Davis, 1985:32).

Both of these constructs have been demonstrated to have a causal relationship with the variable 'intention to use' or 'self-reported use' of an IT (Davis, 1985). A majority of studies have demonstrated that perceived usefulness is a significant explanatory variable in relation to intention to use an IT (Davis, Lee, Kozar and Larsen, 2003). However, perceived ease of use has been less successful as an explanatory variable; of 35 Technology Acceptance Model (TAM) studies examined, only 9 studies reported perceived usefulness as having a significant effect on intention to use an IT (Gefen and Straub, 2000:8). As Davis posits in his original technology acceptance model paper, perceived ease of use is likely to have a greater effect on perceived usefulness than on intention to use as a dependent variable (1985:32). Because of its lack of consistency as an explanatory variable for 'intention to use', this study will measure perceived ease of use's correlation with perceived usefulness of the RE-voting system.

Belief Hypothesis H6: Students who rate RE-voting systems as having high levels of Perceived Usefulness and Perceived Ease of Use will be more likely to support the extension of RE-voting to national elections.

5.2 Perceived Cost (PC) (IV)

Perceived cost (PC) describes the subjective cost of voting. The perceived costs voting are

subjective to the individual, but can be personally assessed by the direct costs of voting, such as financial cost, the opportunity costs of registering to vote, travelling to the polling station, and the decision/information cost of voting, which describes the cognitive effort required to gather information about the candidates and choose who to vote for (Blais, 2000; Goerres and Rabuza 2014:3). There is a consensus that the direct costs of polling station registration and voting are already extremely low (Niemi, 1976; Blais, 2000; Berinsky, 2005; Giammo and Brox, 2010).

The rational choice model of voter behaviour posits that the cost-benefit calculations performed by rational citizens are the key determinants of party choice, voter participation or voter abstention (Downs, 1957). The rational citizen's calculation has four inputs: the anticipated material benefits of electing a given party, the direct and information costs of voting, the 'long-run participation value' of maintaining a democratic system, and the 'marginality' of the election (Downs, 1957: 270,271). Since Downs proposed the model, there have been a number of derivations which have added variables to the cost-benefit calculation in an effort to explain why citizens continue to vote, despite voting often appearing as a non-rational decision. This non-rational participation is particularly true for non-marginal contests where an individual vote has little influence on the outcome, and in contests where party platforms are not easily differentiated, resulting in a party differential of zero.

Increasing the convenience of voting reduces associated transactional costs, such as time and effort, while retaining the utility benefits of voting, which can be instrumental, expressive or both (Downs, 1957:38; Riker and Ordeshook, 1968:36). Downs also discusses the information costs of voting, but since RE-voting technology does not directly affect these costs, they are not a priority for this framework. Utility benefits can be understood as the personal payoffs the individual receives for spending time and effort on voting. Instrumental utility describes

the material payoffs anticipated by the voter which are realised when the voter's preferred candidate is elected (Downs, 1957:36,37). These anticipated material payoffs can take the form of reduced taxes, increased infrastructure investment, or a nationalised healthcare system.

Expressive utility describes the personal payoff gained when the individual votes out of a sense of duty, to express class or peer group solidarity, or for any other personal reason which is not dependent upon guaranteeing the victory of the preferred candidate. These utility items were first expressed as 'D' by Riker and Ordeshook in their reformulation of Downs' model, and later retitled as 'expressive components', as opposed to 'instrumental components', in Morris Fiorina's model (Riker and Ordeshook, 1968:28; Fiorina, 1976:393). According to Downs' model, lowering the marginal cost of voting to the point where it is exceeded by the marginal returns will ensure the participation of the perfectly rational voter (1957:7,8). For a technologically savvy population, RE-voting from a mobile device or desktop computer ought to be the apex of 'low cost' voting.

Methods for reducing the direct costs of voting have been introduced in a number of polities[14] and include absentee voting, postal voting, early voting, and RE-voting (Berinsky, 2005:471). These methods are described collectively as 'convenience voting' methods. The logic behind convenience voting reforms is intuitive; by removing the transactional costs of voting, voter turnout ought to increase. This cost/benefit approach to voting is supported by all-postal voting studies which confirm a positive effect between 10-15% for local elections where postal votes were the only medium available (Southwell and Burchett, 2000; Norris, 2003). Polling station placement and changes to this placement can also have a depressive effect on voter

[14] The United Kingdom, Switzerland, Estonia, the state of New South Wales, the state of Oregon inter alia

turnout (Mcnulty, Dowling and Ariotti, 2009). The lessons from these examples are not confined to the academy; the location and time of polling is significant for political parties; 19th and 20th century parliamentary debates over the tactical advantages of 'paid for' carriages (1855, 1883) and the use of motor cars on polling day (1931, 1938, 1948, 1958) underline the tactical importance of reducing the effort required to vote.

Despite the low direct costs for traditional polling, voting via the internet is faster and does not require the voter to leave their residence as long as they have an internet connection and a computer (Solvak and Vassil, 2016). RE-voting does not affect the decision/information cost of voting, as voters still have to decide who to cast their ballot for. As of 2015, the Estonian RE-voters took an average time of 2 minutes and 36 seconds to vote, while Estonian paper ballot voters took an average of 30 minutes including time spent travelling to and from the polling station (Solvak and Vassil, 2016:77,91). For Estonian citizens, RE-voting is ten times faster than traditional paper voting. The Estonian government has managed to reduce the direct costs of an activity which was already considered to have extremely low costs (Niemi, 1976:115). This difference in speed and convenience may explain why the number of Estonian RE-voters has increased with each parliamentary election, from 1.9% of all voters in 2007 to 43% of all voters by 2019 (E-Estonia, 2019). With these figures in mind, do the perceived costs of traditional paper voting influence support for the extension of RE-voting to national elections?

The empirical literature on perceived cost of voting, or subjective costs, is relatively small. Significant work on the costs and benefits of voting has focused on abstracted direct costs, such as the opportunity cost of one's time, and the financial cost of travelling to the polling station (Downs, 1957, Riker and Ordeshook, 1968; Fiorina, 1976; Wolfinger and Rosenstone, 1980). These works address the various types of cost benefit calculations which voters may engage in, but they do not assess the voter's subjective perception of cost. Blais's 'To vote or

not to vote' is one of the few works to empirically investigate the perception of voting cost (Blais and Young, 1999:49; Blais, 2000:85,86). The survey of undergraduates used ordinal scale questions to assess the perception of voting cost, the results of which are compared against self-reported turnout and ordinal scale questions regarding duty, social pressure and cynicism. Perception of voting as an easy activity was positively related to indicators of duty, while the inverse relationship was observed in respondents who perceived voting as difficult (Blais and Young, 1999; Blais, 2000). A separate survey of Quebec citizens identified a positive relationship between the perceived difficulty of voting and the self-reported time it would take to vote (2000:86). In addition, citizens who had never voted before were more likely to perceive voting as a difficult activity (Ibid).

The perceived cost of voting can affect voter turnout, but only amongst a minority of the population (Blais et al, 2019). A survey of 3000 Canadians demonstrates that the perception of voting as a costly activity reduces turnout amongst a small minority of respondents (2019:150-151). The majority of participants did not consider voting to be a significantly costly activity, but the finding demonstrates the importance of perceived cost for a minority of citizens (Blais, 2019:151). A minority of individuals perceived voting as directly costly to the extent that they were 21 percentage points less likely to vote in elections than respondents who did not perceive direct costs to be significant (Blais, 2019:147). The effect of sensitivity to information/decision costs was much smaller in comparison, with only a 6 point gap between individuals who were sensitive to information/decision costs and those who were not (Ibid).

Based on Blais's findings, students who perceive paper student union elections as having greater direct costs than RE-voting in student elections will be more likely to support the extension of RE-voting to national elections. This is because they are sensitive to the direct costs of voting, and any innovation which can reduce these direct costs will appear attractive

to them. The number of students who will perceive voting as costly is likely to be small, as evidenced by Blais and Young's studies (1999; 2000; 2019). It is also anticipated that perceived cost will have a positive correlation with perceived usefulness and perceived ease of use, but a reciprocal correlation is not expected. This is because individuals who consider traditional voting to be costly are expected to value the potential efficiency of RE-voting, as measured by perceived usefulness indicators. Individuals who score highly for perceived usefulness and perceived ease of use indicators will not necessarily perceive traditional voting to be costly, in this sense the relationship is unidirectional.

It is also expected that perceived cost will be negatively correlated with belief in voting cost, belief in voting uniformity and belief in the publicness of voting. These virtue of voting variables are expected to relate to indicators of duty and civic voluntarism, and duty indicators have been demonstrated to have a strong negative correlation with perceived cost indicators (Blais and Young, 1999; Blais, 2000). In any case, it is predicted that only a small number of respondents will score highly for perceived cost indicators (Blais, 2019).

Belief Hypothesis H7: Respondents who perceive traditional voting methods as costly relative to RE-voting methods will be more likely to support the extension of RE-voting to national elections.

6. Conclusion

Approximately 1.6 million young people in the UK have the opportunity to vote for course representatives and sabbatical officers using RE-voting systems. Frequent use of RE-voting

outside of government elections has normalised the technology, and this normalisation may set expectations for future use of the technology by the state.

Given this context, there is a gap in the literature regarding the specific beliefs 18-24 year olds hold towards voting and technology: whether they hold beliefs about the cost, publicness and uniformity of voting; whether they trust RE-voting systems more-or-less due to their socialisation with the internet; and whether they believe RE-voting to be a personally useful and convenient technology. How an individual's level of RE-voting experience interacts with these beliefs is also unknown. Are these beliefs strengthened or weakened by direct-experience? Which belief cluster is most affected by experience of RE-voting, and what can that tell us about the push-and-pull factors surrounding RE-voting?

To address the primary research question, this chapter has proposed a framework for predicting support for the extension of RE-voting to national elections in relation to RE-voting experience. Support for the extension of RE-voting to first order elections is expected to be strongly related to the perceived usefulness of the technology, and level of trust in the technology and the environment the technology is used in. Beliefs about virtues of in-person voting are expected to undermine support for RE-voting, but the strength of these beliefs may be weakened by level of experience with RE-voting.

If these normative beliefs are not weakened by cognitive-dissonance, they may be dwarfed by beliefs about the advantages of RE-voting, such as its usefulness and convenience. Some individuals may have no strong normative views on the technology and may reject RE-voting solely on integrity grounds; it is anticipated that beliefs about the integrity of the RE-voting environment will have a large influence on attitudes towards RE-voting.

Chapter 4, Measuring Voting and Technology Beliefs: Study Methodology

1. Introduction to survey and interview design

Due to a paucity of data on the link between RE-voting experience and attitudes towards RE-voting in national elections, primary data needed to be collected and new instruments devised. This study employed a mixed methods approach, combining quantifiable survey responses (n445) with individual interviews (n34). Original indicators for the DV were developed alongside a combination of pre-tested and original indicators to measure beliefs about the virtue, integrity, and usefulness & convenience of voting technology.

In mixed methods research (MMR) designs involving survey data, qualitative methods are frequently used to verify the relationships between variables proposed by quantitative analysis and to provide deeper explanations for the survey responses (Patton, 2002:264-267; Gorard, 2003:115; Cammaerts, Bruter, Banaji et al: 2016:31-44; Bruter and Harrison, 2020:48). Norman Denzin, who coined triangulation in the context of social science, roots these mixed methods approaches in the thesis that 'objective reality cannot be captured' by research, but triangulation between different qualitative tools can bring 'rigor, breadth complexity, richness, and depth' to an inquiry (Denzin, 2011:82). Denzin's epistemology denies the researcher the ability to claim objective truths, and sets the researcher the task of producing a multi-faceted narrative to explain reality. This project does not abandon positivism as a research paradigm, but seeks to augment the positivist survey approach with the richness and depth Denzin describes.

These indicators have a descriptive purpose and an explanatory purpose. The descriptive purpose of this study is to illuminate beliefs towards voting technology where no data currently exists: There is no data available on the motivators and demotivators for participating in online elections, and there is little data on public beliefs about the different modes of voting, vis a vis the virtues of voting and the integrity of voting.

The explanatory goal of this project is to demonstrate that i) young people hold beliefs on the virtue, integrity and usefulness & convenience of voting; ii) that these beliefs relate to their support for using RE-voting in general elections, and iii) that these beliefs are influenced by level of direct-experience with RE-voting. For example, high levels of virtue of voting beliefs are expected to correlate with a lack of support for extending RE-voting to national elections, and are expected to be weakened by RE-voting experience. Low levels of trust in technology indicators demonstrate that respondents do not trust black box RE-voting and are unlikely to support its extension to first order elections. Trusting beliefs are not expected to be affected by level of RE-voting experience. High levels of perceived usefulness indicators will likely correlate with support for the extension of RE-voting to first order elections. This belief cluster is expected to be accentuated by RE-voting experience.

2. Survey Instrument development

Questionnaire items were designed to assess beliefs about voting technology, beliefs about voting norms, and experience of RE-voting. The following survey items are discussed in this section: Measurement of attitude towards RE-voting in national elections (DV); the different belief clusters which could predict support for the DV; level of experience with RE-voting technology, control questions to identify confounding variables and demographic questions to identify any sampling bias.

The IV belief clusters i) the virtue of voting, ii) the integrity of voting, and iii) usefulness & convenience were measured using multiple question items, and principal component analysis was used to identify the dimensions of related question items. Highly correlated question indicators were combined by calculating their mean value to measure response to the belief construct, and to identify whether the questions elicited a coherent audience response (Likert, 1932; De Vaus, 2014:179).

The majority of response fields are Likert scales, using a 1-7 scale instead of the 1-5 scale used in the pilot study. Increasing the Likert scale to seven points creates the potential for greater variation in responses and therefore a greater chance of a normally distributed set of responses (Wu and Leung, 2017:528) Five point scales are considered to be the minimum scale level where ordinal data structures can approach the normal distribution structure commonly observed in interval level data (Norman, 2010:620).

Seven point scales were used to strike a balance between brevity for the respondent and the complexity of the response distribution; scales greater than seven may be fatiguing for the respondent and, as established, scales smaller than five points are less likely to approach the normal distributions found in interval data (Norman, 2010). This odd number scale allows for 'fence sitting' by selecting the middle value, but omitting the middle value can affect the validity of responses (De Vaus, 2002:106). In the case of questionnaires, depriving the respondent of a middle value can lead to misleading responses, where the respondent is forced into an opinionated stance (Ibid). Scales which lack a middle value are more effective in face to face interviews, where uncertainty can be noted by the interviewer, but not offered as a scale option.

Covariance across virtue of voting belief questions will demonstrate that individual questions have a reliability, but this does not address whether the underlying concept is coherent and is being measured by the questions. Using multiple indicators and building scales from the responses improves the internal validity of the concepts which the project is measuring (Ibid). The different aspects of the virtue of voting would be difficult to measure with a single indicator, the same goes for trust in technology and technology acceptance and convenience. Single questions decrease the reliability of measurement, as one poorly worded question could misrepresent the concept to respondents. This single question approach also fails to capture multiple dimensions of a concept reducing the validity of the measurement (De Vaus, 2014:180).

Instead of measuring each question as its own variable, the use of scales allows the researcher to composite multiple questions into a single variable (Likert, 1932). This compositing increases the efficiency of the data analysis stage, and brings a necessary brevity to the design of variables. All variable responses are ranked so that a higher score (7) indicates a high level of the variable, and a low score (1) indicates a low level of the variable (Likert, 1932). Questions which are negatively worded may have their scoring reversed, if so, they are marked with an R for reverse.

Exploratory factor analysis was used during the November 2019 pilot study analysis and the loadings were used to inform question design for this study. Questions which did not load to any factor in the pilot were substituted for new questions which were intended to better measure the constructs. These new questions were piloted in two separate surveys in August 2020 (n=44, n=100), and were altered or retained for the final survey based on factor analysis. The purpose of these three pilots was to test the validity of the survey constructs, and the reliability of the indicators which purport to measure them.

A complete discussion of the different variables and their indicators can be found in the theoretical framework chapter. This section provides a discussion of the items used to generate the survey constructs. See appendix 4.1 for a copy of the final survey and the survey codebook.

2.1 Dependent variable: Support for Extension of RE-voting to General Elections

This survey's dependent variable is attitude towards support for the extension of RE-voting to national elections. This attitude towards extension is measured by the seven point Likert scale item IDEM1 ('Online voting should be an option at every UK general election'). Agreement with this item is the primary measure of support for the extension of RE-voting to national elections.

This study uses Fishbein and Ajzen's Theory of Reasoned Action framework to structure the beliefs and attitudes of participants (1975,1980,2010). In this framework, beliefs about an object's characteristics and possible consequences influence the evaluation of that object (Fishbein and Ajzen, 2010). This evaluation is otherwise known as an attitude. It was anticipated that salient beliefs about voting and technology would correlate strongly with attitude towards the use of RE-voting in national elections. These salient beliefs are measured by the three belief clusters: virtue of voting beliefs, trust in technology beliefs and perceived usefulness and convenience beliefs. Direct experience of RE-voting in SU elections, or other non-governmental elections, was expected to have an amplifying effect on the belief clusters

perceived usefulness and trust in technology, and a dampening effect on the virtue of voting belief cluster.

Additional DV adjacent questions were included to assess the broader elements of the attitude towards RE-voting use, such as whether it is beneficial for society, beneficial for the participant as an individual and whether it has a harmful/improving effect on democracy. These items were not combined with IDEM1 during the final variable reduction, but served as validity checks for the principal DV item during exploratory variable reduction. Strong correlations between these items would provide evidence of a broad attitude towards the use of RE-voting at the national level.

Questions IDEM2 (online voting is beneficial for me) and IDEM3 (online voting is beneficial for society) were used to test whether the participant would differentiate between the personal benefits of RE-voting and the broader, societal, benefits of the technology. Testing both of these items allowed for comparison between beliefs about the personal consequences of RE-voting and the societal consequences during analysis.

The last question in this section, IDEM4 (Our democracy would be harmed by online voting'/'Our democracy would be improved by online voting), used a 7 point semantic differential scale to assess beliefs about the consequences of RE-voting. Substantively, IDEM4 is extremely similar to the Likert question IDEM2 (Online voting is beneficial for society), but it was included to improve the robustness of broader social beliefs about RE-voting.

During exploratory principal component analysis, three out of the four DV items strongly correlated to the first component. IDEM2 (online voting is beneficial for me) was the

exception, with a weak correlation to both the DV component and the perceived usefulness component.

Table 4.1 Attitude towards extension of RE-voting indicators (Dependent variable)

Introduction: 'To what extent do you agree or disagree with the following statements?'
IDEM1) 'Online voting should be an option at every UK general election' (Scale, 1-7 Strongly agree/Disagree) (Original Question) (Primary dependent variable question)
IDEM2) 'Online voting is beneficial for me' (Scale, 1-7 Strongly agree/Disagree) (Original Question)
IDEM3) 'Online voting is beneficial for society' (Scale, 1-7 Strongly agree/Disagree) (Original Question)

Introduction: Place the marker closest to the end of the scale you most agree with:
IDEM4) 'Our democracy would be harmed by online voting'/'Our democracy would be improved by online voting') (Semantic differential scale question, 1-7) (Original question)

2.2 Independent variable question design

Experience questions

RE-voting experience was assessed using a combination of categorical and ordinal scale questions. These items were used to create descriptive statistics for the experienced cohort (n192), and were largely excluded from inferential tests since they did not apply to the entire cohort (n445). The most important variable generated from this section was breadth of experience, an ordinal variable which ranked participants according to the number of different online elections participated in. This was required for the inferential analysis of experience and the survey constructs in chapter 6.

To streamline the survey and reduce attrition, the first question item was designed to triage participants to different parts of the questionnaire. Participants who affirmed their experience of RE-voting were filtered to an experience questions section, while participants who reported no experience would be filtered to the attitudes section.

Participation in Online Elections
EXP1.1 'Have you ever voted online in student union elections?' (Categorical dichotomous, Yes/No)
EXP1.2 'Have you ever voted in any online elections? (using the internet for any type of election)' (Categorical dichotomous, Yes/No)

In order to avoid accidental negative responses, the first categorical experience question asked about SU voting experience. If participants responded negatively to this, they were presented with a second categorical question asking whether they had any experience with RE-voting. The decision to lead with SU elections was based on pilot feedback. Pilot participants faced with a general question about their online voting experience often assumed it referred to general elections and answered negatively. Opening with a question on SU elections established that the researcher was interested in a broad range of online elections.

Participants who responded positively to the categorical experience question were presented with further questions on either their most recent SU election, or their most recent non-SU online election: check boxes were used to identify any other types of election they may have participated in, and the type of device they used, and radio buttons were used to measure the number of SU elections or non-SU elections. This section collected data on participants' breadth of RE-voting experience as well as the depth of their SU voting experience. Both items were required to generate ordinal variables for breadth and depth of experience used in the analysis in chapter 6.

Experience 2, quantity questions
EXP2 Have you voted in any other online elections? (checkboxes: Course representative election/National party leadership election/Corporate governance election/Voluntary organisation election/Other)
EXP3 How many online student union elections have you voted in so far? (Radio buttons: 1-6 or more)

Quantity questions were followed by a Likert scale section designed to assess how easy the system was to use, and the overall satisfaction with the experience. A binary categorical question on technical problems was included with an open response box for participants to describe any technical problems. These items were important to gauge the aggregate level of satisfaction with RE-voting, but were ultimately not used in any inferential tests since they only applied to the experienced cohort (n192).

Experience 3, user experience questions
EXP5 Where did you most recently vote online? (Radio buttons: University of study or open response category)
EXP6 How strongly do you agree/disagree with the statement: 'The voting system was easy to use' (Scale, 1-7 Strongly agree/Disagree)
EXP7 How satisfied were you with the experience of online voting? (Scale, 1-7 Strongly agree/Disagree)
EXP8 Did you experience any technical problems? (Categorical dichotomous, Yes/No)

The primary hypothesis for experience (H1) is concerned with the broad relationship between experience level and support for RE-voting in national elections. This experience hypothesis is connected to three additional experience hypotheses (H1.1, H1.2, H1.3), each relating to the effect of experience on the strength of the three belief clusters.

Table 4.2, Experience Hypothesis 1 and Experience Sub-Hypotheses 1.1, 1.2, 1.3

H#	Hypothesis	Variable	Concept Area	Questionnaire Items
H1	Individuals with RE-voting experience will be more likely to support the extension of RE-voting to general elections than respondents with no experience of RE-voting	Experience level	Effect of direct experience	CTRL3 (Experience of voting in online elections)

H#	Sub-Hypotheses	Variable	Concept Area	Questionnaire Items
H1.1	Individuals with RE-voting experience will hold weaker virtue of voting beliefs than participants with no experience.	Experience level	Effect of experience/Virtue of Voting Beliefs	CTRL3 (Experience of voting in online elections)/Virtue of Voting items

H1.2	Individuals with RE-voting experience will hold stronger trusting beliefs about the IT environment (the internet) than participants with no experience.	Experience level	Effect of experience/ Integrity of voting beliefs	CTRL3 (Experience of voting in online elections)/Voting Integrity items
H1.3	Individuals with RE-voting experience will hold stronger beliefs about the usefulness and convenience of RE-voting than participants with no experience.	Experience level	Effect of experience/usefulness and convenience beliefs	CTRL3 (Experience of voting in online elections)/Usefulness and Convenience items

Virtue of voting items

Virtue of voting as a cluster of beliefs is broken into three separate constructs: (i) a belief that voting should carry a cost to the individual, (ii) a belief that voting should be uniform, and (iii) a belief in the publicness of voting. These beliefs represent the three most common dimensions of voting as a virtuous act which are present in the literature.

The RE-voting literature contains a number of objections to RE-voting based on protecting the 'virtue' of the traditional physical ballot (Barber, 1984; Birch and Watt, 2003; Buchstein, 2004; Orr, 2016). These objections are based on a belief in the intrinsic value of the paper ballot and the importance of attending public polling stations (Barber, 1984).

i) Belief in voting cost (BVC) is a normative view which is articulated in the work of Barber (1984), and Buchstein (2004). BVC is the belief that voting should not be cost free, and that it should involve some level of sacrifice where the individual must expend effort, and time to vote. These questions were developed from ideas raised by Hubertus Buchstein's essay 'Online democracy, is it viable? is it desirable? internet voting and normative democratic theory', and from Benjamin Barber's chapter from Strong Democracy 'The real present: institutionalising strong democracy in the modern world'. Belief in voting cost does not bear a direct resemblance to the perceived virtues of publicness of voting or uniformity of voting. However, these concepts are closely bound together as they both concern shared experiences and the

potential for fostering citizenship which shared experiences bring. Belief in voting cost does not concern shared experiences, it concerns beliefs about the degree of commitment expected of a person to participate in voting. The cost of participation is expressed in terms of 'effort' in these questions. Effort is conceived of as a barrier, albeit a low one, which the voter must overcome in order to participate in an election.

Respondents who score highly on belief in voting cost items are expected to be opposed to the use of RE-voting in general elections. Strong beliefs in voting cost may stem from a desire to 'gatekeep' participation in elections. 'Gatekeeping' is associated with insiders who have a high level of investment in an institution/activity/belief and who then try to control who can access that institution/activity/belief. It is anticipated belief in voting cost will positively covary with high levels of engagement in politics, and strong views about voting duty, as these items indicate a level of investment in the democratic system.

Financial or intellectual barriers were not included as questions due to space limitations of the survey format, but these barriers are expected to positively covary with effort as a barrier to voting. Financial and intellectual barriers are an extreme expression of belief in voting cost, as they create an impassable barrier for voters who cannot afford a poll tax, who do not meet the property requirements, or who cannot pass a literacy/numeracy/general knowledge test. Each of these barriers to voting have been used in western democracies during the past 200 years (Folmsbee, 1949:246; LoPatins-Lummis, 2007:323; Blackmon 2008:170). These barriers reduce the accessibility of elections, rather than just the convenience of elections. To keep belief in voting cost focused, questions items were restricted to the subjects of commitment and purposeful effort. Financial and intellectual costs and their links to effort and commitment will be explored in future survey items.

The three voting cost question items (BVC1, BVC2, BVC3) are listed in the tables below. BVC1 and BVC2 have not changed since the first pilot study in 2019. During the pilot factor analysis BVC1 and BVC2 loaded with two belief in uniformity of voting items and one belief in publicness of voting item. The factor loadings indicated a strong positive covariance between these five virtue of voting items. This was for a small sample (n74), but the loadings confirmed the hypothesised relationship between these items. For the large n 2020 survey, items were added for each of the virtue of voting clusters with the intention that each cluster would load to a distinct eigenvalue. Experimentation with semantic differential scales in the August 2020 pilot led to the addition of item BVC3R to belief in voting cost items. This differential scale posed a normative choice between two polar statements: 'Voting should require some effort'/Voting should be effortless'. This question is similar in theme to the Likert scale BVC1 ('Voting should not be made too easy'), but it expands on the scope of BVC1 by giving the respondent a clear choice between stimuli to identify with, rather than just measuring agreement to one stimulus statement. The differential scale also serves as a validity check for BVC1; both questions have a similar theme but use different scales to record the response.

Table 4.3, Belief Hypothesis H2 and indicator items

H#	Hypothesis	Variable	Concept Area	Questionnaire Items
H2	Individuals who score highly for the construct 'belief in voting cost' will be less likely to support the extension of RE-voting to general elections	Belief in Voting Cost (BVC)	Virtue of Voting	BVC1, BVC2, BVC3R

Belief in Voting Cost (BCV) questions

Introduction: 'To what extent do you agree or disagree with the following statements?'
BVC1) 'Voting should not be made too easy' (Scale, 1-7, strongly agree/strongly disagree) (Original question)
BVC2) 'Travelling to the polling station shows a commitment to democracy' (Likert scale, 1-7, strongly agree/strongly disagree) (Original question)

Introduction: 'Mark the scale below closest to the statement you most agree with'
BVC3R): 'Voting should require some effort'/Voting should be effortless' (Semantic differential scale question, 1-7) (Original question) (Scoring reversed)

Belief in voting uniformity (BVU) emphasises an intrinsic value in the equality of the voting experience. The ritual and symbolic importance of a uniform polling day is stressed by Lukes (1975) and Orr (2016).

Table 4.4, Belief hypothesis H3 and indicator items

H#	Hypothesis	Variable	Concept Area	Questionnaire Items
H3	Individuals who score highly for the construct 'belief in voting uniformity' will be less likely to support the extension of RE-voting to general elections	Belief in Voting Uniformity (BVU)	Virtue of Voting	BVU1, BVU2, BVU3R, BVU4R

Belief in Voting Uniformity (BVU) questions

Introduction: 'To what extent do you agree or disagree with the following statements?'
BVU1) Everyone should vote on the same day (Scale, 1-7, strongly agree/strongly disagree) (Original question)
BVU2) 'It is important that everyone votes using the same tools, such as a paper ballot' (Scale, 1-7, strongly agree/strongly disagree) (Original question)

Introduction: 'Mark the scale below closest to the statement you most agree with'
BVU3R) 'I like to keep my voting choice a secret'/'I like to share my voting choice with others' (Semantic differential scale question, 1-7) (Original question) (Scoring reversed)
BVU4R) 'Voting should be compulsory for everyone'/Voting should be optional for everyone' (Semantic differential scale question, 1-7) (Original question) (Scoring reversed)

Belief in the publicness of voting (BPV), the third aspect of the virtue of voting, emphasises the importance of voting in a public space, which is considered to be an important part of the civic ritual of voting (Barber, 1984; Orr, 2015, 2016).

Table 4.5, Belief hypothesis H4 and indicator items

H#	Hypothesis	Variable	Concept Area	Questionnaire Items
H4	Individuals who score highly for the construct 'belief in the publicness of voting' will be less likely to support the extension of RE-voting to general elections	Belief in Publicness of Voting (BPV)	Virtue of Voting	BPV1, BPV2,BPV3R, BPV4

Belief in Publicness of Voting Questions (BPV)

Introduction: 'To what extent do you agree or disagree with the following statements?'

Introduction: 'To what extent do you agree or disagree with the following statements?'
BPV1) 'It is important that voting occurs in public spaces, such as schools, community centres, and churches etc' (Scale, 1-7, strongly agree/strongly disagree) (Original question)
BPV2) 'I like to be around people on polling day' (Scale, 1-7, strongly agree/strongly disagree) (Original question)
BPV3R) 'People don't need to be physically present to vote because you can do everything over the internet now'. (Scale, 1-7, strongly agree/strongly disagree) (Original question) (Scoring reversed)

Introduction: 'Mark the scale below closest to the statement you most agree with'
BPV4) 'Voting is an individual activity'/'Voting is a community activity') (Semantic differential scale question, 1-7) (Original question)

The purpose of these constructs is to assess whether these virtue of voting objections to RE-voting are present in the student population, and, if these virtue beliefs are present, whether they affect the support for extension of RE-voting to national elections.

Integrity of Voting items

The RE-voting literature contains a number of objections to RE-voting on the grounds that it threatens the integrity of elections (Dill, 2008; Springall et al, 2014). These objections are based on both the real and perceived security flaws of RE-voting software which stem from the

black-box design of E-voting and RE-voting systems. These concerns range from the fears over software counting errors, to the potential for domestic or foreign actors to decrypt or fraudulently insert ballots into the system (Dill, 2008). These integrity concerns are articulated in the literature by computer scientists (Shamos, 2004; Dill, 2008; Springall, 2014), but these concerns are also found in surveys of individuals outside of computer science and in the judgements of the constitutional courts of Germany and Austria (Seedorf, 2015; Oswald, 2016).

Beliefs about the integrity of RE-voting are measured by this study in terms of user trust. This trust was broken into three layers in the theoretical framework: (i) Disposition to trust technology, (ii) Trust in the institutional context of the RE-voting system, (iii) Particular trust in the RE-voting system itself (Mcknight et al, 2015). The Likert scale questions relating to these three layers of trust were expected to be correlated and to have a strong internal consistency. It was expected that the items would load together during factor analysis and be combined into one scale variable (1-7): trust in technology.

Disposition to trust technology is measured by a faith in technological progress question, drawn from the World Values Survey WVS (2015 wave). Trust in the online institutional context of RE-voting is measured by questions drawn from Carter and Bélanger (2005:25). Particular trust questions were developed, but were dropped due to similarities to the DV question items, and the possibility for confusion over whether they referred to trust in the SU/course representative system or in RE-voting systems in general. To avoid confusion, particular trust in RE-voting was dropped as a construct from the final survey.

Table 4.6, Belief hypothesis H5 and indicator items

H#	Hypothesis	Variable	Concept Area	Questionnaire

				Items
H5	Individuals who score highly for the construct 'trust in technology' will be more likely to support the extension of RE-voting to national elections	Trust in Technology (TT)	Integrity of Voting	TT1,TT2,TT3,

Trust in technology (TT) questions

Introduction: 'To what extent do you agree or disagree with the following statements?'
TT1, Disposition to trust technology) 'Science and technology are making our lives healthier, easier, and more comfortable' (Scale, 1-7 strongly agree/disagree) (adapted from WVS, 2015 wave)
TT2, Institutional trust) 'In general, the internet is now a robust and safe environment in which to vote over' (Scale, 1-7 strongly agree/disagree) (adapted from Carter and Belanger, 2005:25)
TT3, Institutional trust) 'I feel assured that legal and technological structures adequately protect me from problems on the internet' (Scale, 1-7 strongly agree/disagree) (adapted from Carter and Belanger, 2005:25).

Introduction: 'Mark the scale below closest to the statement you most agree with'
TT4R, Generalised trust) 'In general most people can be trusted'/'You can't be too careful in dealing with people' (Semantic differential scale question, 1-7) (Adapted from Inglehart, 1997:544)

Usefulness and convenience items

Usefulness and convenience items are drawn from The Technology Acceptance Model (TAM) literature and the voter turnout literature. TAM was developed to predict the adoption of new computing technologies, also described as information systems (IS) (Davis, 1985; Lee, Kozar and Larsen, 2003:752-753). The model two constructs to explain technology adoption: (i) Perceived Usefulness (PU), 'defined as the extent to which a person believes that using an IT will enhance his or her job performance', and (ii) Perceived Ease of Use (PEOU), 'defined as the degree to which a person believes that using an IT will be free of effort' with a low barrier to proficiency (Venkatesh, 2008:275).

Perceived Usefulness items are included in this survey, but Perceived Ease of Use items were dropped from the model due to loading strongly with Perceived Usefulness during factor

analysis of the pilot survey results. Removing these items helped to improve the brevity of the usefulness and convenience segment of the survey. The efficacy of the perceived ease of use construct is a common issue in technology acceptance studies (Gefen and Straub, 2000:3,4).

Usefulness and convenience constructs have been applied to E-voting and RE-voting adoption studies in the last twenty years (Schaupp and Carter, 2005; Choi and Kim, 2012; Nemeslaki, Aranyossy, Sasvári, 2016). However, these studies have only focused on the intention to adopt RE-voting in countries where first order RE-voting is either not universal, or is non-existent: USA (Schaupp and Carter, 2005; Choi and Kim, 2012), and Hungary (Nemeslaki, Aranyossy, Sasvári, 2016). This study applies these constructs to a population which have had the opportunity to vote online and so may already have first-hand experience. The items have been included in the survey due to their high level of reliability, having been tested as explanatory variables for e-government adoption in the studies described above.

Table 4.7, Belief hypothesis H6 and indicator items

H#	Hypothesis	Variable	Concept Area	Questionnaire Items
H6	Individuals who score highly for the construct 'perceived usefulness' will be more likely to support the extension of RE-voting to general elections	Perceived Usefulness	Usefulness and Convenience	PU1, PU2, PU3

Perceived Usefulness (PU) questions

Introduction: 'To what extent do you agree or disagree with the following statements?'
PU1) 'Online voting enables me to vote quickly' (Scale, 1-7 strongly agree/disagree) (adapted from Gefen and Straub, 2000:15)
PU2) 'Online voting fits in with a busy lifestyle' (Scale, 1-7 strongly agree/disagree) (adapted from Gefen and Straub, 2000:15)
PU3) 'Online voting makes voting more efficient for me' (Scale, 1-7 strongly agree/disagree) (adapted from Gefen and Straub, 2000:15)

Perceived cost of voting was drawn from the voter turnout literature, specifically Andre Blais' studies of the perception of voting effort (Blais, 2000, 2019). The question items are original since the questions used in Blais' surveys refer to the effort involved in voting in government elections where the mode of voting was in-person or postal. This study's cohort had the opportunity to vote online in their SU sabbatical officer and course representative elections, so a different approach was needed. Three questions were used to tap into the idea of perceived cost: the first item assessed the general feeling of the time saved by voting online; items two and three assessed whether it would be worth voting offline in an SU election.

The first scale question, 'Voting online takes much less effort than voting in person', was designed to tap the individuals' judgement of the amount of effort saved by voting online. It was anticipated that individuals who scored highly for voting duty beliefs would have low scores for this item, as they would have an intrinsic motivation which would compel them to participate, independent of the voting system type.

Questions two and three focused on the motivation for participating in SU elections. This type of election was referenced due to the familiarity of this event to the study cohort; voting online in SU elections is a normal and relatable experience. By asking people whether they would be willing to participate in an offline SU election, the opportunity-cost of voting offline would be assessed. Two separate evaluations would be weighed; the individual's sense of the importance of the election, and their willingness to take the time to vote in-person.

Table 4.8, Belief hypothesis H7 and indicator items

H#	Hypothesis	Variable	Concept Area	Questionnaire Items
H7	Individuals who score highly for the construct 'perceived cost' will be more likely to support the extension of RE-voting to general elections	Perceived Cost of Voting	Usefulness and Convenience	PC1, PC2, PC3

Perceived Cost (PC) questions

Introduction: 'To what extent do you agree or disagree with the following statements?'
PC1) 'Voting online takes much less effort than voting in person' (Scale, 1-7 Strongly agree/Disagree) (Original Question)
PC2) 'Voting in a Student Union polling station would take too much time out of my day' (Scale, 1-7 Strongly agree/Disagree) (Original Question)
PC3) 'If I could not vote online in Student Union elections, I would rather stay at home than vote' (Scale, 1-7 Strongly agree/Disagree) (Original Question)

General belief questions

These questions have been included to investigate respondents' general beliefs towards informed voting, voting as a duty, tradition, and risk. They were drawn from the virtue of voting literature, but are not linked explicitly to belief in voting cost, belief in uniformity of voting or belief in publicness of voting. These questions are intended to tap into broader values about democracy and technology. It was anticipated that they would load closely with the virtue of voting items during factor analysis.

Introduction: 'Mark the scale below closest to the statement you most agree with'
PERS1R) People should do their research before voting/People should not have to do research before voting (Semantic differential scale question, 1-7, scored for research positive responses) (Original question)
PERS2) Voting is a right which I can take or leave/Voting is a duty which I must carry out (Semantic differential scale question, 1-7, scored for duty positive responses) (Original question)
PERS3) Progress is important to me/Tradition is important to me (Semantic differential scale question, 1-7, Scored for tradition responses) (Original question)
PERS4R) I avoid taking risks/I enjoy taking risks in life (Semantic differential scale question, 1-7, Scored for risk aversion responses) (Original question)

2.3 Control variable questions

To identify the effect of any confounding variables on the DV, It is necessary to include variables which are associated with participation in elections in the same model as variables which indicate intention to use RE-voting or support the extension of RE-voting to general elections. This project is concerned with constructs which predict support for the use of RE-voting systems in national elections, controlling for their level of political awareness and political participation. The intention is to control for variables which affect the likelihood of voting in an online election, to expose the remaining variables which determine the adoption of RE-voting technology.

Discussion of politics and hours spent volunteering were used as indicators of political engagement and civic voluntarism. The use of these indicators is necessary to control for political engagement, so that the effects of RE-voting experience can be identified. Inclusion of these questions also permits comparisons between the politically engaged population and in the non-politically engaged population to tease out IVs which may be independent/secular of politicisation. The IVs expected to be secular of politicisation include trust in technology, and interpersonal trust.

The questions relating to political engagement and civic voluntarism indicators have been drawn from the British Electoral Study (BES) and the World Values Survey (WVS). Where gaps in the existing questionnaires have been identified, new questions have been created. Original questions have been created for the indicators of engagement in student union elections and other low-salience online elections.

To assess whether these non-political engagement variables have an effect on the adoption of RE-voting, a difference of means test will be used to judge whether there is a significant

difference in rates of adoption between politically engaged students and non-politically engaged students.

Political engagement
CTRL1) During the last week, on roughly how many days did you talk about politics with other people? (Scale of 1-7 or none) (adapted from the British Electoral Study, 2017)
Civic voluntarism
CTRL2) How many hours a week do you spend volunteering? (1-20+ scale) (adapted from the British Electoral Study, 2017)

Demography questions

Demography questions are important for providing contextual information about the survey target population. Demographic information adds greater context to any descriptive or inferential statistics, and can help with identifying possible causes of heterogeneity in the audience response. For example, respondents may feel differently towards RE-voting based on their religious beliefs, their level of education prior to university, their subject of study, and their age within the cohort.

Demography (D) questions

D1) What is your year of birth? (Categorical: drop down list of years provided, 2001-1950) (Adapted from British Electoral Study, 2019)
D2) Are you male or female? (Categorical: Male, Female, Option for self-identifying) (Adapted from British Electoral Study, 2019)
D3) Do you have any long-term illness, health problem or disability which limits your daily activities or the work you can do? (Categorical: Yes, No, Prefer not to say) (Adapted from British Electoral Study, 2019)
D4) 'What type of course are you doing?' (Categorical: Undergraduate taught (BEng, BSc, BA, LLB etc), Postgraduate taught (MSc, MPhil, MA, MBA etc), Postgraduate research (PhD), Prefer not to say)
D5) What subject area are you studying? (Categorical: Engineering, Mathematics, Natural Sciences, Humanities, Social Sciences, Psychology, Education, Medicine, Law, Economics, Business, Other) (Adapted from British Electoral Study, 2019)
D6) To which of these groups do you consider you belong? (Categorical: White British, Any other, white background, White and Black Caribbean, White and Black African, White and Asian, Any other mixed background, Indian, Pakistani, Bangladeshi, Any other Asian background, Black Caribbean, Black African, Any

other black background Chinese, Other ethnic group, Refused (Adapted from British Electoral Study, 2019)

Survey Pilot studies

Four pilot studies were conducted to shape the final survey. These pilot studies informed the inclusion and exclusion of certain questions, the distribution method, the format and wording of the invitation and the question order and question wording. Factor analysis was used in each pilot to identify questions which were strongly interrelated, and to eliminate questions which had no obvious relationships. See table 4.7 for a summary of the different survey iterations.

Table 4.9, Summary of survey iterations 2019-2020

	Title	Date	Version	n	Participant age range
1	Proto-Pilot	09/2019	1	15	23-30
2	Pilot 1 (Complete survey test)	10/2019	2	74	18-24
3	Pilot 2 (Complete survey test)	07/2020	3	40	18-75
4	Pilot 3 (SDS question testing)	08/2020	SDS battery 1	56	18-75
5	Pilot 4 (SDS question testing)	08/2020	SDS battery 2	28	18-75
6	Final Survey	10/2020	4	445	18-24

3. Survey design: Sampling, time and circumstances

RE-voting software is used for student elections by all 166 HE institutions in the UK, giving 2.3 million full time students the opportunity to vote online (HESA, 2020). The NUS represents 600 student unions across the HE and FE sectors, and the majority of these institutions use the NUS

and Arrkgroup's UnionCloud software. UnionCloud provides a number of online services to NUS member unions including RE-voting software for student elections (Arrkgroup, 2019). Based on these figures, a significant portion of 18-24 year-olds in the UK have the opportunity to use UnionCloud's RE-voting technology in addition to the miscellaneous RE-voting systems used for elections in the voluntary and private sector. These RE-voting opportunities make the 18-24 student demographic a salient population to survey.

Five HE institutions were selected using a tiered combination of enrolment by university 'type' to ensure proportionality, and student retention ranking data to ensure a broad range of student backgrounds were represented (HESA, 2020). HESA's retention ranking table set the parameter for selection at 105 HE institutions. The institutions were selected using a combination of stratification and random selection.

University type as a stratifying layer to the dataset

The 105 universities were sorted according to their foundation date and grouped into categories. The Department for Education stratifies universities into four tiers for their projections of student progression to employment: 'Ancient' universities, 'Red Brick' universities, 'Plate Glass' 1960s universities, and post-1992 universities. This typology is used to categorise the 'prestige' level associated with attending a particular university, the older the university the higher the level of perceived prestige (Blyth and Cleminson, 2016:26). The majority of 'Ancient' and 'Red Brick' universities are members of the Russell Group which enrolled 27% of UK students in 2018 (HESA, 2020). The remaining 73% of students enrolled at a mixture of non-Russell group pre-1960s, 1960s, 1980s, post-1992, or post 2000 universities (HESA, 2020). This simple typology was used to categorise universities for the next iteration of sampling. See table 4.7 for a summary of the enrolment data for each category of institution.

The next HE sampling iteration will approximate these national student enrolment percentages.

Table 4.10, HE Institution type and share of student enrolment

University Type	Enrolment (2016)	Percentage of Student Enrolments (2016)
Ancient	29,495	6.18%
Red-Brick	70,038	14.68%
Plate Glass	117,425	24.61%
Post 1992	260,275	54.54%
Total	477,233	100.00%

Using student enrolment data, the sampling strategy was repeated for institutions with >1000 first year enrolments (n=105). These universities were ranked according to their student retention data. Student dropout is defined by HESA as the number of full-time students who did not did not re-enrol for their second year. Retention data was used as a primary stratifier because it serves as a reliable proxy for the socio-economic background of students; students from economically disadvantaged backgrounds have a higher drop-out rate than students from economically advantaged backgrounds (Crawford, 2014:2).

The sample had a range of 17 percentage points, with the University of Cambridge holding the lowest drop-out rate (1%), and the University of Bedfordshire holding the largest dropout rate (18%). The list of 105 universities was split into quintiles of 21. The sample was drawn from each of the quintiles using a random number generator. Universities were randomly redrawn if they did not reflect the national ratio of university types. The generated list includes an ancient university which is also a member of the Ancient and Red-Brick dominated Russell group of universities (Edinburgh), a 1960s ‘Plate Glass’ university (Sussex), and three ‘post-92’ universities (London South Bank, York St John, University of South Wales). If Edinburgh is used

as a proxy for both Ancient and Red-Brick institutions, this selection better approximates the national distribution of university types. The Ancient universities and Red-Brick institutions are represented by 20% of the sample (21% nationally). Plate-Glass 1960s institutions make up 20% of the sample (24.5% nationally), and three post-1992 institutions constitute 60% of the sample (54.5% nationally). See table 4.8 for a summary of these institutions.

Table 4.12, HE Institutions using sampling strategy based on 'university type' and student retention rank

Retention Rank (/105)	Quintile	HE Institution	Category	Year Founded	County
5	1st Quintile	University of Edinburgh	Ancient University (representing Red Brick Institutions here also)	1583	Midlothian
27	2nd Quintile	The University of Sussex	1960s Plate Glass University	1961	Sussex
53	3rd Quintile	York St John University	Post-92 University	2006	Yorkshire
86	4th Quintile	University of South Wales	Post-92 University	2013	Glamorgan
91	5th Quintile	London South Bank University	Post-92 University	1992	Greater London

Reaching the sample

Random sampling of the target population is only possible with a complete student mailing list for each of the 105 large universities. Each of these emails would be assigned a unique number, and a random number generator would then be used to select numbers within a specified range (De Vaus, 2002). This ideal approach is not possible with the time and

resources available to this study. Student union mailing lists and central management mailing lists where students can be contacted cross-department are not easily accessible to the researcher. Instead, a pragmatic opportunity sampling strategy is required.

Sampling from the 'home' academic department or appealing directly to other academic departments is consistently the most successful strategy for gathering responses from higher education students (Blais and Young, 1999; Colwell et al, 2008; Betancourt and Wolff-Eisenberg, 2019). Sampling from the home department is especially common in the psychology literature, but is considered detrimental to the generalisability of results to the general population (Hanel and Vione, 2016). Due to the obvious problems with this strategy, the researcher's native department was not exclusively sampled. A review of the literature found no UK studies which relied on student union mailing lists to distribute surveys, indicating that student mailing lists were easier to find elsewhere, and/or that cross-department mailing lists are difficult to acquire. Due to the lack of viable alternatives, this study uses a primary strategy of approaching individual university departments directly with the request that they share the survey with their students. To ensure a representative sample of students, every academic department across the five universities were contacted.

Strategy for contacting departments

To maximise the size of the student sample from each institution, a list of university departments and module conveners from each department was used. This list contains contact details of staff responsible for a particular module for every module offered by selected institutions: Edinburgh, Sussex, York St John, South Wales, and London South Bank. Questionnaires distributed by a relevant authority, such as a course convenor, have a higher response rate than those without this authority (Dillman, 2007). Royal Holloway University

branding was included in the email invitation and the questionnaire ‘landing page’ to increase this relevant authority effect.

A personalised paper invitation was posted to 302 module convenors across the five universities. The invitation was sent by 2nd class post to arrive on the 7th or 8th of October. This was followed by a personalised email invitation using the SalesHandy mailer on Friday the 9th of October. The invitation provided them with a summary of the study, and a request to distribute the survey to their students. This email invitation was followed up with weekly reminder emails to non-responders until the end of October. See Appendix 4.2 for the paper and electronic invitation letter.

Invitation letters were timed to arrive at the end of the first or second week of course representative elections, depending on the institution’s election windows. These representative elections were conducted online across the five institutions within two to three weeks of the beginning of the academic year. Invitations were timed to arrive during these elections; this was to boost the relevance of the survey and to ensure that first year students had the opportunity to participate in an online election before responding. The disruption caused by the covid-19 pandemic made sending the survey during the 2020 SU elections unfeasible. In light of this disruption, the 2020 course representative elections were the next-best window for sending out the survey. See table 4.9 for the start date of each university’s course representative elections.

Table 4.13, Course representative elections and survey invitation dates

University	Course representative election start date	Paper survey invitation arrives	Email survey invitation arrives
University of Edinburgh	28th of September 2020	8th of October 2020	9th of October 2020
London South Bank University	28th of September 2020		
University of Sussex	4th October 2020		
York St John University	5th October 2020		
University of South Wales	Between 21st of September and 4th of October 2020		

This survey has a clearly defined and large target population who all have academic (ac.uk) email addresses. These addresses are aggregated into electronic mailing lists by their academic departments. The most cost-effective and efficient way of sampling this population is to negotiate access to these mailing lists, and send the survey using their mailing client. This could be described as an opportunity sampling method, since respondents are not being randomly picked from a pool, or purposefully chosen according to a quota (De Vaus, 2002). Due to the low response rates associated with internet surveys, this opportunity sampling method has been chosen to maximise the size of the respondent pool (Fan and Yan, 2010:2). Opportunity sampling permits as many people as possible to participate in the survey, but this non-selective sampling can be affected by sampling bias. Strategies to mitigate sampling bias, non-coverage error and non-response error are discussed later in this section, though it is worth pointing out that non-coverage error will not affect this study since the entire target population has an ac.uk email address and has access to a computer.

Online questionnaires have many advantages over their paper antecedents: They are cost effective at a large scale, quick for the researcher to administer and for respondents to return,

and they bypass the administrative bottlenecks which paper questionnaires encounter, namely data entry (Nulty, 2008:301). The data gathered is already in digital form, often a CSV file, which allows for the instant application of statistical packages to the dataset. Descriptive and inferential statistics are quicker to derive from the dataset, relative to paper responses (Dillman, 2007; Bista and Saleh, 2017). These improvements make the administration and analysis of questionnaires more convenient for the researcher, but evidence for the response-rate efficacy of online surveys is mixed.

Nulty's metanalysis of seven paper vs online questionnaire experiments found that paper surveys handed directly to the respondents had a response rate average 23 percentage points greater than online surveys, with a median value of 18 percentage points (2008:303). This analysis highlights the importance of proximity between the researcher and the respondent for the response rate. The more contact the researcher has with the respondent, the more likely the survey will be completed (Dillman, 2007). Postal surveys, where respondents do not meet the researchers, have similar response rates to online surveys (Bista and Saleh, 2017).

Sampling bias is a significant weakness for large scale surveys. Whether they are paper or online, mass-mailed surveys inevitably suffer from a 'volunteer bias' (De Vaus, 2002). Individuals who are interested in the survey content, or who have a greater openness to completing surveys may skew the validity of the sample. If the only people to respond to the survey are interested in voting, then the survey will not be valid to the target population. This is a problem of representation. It will not be possible to choose specific participants or construct a stratified sample using the course convenors' mailing lists. This study has two measures in place to avoid sampling bias within the pool of 1,500,000 respondents: incentives and control questions. Each survey respondent had the choice to enter into a lottery for a £50

shopping voucher. This incentive was intended to attract participants who would not normally take an interest in surveys. The literature on questionnaire response rates suggests that financial and material incentives have a positive effect on the response rate, but that non-material incentives, such as the relevance of the survey to the respondent, have a larger effect (Dillman, 1991:230; De Vaus, 2002:136). Questions designed to identify political interest and civic voluntarism were included to control for respondents who are inclined towards the survey's subject matter. These questions will help to identify 'non politicised' respondents during the data analysis and will give an indication of how representative the sample is of the wider population.

Raising the response rate, survey length

There is no prescriptive consensus in the literature on question design, survey length and the order of questions. However, there are indicators of 'bad practice' which researchers have identified as responsible for lowering response rates. De Vaus describes these as 'Intrusive, sensitive, irrelevant or repetitive questions as well as those that are poorly worded, difficult to understand, difficult to answer or have insufficient response categories' (2002:97). Schwarz argues that survey respondents unconsciously apply the social norms of face to face conversation to questionnaires (1998). Violations of the social norms of conversation such as repetition, intrusiveness, and lack of clarity in a survey are treated seriously by respondents. Survey questions should be constructed as good conversation and should be 'clear, concise, honest, and not repetitive' (Dillman, 2007:91). Online questionnaires are conducted without the researcher being present to explain questions or encourage respondents to finish the

survey. This lack of proximity to the researcher makes clarity in question construction and concise questionnaire design extremely important (De Vaus, 2002; Dillman, 2007).

Consistent with Schwarz's social norms of conversation observation, the order of questions of survey is significant for the response rate (1996). As in most social exchanges, the questionnaire should begin with questions which are simple and easy to respond to, before progressing to more substantive questions (De Vaus, 2002:110-111). There should be a logical progression to the questions, and complex concepts should be tackled first in concrete terms before discussing their abstract dimensions (Ibid). Closed questions have a higher response rate than open ended questions, and since open ended questions require greater effort from the participant it is recommended that they are placed towards the end.

Survey length has a significant effect on the response rate (Bista and Saleh, 2017:65). In the literature, survey length is measured in terms of time rather than by number of questions. To avoid depressing the response rate, surveys should be between 10 and 20 minutes in length. The 20 minute ceiling is based on the average adult attention span (Revilla and Ochoa, 2017:558). Time taken to complete the survey differs between individuals, levels of literacy, familiarity with the subject and ability to concentrate all affect survey completion times (Ibid). This questionnaire has been designed with the 20 minute average ceiling in mind.

Ethical Considerations for the survey

This project adheres to the ethical guidelines for social science research specified by the British Sociological Association (2017). Ethical considerations affect this project over five broad areas: voluntary participation, informed consent, ensuring no harm, privacy and data protection. The students who participate in the survey are all volunteers. While an incentive has been provided, they are all participating freely and without coercion. The purpose of the survey was

explained to participants in the introduction to the survey, and they were given the right to withdraw from the study and have their data deleted at any point (BSA, 2017:6). This introductory explanation is necessary in order for volunteers to consent to the study with full knowledge of the study's purpose and its possible implications. It is the responsibility of the researcher to ensure that volunteers are not psychologically or physically harmed by the research (BSA, 2017:5). While there is no obvious physical harm to the RE-voting survey, there is the potential for psychological harm. The survey was risk assessed within the researcher's home school to check for any potential sources of psychological harm, and was subsequently registered and self-certified with Royal Holloway's ethics panel.

Survey participants are not expected to provide their names, and any potentially identifying data such as academic email addresses will not be published. To ensure that participants' data is protected, data collected by the study was stored on a drive protected by two-factor authentication. Encrypted zip files were used for transfer of data between machines, and any duplicate files or files which became surplus to requirements were deleted (BSA, 2017:7). Participants also have the right to withdraw from the study and have their data removed from the database.

4. Interview question design

Individual interviews were used to verify and provide deeper context to the relationships proposed by the survey analysis. Much of the interview material is unquantifiable, but a mixed methods approach was used to allow insights in the quantifiable aspects of the interviews. To allow this, interview responses were assigned categorical codes which permitted the use of summary statistics and the use of non-parametric measures of similarity between responses.

This element of the methodology is described as magnitude coding by Saldaña (2016:86-90). Nvivo software was used to code the interview transcripts and for non-parametric correlation tests between codes.

The most significant survey findings determined the 18 question script used for interviews: (1) the positive correlation between aversion to voting in low salience elections and perceptions of the usefulness of RE-voting; (2) the unexpected lack of correlation between duty/compulsory voting values and the 'virtue of voting' attitudes such as belief in voting cost, belief in uniformity of voting, belief in secrecy of voting and belief in publicness of voting; (3) the confirmation of a negative correlation between belief in voting cost attitudes and support for the extension of RE-voting to general elections; (4) the confirmation of a positive chain of relationships between support for internet voting, support for institutional trust in the internet and optimism about scientific and technological progress. See table 4.10 for a complete list of the 18 survey questions. The development of these questions are discussed in the subsequent sections.

Table 4.14, Interview Questions and themes

Interview Section	#	Question Theme	Question text
1) Experience & Motivation	1	Experience, online elections	Have you ever voted online, in any election?
2	2	Online election motivation	What motivated you to vote in that online election?
5	5	Counterfactual voting question	Would you still have voted if the online election was held offline?
3	3	Experience, higher elections	Have you ever voted in a council/regional/national government election?
4	4	Higher election motivation	What motivated you to vote in the council/regional/national government election?
2) Attitude to voter participation	6	Compulsory voting	In Australian elections, voting is compulsory. What do you think about compulsory voting being used in the UK?
7	7	Voting duty	Do you think people have a duty to vote?
8	8	Perception of voting effort	Do you think of voting as being a low-effort, or high-effort activity?
9	9	Perception of voter turnout	Without knowing the figures, do you feel enough people are voting in general elections in the UK?
10	10	Attitudes to online voting	Do you consider online voting to be an important development for democracy in the UK?
11	11	Ease of voting	Groups like the Electoral Reform Society want to make voting much easier. How do you feel about making it easier for people to vote?
3) Voting cost/effort and location of voting	12	Minimum effort and voting	Some people believe that voting should require some minimum amount of effort from the voter - what do you think about this?
13	13	Embodied presence	Do you feel that voting from a polling station has any benefits, other than casting a vote?
14	14	Public/Private Voting	Is it important that we vote in public and are seen by each other when we vote?
4) Trust in institutions and technology	15	Political advantage	Do you think that online voting would give an advantage to any of the UK's political parties
16	16	Trust in government	Do you trust the government to administer online elections?

17	17	General attitude to technology	Do you feel that technology solves our problems more often than not?
18	18	Future of online voting	Do you think that voting online will be used in general elections within the next 25 years?

4.1 Aversion to voting in low salience elections and perceptions of the usefulness of RE-voting

Strong aversions to voting cost influence the perception of political technologies such as RE-voting. Perception of efficiency (PU1), time saving (PU2) and ease of use (PU3) are all positively correlated with aversion to voting cost scales (PCOST). To further expand on these items, interview participants will discuss their motivations for voting in student union elections, their perception of voting effort and the significance of RE-voting to them.

When tested using logistic regression, the aversion to voting cost scale had the strongest positive influence on the probability of participating in online elections of any kind, including student union elections. Details of this model can be found in the quantitative analysis appendices. Institutional trust in the internet and perceived usefulness of internet voting, which had the strongest positive influence on support for RE-voting in general elections, had no statistical relationship to participation in low salience elections.

This comparison indicates that aversion to voting cost attitudes are important for explaining the decision to participate in low-salience online elections, rather than alternative explanations such as strong beliefs about voting as a duty, or institutional trust in the internet. Perceptions of the time-saving nature and efficiency of RE-voting are significant for explaining participation in these contests. The implication being that the voting medium may be more

significant for encouraging participation relative to alternative forms of encouragement such as education programmes which foster beliefs in voting duty.

The relative importance of the aversion to voting cost scale over voting duty & compulsory voting scale is evidenced by the spearman matrix analysis of the survey data; the voting duty and compulsory voting scale had negative relationships with institutional trust in the internet, (-0.09**) and aversion to voting cost (-0.14***), and no significant relationship to any other items. In contrast to this, both institutional trust in the internet and aversion to voting cost scales were associated with favourable perceptions of internet voting technology, with respective Spearman coefficients of 0.29*** and 0.28*** for perceived usefulness of internet voting. Of these three scales, aversion to voting cost is the strongest predictor for involvement . These observations only apply to low-salience elections which already have low levels of interest and therefore low participation levels.

4.2 Exploring unexpected lack of correlation between duty/compulsory voting values and the 'virtue of voting' attitudes

The absence of a relationship between duty/compulsory voting values and virtue of voting attitudes, such as belief in voting cost and belief in the importance of tradition, was deemed significant enough for further exploration during the interviews. In the theoretical framework it was anticipated that support for voting cost and associated virtue of voting attitudes would be positively correlated with strong views on voting duty, and with strong views on compulsory voting. This expectation was based on the citizenship research of Dalton (2008) and Bennett (2008), whose work identifies a divide between 'duty citizenship' and 'engaged citizenship', or 'actualised citizenship'. Identifiers of duty citizenship are: support for traditional forms of engagement in public life such as military service, jury duty and participation in local

government, strong beliefs about social order, and the importance of participation in elections (Dalton, 2008:81). This 'traditional' citizenship is associated most strongly with generations prior to the 'baby boomers', and is distinct from engaged citizenship which Dalton identifies as having emerged in the last 30 years (2008). Engaged citizenship is characterised by political activity outside of election periods and with a focus on activities such as participating in a demonstration or boycott, which have an expressive element despite their instrumentality (Dalton, 2008). These types of citizenship are described in greater detail in the theoretical framework, but they are referenced here because of the absence of a statistical relationship between support for tradition and support for voting duty. Extrapolating from Dalton's characteristics, support for traditional modes of voting and perception of voting as a duty ought to have a positive bidirectional relationship, or at least a unidirectional one.

This indifference to 'virtue of voting' arguments has already been demonstrated statistically, with significant negative relationships reported in relation to the 'belief in voting cost' scale (BVC), 'importance of physical presence during voting' (BPV3) and 'polling day as a social experience' (BPV2R). The Spearman correlation matrix indicates that young people who have strong views about voting duty and compulsory voting are more likely to have low institutional trust in the internet (ρ=-.09 $p<.05$), but there is no evidence for a positive/negative relationship with normative attitudes towards internet voting, such as the notions of personal cost, the importance of ritual, or the uniformity and publicness of voting.

With regard to the duty and compulsory attitudes, the purpose of the interviews was to provide greater context to this indifference and apparent priority placed on the instrumental aspect of voting. Interviews will also explore whether participants with strong views about voting duty/compulsory voting also hold strong views about measures intended to expand access to voting such as automatic voter registration and reducing the qualifications required

to vote. An ‘expand voting at all costs’ attitude is expected from participants who scored highly on the voting duty/compulsory voting scale.

4.3 Negative relationship between belief in voting cost attitudes and support for the extension of RE-voting to general elections

Finding three, the statistical confirmation that belief in voting cost attitudes reduce support for the extension of RE-voting in general elections required further examination. This finding was anticipated by the theoretical framework, but young people’s motivations for supporting voting cost remain opaque.

Belief in voting cost appears as an exclusionary attitude, but it does not correlate with indicators of political knowledge, duty or engagement. This suggests it is not motivated by ‘gatekeeping’, where individuals with an attachment to local or national politics attempt to control access to the franchise and therefore control who belongs to the political sphere (Orr, 2016:103,104). However, gatekeeping of the franchise may not require an interest in politics, it may be reduced to an ‘ingroup vs outgroup’ phenomenon. Expanding access to the franchise through RE-voting technology potentially dilutes the voting power of electors who are prepared to vote in-person. The ‘ingroup’ in this scenario are the in-person voters, and the ‘outgroup’ are RE-voters.

To probe this aspect of voting cost and access to the franchise, participants will discuss the requirement of citizenship as a qualification for voting, whether electors should have to supply voter ID, and any criteria which should disqualify people from voting such as age or imprisonment. It is anticipated that young people with strong views on voting cost will be opposed to any reductions in voting qualifications and will show a strong preference for enhanced voter verification measures such as voter ID.

There was also a need to clarify whether the opposition to RE-voting from belief in voting cost respondents was related to a lack of trust in technology, or whether it was a purely normative objection. In the literature review, a distinction was drawn between normative objections, that is objections which are based in beliefs about how voting ought to be conducted, and prosaic objections which relate to the integrity of the technology itself. Statistically, responses to these question items were independent of one another, meaning there was no significant positive/negative relationship between them. The role of the interviews was to identify whether this independence was also evidenced on a micro-level, and specifically whether respondents made a distinction between normative objections and integrity objections to RE-voting.

4.4 Positive association between support for internet voting, support for institutional trust in the internet and optimism about scientific and technological progress.

Finding four, the cluster of positive relationships between support for internet voting (IDEM1), support for institutional trust in the internet (ITRUST) and optimism about scientific and technological progress (TT1) was partially predicted by the theoretical framework, but it also requires verification. Institutional trust in the internet was the strongest predictor of support for the internet voting in general elections. This relationship was anticipated as a chain of relationships, with broader trusting attitudes acting unidirectionally on institutional trust. However, the models which supported this had extremely poor Chi Square goodness of fit results. Models which indicated covariant relationships rather than causal relationships between these concepts had stronger Chi Square statistics. Respondents will be asked to

distinguish between their trust in online voting and their trust in the administrator of the system.

The influence of faith in scientific and technological progress on support for RE-voting requires clarification. There was no direct relationship between faith in scientific progress and support for the extension of RE-voting, but there was a strong relationship between institutional trust and support for extension. Respondents with high levels of faith in scientific and technological progress were also extremely likely to have a strong institutional trust in the internet, but this relationship was not found in reverse; high levels of trust in the internet did not predict positive views about scientific and technological progress. The absence of a relationship between faith in scientific progress and support for internet voting will be explored in the interviews.

5. Interview structure and sampling methods

Participants were purposely sampled from the pool of 445 survey respondents. Purposeful sampling is not a probability sampling method, but the requirement to collect detailed information and the limited quantity of survey respondents made purposeful sampling a necessity (Patton, 2002:45). The intention of purposeful sampling is to gain a richer understanding of the subject from a relatively small number of cases, small relative to survey methods (Ibid). Since difference of means tests showed no significant differences in response values between universities, respondents were sampled according to their question responses, rather than institution or course type.

Typically, researchers are physically present for interviews, with the rapport-establishing advantages of eye contact, body language and tea/coffee. Due to the Covid-19 pandemic, interviews were held online using the video conferencing program, Zoom. To improve the

reliability of the post-interview analysis, the video calls were recorded and securely stored (Mosley, 2013:24,25). These recordings were transcribed during post-interview analysis.

5.1 Structure of interviews and (non) spatial arrangements

There is no perfect duration for an interview. Considerations for length depend upon the amount of information needed before a question topic is saturated, and the fatigue/boredom threshold of the interview participant. Duration examples from the literature range from 45 minutes to three hours (Seidman, 2006:70; Bleich and Pekkanen in Mosley, 2013:99; Atkinson in Gubrium et al, 2016:121). Due to the largely impersonal nature of the topic of voting, the age of participants, and the fatigue created by online interaction, interviews were structured to last between 45 and 60 minutes (Seidman, 2006). This time range was designed to give an additional 15 minutes for individuals who are particularly keen to discuss a topic. The uniform structure also allowed the author to provide a reliable time estimate to participants, and to avoid scheduling conflicts when booking multiple interviews on the same day.

Because of the restrictions imposed by the Covid-19 pandemic, interviews took place remotely with respondents participating from their homes. While these are not necessarily neutral spaces, being at home may have increased the comfort of participants and led to greater openness during the interview.

5.2 Structuring the interviews

The interviews followed a semi-structured format, rather than a structured or unstructured format. A semi-structured format where a set of questions is ‘moved through’ by the interviewer while also allowing time for deviations from the question is appropriate due to the time constraints and range of topics to be covered by this study. Unstructured discussion is more appropriate for an exploratory session, where the relevant topics of investigation may

still be unclear (Patton, 2002:342,343; Rubin and Rubin, 2012:31). In this case, the pilot studies and survey have already established the boundaries for the ideas being investigated. The purpose of these interviews is to further explore the content of the survey, rather than to explore entirely new territory.

While there is no universal guide for structuring responses, beginning with general questions before proceeding to more specific questions is a common practice in interview design (Rubin and Rubin, 2012:116,117). To stimulate meaningful responses, interviews should draw upon the direct experiences of their participants (Patton, 2002). 56.9% of potential participants have never voted online (n253) which presents a challenge for exploring experiences of online voting. However, this does not preclude these participants from having a perspective on this mode of voting; providing that participants are already familiar with elections and voting, the fundamentals of online voting are extremely easy to understand.

Each interview has four topics of conversation with a mix of open stimulus and structured stimulus questions used to guide discussion. Timings were structured so that each section lasted approximately ten minutes, with two minutes for a brief introduction and a chance for participant questions. Responses which exceed the time frame were permitted to run-on until the range and depth of reports were exhausted (Merton, Fiske and Kendall, 1956).

1. Introduction (2 minutes)
2. Experience of voting offline and online (10 minutes)
3. Attitudes towards voter participation and democracy (10 minutes)
4. Voting effort and location of voting (10 minutes)
5. Institutional trust in the internet/ Faith in scientific and technological progress (10 minutes)

The interview topics were drawn from the results of the structural equation model analysis in chapter 5 and are coherent with the ideas set out in the theoretical framework.

5.3 Ethical Considerations

Ethical considerations for interview span five areas specified by the British Sociological Association (BSA) (2017): voluntary participation, informed consent, ensuring no harm, privacy, and data protection. Interview participants are volunteers, who have previously completed the internet voting survey and indicated a willingness to participate. The interviews used a reimbursement in the form of a £10 shopping voucher per participant to incentivise participation. Across thirty five participants, the total inducement cost of £350 is covered by the project's budget. Financial inducements are not prohibited by the British Sociological Association.

A participant consent and information form was circulated to the participants in advance of the interview. This form gave a brief summary of the study and outlined any possible risks to the participants. Participants were made aware of their right to withdraw and to remove their data from the study (BSA, 2017:6). This explanation was necessary in order for volunteers to consent to the interviews with full knowledge of the study's purpose and its possible implications. See Appendix 4.3 for a copy of this form.

To ensure that participants' data is protected, data collected by the study was stored on a drive protected by two-factor authentication. Encrypted zip files were used for transfer of data between machines, and any duplicate files or files which became surplus to requirements were deleted (BSA, 2017:7). The project conforms to the Data Management Policy of Royal Holloway, University of London (2021).

It is the responsibility of the researcher to ensure that volunteers are not psychologically or physically harmed by the research (BSA, 2017:5). While there are no obvious physical hazards to participation in online interviews there is the potential for psychological harm. To mitigate these potential harms, the direction and scope of the interview was outlined at the start, and participants were made aware of their right to leave the interview at any point. The research design was risk assessed within the researcher's home department to check for any potential sources of harm, and was subsequently registered and self-certified with Royal Holloway's Ethics Committee. See Appendix 4.4 for a copy of the ethics certificate.

6. Conclusion

To expand upon the existing work on young people's attitudes towards online voting this project necessarily uses new survey and interview questions, alongside some pre-tested questions. The existing literature on 18-24 attitudes towards RE-voting is still relatively small, with Cammaerts et al's 'Youth Participation in Democratic Life' sections on E-voting being the most relevant to this project. This is followed by Solvak and Vassil's work on RE-voting youth participation in Estonia (2016) and Bruter and Harrisons's electoral ergonomics work which builds upon Cammaerts et al's 2016 data (2019;2020). Combining survey and interview methodologies, this project's methodological approach is most closely aligned with the triangulation found in Cammaerts et al's investigations of youth participation.

The survey methodology owes a large debt to the technology adoption survey design established by Davis (1989), which builds upon the attitudinal survey designs proposed by Fishbein and Ajzen (1980, 2010). This technology adoption design has been applied specifically

to political science by Carter and Bélanger (2005) and Schaupp and Carter (2005), both of which have had a significant infuence on thsi project. The interview methodology is largely drawn from the focused interview approach and rules proposed by Merton (1946) and Merton Kendall and Fiske (1956).

By triangulating between survey and interview methodologies, this project compensates for the weaknesses native to each research tool. The interview brings the 'biographical' narrative to the foreground (Denzin, 2009). Survey data are shorn of this biographical information by necessity, but this data can expediently represent the large patterns which would require many hours of interviews. Following Denzins line of inquiry, representing the true 'reality' of RE-voting experience is extremely challenging. A 'bricolage' of methodologies provides the breadth and complexity required to approximate the reality of RE-voting beliefs and experience (Denzin, 2009).

This doctoral project is limited by time and resources. The author is acting as an individual rather than a team, and has a limited budget to draw from. With greater resources, the author would make a number of expansions to the methodology: the addition of an ethnographic methodology for capturing data on the political culture of each university and their SU elections. This 'on the ground' experience of SU elections would add further context to the survey and the interview findings. For the survey methodology, the author would double number of universities in each strata of the sampling frame from five to ten. This would increase the sample size, but also create a redundancy should any institution refuse to participate. To better test the effect of experience, an experimental design would be used for the survey. Pre-RE-voting and post-RE-voting surveys would assess any differences in beliefs

across an experiment group and a control group. This approach would require a a doubling of the sample due to the use of sub-groups and because of the risk of participant drop-out, since continuity between pre and post-RE-voting responses is essential for any data analysis.

Chapter 5, Survey Analysis: Creating Belief Constructs and Establishing Relationships

1. Introduction

This survey analysis tests the proposed relationships between the three belief clusters and their relationship to support for the extension of RE-voting in national elections: i) virtue of voting beliefs, ii) integrity beliefs and iii) usefulness and convenience beliefs.

Principal component (PC) analysis with orthogonal rotation was used to combine related scale variables. The results of the PC analysis were used to build a linear structural equation model (SEM) where variable relationships were specified and then estimated using Pearson regressions. The results of the model indicate that institutional trust in the internet and perceived usefulness constructs have a significant positive relationship to support for the extension of RE-voting to general elections (DV) belief in voting cost is the only virtue of voting variable to have a significant negative relationship with the DV.

SEM testing also identified four possible exogenous variables with positive relationships to the constructs described above: aversion to voting cost beliefs have a significant positive correlation to with perceived usefulness of RE-voting; the WVS items generalised trust and faith in scientific progress have a significant positive correlation with institutional trust in the internet; tradition/risk aversion values have a significant positive influence on belief in voting cost, and a number of other smaller virtue of voting items. These relationships are elaborated on in the SEM section of this chapter. Survey data and do files for reproduction of results are available in appendix 4.1.

Alongside these findings, this chapter finds that the majority of variable indicators correlated strongly to their predicted factors during confirmatory component analysis. These correlations demonstrate that the majority of question items have an acceptable level of validity regarding the construct they measure. However, there were some unanticipated component relationships. The most challenging of these being the non-significant relationships between the duty/compulsory voting component and the majority of virtue of voting items, including the belief in voting cost component. It was expected that these items occupied the same conceptual space and would be positively related.

The role of experience in relation to support for the extension of RE-voting to general elections is explored in the next chapter (6). This chapter is concerned with generating constructs from the survey data and identifying their relationships with the dependent variable. The outputs of this chapter provide the foundation for exploring the role of experience in chapters 6 and 7.

2. Sample characteristics

To gauge the validity of the sample, this section compares the sample's characteristics against the characteristics of the target population of 18-24 year olds in HE. A total of 560 respondents participated in this study, 445 of whom were aged between 18-24. Responses from participants aged over 24 have been excluded from this analysis because this study focuses on the beliefs and attitudes of voters still at a formative life stage.

Some characteristics of the sample such as ethnicity and age are representative of the national student parameters, but the sample deviates significantly from the parameters in the areas of gender, and subject choice. This comparison is possible using the most recent demographic data from the Higher Education Statistics Agency (HESA), from the 2017-18 academic year. See

table 5.1 below for a description of the differences between the survey sample and the population parameters.

Table 5.1, Survey sample compared against target population

	Characteristic	Sample %	Target Population % (HESA 2017-18 Data)	Degrees of freedom	X^2 goodness of fit test (.95 Confidence level)
Gender	Male	29.9	43	2	2.6
	Female	67.2	56.9	2	1.1
	Other	0.6	0.1	2	3.6
	Prefer not to say/No response	2.2	N/A	N/A	N/A
Age Groups	18-20	64.3	59.6	3	0.3
	20-24	35.7	40.3	3	0.3
Ethnicity	White British or other White ethnicity	76.6	75.2	1	0
	Non-White ethnicity	20.3	24.8	1	0.3
	Prefer not to say/No response	3.1	N/A	N/A	N/A
Disability	Known disability	9.2	12.9	1	0.4**
	No known disability	86.5	87.1	1	0
	Prefer not to say/No response	4.3	N/A	N/A	N/A
Subject Category	Humanities	25.4	23	2	0.1
	Social Science	44.7	28	2	3.7
	Natural Science & STEM	28.9	47	2	4.6
	Prefer not to say/No response	1.3	N/A	N/A	N/A
Institution Type	Ancient/Red-Brick Universities	60	20	2	20.5**
	Plate-Glass Universities	25.2	26	2	0
	Post 1992 universities	14.8	54	2	23.1**

HESA national records indicate that 75.2% of students have either a white British ethnicity or are from another white ethnic group, while 24.8% have a non-white ethnicity (HESA, 2018). For the sample, 76.6% of respondents recorded their ethnicity as white British or other white ethnicity, with 20.3% recording a non-white ethnicity and 2% recording 'prefer not to say'. The difference between the national parameter for respondents with white backgrounds and the sample is 2.3%. X^2 reports no significant difference at the 95% level between the observed sample and the national population, demonstrating that the sample is extremely representative in terms of ethnicity.

In the 2018 18-24 cohort, 59.6% of students were aged 20 or younger, 40.3% were aged 21-24 (HESA, 2019). The 20 or younger cohort of the sample only differs by 4.3 percentage points from the national parameter (64.3%), and the 21-24 group by 4.6 points (35.7%). This is only a moderate departure from the national parameters of age, and the X^2 statistic shows no significant difference between groups.

The sample's largest departures from the national parameters are in the categories of gender, subject choice and type of university attended. In the 2017-2018 academic year, females constituted 56.9% of the student population, males constituted 43%, and 0.1% of the population were recorded as 'other' by HESA (2019). In this sample, 67.2% of respondents recorded their gender as female, 29.9% recorded as male, 0.6% recorded as non-binary, and 2.2% would not disclose their gender. With a 10.3 point gap, the male-female difference is a departure from the national gender parameters, but this difference is statistically significant at the 95% level.

With regard to subject choice, the sample also differs significantly from HESA's national level data. HESA uses a binary coding system to distinguish between 'science' subjects and 'non-

science' subjects (HESA, 2019). To give greater nuance to the demographic analysis, HESA's 'non science' category was divided into 'social sciences' and 'humanities', and HESA's science category was relabelled as natural science and STEM subjects. This decision was made in order to distinguish between subjects which have historically been regarded as humanities subjects (creative arts, music, history, philosophy, law and languages), and social science subjects which involve some form of scientific method applied to the social world (political science, economics, psychology, business and management studies).

The recoding of subject choice generated three categories: (1) natural science and STEM subjects, (2) social science subjects, and (3) humanities subjects. Nationally, 47% of students are studying natural science and STEM subjects, 28% are studying social science subjects and 23% are studying humanities subjects (HESA, 2019). Subject choice is dominated by natural science and STEM subjects at this level, while subject choices are more evenly distributed in the study sample: 28.9% are studying natural science and STEM subjects, 44.7% are studying social science subjects and 25.4% are studying humanities subjects, with 1.3% who did want to disclose their subject choice. Although the sample does not closely follow the national parameters of subject choice, the X^2 goodness of fit test reports no significant difference between the sample and target population at the 95% level.

The sample's largest departure from the national parameters is the type of university attended. To represent a diverse range of student backgrounds, the sampling frame used five different universities to represent the UK's ancient, red-brick, plate glass and Post 1992 universities: Edinburgh, Sussex, York St John, South Wales and London South Bank were used respectively for this task. Due to a lack of response from the University of South Wales and a low response from York St John University, the sample is dominated by students from Ancient/Red-Brick institutions (60%).

These institutions are heavily represented in the 1st and 2nd quintiles of UK university league tables but only enrol 20% of UK students (HESA, 2020). 60% of survey responses came from the University of Edinburgh, an ancient university in the top quintile of the league table representing both Ancient and Red-Brick institutions in this study. 25.2% of responses came from the University of Sussex which represented plate glass universities in the 1st and 2nd quintiles of the league table. This means 85% of the sample were drawn from 1st and 2nd quintile universities, a percentage which is not reflective of the national parameters for student enrolments. The X^2 statistic highlights these gaps, with reports of statistically significant differences between sample and national parameters for Ancient/Red Brick Universities (X^2 =20.5**) and Post-1992 Universities (X^2 = 23.1**).

Post 1992 universities, which enrol 54% of all HE students are heavily represented in the 3rd, 4th and 5th quintiles of university league tables (HESA, 2020). These universities only constitute 14.8% of the sample responses, and the majority of these post 1992 responses are from London South Bank University (12.4%) followed by York St John University (2.5%). There were no responses from the University of South Wales to the survey; the 65 staff members contacted either did not respond or refused to share the survey citing management policy. Any future waves of this survey will focus on how to improve recruitment from post-1992 universities.

3. Variable reduction: Principal Component Analysis with orthogonal rotation of components

To construct Likert scales with strong internal consistency a method of combining the individual Likert items is required (Kaiser, 1970). Since the concepts which Likert scales are attempting to capture are often multi-faceted and abstract, Likert scales consisting of single items are likely to be unreliable measures (Likert, 1932:51). Likert scales should be constructed from a minimum of two items which have highly correlated response data and which can be logically related to one another. To simultaneously identify multicollinearity in question items, identify potential latent variables and reduce the number of variables in a dataset, variable reduction methods such as factor analysis and principal components analysis are recommended (Agresti and Finlay, 1997:630). Principal component analysis with a varimax rotation was employed for variable reduction for this project. See Table 5.2 for a full description of the scale variables selected for reduction.

The DV 'support for the extension of RE-voting to national elections' is included in the table, but it was not included in the component analysis of the IV items.

Table 5.2, Summary of variables, including 25 IVs items selected for principal component analysis

	Concept Area	Data Type	Questionnaire Item	n	Mean	S.D.	Mode	Min-Max
DV	**Support for extension**	Ordinal	IDEM 1, 'Online voting should be an option at every UK general election'	445	6.06	1.14	5	1-7
IV	**Usefulness and Convenience**	Ordinal	PU1 'Online voting enables me to vote quickly'	445	6.12	1.15	7	1-7
		Ordinal	PU2 'Online voting fits in with a busy lifestyle'	445	5.81	1.36	7	1-7
		Ordinal	PU3 'Online voting makes voting more efficient for me'	443	5.72	1.42	7	1-7
		Ordinal	PC1 'Voting online takes much less effort than voting in person'	444	4.28	1.82	7	1-7

		Ordinal	PC2 'Voting in a Student Union polling station would take too much time out of my day'	442	3.94	2.09	5	1-7
		Ordinal	PC3 'If I could not vote online in Student Union elections, I would rather stay at home than vote'	444	2.41	1.63	1	1-7
	Virtue of voting	Ordinal	BVC1 Voting should not be made too easy'	444	3.80	1.91	1	1-7
		Ordinal	BVC2 'Travelling to the polling station shows a commitment to democracy'	444	2.94	1.70	5	1-7
		Ordinal (reversed)	BVC3R Effort and Voting SDS (Effort Positive)	445	4.04	1.86	1	1-7
		Ordinal	BVU1 'Everyone should vote on the same day '	445	3.03	1.78	4	1-7
		Ordinal	BVU2 'It is important that everyone votes using the same tools, such as a paper ballot'	445	4.01	1.94	2	1-7
		Ordinal (reversed)	BVU3R Secrecy and voting SDS (Secrecy Positive)	445	4.20	2.04	3	1-7
		Ordinal (reversed)	BVU4R Compulsory voting SDS (Compulsory Positive)	445	4.38	1.70	5	1-7
		Ordinal	BPV1 'It is important that voting occurs in public spaces, such as schools, community centres, and churches etc'	445	3.83	1.61	4	1-7
		Ordinal	BPV2 'I like to be around people on polling day'	444	5.05	1.56	4	1-7
		Ordinal (reversed)	BPV3R 'People don't need to be physically present to vote because you can do everything over the internet now'	444	2.95	1.56	2	1-7
		Ordinal	BPV4 Community voting SDS (Community Positive)	444	5.09	1.42	4	1-7
	Integrity of Voting (Trust in technology)	Ordinal	TT1 'Science and technology are making our lives healthier, easier, and more comfortable'	445	3.89	1.63	5	1-7
		Ordinal	TT2 'In general, the internet is now a robust and safe environment in which to vote over'	445	3.47	1.63	5	1-7
		Ordinal	TT3 'I feel assured that legal and technological structures adequately protect me from problems on the internet'	444	3.64	1.54	3	1-7
		Ordinal (reversed)	TT4R Generalised Trust SDS (Trusting Positive)	445	5.00	1.75	3	1-7
	General Beliefs	Ordinal (reversed)	PERS1R Research before voting SDS (Research Positive)	445	6.32	1.09	7	1-7

		Ordinal	PERS2 Voting duty SDS (Duty Positive)	445	4.92	2.01	7	1-7
		Ordinal	PERS3 Tradition SDS (Tradition Positive)	444	1.94	1.28	1	1-7
		Ordinal (reversed)	PERS4R Risk aversion SDS (Risk Aversion Positive)	444	3.46	1.47	3	1-7
Controls	**Political Engagement**	Interval	CTRL1, Political Engagement, During the last week, how many hours did you spend talking about politics?	445	3.85	2.12	3	0-7
	Civic Voluntarism	Interval	CTRL2, Civic voluntarism, How many hours a week do you spend volunteering?	444	1.33	2.48	0	0-16
	Participation in low salience online elections	Ordinal (dichotomous)	CTRL 3, Participation in SU and other low salience online elections	445	0.43	0.50	0	0-1

Principal Component Analysis with a varimax rotation of the question items identified eight factors with eigenvalues greater than 1.0, which justify their retention using the Kaiser-Guttman rule (Kaiser, 1970:401). Question items with loadings below .4 have been excluded from the variable reduction process. Agresti and Finlay (1997) recommend a minimum factor loading of .4 as a rule of thumb, while .6 or .7 are considered to be the extreme upper-limit for loading thresholds (Matsunaga, 2010:101). 17 of 25 survey items loaded onto one of the four factors with a factor loadings >.4. 11 items had loadings <.4 and so were dropped from the model. The remaining 17 items were then combined according to the factor which they loaded most strongly against, creating eight scale variables.

To identify suitable items for principal component analysis, it is best practice to use a sampling adequacy test and avoid variables which vary significantly from the normal distribution (Kaiser, 1970). This is because principal component and factor analysis use a parametric method, the Pearson correlation, to generate the component loading scores.

To test for sampling adequacy, the intercorrelation Kaiser Meyer-Olkin (KMO) test was employed. The KMO test measures the level of intercorrelation between variables, assessing whether they are part of the same 'family of psychometric variables' (Kaiser, 1970; Dziuban and Shirkey, 1974; Asnawi, Gravell, and Wills, 2012). It is important to note that the overall score is an average across all variables. Overall scores above 0.7 are considered adequate for analysis (Dziuban and Shirkey, 1974:359).

An overall KMO index score below .5 indicates that there is little intercorrelation between variables and so they are not appropriate for analysis. Scores of .7 are considered relatively strong, and scores >.8 are considered extremely strong. The majority of variables scored above .6 and the KMO overall mean score was .72 indicating an acceptable level of intercorrelation for principal component/factor analysis (Dziuban and Shirkey, 1974:359). Of the 25 Likert items assessed by the KMO, the lowest score of .53 was tied between belief in voting uniformity 1 (BVU1), belief in voting uniformity 4R (BVU4R), and voting duty (PERS2). With .88, Belief in Publicness of Voting 3 (BPV3) had the highest KMO score. Correspondingly, the items which received low KMO scores had relatively poor factor loadings. See Appendix 5.1 for the tabulated KMO results.

The approach to principal component analysis was confirmatory since item clusters were predicted prior to analysis in the theoretical framework chapter (Agresti and Finlay, 1997). 6 components were identified: Belief in voting cost, belief in uniformity of voting, belief in publicness of voting, trust in technology, perceived usefulness and aversion to voting cost. Of these six predicted items five items loaded as anticipated, plus three unanticipated items. All components had eigenvalues >1.0. In the 2019 pilot study, only four items with eigenvalues >1.0 emerged during factor analysis. This expansion in components can be explained by the

significant increase in sample size, and the use of principal component analysis rather than factor analysis.

PCA followed by an orthogonal Varimax rotation was applied to the items. Orthogonal rotation was used for the final analysis despite experimentation with oblique rotations. Varimax rotation was used to maximise the contrast between small and middling loading scores. Unlike oblique rotations, the method assumes the independence of factors and maximises the differences between factor loadings of small magnitude (.1,.2) by bringing them closer to zero, and reducing the likelihood of an item loading strongly across multiple factors. This maximising of difference makes it easier for the researcher to match item loadings to the appropriate component (Agresti and Finlay, 1997; Matsunaga, 2010). Analysis and rotation of the 25 Likert items identified four components with eigenvalues greater than 1.0, considered as significant using the Kaiser rule (Kaiser, 1970:401). A scree test was also used to test the robustness of the component size. The steep descent of components 1-8 confirmed the validity of using the Kaiser rule in this instance.

Accepted component loading scores (>0.4) are indicated by green coloured cells in the component loading table. The item uniqueness score items is displayed in the last column of the table.

Table 5.3, PCA loadings for 25 questionnaire items, with orthogonal Varimax rotation

Survey item	1, Perceived usefulness of internet voting	2, Belief in voting cost	3, Institutional trust in the internet	4, Belief in secrecy of voting	5, Belief in compulsory voting and voting duty	6, Aversion to voting cost in low-salience elections	7, Belief in tradition and high level of risk aversion	8, Belief in uniformity of voting	Unexplained
PU1	0.52	0.01	-0.08	0.00	0.07	-0.04	0.02	0.01	0.33
PU2	0.50	-0.02	-0.03	-0.08	0.00	0.04	0.01	0.04	0.29
PU3	0.50	0.04	0.05	0.02	-0.05	-0.01	0.00	-0.06	0.27
PC1	0.41	0.01	0.02	0.02	0.00	0.12	-0.04	0.04	0.43
PC2	0.08	-0.04	-0.05	0.09	-0.06	0.58	-0.02	-0.01	0.34
PC3	-0.03	-0.04	0.07	0.00	-0.05	0.58	-0.05	0.02	0.39
BVC1	-0.02	0.50	0.07	0.10	-0.11	0.06	-0.01	0.04	0.36
BVC2	0.07	0.42	0.07	-0.03	0.14	-0.09	0.07	-0.05	0.49
BVC3R	0.02	0.49	-0.05	0.01	-0.12	-0.11	-0.23	-0.01	0.34
BVU1	0.01	-0.03	0.05	-0.07	0.01	-0.04	0.06	0.75	0.27
BVU2	-0.02	0.30	0.01	0.09	0.03	0.08	0.09	0.37	0.44
BVU3R	-0.06	0.12	0.00	0.57	0.08	0.15	0.07	-0.11	0.42
BVU4R	-0.04	-0.04	0.03	0.07	0.65	0.02	-0.06	0.03	0.29
BPV1	-0.08	0.28	-0.03	-0.19	0.15	0.36	0.23	-0.18	0.41
BPV2	0.03	0.26	0.02	-0.43	0.00	-0.03	0.10	-0.13	0.43
BPV3R	0.12	-0.18	0.32	-0.06	-0.11	0.00	-0.20	0.08	0.41
BPV4	-0.03	-0.04	-0.09	-0.45	0.14	0.13	0.07	0.04	0.57
TT1	0.09	-0.10	0.22	0.13	0.06	0.11	0.32	-0.12	0.57
TT2	0.01	0.01	0.61	-0.02	0.02	-0.02	-0.01	-0.02	0.17
TT3	-0.06	0.05	0.62	0.03	0.04	0.02	0.01	0.06	0.19
TT4R	0.03	-0.03	0.17	-0.13	-0.09	-0.19	0.20	-0.39	0.55
PERS1R	0.09	0.13	0.00	0.23	0.12	-0.11	-0.50	-0.10	0.46
PERS2	0.05	-0.01	0.01	-0.05	0.65	-0.07	0.01	0.01	0.25

PERS3	0.05	0.13	0.01	0.07	-0.05	-0.14	0.48	0.17	0.49
PERS4R	0.07	-0.08	-0.12	0.33	0.01	-0.14	0.43	-0.04	0.51

Table 5.4, Eigenvalues for Components 1-8

Component	Eigenvalue	Varimax rotation variance	Difference	Proportion of variance	Cumulative variance
1, Perceived usefulness of internet voting	4.13	2.81	0.24	0.11	0.11
2, Belief in voting cost	2.34	2.57	0.33	0.10	0.21
3, Institutional trust in the internet	1.91	2.23	0.52	0.09	0.30
4, Belief in secrecy of voting	1.79	1.72	0.05	0.07	0.37
5, Belief in compulsory voting and voting duty	1.56	1.67	0.03	0.07	0.44
6, Aversion to voting cost in low-salience elections	1.33	1.63	0.24	0.07	0.50
7, Belief in tradition and high level of risk aversion	1.22	1.39	0.07	0.06	0.56
8, Belief in uniformity of voting	1.05	1.32	.	0.05	0.61

The dependent variable 'support for the extension of RE-voting to general elections' was excluded from this PCA. Initial PCA tests demonstrated the independence of this DV item from the other survey items; in these tests the item loaded to the largest component (λ=5.89) along with the DV adjacent items 'Online voting is beneficial for society' and the SDS scale 'Democracy would be harmed/improved by online voting'. These items were highly correlated, with loading scores <.40. A combination DV had a high similarity to the single DV item in regression tests, but the single item was used in the final analysis to maintain the clarity of the DV concept. The inclusion of correlated items which did not refer explicitly to the extension of

RE-voting to national elections risked diluting the meaning of the DV. A PCA table featuring loadings of the DV and DV adjacent items can be found in appendix 5.2.

Component 1, perceived usefulness. Component 1 is dominated by the usefulness and convenience belief cluster, with perceived usefulness items (PU1-3) and one perceived cost of voting item (PC1) loading also. Component 1's eigenvalue (4.13) is significantly larger than components 2-5, and it accounts for 36% of the variance in the responses. Perceived usefulness 1-3 assessed respondents' level of agreement with a series of statements on the speed, efficiency and convenience of RE-voting. These three items had positive loadings of 0.52, 0.50 and 0.50 respectively, showing a strong association between the question items. Perceived cost 1 measured level of agreement with the statement 'voting online takes much less effort than voting in person'. With a positive loading of 0.41, this item had a much stronger relationship with the perceived usefulness items than the remaining perceived cost items.

Component 2, belief in voting cost. Component 2 is composed of three 'belief in voting cost' items (BVC1, BVC2, BVC3R) from the virtue of voting belief cluster. The component has an eigenvalue of 2.33 and accounts for 9% of the variance in responses. Belief in voting cost 1 assessed respondents' level of agreement with the statement 'voting should not be made too easy' (loading = 0.50). Belief in voting cost 2 assessed respondents' level of agreement with the idea that 'travelling to the polling station shows a commitment to democracy' (loading = 0.42). Belief in voting cost 3R uses a semantic differential scale to assess a respondents' preference between the ideals of voting which 'ought to require some effort' and 'effortless voting' (loading = 0.49). The scores for this question were reversed to give weight to answers in favour of voting effort. Taken together, the strong positive correlation of these items to component 2

indicates a shared construct that voting should not be effortless and should require some kind of commitment from the voter.

Component 3, institutional trust in the internet. Component 3 is dominated by institutional trust in the internet as measured by integrity cluster items TT2-3. The component has an eigenvalue significantly smaller than components 1 and 2 (1.90) and it accounts for 8% of the response variance. Both questions had extremely strong positive loading scores of 0.61 and 0.62. TT2 assessed strength of agreement with the statement 'the internet is now a robust and safe environment in which to vote over'. TT3 measured respondents' strength of agreement with the statement 'I feel assured that legal and technological structures adequately protect me from problems on the internet'.

Trust in technology 1 (TT1) had its 2nd strongest loading on component 3 (loading = 0.22). The question assessed the respondents' beliefs about general scientific and technological progress, but did not meet the loading threshold. TT4R assessed levels of generalised trust using a semantic differential scale, presenting a scaled choice between two statements 'in general, most people can be trusted' and 'you can't be too careful in dealing with people'. This generalised trust question had its strongest loading (0.17) on component 2, and its second strongest loading (0.20) on component 7, support for tradition and high risk aversion. It was dropped from both components as it fell short of the loading threshold. Belief in publicness of voting 3 (BPV3R), 'People don't need to be physically present to vote because you can do everything over the internet now' had its strongest negative loading on this component (-0.32). Indicating that respondents who have a strong level of trust in the internet, are also indifferent to being physically present for voting.

Component 4, belief in the secrecy of voting. Component 4 is composed of only one semantic differential scale question: 'I like to keep my voting choice a secret'/'I like to share my voting choice with others'. The component has an eigenvalue of 1.57 and accounts for 7% of response variance in the model. This item is expected to be positively correlated with the predicted virtue of voting variable clusters: cost of voting and uniformity of voting. However, it has its 2nd strongest loading (0.15) against perceived cost of voting - which was hypothesised to be negatively correlated with virtue of voting items.

Component 5, **Belief in voting duty and compulsory voting.** Component 5's strongest loadings were provided by the belief in voting uniformity (BVU4R) and voting duty questions (PERS2). component 4 has an eigenvalue of 1.56 and accounts for 6% of the variance in responses. BVU4R used a semantic differential scale to assess whether respondents felt voting should be optional or compulsory, and PERS2 also used a semantic differential scale to assess the respondents' preference between voting as a right and voting as a duty. These components correlated strongly to component 4 with positive loadings of 0.65 and 0.65 respectively. The strong association between these loadings indicate that respondents in favour of universal compulsory voting also have strong views about voting as a personal duty. This component is unique in containing a large number of negative loadings. Perceived cost questions 2 and 3 have their largest negative loadings on component 4 (-0.35, -0.34). These scores indicate that respondents who perceived voting as a duty, and thought voting ought to be compulsory were insensitive to the costs of physical voting in SU elections; they did not perceive voting in an SU polling station to be a costly activity, perhaps motivated by their perception of voting as a personal duty.

Component 6, Aversion to voting cost in low salience elections. The loadings for Perceived Cost items 2 and 3 were at their largest on component 6 (0.58, 0.58). These questions assessed the level of effort a respondent was willing to expend to vote in student union elections if they could not vote online by measuring level of agreement with the statements: 'Voting in a Student Union polling station would take too much time out of my day' and 'If I could not vote online in Student Union elections, I would rather stay at home than vote'.

The component was renamed from 'perceived cost' to 'aversion to voting cost in low-salience elections' to reflect the specific reference to SU elections in items 2 and 3. Perceived cost items 2 and 3 were not interpreted in the same way as perceived cost 1, which has a stronger association with perceived usefulness. A majority of respondents gave negative responses to perceived cost 2 and 3, indicating that most of the 18-24 cohort are insensitive to the small costs of voting in a polling station.

There were few significant negative loadings to component 1. The publicness of voting item 'People don't need to be physically present to vote because you can do everything over the internet now', which measured strength of disagreement to the statement, had a weak negative loading (-0.25) on component 1. This loading corresponds to the hypothesis that individuals who value the publicness of voting will be less supportive of RE-voting. There was also a negative loading (-0.19) from the generalised trust scale question to this component, indicating a weak negative association between low generalised trust responses and high perceived usefulness responses.

Component 7, **belief in tradition and risk aversion.** Component 7 is composed of two question items which do not relate explicitly to voting: belief in tradition and high level of risk aversion. These items have component loadings of .48 and .43 respectively. Both were semantic

differential scale questions which were included as indicators of general value - rather than specific views on voting. Responses to these scales were expected to correlate positively with virtue of voting responses. The component has an eigenvalue of 1.22 and accounts for 6% of the response variance.

Component 8, **belief in uniformity of voting.** Component 8 is only composed of one uniformity of voting item: 'everyone should vote on the same day' with a positive loading of .75. Associated items from the virtue of voting belief cluster did not load as anticipated. The scattering of uniformity of voting and publicness of voting items, shows there is more conceptual work to be done in this area. The component had an eigenvalue of 1.05 and accounts for 5% of response variance.

The mean was used to calculate the values for each of the six new Likert scale variables (Norman, 2010). The Likert scale questions were created with a minimum value of 1 and a maximum value of 7, so the items were well suited to an average score rather than summation. See table 5.5 for a summary of the new variables created from component analysis.

Table 5.5, Eight scale variables used for hypothesis testing

	Number of items	Mode	Mean	sd	n	Min-Max
1, Perceived usefulness of internet voting	4	7	5.92	1.03	445	1-7
2, Belief in voting cost	3	3	3.05	1.35	445	1-7
3, Institutional trust in the internet	2	4	4.49	1.25	445	1-7

4, Belief in secrecy of voting	1	3	4.01	1.94	445	1-7
5, Belief in compulsory voting and voting duty	2	7	4.56	1.79	445	1-7
6, Aversion to voting cost in low-salience elections	2	3	4.11	1.69	445	1-7
7, Belief in tradition and high level of risk aversion	2	2.5	2.7	1.05	445	1-6
8, Belief in uniformity of voting	1	4	4.04	1.86	445	1-7

3.1 Component Spearman matrix result

A correlation matrix using Spearman's Rho (ρ) was used to check for multicollinearity and to provide a non-parametric assessment of the strength of association between the DV and the five IVs which emerged from the principal component analysis (von Eye and Schuster, 1999:80). Both ranked correlation measures were used to improve the robustness of results. Spearman's rank correlation coefficient is sensitive to outlying data, while Kendall's tau is less sensitive, measuring only concordant and discordant pairs in the data. There were no significant differences between the coefficients of either test, so the results have been reported below using only the Spearman correlation coefficient.

See table 5.6 below for the complete correlation matrix. The largest component associated with the virtue of voting, Belief in Voting Cost, has a moderate negative association with the DV (ρ=-.24 p<.01) and with Perceived Usefulness (ρ=-.14 p<.01). Component 6, aversion to voting cost in low salience elections has a moderate positive relationship with the DV (ρ=-.12 p<.01). Component 7, belief in tradition and risk aversion has a negative relationship to

support to the DV (ρ=-.17 p<.01) and a positive association with component 3, Belief in voting cost and uniformity of voting (ρ=.11 p<.05).

Table 5.6, Testing relationships, Spearman's rho correlation matrix,(n=443)

	DV Support for extension of RE-voting to General Elections	1, Perceived usefulness of internet voting	2, Belief in voting cost	3, Institutional trust in the internet	4, Belief in secrecy of voting	5, Belief in compulsory voting and voting duty	6, Aversion to voting cost in low-salience elections	7, Belief in tradition and high level of risk aversion	8, Belief in uniformity of voting
DV Support for extension of RE-voting to General Elections	1								
1, Perceived usefulness of internet voting	0.29**	1							
2, Belief in voting cost	-0.24**	-0.14**	1						
3, Institutional trust in the internet	0.41**	0.23**	-0.03	1					
4, Belief in secrecy of voting	-0.05	0	0.04	-0.01	1				
5, Belief in compulsory voting and voting duty	0.01	0.02	0.02	-0.05	-0.01	1			
6, Aversion to voting cost in low-salience elections	0.12**	0.28**	-0.16**	0.17**	0.01	-0.13**	1		
7, Belief in tradition and high level of risk aversion	-0.17**	-0.09*	0.11*	-0.08	0.18**	-0.03	-0.09	1	
8, Belief in uniformity of voting	-0.02	0.01	0.13**	0	-0.01	0.01	0.03	0.09	1
**** = p ≤ 0.01 * = p ≤ 0.05**									

4. Parametric modelling of scale data

4.1 Testing study hypotheses using parametric tools:

A structural equation model (SEM) was used for parametric analysis of the 8 components. This method is an extension of the biological path analysis methods established by Sewall Wright (1934), and is restricted by Wright's path analysis rules: coefficient relationships between variables should not double back, meaning that paths arrows cannot return to their originating variable; Exogenous variables cannot be pointed at by endogenous variables; Exogenous variables should have reported covariances (identified by curved, rather than straight arrows), unless a non-meaningful relationship has been specified (Loehlin and Beaujean, 2016:4-6). SEM allows the researcher to simultaneously test chains of relationships between variables.

The SEM model uses a Pearson correlation coefficient to test relationships between variables. This coefficient was appropriate since the DV is being treated as an interval variable and 3/8 of the components have an approximately monotonic and linear relationship with the dependent variable. This was tested by comparing the differences between linear and curvilinear lines of best fit across scatterplots of the DV and IV. There was no substantial difference between the line shape or direction when using a linear DV or a logarithmic DV, see Appendix 5.3 for evidence of this linearity and monotonicity.

Six one sided hypotheses were tested in the model with a confidence level set at 95%. The 95% confidence level is the standard for social science and allows for a 5% chance that the null hypothesis is mistakenly rejected, ergo any positive or negative coefficients reported by the model are not present in the target population (Wooldridge, 2002: 118,119). In addition to the confidence level requirement, the null hypothesis cannot be rejected if an IV's partial coefficient is equal to zero as this demonstrates the absence of a relationship between an IV

and the DV (Wooldridge, 2002:117). See table 5.7 below for a complete description of the six hypotheses.

Table 5.7, Belief hypotheses associated with the three belief clusters

H#	Belief Hypothesis	One sided direction	Associated belief cluster	Pre-factor analysis questionnaire items
H2	Individuals who score highly for the construct 'belief in voting cost' will be less likely to support the extension of RE-voting to general elections	Left tail (negative)	Virtue of Voting	BVC1, BVC2, BVC3R
H3	Individuals who score highly for the construct 'belief in voting uniformity' will be less likely to support the extension of RE-voting to general elections	Left tail (negative)	Virtue of Voting	BVU1, BVU2, BVU3R, BVU4R
H4	Individuals who score highly for the construct 'belief in the publicness of voting' will be less likely to support the extension of RE-voting to general elections	Left tail (negative)	Virtue of Voting	BPV1, BPV2,BPV3R, BPV4
H5	Individuals who score highly for the construct 'trust in technology' will be more likely to support the extension of RE-voting to national elections	Right tail (positive)	Integrity of Voting	TT1,TT2,TT3,
H6	Individuals who score highly for the construct 'perceived usefulness' will be more likely to support the extension of RE-voting to general elections	Right tail (positive)	Usefulness and Convenience	PU1, PU2, PU3
H7	Individuals who score highly for the construct 'perceived cost' will be more likely to support the extension of RE-voting to general elections	Right tail (positive)	Usefulness and Convenience	PC1, PC2, PC3

One sided alternative hypotheses were chosen rather than two sided, as established theory predicted the direction of each variable. The purpose of these models is to test those predicted directions. Hypotheses one to three are positive, occupying the right tail of the normal distribution, and the hypotheses four to six are negative, occupying the left tail of the normal distribution.

In order to reject the null hypothesis for the right tailed hypotheses, the partial coefficients must be positive and sufficiently large, with small standard errors, to generate a test statistic

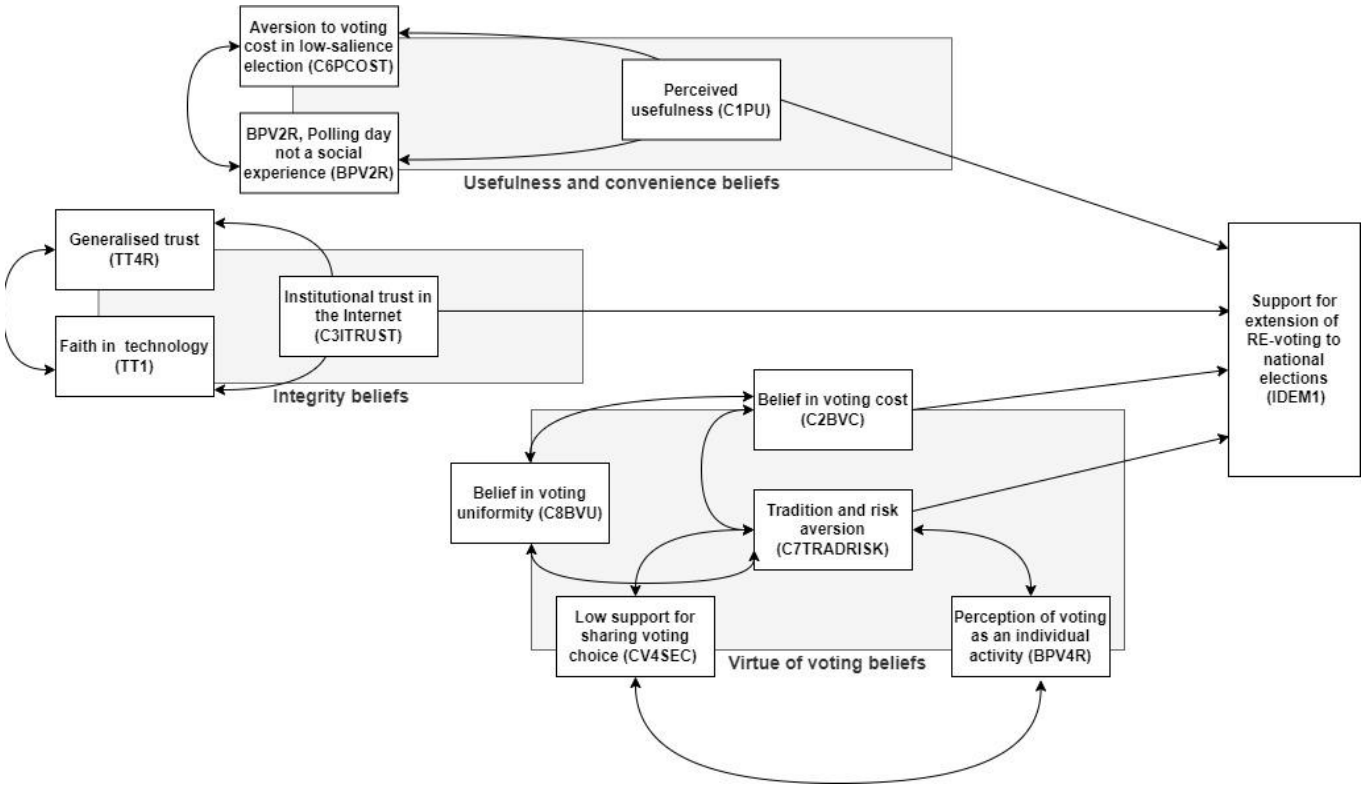
within the 95th percentile of a t-distribution's right half with either 436, 439, or 443 degrees of freedom (Wooldridge, 2002:119). The number of degrees of freedom are calculated by subtracting the number of parameters (IVs) estimated by each model and subtracting 1. As the number of variables increases, the statistical power of the model is reduced since there are fewer degrees by which the variability of the parameters may be estimated.

Sufficiently large negative coefficients and small standard errors must also be observed for the three left tailed hypotheses to reject the null hypothesis. To reject, the t-statistic must be within the 95th percentile of the t-distribution's left half with 436-444 df, depending on the number of IVs in the model (Wooldridge, 2002, 121,122).

4.2 Testing normative support for RE-voting in general elections - Linear Structural Equation Model

Figure 5.1 shows the path diagram for the structural equation model. Straight arrows indicate coefficient paths - where a variable is influencing another variable. Where there is a strong relationship between the variables, but no justification for causal influence, curved arrows indicate the covariance between two variables. Rectangular boxes indicate observed variables and ovals indicate latent variables. Exogenous variables are identified by the absence of path arrows pointing to them, and endogenous variables are identified by the presence of a path arrow pointed at them (Loughlin and Beaujean, 2017:13).

Figure 5.1, Structural Equation Model without reported coefficients, covariances or error terms: Variables determining support for online voting



The 8 components identified by PC analysis are present in this model. They have been supplemented by individual survey items where there is evidence of a significant relationship, while also maintaining consistency with the theoretical framework. Five likely exogenous variables acting upon the DV were identified from initial regression tests: institutional trust in the internet, perceived usefulness, belief in voting cost, and tradition and risk aversion values. The criteria for inclusion as exogenous variables are as follows: (1) consistency with the established theoretical framework, (2) a statistically significant linear relationship with the DV, (3) ideally, a unidirectional relationship where the coefficient is not mirrored when the relationship is reversed.

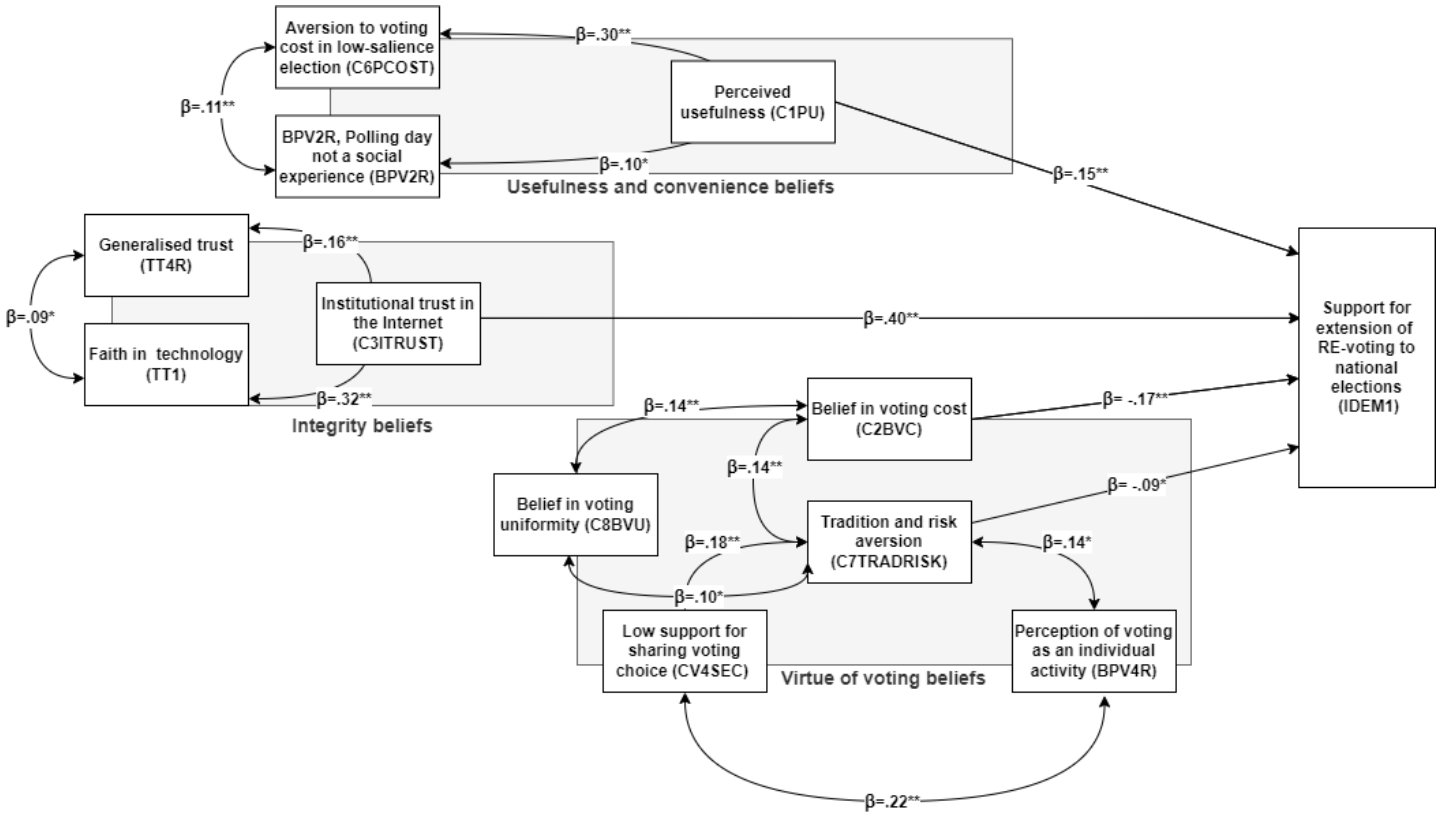
The WVS items generalised trust and faith in technology fit each of these criteria and so are considered exogenous in their effect on institutional trust in the internet. The unidirectional relationship between these values and institutional trust were anticipated.

Aversion to voting cost in low-salience elections was considered exogenous to perceived usefulness, and was anticipated to increase the attractiveness of RE-voting technology. The coefficient relationship between these components is bidirectional; its covariant relationship is indicated in the model by a curved arrow, rather than by a straight arrow which would indicate a one-way causal relationship. In this instance theory is relied upon to determine the order of effects. Aversion to voting cost beliefs are highly likely to precede a respondent's opinion on RE-voting, a specific voting medium. Aversion to voting cost also has no direct effect on the DV, support for the extension of RE-voting to general elections, but it has a significant positive correlation with perceived usefulness, which itself has a positive influence on the DV. Aversion to voting cost is likely not the only variable acting upon perceived usefulness.

Finally, tradition and risk aversion values are considered exogenous due to their effect on a large number of virtue of voting variables and their consistency with the theoretical framework. Tradition and risk have a positive influence on belief in voting cost, belief in the uniformity of voting time, perception of voting as an individual activity, and low support for sharing voting choice. The majority of these variables do not have significant linear relationships, but they all share a significant linear relationship with tradition and risk aversion. This 'common relation' status of the tradition and risk-aversion component is justification for treating it as exogenous.

Figure 5.2 displays a path analysis diagram reporting partial coefficients, covariances and standard errors. For a complete description of the model's path coefficients, standard errors and confidence intervals please see appendix 5.4.

Figure 5.2, Structural Equation Model with reported coefficients, covariances and error terms: Variables determining support for online voting



The model indicates that the perceived usefulness of RE-voting is strongly correlated with an aversion to voting cost in low-salience elections. This aversion to voting cost may be the primary 'draw' towards online voting systems. Participants who scored highly on 'aversion to voting cost in low salience elections' also had high scores for perceived usefulness of RE-voting. These variable relationships with the DV are not equal which provides some indication as to the order of relationships.

Aversion to voting cost has a non-significant negative relationship with the DV, support for the extension of RE-voting to general elections (P> z =.63), therefore the null hypothesis could not be rejected for H7. However, aversion to voting cost has a standardised coefficient .30, p<.00, when regressed against perceived usefulness, indicating a positive relationship between these constructs.

Perceived usefulness has a significant but small positive relationship with the DV with a coefficient of .18 (p<.01), confirming H6. The relationship between aversion to voting cost and perceived usefulness is bidirectional, but the inequality between their effects on the DV suggests that perceived usefulness is endogenous, and aversion to voting cost is a deeper belief which is exogenous to perceived usefulness and support for the extension of RE-voting to general elections.

This relationship has an intuitive sense as RE-voting systems greatly reduce the time required to vote (Solvak and Vassil, 2016:77,91). While a majority of people may agree that online voting is useful - individuals who score highly for aversion to voting cost are extremely likely to perceive the technology as useful, suggesting that perceived usefulness is an endogenous variable, and is affected by this aversion to voting cost. As expected, aversion to voting cost has a negative relationship with the virtue of voting variable cluster.

There is little overlap between aversion to voting cost and the virtue of voting item clusters. Belief in voting cost has a negative correlation with aversion to voting cost (β=.17 p<.01) while belief in uniformity of voting and voting secrecy have non-significant relationships to this variable. These findings are intuitive and the negative relationship between virtue of voting variables and aversion to voting cost was expected.

The component belief in tradition and high risk aversion has a strong positive correlation with belief in voting cost (β=.14 p<.01), belief in voting uniformity (β=.1 p<.01), belief in the importance of voting secrecy (β=.18 p<.01)and the perception of voting as an individual rather than community experience (β=.14 p<.01). Due to the broad value-based nature of the tradition/risk aversion variable and the strong positive relationship it holds with four granular voting questions, it is identified as an exogenous variable. The four granular endogenous variables can be paired according to their covariance: belief in voting cost and belief in voting uniformity have a significant covariance of β=.14 p<.01, while belief in the importance of voting secrecy and voting as an individual experience have a stronger covariance of β=.22 p<.01. There are no other significant covariances between these variables.

These four variables have negative relationships with both institutional trust in the internet and with perceived usefulness. However, only belief in voting cost's negative relationship to support for extension of RE-voting and perceived usefulness is significant at the 95% confidence level (β=-.15 p<.01, β=-.10 p<.05). These results confirm belief hypothesis H2, but provide no support for H3 or H4. Belief in voting cost has no significant relationship to institutional trust in the internet, an absence which provides statistical evidence for the qualitative distinction between the issue of RE-voting system integrity and normative objections to RE-voting systems. Respondents with strong normative objections to RE-voting do not necessarily have low levels of trust in technology and the internet and respondents with high levels of trust do not exclusively hold positive views of the normative aspects of RE-voting. The OLS regression reveals that belief in voting cost is the only variable with a significant effect inside the 'virtue of voting' cluster. Its magnitude in the SEM is linked to the size of its PCA eigenvalue, having the 2nd largest value of the eight components.

As a set of normative views about voting, the ‘virtue of voting’ cluster is in opposition to the belief in voting duty/compulsory voting construct. With the former focusing on exclusionary aspects of the ballot and the latter on expanding inclusion.

Institutional trust in the internet has the largest positive relationship with support for the extension of RE-voting to general elections (β=.40 p<.01), this result partially confirms belief hypothesis H5 and identifies to perceptions of the internet as the most salient trust construct. The construct is positively correlated with the WVS items ‘faith in scientific progress and technology’ and ‘generalised trust’, with respective coefficients (β=.32 p<.01) and (β=.16 p<.01).

The relationships between these ‘generalised’ variables and institutional trust was predicted. However, these relationships are bidirectional, meaning they remain significant when the causal direction is reversed. This evidence fails to support the expectation that there would be a unidirectional causal path between ‘faith in scientific progress’, ‘generalised trust’ and institutional trust in the ‘internet’. It was hypothesised that trust could be illustrated as a funnel, moving from broad abstract values at the top down to narrow trust in the institutions of the internet at the base, and where the broader variables would be exogenous to institutional trust. The bidirectionality in the model rejects the downward cascade of trust proposed by the framework. The three variables are clearly positively associated, but there is no evidence for a tiered relationship between them in the model.

Institutional trust has no significant relationship to any of the variables in the ‘virtue of voting’ cluster. However, it has significant positive associations with the construct duty/compulsory voting (β=.21 p<.01) and perceived usefulness (β=.28 p<.01). The relationships between these clusters were expected to be non-significant; the existence of positive coefficients between

these variables muddies the framework. It is a small reassurance that the largest standardised coefficient emanating from institutional trust connects to the DV, support for RE-voting in general elections. Any change in the magnitude of institutional trust will affect the DV to a greater degree than any other variable in the model.

'Belief in voting duty and compulsory voting' emerged as a significant component during PC analysis, but it did not relate significantly to any variables in the model. It had no significant negative relationship to the variables predicted: support for the extension of RE-voting (β=.02 p<.55) and Perceived Usefulness (β=.03 p<.22). However, it did have a significant negative relationship to Aversion to Voting Cost (β=-.14 p<.01). A variable which had a strong influence on the perceived usefulness of RE-voting technology. This negative relationship reinforces the existing evidence that individuals who view voting as a duty or obligation are less sensitive to the direct costs of voting, such as leaving the house to vote during a storm (Knack, 1994:199-203).

While 'belief in voting duty and compulsory voting's standard errors were small, its coefficient size was also small, resulting in a large number of non-significant t-ratios. It was anticipated to correlate strongly with the virtue of voting items; individuals with strong views about voting duty were expected to also have strong views on the amount of effort, commitment, and publicness required for voting, and were expected to favour the embodied presence of the polling station. This was not the case and there is no evidence for a linear relationship between these variables.

While the expectations of the duty/compulsory voting in relation to virtue of voting constructs were not met, interesting relationships with other variables were observed. As reported

above, Duty/compulsory voting has a significant negative relationship to aversion to voting cost. Belief in tradition/risk aversion also has a negative relationship to duty/compulsory voting (β=-.09 $p<.25$), but this is also non-significant at the 95% level. Because of its lack of statistical relation to the majority of components, belief in voting duty/compulsory voting was dropped from the model.

Questions assessing voting duty and compulsory voting were tested in a separate pilot study to the virtue of voting questions, so it was not possible to test their relationship in advance. There was an expectation that strong beliefs about voting duty would positively correlate to strong beliefs about the cost, publicness and uniformity of voting. The spearman matrix and Pearson regression results confirm the distinction between these beliefs; participants who had strong views about voting duty and compulsory voting did not hold strong views about the conduct of voting. This is a significant finding, since it further delineates the virtue of voting cluster. Individuals with strong views on the way voting is conducted do not have strong views about participation in elections, or the necessity for expanding the inclusivity of elections. Belief in tradition and high risk aversion provide a better values based explanation for the virtue of voting variables.

4.3 Model Fit

The Satorra-Bentler scaled Chi Square test was used to compensate for the non-normality of four of the survey components. Violations of the normality assumption can inflate Chi-Square outputs, creating the false impression of a significant difference between implied and observed models (West, Finch and Curran, 1996:63,64). This non-normality is present in the following components: perceived usefulness (PU1), belief in voting cost (BVC), aversion to voting cost in low-salience elections (PCOST) and tradition, and risk-aversion (TRADRISK). These components have the long, thin tails associated with negative skewness when represented as histograms. The Satorra-Bentler scaled test compensates for this non-normal inflation by measuring the level of average multivariate kurtosis in the variables and producing a 'scaling correction factor'. The Chi Square value is then divided by to produce the Satorra Bentler scaled Chi Square value (Satorra and Bentler, 2001).

Using the chi square test with the Satorra-Bentler adjustment as an index for goodness of fit, the difference between the implied and observed SEM models is relatively small at 16.67. This is two points smaller than the unadjusted Chi Square statistic of 18.9. Combined with the model's seven degrees of freedom, this critical value equates to a 2% probability that any difference between the models is due to chance. The inverse of this probability means that any differences between the models are not significant at the 99% confidence level, but the differences are significant at the conventional social science confidence level of 95%. In typical goodness of fit tests, the Chi Square statistic must be sufficiently large to demonstrate a difference between two groups.

However, in this application the aim is to demonstrate the strength of similarity between the model implied by this study and the model observed in the samples' covariance matrix; the closer Chi Square is to zero, the more perfect the union between implied and observed models

will be. Because of the anticipation of similarity over difference, Hoyle describes Chi Square's application in the context of SEM as a 'badness of fit' test (1995:7). Since the test statistic exceeds the 99% confidence threshold but does not exceed the 95% threshold, the SEM model has an adequate similarity to the observed model, but elements of the covariance matrices do not overlap. See table 5.8 for the scaled Chi Square outputs and associated goodness of fit indexes.

Table 5.8, Satorra–Bentler scaled chi square statistic, and parallel goodness of fit statistics

	Goodness of Fit statistic	Value
Satorra–Bentler Scaled Chi Square Statistic	chi2sb ms(7)	16.67
	p > chi2	0.02
Population error	Root mean squared error of approximation (RMSEA)	0.06
	90% CI, lower bound	0.03
	upper bound	0.10
	pclose	0.24
	RMSEA Satorra-Bentler	0.06
Satorra–Bentler Baseline Comparisons	Comparative fit index (CFI)	0.93
	Tucker–Lewis index (TLI)	0.89
Size of residuals	Standardized root mean squared residual (SRMR)	0.02
	r^2/Coefficient of determination	0.28

While all of the relationships are statistically significant at the 95% level, the cumulative R squared statistic is small (.28) and the amount of variance explained by the variable relationships is unevenly distributed throughout the model. 88% of the variation in

Institutional trust in the internet is unexplained while many of the smaller question items such as uniformity of voting time (BVU) or perception of voting as an individual activity (BPV4R) have unexplained variances of 98% or 99%. The proposed exogenous variable influencing these items, tradition/risk aversion, only accounts for 1-2% of their variance. The component belief in voting cost (BVC) is also largely unexplained by Tradition/Risk Aversion with 98% of variance unaccounted for. This high level of variance can be explained since only a quarter of respondents expressed strong support for belief in voting cost about. These r^2 values indicate that there may be unidentified exogenous variables which provide a superior explanation for these endogenous variables.

The DV, support for the extension of RE-voting to general elections (DV) has an unexplained variance of 76%. The 3 endogenous variables which have a significant influence on the DV account for only 23% of the variance in the model. This unexplained variance highlights the limitations of the proposed influencing variables and that there may be other variables beyond the model which provide a stronger explanation of support for RE-voting.

5. Conclusions

This analysis identified the constructs which relate to support for RE-voting in general elections. This purpose is informed by the research aims established by the theoretical framework: (i) survey student beliefs about voting and remote electronic voting systems, (ii) establish the motives for individual support or rejection of RE-voting technology, and (iii) whether experience of RE-voting affects support for the extension of RE-voting to first-order elections.

These aims were met by collecting survey data and testing seven alternative hypotheses which related to research aims ii and iii. The null hypotheses were rejected for four out of six of the belief hypotheses H2, H5, H6, and H7, relating to the following constructs perceived usefulness, aversion to voting cost, belief in voting cost, and institutional trust in the internet. The null hypotheses were not rejected for H3 and H5 which related to belief in voting uniformity and belief in the publicness of voting.

It was anticipated that publicness of voting items would load strongly with other virtue of voting items, but that item clusters would be unpredictable. To reduce this unpredictability, the question items for each of the virtue of voting concepts were revised and expanded for the large n survey. The publicness of voting items did not load together during variable combination, and when tested in the SE model were not significant at the 95% level in their relationship to the DV. However, some individual items had significant negative relationships to aversion to voting cost beliefs; BPV2R which measured indifference to social experiences on polling day was positively influenced by aversion to voting beliefs, with a standardised coefficient of $\beta=.11$ $p<.02$.

This finding opens the possibility that unidentified beliefs about aversion to voting cost have been affecting responses to technology adoption studies since they were first applied to RE-voting by Carter and Bélanger (2005), Schaupp and Carter (2005) and Nemeslaki, Aranyossy and Sasvári (2016). Technology applied in the political sphere is perceived differently to technology outside of the political sphere. By approaching RE-voting in the same way as e-commerce technologies, technology adoption studies have largely overlooked user motivations which are unique to the political dimension, such as normative beliefs towards voting.

The four belief hypotheses where the null was rejected confirm large parts of the study's theoretical framework. The OLS models revealed three linear relationships between the IVs and the DV: Trust in the institutional context of the voting system, the internet, is significant for support for RE-voting in general elections. An absence of trust in security and accountability online severely reduces support for RE-voting in general elections.

Perceiving RE-voting as a useful time-saving tool for voting has the second largest effect on support for RE-voting. Respondents who did not regard RE-voting as particularly time-saving or useful were either indifferent or opposed to extending RE-voting to general elections.

Beliefs about the importance of voting requiring a cost from the voter have the third largest influence on support for RE-voting extension. Respondents who were supportive of voting cost and voting uniformity were opposed to the extension of RE-voting. Since this was a linear relationship, respondents who were strongly opposed to voting cost and voting uniformity were also strongly in favour of RE-voting extension. This variable is strongly related to belief in uniformity of voting which had no significant effect on the DV in the SE model, and to the tradition/risk aversion variable. The positive correlations between these three variables were highlighted in the component Spearman rho matrix. These virtue of voting components are negatively correlated with convenience and trust concepts, though the difference in magnitude is not uniform. The negative relationships between variables are consistent with the expectations established by the framework.

The findings of this study support the previous applications of the technology adoption model (TAM) to e-government and e-voting. However, by including beliefs regarding the virtue of voting, particularly belief in voting cost, the study identifies variables which negatively affect support for technology adoption (Carter and Bélanger, 2005; Schaupp and Carter, 2005).

Across bivariate and multiple models, perceived usefulness and institutional trust were significant predictors of support for the extension of RE-voting to general elections, and belief in voting cost was a significant predictor of opposition towards RE-voting.

Chapter 6, Experience Leads? Experience as a Moderator of Support for Online Voting in National Elections

1. Introduction

With 1.6 million young people having the opportunity to vote online, what is the effect of this experience on attitudes towards RE-voting in national elections? Beliefs formed through direct experience result in stronger attitudes and greater attitude-behaviour consistency than beliefs formed through second-hand information or from inference (Fazio and Regan, 1977; Fazio and Zanna, 1978, 1981; Fazio et al, 1982; Fazio, Powell and Herr, 1983; Sherman and Fazio, 1983). It follows from this principle that individuals with direct experience of RE-voting will be more confident in their beliefs about the merits and limitations of the technology than individuals without experience. This first-hand positive/negative experience acts as a simple heuristic for attitudes towards RE-voting technology in elections with higher stakes, such as elections to the national legislature. This point is the nub of this chapter; does positive experience with RE-voting in a low-stakes election result in support for the use of RE-voting in national elections where consequences of technical failure are much greater?

Experience hypothesis H1 and subsidiary experience hypotheses (H1.1,H1.2,H1.3) anticipated that respondents with experience of RE-voting in low salience elections would hold stronger beliefs about the usefulness and trustworthiness of the technology, as well as holding weaker beliefs about the required effort, publicness or uniformity of voting. A combination of these beliefs would predispose them to supporting RE-voting in general elections, having tested the technology and developed a familiarity with it. It was also anticipated that individuals with less experience of RE-voting would have weaker attitude accessibility and therefore be more ambivalent in their survey responses. Conversely, individuals with more experience would

have stronger attitude accessibility and be less likely to record polarised scale responses instead. This polarisation would be indicated by a higher frequency of 1,2 and 6,7 values on the Likert scales (Raden, 1985:318).

These expectations were only partially confirmed by the tests in this chapter. A combination of t-tests and multiple regression models with interaction effects were used to test the link between direct experience and the DV attitude, and the results indicate a small but non-significant influence of direct experience on attitudes towards voting in national elections. The only construct to correlate with support for RE-voting in national elections which also positively correlated with experience level was perceived usefulness. Other constructs only emerged as partially significant; aversion to voting cost in low-salience elections and belief in voting uniformity both positively correlated with experience, but had no relationship with support for RE-voting extension. The DV, support for the extension of RE-voting to national elections, and adjacent survey items which related to the societal implications of RE-voting had no significant relationship with experience level.

2. Assessing experience and creation of experience variables

Of the 445 respondents, 192 had experience of voting in online elections. Of this group, 137 respondents had experience of RE-voting in student union elections and other low salience elections, while 49 respondents only had experience of non-SU online elections. These included course representative elections, voluntary organisation leadership elections and national party leadership elections. With an experience range of one to four elections, group sizes diminished as experience level increased; The majority of experienced respondents had only participated in one election (85), and only two respondents had participated in four online

elections. See frequency table 6.1 for details of the online voting experience range of the sample.

Table 6.1, Experience groups: Online voting experience amongst 18-24 year olds

	Online voting experience, number of online elections participated in	Frequency in sample (n445)
Group 0	0	253
Group 1	1	85
Group 2	2	75
Group 3	3 or more	32

Of the four experience groups, respondents with two or more experiences held stronger beliefs about voting and online voting technology than respondents with one experience or no experience. These 'power users' comprised 24% of the overall sample and 55% of the experienced subgroup.

University year group and age plays a decisive role in level experience with RE-voting systems. Experience of RE-voting is cumulative; the longer a respondent attends university, the more opportunities they will have to vote. All participants of this study had the opportunity to participate in online elections in the form of course representative elections starting between the 21st of September and the 5th of October 2020, but first year participants would not have had the opportunity to vote in student union elections which are usually held in the spring term. Because of this disparity in accumulated experience, only 31% of first year respondents had experience of RE-voting. In comparison, 53% of second year, third year, and post-graduate students had experience of RE-voting. This pattern was also found for the age 25+ students (n85) who do not feature in this study, where 55% of respondents were experienced. See table 6.2 for a description of the quantities.

Table 6.2, RE-voting Experience by age group

	20-24	17-19
Respondents	245	200
Experienced respondents	131	61
Inexperienced respondents	114	139
% with experience	0.53	0.31

Analysis of variance (ANOVA) testing was used to quickly indicate differences in construct responses according to experience group (0-3). The tests identified three significant construct response differences between the four experience groups. Responses to perceived usefulness (C1PU), aversion to voting cost (C6PCOST) and belief in the uniformity of voting (C8BVU) differed according to level of experience; respondents with greater levels of experience were more likely to perceive RE-voting technology as personally useful. These participants were more likely to be sensitive to the time and effort cost of voting in SU elections, and they were more likely to oppose beliefs about the uniformity of the voting experience. The inverse of these responses was found in the lowest experience groups: respondents with zero experience were less likely to view RE-voting as a useful technology, were less sensitive to the costs of voting in SU elections, and were more likely to hold positive beliefs about the uniformity of voting.

ANOVA tests identify differences in construct responses between groups but cannot provide confirmation of the directional effect of experience on a construct. Due to the inclusion of ordinal variables, Spearman rank-order correlation was used to establish the correlation size and direction of experience. Significant experience-construct correlations corresponded with the ANOVA experience group results; perceived usefulness, aversion to voting cost, and belief

in uniformity of voting had strong correlations with level of experience. See table 6.3 for a complete description of the Spearman results.

Table 6.3, Spearman matrix, survey constructs and experience level correlations

Construct Name	Code	Correlation to experience level (0-4)
Perceived Usefulness	C1PU	0.1064*
Belief in Voting Cost	C2BVC	-0.0411
Trust in the Internet	C3ITRUST	0.042
Belief in Secrecy	C4VSEC	-0.0071
Belief in Voting Duty	C5DUTYCOMP	0.0455
Aversion to Voting Cost	C6PCOST	0.1320**
Tradition and Risk Aversion	C7TRADRISK	-0.0501
Belief in Voting Uniformity	C8BVU	-0.1480**

Perceived usefulness and aversion to voting cost were weakly correlated with level of experience (ρ=.1 $p<.05$, ρ=.13 $p<.01$). These small coefficients indicate that higher levels of experience are linked to positive beliefs about the utility of voting systems, as well as being linked to an aversion to the costs of voting in paper student union elections. The usefulness relationship is intuitive; respondents with more experience of a technology, which has not routinely failed, would be expected to hold positive beliefs towards it (Fazio and Zanna, 1981; Davis, 1985; Fishbein and Ajzen, 2010).

The majority of participants (81%) reported a moderate-to-high level of satisfaction with their RE-voting experience. Using a 1-7 scale, 157 respondents reported levels of satisfaction greater than 4.8. While only 35 respondents reported satisfaction levels lower than 4.15. The scale area with the highest frequency of responses was 6-6.5 with 74 responses. For the majority, RE-voting was a positive experience, which helps to explain why scores of perceived usefulness are much greater for groups with greater experience. However, aversion to voting cost's

relationship to experience is not immediately explicable, and is more likely to be explained by the age of participants.

Greater levels of RE-voting experience were positively correlated with greater sensitivity to the costs of in-person voting. These respondents reported they were less likely to participate in SU elections if they were held in-person. In contrast to these higher experience respondents, the 225 respondents with no experience of voting in SU elections, or any other online elections, were less likely to be averse to in-person voting in SU elections; they believed they would still vote if elections were held in-person. This response can be explained by the 139 first year respondents who had the opportunity to vote in online course representative elections, but had not yet voted in student union elections. Since aversion to voting cost questions refer specifically to voting in student union elections, a lack of opportunity to participate is the likely explanation for this difference between experience groups. The importance of age for response to aversion to voting cost is supported by ANOVA testing, which shows a significant difference in responses between eight ages 17-24 ($p > f = 0.01$). With the exception of 17 year olds, the mean perception of the costs of voting in-person increases with age. 18 year olds have the lowest level of aversion to voting cost, while 24 year olds have the greatest level. Mean response increases and standard deviations are detailed in table 6.3 below. This steady increase is unique to the aversion to voting cost construct, significant response differences between ages do not occur with any other construct. This uniqueness highlights the measurement problems with this construct; it appears to be affected by level of exposure to student union elections, rather than by an aversion to voting in-person. Respondents with experience were able to weigh up whether they would still participate in-person, but respondents without experience were unable to make the same assessment and were possibly guessing at what voting in an SU election would be like. See table 6.4 below for details of the differences in aversion to voting cost by age group.

Table 6.4, Aversion to Voting Cost Response by Age (17-24)

Age	Mean Aversion to Voting Cost Response (1-7)	Standard Deviation	Frequency
17	3.92	1.07	6
18	3.56	1.67	86
19	3.81	1.74	108
20	4.4	1.69	86
21	4.42	1.55	71
22	4.47	1.76	44
23	4.52	1.75	24
24	4.61	1.17	19
Totals	4.11	1.69	444

Despite the differences in construct responses, experience groups did not differ significantly in their responses to the dependent variable, support for RE-voting in national elections (p> f =.17). The lack of difference indicates that attitudes towards the use of RE-voting in national elections are independent of experience level, and may be affected by variables outside of the proposed model. Though experience level has no direct effect on the DV, it still has the potential to act as a moderator variable, dampening or amplifying the effect on constructs which do have an effect on the DV.

Belief in voting uniformity was the only construct with a significant negative relationship to experience level. Respondents with no experience of RE-voting held stronger views about voting uniformity than respondents with one or more experiences. This finding provides some evidence for the mitigating effect of experience on normative beliefs about voting. RE-voting likely has a mitigating effect on beliefs about the importance of voting uniformity, such as voting on the same day, or using the same medium for voting.

3. Control variables and experience levels

Control questions were used to identify three confounding variables which could be collinear with experience level: level of political interest, belief in voting duty, and level of civic voluntarism. If these control variables were not collinear with level of RE-voting experience, this would establish the independence of experience level as a moderator variable. It is intuitive that individuals with greater interest in politics, beliefs about voting duty and greater civic-mindedness would be more likely to participate in online elections, and therefore have more RE-voting experience.

Political interest was measured by the number of days participants reported talking about politics in the past week (0-7), a question which was drawn from the British Election Study (2019). Oneway ANOVA testing revealed no significant differences between RE-voting experience groups (0-3) and level of political interest ($p=f>.19$). Despite the absence of an ANOVA pattern, Spearman correlation testing showed a small positive correlation ($\rho=.09$ $p<.05$) between political interest and level of RE-voting experience (0-3).

When tested against the survey components, Spearman correlation testing indicated only one positive coefficient with one of the eight survey constructs, belief in Duty and Compulsory voting ($\rho=-.14$ $p<.05$). This construct had no significant effect on the DV. Level of political interest was also negatively correlated with tradition and risk aversion ($\rho=-.15$ $p<.05$) and belief in voting secrecy ($\rho=-.22$ $p<.05$).

Belief in voting duty was measured by a seven-point semantic differential scale between voting as a duty which must be carried out, and voting as a right which is optional. Oneway ANOVA testing identified no significant differences in voting duty beliefs between RE-voting experience

groups (p=f>.18). Spearman correlation testing did not identify any significant relationship between experience level and belief in voting duty (ρ=.05).

Civic voluntarism, as measured by the number of hours spent volunteering, had the strongest relationship to experience level of the three controls. This ordinal control item recorded six levels of volunteering: 0 hours, 1-2 hours, 2-4 hours, 4-8 hours, 8-16 hours, and 16+ hours. For testing, it was collapsed into a 1-4 ordinal scale variable, with 1 = 0 hours, 2=1-2 hours, 3=2-4 hours and 4=4-8 hours or more. Collapsing was necessary to improve statistical power due to the extremely small (>3) frequency sizes of 8-16 hours and 16+ hours groups.

ANOVA testing identified significant differences between levels of civic engagement and RE-voting experience groups (p> f =.01). Above two hours of volunteering per week, the number of hours spent volunteering increased with an individual's level of RE-voting experience. The groups with the greatest level of experience (3-4 experiences) reported volunteering for more than eight hours per week. This group-level pattern is supported by Spearman correlation testing, which showed a small positive correlation between voluntarism and RE-voting experience (ρ=.16 p<.05). This coefficient size confirms there is a relationship between these variables, but that they are distinct enough to avoid multicollinearity. Coefficients greater than .8 are indicators of multicollinearity between variables (Agresti, 2018).

Based on its significant ANOVA result and Spearman correlation, civic voluntarism is the control variable most closely associated with RE-voting experience level. This relationship makes it a strong candidate as a confounding variable for experience level. However, the items are not equal in their relationship to the eight belief constructs; volunteering does not mirror the effect of experience when tested using either Spearman or Kendall's tau coefficients. See table 6.5 below for details of these relationships.

Table 6.5, Spearman correlation matrix, RE-voting experience level and civic voluntarism score

	RE-voting experience level (0-3)	Control, Civic voluntarism score (0-4)
RE-voting experience level (0-3)	1.00	
Control, Civic Voluntarism (0-4)	0.16*	1.00
C1, Perceived Usefulness (1-7)	0.10*	-0.02
C2, Belief in Voting Cost (1-7)	-0.04	-0.06
C3, Institutional Trust in the Internet (1-7)	0.04	-0.06
C4, Belief in Voting Secrecy (1-7)	-0.01	0.01
C5, Belief in Voting Duty and Compulsory Voting (1-7)	0.04	0.08
C6, Aversion to Voting Cost in Low Salience Elections (1-7)	0.13*	-0.04
C7, Belief in Tradition and Risk Aversion (1-7)	-0.05	0.00
C8, Belief in Voting Uniformity (1-7)	-0.14*	0.04
* = $p \leq 0.05$		

Voluntarism's lack of any significant relationships to the survey constructs increases the independence of RE-voting experience level. In addition to the lack of significant effects on survey constructs and the small, shared correlation coefficient, civic voluntarism and experience level do not share the same coefficient directions or magnitudes and therefore unlikely to be collinear. RE-voting experience level is fit for purpose as a moderator variable, which is closely related with civic voluntarism, but is not masking the effects of civic voluntarism.

4. Measuring differences between experience groups

As the number of groups compared in ANOVA increases so does the probability of a type I error (Nolan and Heinzen, 2014:297,298). This is exacerbated by asymmetries in sample size among experienced respondents, whose sample sizes became progressively smaller as experience level increased. To dampen this problem, difference of means tests were used to compare the differences in response to survey constructs. Experience groups 0-3 were reduced to create a binary experience variable composed of a smaller group with experience of RE-voting (n=192) and a larger group with no experience (n=253). These samples are independent of one another since respondents did not volunteer based on whether they had experience of RE-voting or not. This reduction of the data inevitably results in a loss of detail, but the increase in sample size for experienced participants improves the statistical power of the test.

To further reduce the chance of type I error, two variants of the difference of means test were used: Welch's t-test and the student t-test. These tests provided a measure of the significance and direction of the difference between groups, while Cohen's d was used to estimate the effect size (1988). The t-tests were used since the sample sizes are sufficiently large (>30) relative to the skewness of the response data for both samples (Agresti and Finlay, 1997: 171,172). Unlike non-parametric tests such as the Mann-Whitney U test, the t-test generates an inference regarding the difference between the sample parameters, not just a difference between the sample means (Agresti and Finlay, 1997).

Welch's adjusted t-test is used as the foremost difference of means test for this analysis, with the Student t-test included for comparison. Welch's t-test compensates for asymmetry of sample sizes and asymmetry of sample variance by adjusting the test's degrees of freedom, a function which makes it appropriate for use with asymmetric group sizes. When used on

asymmetric samples, the adjustment reduces the chance of accepting an incorrect null-hypothesis (type I error) relative to both the student t-test and the Mann-Whitney U test (Zimmerman, 2004:174; Delacre, Lakens, Leys, 2017:99). As the probability of type I error reduces, the probability of incorrectly rejecting the null-hypothesis increases. Cohen's d was used to measure power size to reduce the likelihood of type II error.

Cohen's d provides a standardised estimate of the magnitude of difference between distributions (1988). Cohen's statistic has been included to counter the inflating effect of sample size on the significance of the test statistic, as reported by Welch's/Student t-test. As sample size increases, the size of test standard errors are reduced and the potential for t-statistics within the acceptable alpha level but with extremely weak effect sizes increases. These statistically significant yet inconsequential effects characterise type II error (Singh, 2004:159,160; Nolan and Heinzen, 2012:204,205). Cohen's t-test power sizes range between 0.2 (small), 0.5 (medium), and 0.8-4.0 (large) (Cohen, 1988:24-27). These power sizes are equal to distribution divergences of 14.7%, 33%, and 47.4%-97.7%. Distribution divergence in this context describes the amount by which the two distributions do not overlap and is denoted by U^1. Despite only small differences in standard deviations between response distributions, Glass's Delta was calculated alongside Cohen's d, but the statistic was negligible in difference and so was not reported. Cohen's d is reported in the third column of each table.

Of the 8 PCA constructs, only three differed significantly according to experience group: perceived usefulness, aversion to voting cost, and belief in voting uniformity. These items had p-values below the 0.05 alpha level and had Cohen's d effect sizes of over 0.2 or approaching this threshold (1.96). Perceived usefulness and aversion to voting cost scores were greater in groups with experience (t=2.08 U^1=13.3%, t=2.81 U^1=18.9%), and belief in voting uniformity scores were much lower (-3.07 U^1=21.3%). The remaining constructs had extremely small t-

statistics and power sizes, indicating the strong similarities between response distributions. These low-difference constructs were belief in voting cost, trust in the internet, belief in secrecy, belief in voting duty, and belief in tradition and risk-aversion. See table 6.6 for a complete description of the t-test results and power analysis.

Table 6.6, Difference of means testing, significant differences between 0 and 1 experience groups

Survey Construct	Belief difference according to <1 experience	Welch t-test difference	Student t-test difference	Cohen's d	% of non overlap (U^1)
C1PU, Perceived Usefulness	Increased	2.08*	2.05*	0.19	13.30
C2BVC, Belief in Voting Cost	No significant difference	-0.20	-0.20	-0.02	1.35
C3ITRUST, Trust in the Internet	No significant difference	0.89	0.89	0.08	5.94
C4VSEC, Belief in Secrecy	No significant difference	-0.25	-0.25	-0.02	1.70
C5DUTYCOMP, Belief in Voting Duty	No significant difference	0.66	0.66	0.06	4.40
C6PCOST, Aversion to Voting Cost	Increased	2.81*	2.80*	0.27	18.75
C7TRADRISK, Belief in Tradition and Risk Aversion	No significant difference	-0.10	-0.10	-0.01	0.68
C8BVU, Belief in Voting Uniformity	Decreased	-3.07*	-3.08*	-0.29	20.61
*= $p < 0.05$					

The t-test results point to a positive relationship between experience of RE-voting and greater perceptions of usefulness, alongside a lower tolerance for voting cost in low-salience elections, and weaker beliefs about the importance of voting uniformity. These results mirror the correlations found in the spearman matrix in the previous section. Of these constructs, perceived usefulness has a small positive correlation with support for RE-voting in national elections (β=.17 p<.01). Response distributions to support for RE-voting in national elections did not differ significantly between groups (t = -0.92; d=0.09), indicating that RE-voting experience has little effect on this attitude. The other constructs relevant to this t-test,

aversion to voting cost and belief in voting uniformity, had no significant relationship to the DV in any of the multiple-regression models. These beliefs may be reinforced or undermined by experience of RE-voting and are secular of support for RE-voting in national elections. Perceived usefulness is the only construct in this test which may have an influence on support for RE-voting in national elections, and which may indicate a link between experience, beliefs, and the DV attitude.

Higher scores for perceived usefulness of RE-voting may be greater in the experienced group due to the largely positive experience of RE-voting amongst the 253 participants. The positive association between RE-voting experiences in low-salience elections and RE-voting technology more generally may explain the positive correlation between this construct and the DV. Even where experienced participants may hold anti-convenience beliefs, a desire to reduce the cognitive dissonance between their positive experience of RE-voting and these beliefs may result in an overall positive attitude towards RE-voting in national elections (Festinger, 1957).

The non-significant findings with weak effect sizes are also of interest as they highlight commonalities between groups. This lack of difference applies to the following constructs: belief in voting cost, trust in the internet, belief in secrecy, and belief in tradition and risk aversion. Of these constructs, belief in voting cost, trust in the internet, and belief in tradition and risk aversion all have significant relationships with the DV, with regression power sizes ranging from large (d=.64) to extremely large (d=<.99) (Cohen, 1988:83-87). These sizes demonstrate the salience of these constructs to the DV, but the t-test results show that support/opposition to these belief constructs are relatively equally distributed between experience groups. In other words, these constructs are clearly expressed by the sample, but have no relationship to experience.

The absence of any difference for trust in the internet between groups is particularly interesting since it is the most influential of the survey constructs; in the structural equation model, it had the largest positive correlation to support for the extension of RE-voting. The absence of any differences between groups may be due to acclimation to the internet amongst the respondents All respondents can be considered as true digital natives, the eldest of the cohort having been born in 1996.

Across the experience-attitude literature, direct experience, rather than indirect information, is significant for determining an individual's attitude towards an attitude-object (Festinger, 1957; Watts, 196; Zajonc, 1968; Bem, 1972; Fazio and Zanna, 1978, 1981; Fazio et al, 1982; Fazio, Powell and Herr, 1983; Sherman and Fazio, 1983). The more involved an individual is with the experience, the greater the effect of the experience will be on attitude strength and direction (Watts, 1967). In this example, experience of RE-voting may be responsible for increased perceived usefulness scores, a construct which is positively correlated with support for the use of RE-voting in national elections. In contrast to this, trust in the internet has a strong coefficient relationship with the DV, but it does not differ according to experience level. Across regression models, trust in the internet has the strongest coefficient relationship with the DV, though this relationship appears to be secular from experience level. This finding does not support experience sub-hypothesis H1.2.

Levels of the control variables, interest in politics and hours spent volunteering, were significantly different between experience groups (t=1.71, t=2.24). The variables were significant at the 0.05 alpha level, but had small power effect sizes of 0.17 and 0.17 (Cohen, 1988). This effect size is equal to a divergence of 11.9% between the experienced distribution and the inexperienced distribution, indicating only a small divergence in distribution overlap. Despite its size, this divergence supports the assumption that politically engaged and civic-

minded participants are more likely to participate in online elections, and justifies the inclusion of these control items. See table 6.7 below for a summary of the control variable t-test results.

Table 6.7, Control variable t-test results

Question item	Belief change according to <1 experience	Welch t-test difference	Student t-test difference	Cohen's d	% of non overlap (U^1)
CTRL1, Interest in Politics	Increased	1.79*	1.79	0.17	11.96
CTRL2, Hours volunteering	Increased	2.24*	2.27	0.17	12.17
*= $p < 0.05$					

Of the DV and adjacent items associated with support for RE-voting in national elections, only the item 'online voting is beneficial for me' had a significant difference between response distributions (d=.24 U^1=16.58%). This difference highlights the volume of positive responses to this item among experienced participants. This differential may be an indicator of the direct experience effect - participants with experience felt the technology was more personally relevant to them than participants without experience (Fazio and Zanna, 1978;1981). Focusing on the consistency between behaviour and attitudes, Bem's self-perception theory can also help to explain the consistency between experience of RE-voting and positive responses to questions about the technology when prompted (1972). However, while this item may be adjacent to the DV, it does not tap the broader social implications of the DV.

The DV item, 'support for the extension of voting in national elections' had only a small non-significant difference between groups with a non-overlapping area of 6.17%. The difference was also negative in relation to experience level; experienced participants were marginally more likely to oppose RE-voting in national elections. This difference is not significant at the .05 alpha level. but it still runs counter to H1, that experience would be related to greater support

for RE-voting in national elections. Next to the DV, the two items concerning the societal implications of RE-voting technology had no significant differences between response distributions, and extremely small distribution overlaps (U^1=1.21%, U^1=1.23%). The absence of difference reinforces the argument that direct experience of online voting has little influence on attitudes towards online voting as applied to national elections.

Table 6.8, DV and DV adjacent items t-test results

Question item	Belief change according to <1 experience	Welch t-test results	Student t-test results	Cohen's d	% of non overlap (U^1)
IDEM 1 Support for extension of online voting	Reduced	-0.92	-0.92	-0.09	6.17
IDEM 2 Online voting is beneficial for me	Increased	2.49*	2.47	0.24	16.58
IDEM 3 Online voting is beneficial for society	Increased	0.18	0.18	0.02	1.21
IDEM 4 Online voting is harmful/beneficial for democracy (SDS)	Reduced	-0.18	-0.18	-0.02	1.23
*= $p < 0.05$					

5. Experience as a moderator variable: The interaction effect of experience on belief construct relationships

Four multiple regression models with factor interaction effects were used to test the effect of RE-voting experience on the survey constructs in relation to support for RE-voting in national elections. Cross-product terms were used to test the role of experience as a categorical moderator variable. In this instance, the terms were created by multiplying the experience dummy variable with each of the relevant survey constructs (Agresti, 2018:326). Constructs were selected for interaction testing based on their relationship to the DV from the SEM and from their significance in the experience t-test results. The five models with cross-product interaction terms are expressed below:

1) Support for RE-voting extension = α + β1Perceived usefulness + β2Aversion to voting cost + β3Belief in voting cost + β4Belief in voting uniformity + β5 Institutional trust in the internet + β6RE-voting experience+β7Perceived usefulness*RE-voting experience+e
2) Support for RE-voting extension = α + β1Perceived usefulness + β2Aversion to voting cost + β3Belief in voting cost + β4Belief in voting uniformity + β5 Institutional trust in the internet + β6RE-voting experience+β7Aversion to voting cost*RE-voting experience+e
3) Support for RE-voting extension = α + β1Perceived usefulness + β2Aversion to voting cost + β3Belief in voting cost + β4Belief in voting uniformity + β5 Institutional trust in the internet + β6RE-voting experience+β7Belief in voting cost*RE-voting experience+e
4) Support for RE-voting extension = α + β1Perceived usefulness + β2Aversion to voting cost + β3Belief in voting cost + β4Belief in voting uniformity + β5 Institutional trust in the internet + β6RE-voting experience+β7Belief in voting uniformity*RE-voting experience+e
5) Support for RE-voting extension = α + β1Perceived usefulness + β2Aversion to voting cost + β3Belief in voting cost + β4Belief in voting uniformity + β5 Institutional trust in the internet + β6RE-voting experience+β7Institutional trust in the internet*RE-voting experience+e

A binary categorical variable was used to create the interaction effect, identifying no experience of RE-voting (0) or one or more experience of RE-voting in any election (1). Despite holding data on user experience with a range of 0-4, the small size of the higher experience subgroups meant that an ordinal experience variable would be too heteroskedastic for regression analysis. The diminished sample size for the greatest experience group (2) was

lower than the model degrees of freedom (4), severely limiting the effectiveness of the analysis when using disaggregated subgroups.

To improve the statistical power of the experience subgroups, experience levels one to four were merged together to create a subgroup of n192. This subgroup merge inevitably results in data loss, but was a necessary compromise to improve the statistical power of the model. As in the previous models, the survey constructs are treated as continuous rather than ordinal variables. A similar binary variable was also created for SU only elections. This variable interacted in the same way as the 'total experience' variable, but it also excluded participants who may have had experience of RE-voting, but had not voted in an SU election. Figures for the 'SU only' variable are in appendix 6.2.

Stata's postestimation package Margins was used to calculate the predicted probabilities of support for RE-voting extension according to an individual's survey component scores and their level of RE-voting experience (0/1). In combination with the cross-product term, predicted probabilities were used in post-estimation to map the effect differences between experience groups at each level of the predictor variable (1-7) (Williams, 2012:309). The difference in predicted probabilities between groups is the 'marginal effect' of the binary experience variable. The postestimation command Marginsplot was used to plot regression lines for both experience groups, exposing any differences in slope gradients between experience group 0 and experience group 1 inside the model. Appendix 6.1 contains the full interaction model results, and appendix 6.2 contains details of the differences in predicted probabilities for each interaction effect.

With regard to the interaction effect of experience, some results conformed to the expectations of the theoretical framework and some were counter to expectations. Experience

appears to have a small amplifying effect on perceived usefulness, and a weakening effect on belief in voting cost. Institutional trust in the internet, perceived voting cost and belief in voting uniformity were not affected by level of experience in any way.

The interaction effects provide an indication that direct-experience may positively predispose participants towards RE-voting in national contests, and that direct experience has a small amplifying effect on the beliefs about the usefulness of RE-voting. It is established that informational beliefs are weaker in their effect on attitude formation and maintenance than observational beliefs, which are formed by first-hand experience (Fishbein and Ajzen, 2010:221-223). However, this effect may be a product of the personalities of participants; higher-experience participants may be more interested in RE-voting technology and so may already be predisposed to favour it. Belief direction was measured in this study but belief strength was not assessed. This absence of belief strength data means that differences in the confidence of beliefs cannot be compared between groups, something which will be included in future studies.

5.1 Experience and Perceived Usefulness and Aversion to Voting Cost

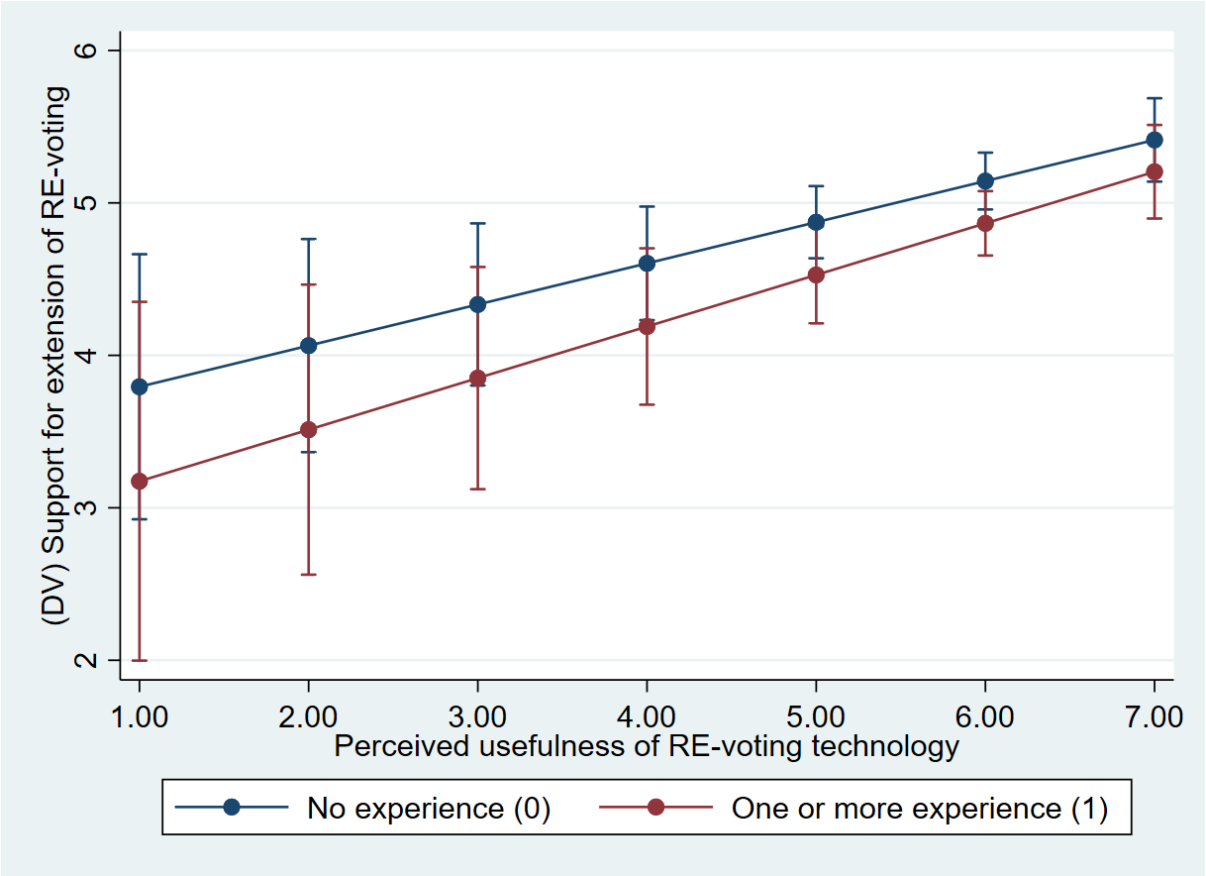
Perceived usefulness and aversion to voting cost were selected for interaction testing due to their significant t-test results. Scores for both constructs were greater amongst experienced participants, relative to inexperienced participants. These small but significant differences indicated a possible link between experience and the theme of convenience and usefulness.

For perceived usefulness, no significant relationship was found between the cross-product term for perceived usefulness*experience and support for RE-voting in national elections (P > z

= .64). The non-significant coefficient indicated that direct experience of RE-voting had a small positive effect on the strength of the relationship between perceived usefulness and support for RE-voting in national elections (β=.11). Because of the large probability of error, the null hypothesis for experience hypothesis H1.3 was not rejected. Complete model regression tables are in appendix 6.1.

The relationship direction conforms to the expectations of the theoretical framework - where direct positive experience was predicted to reinforce perceived usefulness beliefs. The interaction of experience level (categories 0-1) with perceived usefulness resulted in an increase in coefficient size, significant at the 5% level for each of perceived usefulness's seven point intervals. However, the overlapping confidence intervals at each stage of the independent variable show that there is too much variation in the interacted variable. The difference between groups is not strong enough, and the model findings should be interpreted cautiously. This variation may be reduced with a larger sample size (Nolan and Heinzen, 2012:214). See figure 6.1 for a representation of the average marginal effect of experience*perceived usefulness on support for RE-voting in national elections.

Figure 6.1, Average marginal effect of Perceived Usefulness with experience interaction effect



The interaction effect creates a small difference in coefficient gradients between groups, but the 1 experience group's line does not exceed the 0 experience group. The coefficient gradient for the experienced group is .13 points steeper than the 0 experience group's gradient (β=.59 > β=.46). The effect of this gradient difference is demonstrated by the closing of the gap between each group's intercept; as the perception of usefulness increases, the vertical gap between experience groups (.62) progressively narrows until it reaches the smallest difference (.21) at the maximum point on the x axis. It is also important to note that neither of these gradients are significant at α=0.05 in the interaction model.

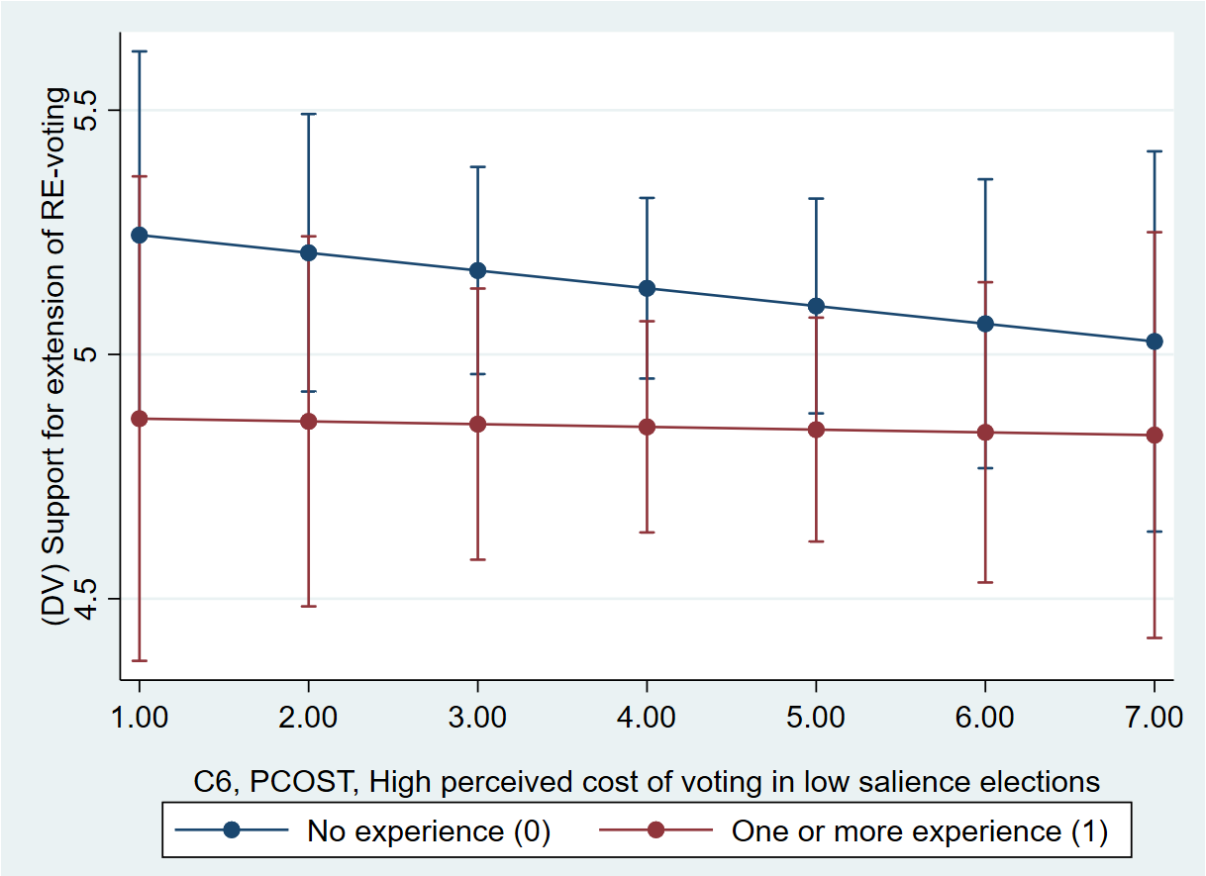
As seen in the t-tests, perceived usefulness scores may be greater on average among experience group 1 than group 0, but this does not translate to a greater willingness to support

RE-voting in national elections. The marginal effects model shows a narrowing gap between experience groups with lower-experience groups maintaining higher support for RE-voting in national elections, despite having a shallower coefficient slope than experience group 1. This difference between groups is masked in across-group multiple regression models which report a positive relationship between perceived usefulness and the DV.

Aversion to voting cost*experience had an extremely small coefficient size relative to its standard error size. However, this was not unexpected as previous regression testing had not indicated a significant relationship between aversion to voting cost and the DV. Although Welch's t-test indicated significantly greater scores for aversion to voting cost amongst the experienced group, the difference between groups was irrelevant to the DV. The t-test results warranted the inclusion of aversion to voting cost in this section, but it is clearly secular of support for RE-voting in national elections.

Average marginal effects testing did not reveal any significant differences between groups. Inexperienced participants' level of support for RE-voting in national elections decreased as their aversion to voting cost scores increased, with a non-significant coefficient gradient of β= -.04. Providing a slight contrast to this effect, experienced participants' support for the DV did not change according to aversion to voting cost score (β= -.00, P > z = .90). The gap between the y intercepts between these groups was also extremely small at .38. As with perceived usefulness, the null hypothesis for experience hypothesis H1.3 could not be rejected with this t-ratio. figure 6.2 for a representation of the average marginal effects model.

Figure 6.2, Average marginal effect of Aversion to Voting Cost with experience interaction effect



5.2 Experience and anti-convenience beliefs

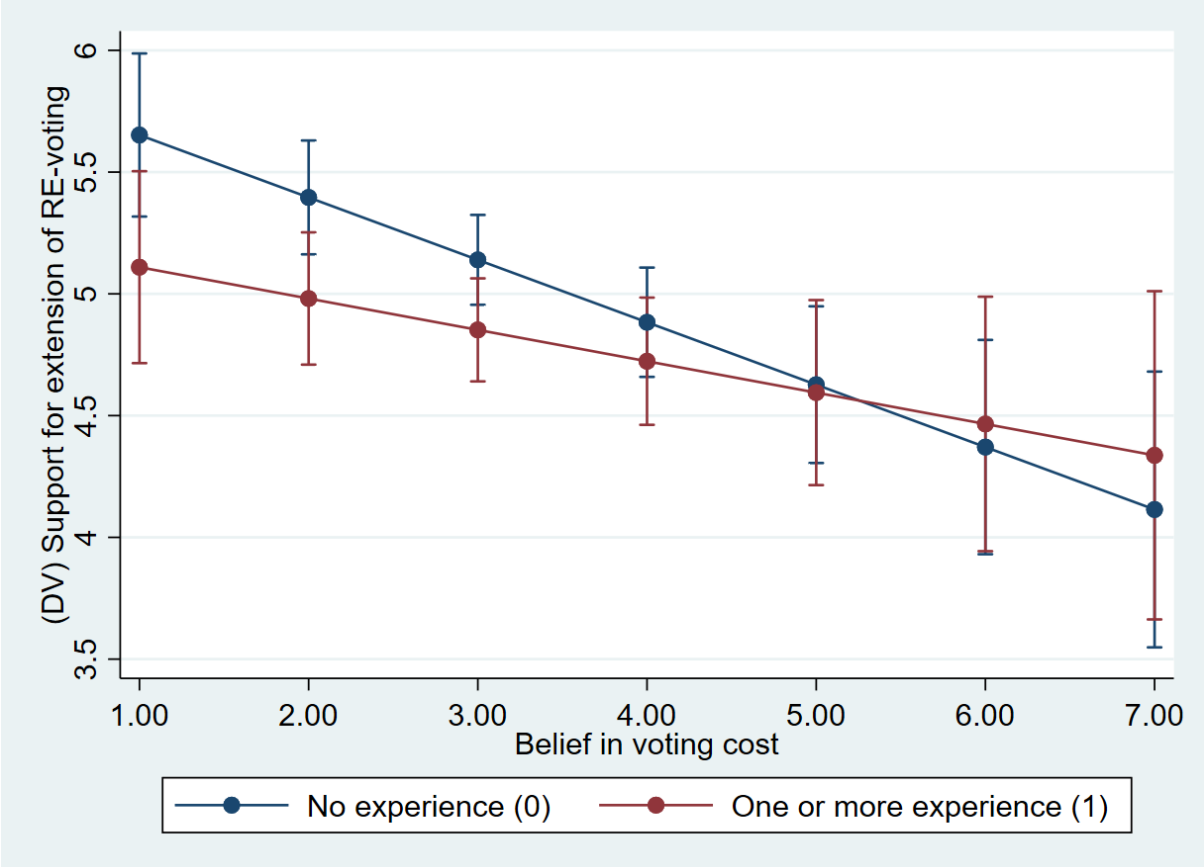
It was anticipated that anti-convenience beliefs would be reduced by the experience of RE-voting (H1.1). Correlation testing and difference of means tests established that voting uniformity beliefs were stronger amongst participants with no RE-voting experience and weaker amongst experienced participants. Regression testing also established that belief in voting cost and belief in voting uniformity had negative relationships with the DV. However, when introduced, the experience level moderator variable decreased the effect size and increased the standard error of these relationships. Despite the lack of significant

relationships, there are initial indicators of a relationship between belief in voting cost*experience. This was not true for belief in voting uniformity, however.

Belief in voting cost*experience level had a small, positive, non-significant relationship to support for RE-voting extension (β=.12, P > z = .23). When viewed as an average marginal effects model, coefficient size decreases according to level of experience. This is an initial indication that experience level weakens the negative effect of belief in voting cost on support for RE-voting extension. Complete model regression tables can be found in appendix 6.1.

The marginal effects model in figure 6.3 indicates that the inexperience group holds stronger views about voting cost. These beliefs have a negative correlation to support for RE-voting extension. This interaction effect conforms to the experience expectations of the theoretical framework.

Figure 6.3, Average marginal effect of Belief in Voting Cost with experience interaction effect



Using the marginal effects model in figure 6.3, the shallower gradient for experienced participants (β=-.12) relative to inexperienced participants (β=-.26) provides a small indication of this weakening effect. Rejection of RE-voting at national elections is marginally weaker amongst the experienced using the interaction effect. However, neither of these effects are significant at $\alpha = 0.05$ due to their extremely large standard errors.

Considering alternative explanations, it is possible that this weakening effect is linked to apriori levels of political interest. Participants with an interest in politics are likely to be drawn to participating in elections and therefore to be more likely to have RE-voting experience. However, the relationship between this potential confounding variable and the DV was not evidenced by testing; Pearson regression tests showed no monotonic relationship between political interest as an interaction term on belief in voting cost and support for RE-voting; strength of belief in voting cost is unlikely to meaningfully related to level of political interest.

This weakening effect can be explained by the direct-experience literature. Direct experience of RE-voting may create a cognitive-dissonance between normative beliefs about voting and the positive experience of the technology (Festinger, 1957). The resolution of this dissonance is expected to favour direct-experience over any vague or weakly-held beliefs (Festinger, 1957; Festinger and Carlsmith, 1959; Bem, 1972; Greenwald and Ronis, 1979). In this study, the normative beliefs about voting which emerged from PCA testing were belief in voting cost and belief in voting uniformity. These are the beliefs which direct-experience of RE-voting was expected to challenge.

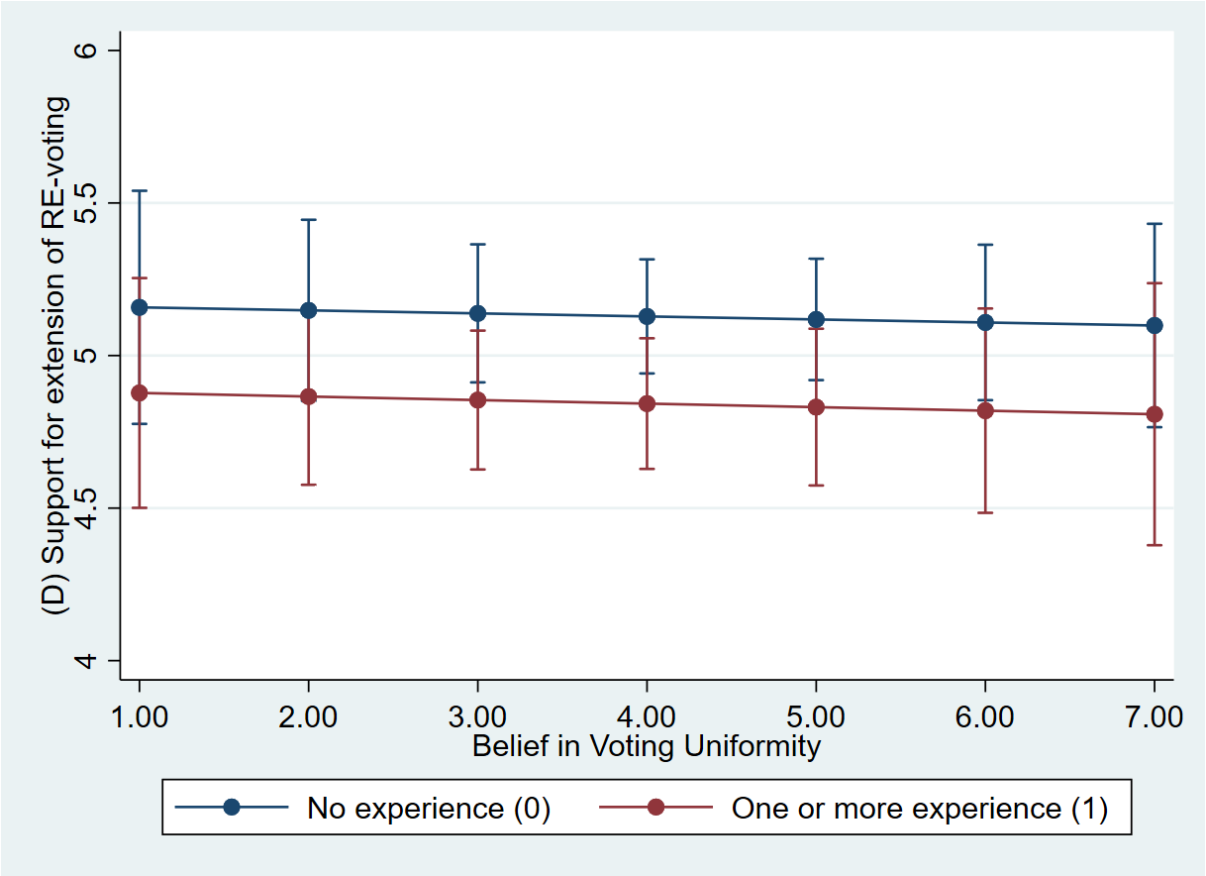
It was also anticipated that individuals with higher levels of interest in politics would be more likely to hold strong beliefs about the cost of voting, acting as ‘gatekeepers’ to political

engagement. This expectation was not confirmed. ANOVA testing of groups by voting cost beliefs and political interest showed no significant differences in level of beliefs between any of the political interest groups (p>f=.78).

Unlike belief in voting cost, belief in voting uniformity*experience level had an extremely weak coefficient size relative to the standard error, resulting in low t-ratio and non-significance at α=0.05 (β=.00, P > z = .84). Despite significant differences between score distributions according to experience level, greater uniformity scores amongst the 0 experience group did not have any correlation to weaker support for RE-voting. Conversely, lower-levels of belief in voting uniformity amongst higher experience groups had no influence on the DV either. The established correlation between experience level and belief in voting uniformity has no relationship to support for RE-voting in national elections.

This absence of a relationship between belief in uniformity*experience and the DV was further evidenced by average marginal effects testing. Both experience groups had similar coefficient gradients and a small distance of 0.05 between intercepts. The higher intercept of experience group 0 (5.15) relative to experience group 1 (4.87) conforms with the t-test and spearman matrix results which indicated that inexperienced participants had stronger beliefs about voting uniformity. See figure 6.4 for a representation of the average marginal effects model.

Figure 6.4, Average marginal effect of Belief in Voting Uniformity with experience interaction effect

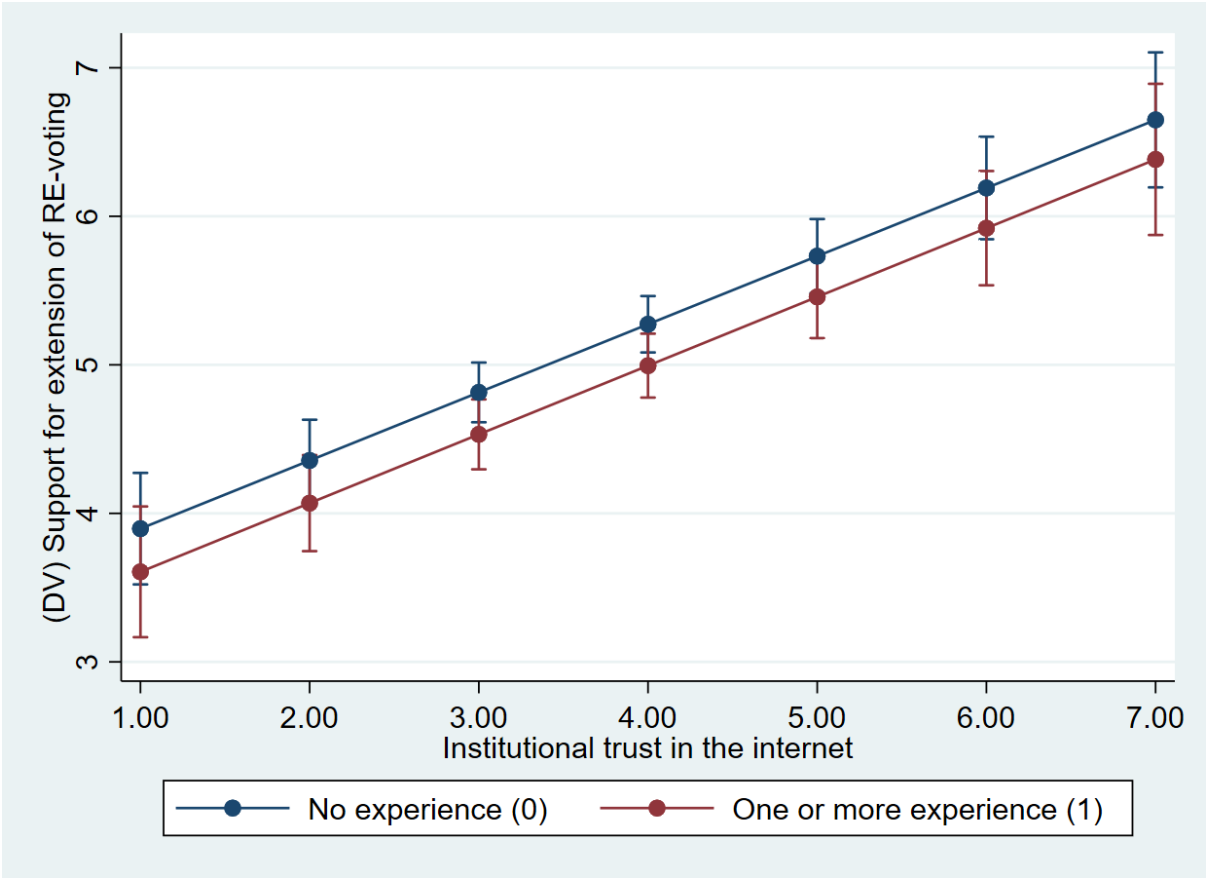


5.3 Experience and Institutional Trust in the Internet

Experience level was expected to have a positive interaction with institutional trust in the internet and support for RE-voting extension; individuals with high levels of RE-voting experience were expected to have greater levels of trust and this was expected to be linked to greater support for RE-voting extension (H1.2). Welch's t-test results indicated there was no significant difference between experience groups, weakening the expectation of a link. Using experience as a moderator variable, the multiple regression results did not support this expectation either. The internet trust*experience interaction term was not significant at α=0.05 due to an extremely weak coefficient size (β=.004) relative to the standard error (SE=.09). Due to this result, the null for experience hypothesis 1.2 could not be rejected. The model's regression table is located in appendix 6.1.

Further confirming this extremely weak effect, average marginal effects testing reported no difference between the group coefficient gradients. See figure 6.5 for a representation of these relationships. The gradients of two groups were almost identical at β=.557 and β=.558. The intercept for experience group 0 was .2 points larger than experience group 1, indicating an extremely small and consistent difference between groups. The near identical gradients and small intercept difference also corroborates the t-test results, which reported no significant differences between groups.

Figure 6.5, Average marginal effect of Trust in the Internet with experience interaction effect



The lack of difference between experience groups was not anticipated by the theoretical framework. The strong similarity between groups is likely due to the high level of familiarity with the online world amongst the 18-24 cohort.

5.4 Alternative moderator variables

To test the robustness of breadth of experience as a moderator variable, frequency of SU election participation was tested alongside it. This categorical variable measured the number of SU elections participated in, with a range of 0 to 6. The upper frequencies of this range were collapsed to increase the sample size relative to the degrees of freedom for the high experience categories, and to mirror the categorical structure of breadth of experience. The adjusted variable had a range of 0-3, with frequencies greater than 3 collapsed into 3 (n10). It was anticipated that these moderator variables would closely correlate, and this was the case for the majority of variables. The close alignment of breadth of experience and frequency of SU election experience demonstrates that there is a strong overlap between breadth of experience in different elections and depth of experience with SU elections. This overlap was further confirmed using one-way ANOVA which reported a significant difference between breadth of experience groups according to the number of SU elections participated in ($p > f = .01$). Unsurprisingly, this was a positive relationship; as breadth of experience increased by group, so too did the average number of SU elections participated in.

When tested with frequency of SU elections as an interaction variable, relationships between the survey constructs and support for RE-voting extension were similar in magnitude and range but had a greater monotonicity than when interacted with breadth of experience. This

monotonicity effect applied to aversion to voting cost and trust in the internet. When tested using breadth of experience, experience group 2's coefficient size exceeded experience group 1's for both of these constructs. This size difference disappeared in the SU election frequency condition, creating a monotonic pattern between the four experience levels. The monotonicity of belief in voting cost was not affected, with only marginal differences between interaction conditions.

6. Conclusion

This chapter addresses the main empirical question of this thesis, whether experience of RE-voting has an effect on support for RE-voting in national elections. Increasing usage of RE-voting in non-governmental elections has arguably normalised the technology, but does this experience have an effect on support for RE-voting in national elections where risks are greater? In other words, does experience of RE-voting act as a positive heuristic for its acceptability in national elections? In this instance, there is little compelling evidence for the proposed effect of RE-voting experience.

The H1 expectation that experience would have a significant influence on support for RE-voting in national elections was not met, and the theories which explain the relationship between experience and attitude could not account for the differences between experience groups. The closest indication of an experience effect was found in the belief constructs which correlated with support for or neutrality towards RE-voting: Perceived usefulness and belief in voting uniformity. Perceived usefulness scores were stronger according to experience level, while belief in voting uniformity scores were weaker. Aversion to voting cost also increased according to experience level, but this construct has no significant correlation to support for RE-voting at the national level.

The integrity cluster construct 'Institutional trust in the internet' did not vary by level of experience, indicating that the construct is likely already well formed prior to experience. It was expected that experienced RE-voters would have higher levels of institutional trust in the internet because of the positive feedback from successfully avoiding risks when voting in low-salience elections. In light of the interview results in the next chapter, the possibility that higher levels of institutional trust develop after SU RE-voting is possible, but this is not a prerequisite for voting since the user encounters few risks when deciding to vote in small-scale elections; as acknowledged by the majority of interview respondents in the chapter seven, the outcome of an SU election has extremely limited consequences, unlike a national election.

From the t-test results, participants with direct experience were more likely to view RE-voting as a personally useful and convenient technology, but this did not extend to greater support for RE-voting in the context of national elections. This finding undermines this study's expectation of an 'attitude accessibility' effect where a positive experience of RE-voting would result in a positive attitude towards its use in a national, higher risk context (Fazio et al, 1982; Fazio, Powell and Herr, 1983; Sherman and Fazio, 1983; Fazio et al, 1986). There is no evidence that participants used their experience of RE-voting in small-scale elections as a heuristic guide for evaluating RE-voting in national elections.

The absence of an effect also conflicts with 'sub-cognitive' explanations of the role of direct-experience. The 'mere exposure effect', where individuals respond favourably to repeated exposures of stimuli, does not appear to have been transferable outside the context of small-scale elections, and nor does the behaviour-attitude consistency of self-perception theory (Zajonc, 1968,2001; Bem, 1967, 1972). Participants were not more favourably disposed towards RE-voting in national elections simply by virtue of their experience level.

The failure of attitudes towards RE-voting in one context to transfer to another context may simply be explained by the difference in risk; RE-voting in national elections is considered as a completely different context to the often low-salience elections which participants had experience of. Holding a positive view of the technology itself did not mitigate concerns over the possible risks of RE-voting such as internal/external interference with the election count. Assessing the risks of RE-voting in national elections may be too great a leap of imagination from experience of RE-voting in a different context.

The interaction regression models demonstrated that experience does not play a significant role as a moderator variable as predicted by H1 and subsidiary hypotheses H1.1.,H1.2 and H1.3. Each cross-product variable was non-significant when included in fully-specified regression. In each case the cross-product variable's standard-errors increased dramatically once the original non-interacted variable was included in the model, indicating collinearity due to the small to null interaction effect. However, the average marginal effects estimation provides two small indications that level of experience has an effect on the relationship between the survey constructs and support for the extension of RE-voting; greater experience has a small effect on perception of usefulness while also weakening the effect of belief in voting cost.

Identifying experience level as the driving force of these relationships is a significant challenge. Possible collinear variables were included in the survey: level of political interest, belief in voting duty, and civic voluntarism. The lack of strong correlation between experience level and these control variables, combined with an absence of effect on the survey constructs, add weight to the argument that RE-voting experience is acting independently. Despite this, there may be unidentified confounding variables acting upon RE-voting experience.

A change in research design may benefit future studies. Due to the need to ensure a large sample and avoid participant attrition, this methodology relied on a between-individual survey which could be administered over a single period. The expediency of this single period did not permit a within-individual approach, which would have required that participants complete a pre-RE-voting survey followed by a post-RE-voting survey. Using this approach, any changes in beliefs between conditions could be identified, and an argument for the causal influence of experience could be made. With a greater sample size and a within-individual approach, the moderating effect of direct experience in the context of elections may be made clearer.

Chapter 7, “So why not vote?” First-Hand Experiences of Online Voting in Small Scale, Low-Risk Elections

1. Introduction

If RE-voting experience has an influence on the perceived usefulness of the technology, and a weakening effect on anti-convenience beliefs, how are these items understood by participants? The subliminal effects of direct-experience are not accessible to either the participant or the researcher through overt questions, but participant’s experience of RE-voting and salient beliefs are more accessible through interview responses than the limited frame of a survey. Follow-up interviews are frequently used alongside surveys for this reason (Gorard, 2003:115; Harris and Brown, 2010:2-4).

The broad purpose of the interviews was to expand upon the concepts established by the survey and test the ecological validity of the survey. This purpose can be broken into three objectives: to explore how RE-voting is experienced in low-salience elections and how these experiences may affect support for the technology at a national level; to test whether the correlations found in the survey data are reflected at the micro-level of the interview sample; and to expand upon the personal meaning of the survey belief constructs relating to usefulness, the cost, publicness and uniformity of voting, and trust in institutions and technology.

34 individual interviews were conducted between May 2021 and July 2021. Participants were drawn from the pool of survey respondents (n445) by email invitation and offered a reimbursement of £10 worth of vouchers for their time. A set of 18 questions encompassing 4 topics were posed to and interview participants, but time was permitted for individual follow-up questions and tangential conversations. This approach maintained a degree of uniformity

for cross-comparison, but allowed for spontaneous expansions of range and depth. Interview durations were relatively uniform and the majority were just below the planned time of 45 minutes; interviews lasted for an average of 43 minutes, with a standard deviation of 11 minutes and a median time of 41 minutes; the longest interview duration was 74 minutes and the shortest was 28 minutes.

Interviews were broken into three thematic sections: RE-voting experience and motivation, the cost, uniformity and publicness of the voting experience, and trust in institutions and technology. A summary of the findings of each of these sections are included below.

Support for online voting in general elections (DV) was contextualised during the first section of the interview and was partially linked with aversion to offline voting in SU elections. Next to this, the motivating power of reduced voting costs was a significant explanation for participation. By reducing the direct and information costs of participation, RE-voting facilitated a spontaneous 'why not vote?' attitude which bypassed some participants' lack of interest in SU politics. For many politically engaged participants, their interest in national and local politics did not extend to the hyper-local politics of the SU. These patterns contextualise the survey experience items and provide a key for understanding how RE-voting encourages participation in low-payoff, low-risk elections.

Aversion to voting cost in low salience elections, otherwise referred to as perceived cost, was reinforced as an important concept by the interview results; participants who would not vote in an offline student union election were more likely to view online voting positively and support the use of online voting in general elections. This relationship supports the link between aversion to voting cost and support for online voting proposed in the theoretical framework.

Beliefs about the cost, uniformity and publicness of voting, also referred to as the virtue of voting cluster, were discussed in the second interview section. These items were only partially linked with opposition to RE-voting in national elections amongst the cohort. A weak link was observed between beliefs about voting cost and opposition to RE-voting; belief in cost/effort was held alongside conflicting beliefs, as participants who held these beliefs also supported policies to remove barriers to voting, such as automatic voter registration. These participants were not in favour of making voting harder, but they were concerned about the consequences of making the voting process too streamlined, a possible consequence of which could be 'thoughtless' voting or voting without intention. This specific consequence was significant as 15/34 participants raised fears about 'thoughtless' or 'uninformed' voting.

With regard to the other 'virtue of voting' variables, a similarity between support for public voting and belief in voting cost emerged during analysis. The inverse of this relationship was also congruent, with voting cost sceptics expressing opposition to public voting in their responses. However, not all virtue items were so clearly related; positive views towards physical presence during voting, otherwise referred to as 'embodied presence' by Coleman (2013), were not clearly related to belief in voting cost. Personal attachment to in-person voting was also not a reliable indicator of support for RE-voting. Instead, participants who valued in-person voting were more likely to be supportive of RE-voting in national elections. There was no evidence of a 'gate-keeping' attitude to in-person voting amongst these participants.

The third interview section indicated that participants who expressed trusting beliefs were also more likely to support RE-voting in national elections; both trust in the government and positive beliefs about technology were strongly linked to support for RE-voting in national

elections. This finding reflects Fisher and Savani's positive correlations between willingness to vote online, feelings of political 'belonging' and confidence in publicly administered elections (2022:15-17). Beliefs about the inevitably of technological progress and the expansion of online services were also closely linked with support for RE-voting. As demonstrated by the experience analysis, beliefs about the internet and technology in general are likely to be independent of RE-voting experience level; the cohort already has been socialised with the online world, and their scepticism or support for it is likely well to be well formed - beliefs which will inform their attitude to voting being moved online. These findings support the existing evidence in the technology adoption literature, as well as the expectations of the theoretical framework. Participants' anxieties about the internet and its effect on democracy were also explored in this section of the analysis.

1.1 Characteristics of participants

Representing 7% of the 445 survey participants, the interview participants were closer to the national parameters in terms of gender and declaration of disability, but deviated significantly in terms of ethnicity, university type and subject choice. Table 7.1 compares the characteristics of the interview sample (n34) against the characteristics of the survey sample (n445) and the target population of HE students (n1,622,100).

Table 7.1, Sample characteristics

	Characteristic	Interview Sample % (n34)	Survey Sample % (n445)	Target Population % (HESA 2017-18 Data) (n1622100)
Gender	**Male**	41.2	29.9	43

	Female	58.8	67.2	56.9
	Other	0	0.6	0.1
	Prefer not to say/No response	0	2.2	N/A
Age Groups	**18-20**	69.4	64.3	59.6
	21-24	30.6	35.7	40.3
Ethnicity	**White British or other White ethnicity**	88.2	76.6	75.2
	Non-White ethnicity	11.8	20.3	24.8
	Prefer not to say/No response	0	3.1	N/A
Disability	**Known disability**	5.9	9.2	12.9
	No known disability	88.2	86.5	87.1
	Prefer not to say/No response	5.9	4.3	N/A
Subject Category	**Humanities**	29.4	25.4	23
	Social Science	35.3	44.7	28
	Natural Science & STEM	35.3	28.9	47
	Prefer not to say/No response	0	1.3	N/A
Institution Type	**Ancient/Red-Brick Universities**	67.6	60	20
	Plate-Glass Universities	26.5	25.2	26
	Post 1992 universities	5.9	14.8	54

The interview participants had a significant amount of voting experience, both in online elections (91%) and national elections (94%). This level of experience is much greater than the survey participants, 43% of whom had never voted in a student union election or any other online election. Interview respondents were proportionally more supportive of encouraging

voting and of removing barriers to voting than the survey participants (94% in favour). These indicators highlight a selection bias in the interview sample; students with experience of voting and an interest in politics were far more likely to respond to the interview invitation than those with no experience of voting and little interest in politics. This happened despite nearly half of survey respondents having no experience of online voting, and despite the use of a financial incentive to broaden the appeal of the topic. See Appendix 7.2 for anonymised summary data of the 34 interviews.

2. Analysis and discussion of results

2.1 Coding of questions and quantitative analysis

The interview transcripts were coded using a mixed methods approach; a combination of nested thematic codes and magnitude codes were used to identify recurring themes in the 25 hours of interview data and to allow for quantitative analysis of these themes (Saldaña, 2016). Magnitude coding was used to create summary statistics and for cluster analysis of responses. Cluster analysis methods cluster responses according to their similarity/dissimilarity, complementing the deeper unquantifiable aspects of the interview (Agresti, 2013; Saldaña, 2016; Morse in Gubrium et al, 2016).

For cluster analysis, Jaccard's coefficient of similarity, or Jaccard similarity of sets, was used to compare pairs of codes. The coefficient originates from the botanical sciences where it was used to compare the volume of plants in a locality against the type of locality, with an end to finding common characteristics between localities (Jaccard, 1912:39-41). It is frequently used for the analysis of textual data in computer science, otherwise known as data mining (Leskovec, Rajaraman and Ullman, 2014). The coefficient measures the amount of intersection between two sets, described as similarity, or 'overlap'.

This method is appropriate for this analysis because the coefficient's computational simplicity suits the binary coding applied to responses (0/1). The method compares the intersections and union of between pairs of categorical responses, treating the categories as binary data (0/1) and does not require normally distributed data for computation (Agresti, 2013:577). More powerful parametric measures of similarity such as the Pearson coefficient were passed over because the response codes are necessarily categorical and the dataset is not suited to transformation to continuous data.

The coefficient for a pair of sets is calculated by dividing the intersection of two sets by the union of two sets, generating a coefficient between 0 and 1 (Jaccard, 1912). 1 indicates complete intersection of the two sets and 0 indicates no intersection. For quick interpretation, the Jaccard coefficient will be represented as a percentage in this chapter. The equation is expressed below.

$$\boldsymbol{J(A,B)} = |\boldsymbol{A} \cap \boldsymbol{B}| \,/\, |\boldsymbol{A} \cup \boldsymbol{B}|$$

A total of 18 questions were posed to the 34 participants, generating 25 hours of interview recordings. These recordings were transcribed and the transcripts were then coded into response categories using the NVIVO software package. NVIVO was used as it permits the creation of linked coding 'nodes' which allows branching categories or 'sub-codes' to be linked back to a master code. See appendix 7.1 for a complete list of the 18 core questions and their associated codes.

Questions were coded using a combination of predetermined master codes, emergent master codes, and emergent sub codes. Question titles were used to create 18 predetermined master codes, below which different categories of response were coded into 67 emergent sub-codes.

See table 7.2 below for a summary of these predetermined codes. Any responses which did not fit within the scope of the predetermined master codes were coded as emergent master codes. 13 of these codes were generated from the responses, with 19 emergent sub-codes. See table 7.3 for a summary of these emergent codes.

Table 7.2, Predetermined question sections and coding themes

Question Theme	Code #	Predetermined Code Title	Sub codes level 1	Sub codes level 2	No of cases	No of References
Experience & Motivation	1	Experience, Online voting	3	0	34	44
	2	Motivations for voting in online elections	3	11	34	45
	3	Experience, Voting Higher Elections	3	0	34	61
	4	Motivations for voting in higher elections	1	0	34	42
	5	Counterfactual Q, Would you still vote offline	3	3	34	34
Attitudes to Participation	6	Perception of voting effort	4	0	34	54
	7	Compulsory voting	3	0	34	65
	8	Voting and Duty	4	0	34	64
	9	Views on voter turnout	4	0	34	44
	10	Attitudes to online voting	3	10	34	87
	11	Ease of voting	4	0	34	48
Attitudes to Voting Cost and Public Voting	12	Minimum effort and voting	4	0	34	69
	13	Embodied presence	4	0	34	62
	14	Public and Private voting	3	0	34	52
Trust in institutions and technology	15	Political advantage and online voting	4	0	34	53
	16	Trust in the Government	3	0	34	53
	17	General attitude to technology	3	10	34	45
	18	Future of online voting	3	0	34	42

Table 7.3, Emergent question sections and coding themes

Question Theme	Code #	Emergent Code Title	Sub codes branch 1	Sub codes branch 2	No of cases	No of References
N/A	19	Concerns, online voting	10	0	34	41
	20	Tradition and voting	3	0	17	20
	21	Event of voting	1	0	17	32
	22	Fear of uninformed voting	0	0	15	17
	23	Importance of voting, explanations	0	0	16	19
	24	Trust in internet	3	0	8	14
	25	Instrumental or intrinsic value of voting	2	0	5	9
	26	Fear of foreign actors	0	0	4	5
	27	Trust in voting technology	3	0	4	9
	28	Early experiences with tech	0	0	2	4
	29	Memory & significance of voting	0	0	1	1
	30	Intentional voting	0	0	1	2

2.2 Experience, motivation and convenience

The first third of the interview concerned participants' experience with RE-voting, their motivations for participating in online elections, and the convenience of those elections. Five patterns emerged from this section: (1) the importance of reduced direct costs and

information costs for voter motivation; (2) the relative unimportance of both interest in SU politics and instrumental payoffs as a motivator for participation; (3) RE-voting as a facilitator of spontaneous-'why not vote?' -participation and other unknown voting payoffs; (4) the partial link between aversion to offline voting in SU elections and support for RE-voting in national elections; (5) Interest in national and local politics does not extend to interest in the hyper-local politics of the SU. These patterns contextualise the survey experience items and provide a key for understanding how RE-voting encourages participation in low-payoff, low-risk elections.

Taken as a group, the interview participants had a large amount of voting experience, both in online elections and national elections. 33 out of 34 respondents had experience of voting in some form of online election, the majority of which were within their university. 28 participants had experience of voting online in student union elections, and 12 participants had experience of online elections beyond the student union. These elections included national party primaries (3), voluntary and sports organisations (4), university societies (4), and school prefect elections (1). The two participants with no experience of any online elections chose not to participate in student union elections due to a sense of disconnection from campus life. These participants spent the majority of the 2020-2021 academic year off campus due to the Covid-19 pandemic and did not feel the elections were relevant to them.

Reflecting their high level of RE-voting experience, the interview cohort closely mirrored the experience group analysis results. Their survey scores for perceived usefulness and aversion to voting cost were extremely high; all participants held positive beliefs about the usefulness of RE-voting technology, and 25/34 participants reported a strong to moderate aversion to the costs of voting offline. These responses to the survey scales were vocalised during interviews, extracts of which are included in this section.

The respondents' experience of voting in online elections was positive with no reports of technical problems or poorly designed websites. The only negative comments concerned an overwhelming number of roles and choices in some student union elections (2). Positive aspects of the online voting experience encompassed the convenience of voting remotely, the centralisation of candidate information and manifestos for comparison, and the use of email reminders at election time.

(1) Positive comments all related to the reduction of the direct costs and information costs of voting. The direct costs of voting such as time and physical effort were reduced by the ability to vote remotely online. This combination of reduced direct costs, email reminders and centralised candidate information seemed to bypass the apathy of many participants, encouraging them to vote despite their lack of interest. Ten participants referred to the convenience of voting remotely when asked about their experience of online voting.

> AN3: I find it really easy. And it only took a couple minutes. And yeah, I feel like, if it was in person, it probably wouldn't have gone. Because it was online and so easy, and made me want to do (it).

Seven participants reported that the information costs of voting were eased by the centralisation of candidate manifestos by the RE-voting system. Information costs are defined as the marginal costs of locating candidate information and expressing a preference based on this information (Downs, 1957:218,219). The more time taken to locate relevant information, determine its authenticity and assimilate it, the greater the marginal cost of the exercise. If the marginal costs of information gathering and assimilation outweigh the marginal returns of voting, then the rational individual will not participate (Downs, 1957:219). Five participants

acknowledged that the marginal returns of voting in an SU election were extremely small to non-existent. It seems that any measures to reduce the information costs of voting in such a low-payoff election would be consequential for participation.

> EV1: it was pretty simple. The Student Union one was great. Because when you went to like, obviously, the person's name to click, whether or not you were to place their vote, it had a link to their Manifesto. And it was like a simplified Manifesto, and then you could extend it into a bigger one. So that was great.

Participants expressed satisfaction with how easy it was to access information on the candidates and to compare between candidates before voting. The information gave them the confidence to make a decision in a relatively short space of time. The onus was not on the participants to research the candidates in advance of the election, nor were the participants reliant on the serendipity of being handed a candidate's manifesto on campus. Using their SU's voting webpage, the marginal cost of information gathering was arguably nil. The only marginal cost was that of assimilating the information provided by the webpage. Consequently, students who were unfamiliar with the election campaign were able to make a decision they felt satisfied with in a short space of time.

> PO1: You can see on the website, every candidate's manifesto. And you can order them. You can just vote for one person if you want, but you can sort of order preferences. And I yeah, I just found it's always really well laid out. And people's manifestos tend to be quite comprehensive.

RE-voting's reduction of the direct costs of voting, such as time and physical effort, were referenced by nine participants. Blais et al define the direct costs of voting as 'costs associated

with the act of voting' which are not information related (2019:146). This definition acknowledges Down's description of time as the principal cost of voting, while keeping the category broad enough to include other direct costs such as physical exertion or money (1958:265). Direct costs are low for SU elections, whether they are held online or offline; in the case of offline SU elections pre-2010, most students attended their university campus on a weekly basis, putting them in close proximity to the student union polling station. In the post 2010 'online era', the direct costs of SU elections are even lower, requiring only an internet connection and access to an internet enabled device to vote remotely. All participating students had access to these resources, whether they were their personal property or the property of the university. This low barrier to entry was significant enough for a fifth of the interview participants to comment on.

> SU1: 'Because I'm new to this university. It's my first day, I didn't really know a lot of people. Well, when the online voting system came, I think it was because they put their descriptions and they could explain them for themselves, like, in a better way. So I think it was like faster and easier'.

> SA2: 'I think for the most part I just voted because it was easy, and I wanted to be able to have a say in the matter'

(2) When asked about their motivation for voting in the SU elections, participants described the RE-voting system as 'convenient', 'straightforward', and 'easy to use'. The direct costs of voting in national elections are acknowledged in the literature as being extremely small, but they are not insignificant, and these costs may be of greater significance in low-salience contests such as SU elections (Niemi, 1976; Blais, 2000). Used in this context, low salience refers to the low level of instrumental and expressive utility gained from participation.

While the experience of voting was positive, participants were less enthusiastic about the prospect of voting in-person for student union elections. When asked whether they would still have voted in an offline SU election, 11 felt they were unlikely to vote in-person, 5 were unsure of whether they would still participate, and 3 had no interest in participating in either form of election. The lack of motivation to participate stemmed largely from a perception that the governance of the student union was not relevant to participants' daily lives, and that it was just too much effort to travel to the campus to vote.

Participants who discussed convenience as their motivation for participating in SU elections were the most likely group to report that they would not vote in offline SU elections. Comparison between response codes using Jaccard's similarity coefficient highlighted an overlap of 35% between answers which referred to convenience as a motivator and reluctance to vote in an offline SU election. Including convenience responses, respondents who didn't discuss governance of the SU accounted for 34% of the reluctance to vote in offline elections. In contrast to this, there was a similarity of 31% between answers which explicitly referred to governance issues and willingness to participate in SU elections offline. These coefficients were the largest reported out of comparison between the two coding sets: willingness to participate in an offline SU election and motivations for voting in online elections. These answers were all given by participants who already had experience of voting in online elections.

> AN3: Uhm, Probably not. It's kind of with the Student Union. And I kind of feel that often not much gets done by the union anyway, and they have a lot of people who are elected. So unless you have a friend that is standing for the position, I don't really feel that inclined to - so I wouldn't have gone if it was in person.

The direct costs of voting were frequently referenced during the discussion of the counterfactual voting question, rather than information/decision costs (Blais, 2019:147,151). Distance from the university campus also played a large part in whether participants felt they would vote in an offline election. Proximity to the student union, as well as campus routines played a large part in some participants' estimation of whether they would still vote. The Covid-19 pandemic was referenced multiple times as a reason to stay away from campus, and therefore to not vote offline.

> HA1: I think it depends about whether people are on campus or not. So, if it was this year, I probably wouldn't have voted, because I haven't gone to campus for a 14 minute journey.

When discussing their motivations for voting, 15 participants either omitted SU activities from their answers or stated that SU was not relevant to them. For 9 of these participants, the decision to vote in their student union elections was characterised by a passive attitude, or a 'why not' attitude of resignation, rather than a genuine interest in the election. These attitudes were further highlighted by the absence of local governance issues in their answers. They considered themselves unlikely to vote in these elections if they were held offline, but RE-voting made the decision relatively costless.

> AL1: I felt that it's very straightforward online, if it was sort of like, in person voting for student elections, I would maybe be less likely to go. So when I can just sit and do it on my computer, you know, I just sort of feel like, well, I might as well just do it.

(3) Viewed through the lens of rational choice theory, the instrumental payoff for voting for these participants was non-existent and the expressive payoffs were scant (Fiorina, 1976: 393);

participants acknowledged that they would not benefit or be affected by the outcome of the election, nor did they have any personal connection to the candidates. Expressive utility payoffs were also thin. Participants who adopted a ‘why not’ attitude to voting did not indicate any expressive satisfaction such as performing a duty, being part of a community, or supporting the SU as an institution (Riker and Ordeshook, 1968:36). Their voting experience was characterised by disinterest in the candidates and the SU, but they still voted because it was extremely easy to do so. Fitting neither the instrumental nor expressive payoff categories, this behaviour is labelled here as an unknown payoff.

The combination of online voting with frequent email reminders was also referenced multiple times as a reason for participating, despite a lack of interest in the outcome of the election. Emails from the student union and reminder posts on Instagram were cited as triggers for online voting, with voting taking place shortly after receiving the reminder.

> OL1: A few people who are running for different offices or whatever, were like, 'hey, vote for me'. Like in person. And so, I think, yeah. I'm not really sure if that is a motivation, but basically, because they kept sending me emails and because people kept asking me.

> PA1: I think it is a lot about how much they would have advertised it, because I usually don't look in my calendar and see - Oh, yes, I still have to vote in these elections. It's more like, I get an email here, please do vote for us now, do it, it doesn't take long.

The remaining 16 participants reported that they would still vote offline, in the absence of an online voting system. With a 47% similarity coefficient, respondents who referenced issues of democracy and local governance when discussing voting motivation were the category most

likely to also report a willingness to participate in offline elections. It should be noted that two of the 16 participants who referenced local governance issues were candidates themselves and so had an instrumental interest in the SU elections. The similarity between interest in local governance and self-reported willingness to vote offline supports the well-established link between the expressive payoffs of voting, such as fulfilling a sense of duty, and the increased likelihood of voting (Riker and Ordeshook, 1968:36).

(4) Support or scepticism towards online voting in general elections was loosely linked to responses to the counterfactual question of whether a participant would still vote in an offline SU election. However, there was no difference in similarity coefficients between respondents who stated they would still vote in offline SU elections; both support for and scepticism of online voting response codes had identical similarity index scores of 30%, indicating no real difference between these groups.

The greatest difference between similarity scores was amongst the participants who stated they would not vote in offline SU elections. The group with the largest similarity coefficient in this comparison were supportive of online voting (30%). This was followed by participants who were sceptical of online voting (15%), and finally by participants who were ambivalent to online voting (7%). These coded answers provide partial confirmation of the aversion to voting cost survey results. The survey data showed a strong positive relationship between aversion to voting cost in offline elections and positive perceptions of online voting (β =.3; p>0.00). In the interviews, sensitivity to the costs of voting in SU elections was expressed as disinterest in SU politics. The SU's online voting platform, combined with email reminders, nudged these participants into voting since it eliminated these costs. As discussed earlier, only three participants did not vote in their online SU elections despite the ease of voting and use of

email reminders. Two of these participants expressed an interest in national politics, but reported having no interest at all in SU politics and so abstained from the elections.

Individuals who are sensitive to the costs of voting in low salience contests, such as SU elections, are more likely to hold positive beliefs about online voting, and are more likely to support the use of online voting in general elections. Blais' found that the perceived 'direct costs' of voting, such as time and effort, acted as a significant deterrent for a minority of voters (2019:151). The findings of the survey and interviews show that aversion to voting cost is also a minority attitude, but is an effective predictor of support for RE-voting, a voting medium which reduces Blais' direct costs of voting. Any technology which reduces the perceived direct costs of voting may encourage greater participation at the polls.

These offline-positive participants were more supportive of being physically present for voting in national elections (41%) when compared against participants who reported they would not vote offline (31%). Beliefs about voting as a duty were also much greater among offline SU voters (51%) than among online only SU voters (23%). Offline voters were also marginally more likely than online voters to oppose any kind of minimum effort requirement or cost for voting, with respective similarity scores of 28% against and 23% against.

Despite these differences, there were few other significant differences between 'online' and 'offline' respondents in terms of the attitudinal components. The absence of any significant pattern highlights the gap in perception between the different levels of election; the perceived salience of SU online elections and similar small-scale online elections is very different to the perception of national elections.

All participants who expressed ambivalence or disinterest towards SU online elections were also interested in national politics and elections. They did not view their lack of interest in online SU elections as incongruous with their interest in national politics. One participant who was highly engaged with a national political party explained why he did not participate in SU elections, despite being highly involved in local politics:

> JA1: I think motivation is important, but like, I think it's got to have some sort of effect on you as well, like politics and student unions are two very different things. Because a student union isn't politics. Politics is politics, student unions are just about, I see student unions as just a thing, which sort of they set up events and stuff like that, but I'm not really part of the events in universities.

(5) Within the interview sample, disinterest in student democracy and SU governance did not equate to lower participation in national elections either. Participants who omitted topics of local governance when discussing their motivations for voting in online elections were only marginally less likely to have voted in national elections than participants who spoke about local governance, with respective Jaccard similarity coefficients of 37% and 42%. The small gap between scores highlights the ambivalence which otherwise politically engaged participants feel towards the governance of their student unions. Of the 17 participants who did not refer to topics of local governance when discussing online elections, five explicitly discussed their detachment and ambivalence towards the student union. These participants perceived the student union as lacking in power and believed the union to be irrelevant to their university experience.

One politically engaged respondent described how he participated in SU online elections anyway despite this low motivation, citing the speed of online voting as a reason. This

response was not unusual, with nine other participants referring to convenience or speed when discussing their motivation for voting in SU elections.

> ST1: I've never seen the student president. I don't really know what they actually get up to once they're elected. I've no idea how important that actually is. It's just one of them where it literally takes like 30 seconds, so let's do it.

Following this theme of convenience as a motivator, some offline-affirmative participants admitted that their motivation to vote would depend on how close they lived to the student union, as well as whether they knew any of the candidates running.

> CA1: Um, I would say yes, but there would have been a lot more grumbling about it ... I think that was the - I think that's basically the primary reason why I would still have (voted) if it was in person. I think if it was unknown candidates, my motivation would have been a lot less.

In summary, these patterns provide a key for understanding how RE-voting facilitates participation in low-salience, low-payoff, low-risk elections. A slim majority of SU voters (16/28) described an expressive or instrumental investment in the SU elections which explained their voting behaviour, independent of the reduced costs of voting. However, a quarter of SU voters (7/28) acknowledged the lack of instrumental/expressive payoffs, but voted anyway. They cited the extremely low information costs and direct costs as the facilitator of this. These explanations provide an indication of the significant power of RE-voting to bypass the apathy of voters and encourage participation, regardless of whether the participant has a payoff for participation. A significant weakness of this section is the small number of explanations for non-participation in SU elections.

A limitation of this section is the lack of input from non-SU voters. Only 2/34 participants had no experience of SU elections, relative to the 308/445 survey participants without SU voting experience. The input of participants who were resistant to the reduced costs of RE-voting would provide a counterweight to the views of participants who voted despite their lack of interest. Recruitment of participants without SU experience was challenging, despite the inclusion of a financial reimbursement in the interview invitations

2.3 Cost, location and publicness of voting

The second third of the interview concerned beliefs about the required effort/cost, the publicness of voting and the location of voting. Four patterns emerged from this section: (1) A weak link between beliefs about voting cost and opposition to RE-voting in national elections amongst participants with RE-voting experience; (2) conflicting beliefs about voting/cost effort and inclusive elections were held simultaneously without obvious discomfort; (3) a common anxiety that 'thoughtless' or 'uninformed' voting could be facilitated by technology; (4) personal attachment to in-person voting is not linked to scepticism of RE-voting, instead it is associated with support for RE-voting; (5) evidence of a partial link between voting cost and the publicness of voting.

Belief in voting cost emerged from the survey as a significant indicator of support or opposition to online voting, though this was not affected by level of RE-voting experience. The interviews were designed to elaborate upon the tensions between beliefs about the virtues of traditional voting and the desire to make voting more inclusive. Beliefs about the importance of voting cost, uniformity and publicness were often held alongside beliefs about the importance of inclusivity. The majority of participants did not acknowledge the apparent tension between these beliefs, and were relaxed when discussing both items.

Participants' attitudes towards the cost of voting closely followed the survey results, with 21 (61%) participants opposed to the idea of voting requiring a minimum amount of effort, 5 (14%) expressing ambivalence and 8 (23%) participants expressing support. 34 responses were coded into the categories of opposition to minimum effort, ambivalence to minimum effort, and support for minimum effort. There was a parallel coding category for respondents who also expressed views about the requirement of a minimum effort for researching candidates before voting, which 8 (23%) of participants supported.

(1) The negative survey relationship between beliefs about voting cost and support for RE-voting in national elections was only weakly represented in the interview responses. When analysed using the Jaccard index, strong similarities emerged between opposition to voting having a minimum cost and support for online voting (53%). Similarities in the inverse were also found, but the index scores were weaker; participants who supported the ideal of a minimum cost for the act of voting had a 25% similarity to scepticism of online voting responses. Participants who supported the ideal of research before voting as a minimum cost for participation also had a 25% similarity to scepticism responses.

The low-level of opposition to RE-voting in national elections supports the expectation that direct experience of RE-voting weakens the link between virtue of voting beliefs, such as voting cost, and opposition to RE-voting. However, this analysis only shows half of the possible pattern; since only 1/34 of the interview participants were inexperienced with RE-voting, there was no opportunity to compare voting cost beliefs to support for RE-voting in national elections amongst inexperienced participants. It is also important to note that parametric analysis of experience levels did not detect any difference between belief in voting cost

according to experience group. Belief in the uniformity of voting was the only related construct which increased in strength according to lack of experience.

For the 22 participants who rejected the requirement of a minimum amount of effort for voting, a common theme was concern about raising barriers to voting and therefore making voting more difficult. These respondents shared an egalitarian view of voting, referring to ‘encouraging voting’ and ‘improving accessibility’ in their answers.

> LA1: Got to encourage people, would be bad to be turning people off, and you're more likely to lose people, as you say, on a rainy Thursday, and might not be as good to, say, for the overall population. And it is a bit unfair in some situations, like, I might be able to walk out and vote on Thursday, but some people might not be due to other commitments, or maybe disabilities, things like that.

Some participants admitted they enjoyed putting in a small amount of effort to vote by walking to the polling station, but that they would not expect that from other people. For them, polling day was a personal ritual which they were not prepared to generalise.

> LU1: Probably not, I'd quite enjoy it. Because I think for lots of people, it's a moment of calm, and you can really think about how beautiful it is that we can vote and all the struggle that went into it. And that's important. But for lots of people walking over 10 minutes is a barrier to being able to vote, and that's problematic.

For the 8 participants who supported some amount of minimum effort for voting, the explanations for their answers were fragmented. Some participants believed that voting would lose its significance to voters if it were made too easy, while others felt that it would reward

people who were less interested in voting. These responses conflicted with an earlier question on the ease of voting, 'How do you feel about making it easier for people to vote?', which received a positive response from 33 out of 34 participants.

(2) The apparent tension between belief in cost/effort and support for inclusive elections did not cause discomfort to participants. It appears contradictory that 8 participants should support some minimum amount of effort from voters, but an internal logic emerged from the explanations; participants in this grouping were opposed to the idea of making voting more difficult for voters in general, but they were concerned about the consequences of making voting too easy by moving it online. The lack of acknowledgement of the distance between these beliefs suggests they are either compatible beliefs, or that they are conflicting beliefs and participants have managed to successfully rationalise them.

The most frequent RE-voting concern was that voting would lose its significance and meaning if it became a relatively effortless process by moving online. These responses are best characterised as supporting 'intentional voting', as opposed to 'passive voting'. Passive voting used in this context describes taking a reactive role in an election by neglecting to research candidates and relying on reminder prompts to vote. It is not to be confused with passive voting in the context of European human rights law, which defines it as the 'eligibility to be elected' (Venice Commission, 2006:17). These participants expressed concern that relatively effortless online voting would result in voters treating voting like any other mundane task, rather than with the significance they felt it was due.

> SO3: One problem I might see is that people might make less of an effort to inform themselves as it's even easier and easier to just click the button. It feels like a less important decision than actively going in.

A fear of voter passivity emerged from some of the responses. This was characterised by concern that online voters would be nudged along by email reminders, instead of taking an active role in organising their polling experience. Email reminders emerged as an important part of the online voting experience during the discussion of SU voting experiences, with 6 participants referencing email reminders when discussing their decision to vote. These reminders often nudged participants to log into the SU voting system and vote for their candidates, whether they felt motivated by the candidates or not. The combination of a reminder email and a hyperlink to the voting portal prompted these participants to vote.

> EL1: I mean, as I said earlier, when I was talking about voting in student elections, I do feel more engaged with it, when I actually have to put some effort into doing it, rather than it just be another task for me to do on my computer. I think it's a good idea to have kind of, to make sure that people have that, again, that base awareness, and that they're conscious of something they're actively doing, not just ticking off another to-do list.

One participant felt that the increased convenience and speed of RE-voting ought to be counterbalanced by an information or attention check before being able submit an online vote. This was the only instance of a participant supporting a formal requirement for voting.

> ST1: I think maybe if there was anything like that, where you were required to, like, read certain things, before you could submit a ballot. I would maybe be less hostile to it. But the idea of just putting your national insurance number in and tick a box - send it off - is something I would not probably not consider a healthy development

ST1 had experience of online voting in SU elections, was highly engaged with national politics and was an active member of a political party in his home constituency. His suggestion was motivated by a concern that online voting would increase the likelihood of voters participating without relevant information. Voters without this information would be more likely to vote 'incorrectly', which would result in an election result which did not reflect the true preferences of the population. For example, voting for a candidate whose policy platform does not correspond to the voter's private preferences. Although not referenced by ST1, 'correct' voting as a testable concept is described by Redlawsk and Lau in their study of voters' policy preferences and voters' decisions at the polls (1997:686,687). Jeffrey Brennan's description of 'bad voting', where citizens 'vote without sufficient reason for harmful or unjust policies or for candidates that are likely to enact harmful or unjust policies', is also similar in sentiment to ST1's suggestion (2009:537).

(3) These views recall the discussion of voting cost in the literature, particularly Buchstein's argument that 'costless' voting would lessen the significance of voting and make 'junk voting' easier, where individuals vote quickly and without much thought, empowered by an online voting system (2004:55). Anxieties about technologically enhanced voting can be traced back to Barber (1984) and his prediction that technology enabled plebiscites would be the 'death of democracy' due to a combination of poor deliberation and instantaneous voting powers (1984:290). It is important to note that participants who expressed concern about reducing the cost of voting were not in favour of restricting the franchise; the majority of participants' discussions of voting cost were uncritical of voters' faculties, and there was no mention of the potential for Buchstein's 'junk voting' (2004), Redlawsk and Lau's 'correct voting' (1997), or Brennan's 'bad voting' (2009). This absence of an overlap between support for voting cost/effort and opposition to restricting the franchise implies that the two arguments are not related. Individuals who hold strong views about protecting access to the ballot can also hold

negative views about the convenience offered by online voting. Prima facie, these appear to be conflicting arguments, but participants did not acknowledge them as contradictory.

Fears of uninformed voting were raised independent of discussions of voting effort and cost; 17 out of the 34 participants discussed concerns about uninformed voting during the interviews. Anxiety towards uninformed voters is well represented in political theory, having been discussed by Jean Jacques Rousseau, John Stuart Mill and many contemporary scholars. Brennan's discussion of 'bad voting', where citizens vote for a harmful or unjust policy without sufficient reason (2009:536,537).

> FR1: So I think like it, that there will always be kind of more people that could vote, but at the same time, if the people who don't vote - don't want to read up on it, and they don't inform themselves, then I would kind of rather they didn't vote, because if they just kind of, you know, close their eyes and pick one randomly, there's no point then. You need to know what you're voting for.

Despite this high volume of concern, there was no pattern between responses which supported a minimum effort for voting and responses which referenced a fear of uninformed voting. Both participants in favour of and opposed to minimum effort had similar Jaccard coefficients when checked against references to uninformed voting (43%, 39%).

Instead of a fear of uninformed voting, participants who supported a minimum effort ideal for voting often linked the effort they put into the act of voting to a feeling of significance. These sentiments were echoed by a participant who linked effort with consideration of the voting decision:

> HA1: I guess it is good to be actually doing something in order to vote kind of makes it more of a real thing. And, like, more important, so if it's - if you have to go and walk and do something, you might put more effort into thinking about who you want to vote for. Whereas if it's just a quick click of the button or something, (it) might be more easy to kind of brush off as not an important kind of democratic duty if it's just easy, but I think the minimum should be a low minimum.

Following this theme of effort and significance, one participant felt that there was a relationship between the effort of voting and the feeling of investment in the act. The more effort they expended on the act, the greater the personal significance of the act.

> NA1: I think I've heard somewhere that if there's like, some effort put into something you make it - you'll feel more meaningful, meaningful and more significant for them. Yeah, I forgot where I heard, but yeah, I believe in this.

These accounts of personal significance echo the results of Cammaerts, Bart, Bruter et al's RE-voting experiments (2016:76-81); in a mock election, participants who voted in-person reported a greater positive emotional response than participants who voted online (2016:78). 17/34 of the interview participants referred to in-person voting as a personal event which they expressed positive affect towards. The language used to describe the positive aspects of this personal event included "a nice thing to do", "quite exciting", "validated", "felt good", and "sense of community". Two common themes across the seventeen responses were excitement and self-efficacy. The link between in-person voting and feelings of personal significance is likely to influence habit-formation and the possibility of repeat voting (Bruter and Harrison, 2019:5,6).

Descriptions of a sense of community overlapped with descriptions of the personal significance of polling-station voting. Seven out of the thirty four participants invoked a sense of community in their reports. Phrases used to describe this ranged from the importance of witnessing democracy to the simple pleasure of participating in a shared experience: “Everybody is together - together for great focus, purpose”; “I like going and seeing people and like watching democracy happen”; “You see everyone kind of walk into that - it kind of feels like you're part of something and everyone else is doing this”; “it shows you that politics is a very real thing, and it's a very human thing”; “the atmosphere of voting, at least at my polling station - it's a friendly environment. Even if I don't know anyone there”. Although not explicitly stated, these responses invoke the imagery of a group ritual; this is the often referenced ritual of election day, with its bonding and witnessing of the polity (Lukes, 1975; Nimmo, 1985; Monnoyer-Smith, 2006; Coleman, 2013; Orr, 2016). These participants enjoyed the collective elements of in-person voting enough to directly reference them.

4) Cluster analysis revealed a tendency towards RE-voting support amongst participants who acknowledged in-person voting as a personal event. ‘Personal event’ responses had a 50% overlap with support for RE-voting in national elections, while responses which omitted the ‘personal event’ only had a 24% overlap with support. There was also a clear pattern amongst participants who were sceptical of RE-voting; Participants who referenced the personal event of voting had an overlap score of only 11% with scepticism of RE-voting, while participants who omitted this item had a much greater similarity score of 45% to scepticism of RE-voting. The level of openness to RE-voting amongst the ‘personal event’ group appears counter-intuitive; participants who value the experience of in-person voting the most are also the least sceptical of RE-voting technology. The personal value attached to in-person voting is not linked to a rivalrous view of voting modes or a ‘gate-keeping’ attitude to in-person voting. Jaccard results

suggest this is linked to either an interest in democratic inclusion, or an interest in technological innovation.

Cluster analysis of virtue of voting beliefs also identified a divide between participants who acknowledged the personal event of voting, and those who did not. Personal event responses did not overlap strongly with beliefs about the importance of cost/effort for voting, with a similarity score of 13% for support and 46% for scepticism. The group also had an overlap of 33% with support for public voting and a 17% overlap with scepticism of this belief. Cluster analysis revealed stronger patterns for participants who did not have a personal event story about voting; this group had a greater similarity score for support of voting cost/effort (25%) and a lower level of scepticism (31%) compared to the personal event group. These participants also had significantly lower support for public voting (16%) and a much higher level of scepticism of public voting (50%).

These scores indicate a small belief divide between participants; participants who acknowledge voting as a 'personal event' have a marginally more inclusive view of elections while also being supportive of voting from public spaces. This difference tells us that attaching value to the experience of voting is not associated with support for voting cost/effort amongst the cohort. This indication runs counter to the expectations of the theoretical framework, where personal attachment to the voting experience was expected to correlate strongly with beliefs about voting cost.

(5) When compared across interview participants, beliefs about the publicness of voting were linked to beliefs about voting cost/effort. Scepticism of public voting and opposition to minimum effort for voting had a Jaccard similarity of 48%. Indicating that scepticism of the traditions of polling day is linked with support for increasing the convenience of voting. This

link partially supports the expectations of the theoretical framework. However, the inverse of this relationship was weaker with a 35% similarity between support for public voting and support for minimum effort for voting.

The theoretical link between voter suppression attitudes and voting cost attitudes was only weakly supported by this analysis; participants opposed to minimum effort for voting had larger similarity scores for 'concern over low voter turnout' at 39%, while those in favour of minimum effort had similarity scores of 26%. The majority of participants were highly concerned about low voter turnout and felt that higher turnouts would be beneficial for governance in the UK. In this analysis, attitudes towards increasing/suppressing voter participation are not linked to attitudes towards voting cost.

2.4 Trust in institutions and attitude to technology

The last third of the interviews concerned trust in institutions and general beliefs about the internet and technology. Three patterns emerged from this section: (1) Trust in the government was strongly linked with support for RE-voting in national elections; (2) General beliefs about technology mirrored support/ambivalence/scepticism for RE-voting in national elections; (3) Strong beliefs about technological progress and the inevitable expansion of the online world were linked to support for RE-voting technology. Paralleling the survey results, trust in both the government and technology were the strongest indicators of support for RE-voting. Confidence in the integrity of elections and in the integrity of the technology are the most important determinants of support for RE-voting. These beliefs are likely to be unaffected by RE-voting experience, as indicated by the experience level analysis.

Trust in the internet and trust in technology are well established in the literature as key predictors of intention to use online voting (Schaupp and Carter, 2005; Powell, Williams, Bock

et al, 2012; Nemeslaki, Aranyossy and Sasvári, 2016). The survey results further supported this trend, with institutional trust in the internet having the largest significant coefficient in the structural equation model (β =-.37; p>0.00). Analysis of experience levels indicated that trust in the internet was independent of RE-voting experience, with no significant differences between experience groups.

Some discarded survey items were reintroduced for the interviews; due to its weakness as a predictor of intention to use RE-voting, trust in the government items were not included in the survey (Carter and Bélanger, 2005; Powell, Williams, Bock et al, 2012; Nemeslaki, Aranyossy and Sasvári, 2016). However, government trust was reintroduced for the interviews due to the strength of the internet trust survey construct which referenced online legal protections and safeguards. It was anticipated that any discussion of online legal safeguards and protections would lead back to a discussion of the government and of regulation and so government-centric questions would be relevant.

Participants were divided on whether to trust the government, with a slim majority reporting a high level of trust in technology: 18 participants trusted the government to administer any future online voting system, 11 would not trust the government with online voting, while 5 were ambivalent on whether they could trust the government. The most common causes for scepticism or ambivalence about the government administering online voting were concerns about neutrality and concerns about competence.

Institutional trust responses were coded into 3 categories: general trust in the government, trust in the independence of elections and the civil service, and trust in checks on government power. Participants in the first category were generally positive and uncritical of the government but did not qualify their response. Participants who had confidence in the

independence of elections and the civil service were more sceptical of the government to administer, but had sufficient faith in the civil service to organise elections competently and with neutrality. Participants who expressed trust in checks on government power were also mildly sceptical of the government, but believed that the electoral commission and the media act as effective checks on election fraud.

> CA1: Yes, to be honest - as little faith - I don't have a lot of faith in Westminster in general. But there is a relatively high level of political accountability in this country, and a relatively high level of transparency in terms of government practices, obviously, there are things that get swept under the rug and that fly under the radar a little bit. But in general, when it comes to election elections, the level of transparency, the level of accountability and oversight that we have in this country is, in general, pretty good.

(1) Collectively, participants had a large degree of faith in the stability of the UK's political institutions, whether they supported the government or not. They felt that the system was largely self-correcting and could endure the attacks of a corrupt government. These trusting responses significantly overlapped with support for online voting with a similarity score of 48%, indicating amongst the sample that trust in government and political institutions was closely linked to support for online voting.

This result broadly relates to the survey findings, where greater levels of trust in the institutional aspects of the internet, such as legal protections and safeguards, predicted support for online voting in general elections. However, there is a conceptual distinction between trust in the institutions of government and the institutions of the internet; the survey predictors of these concepts have different statistical relationships with support for RE-voting. Nemeslaki, Aranyossy and Sasvári's 2016 study of 608 Hungarian students found that trust in

the internet was a significant predictor of intention to use a RE-voting system, but trust in government was not a significant predictor of this intention. The interview codes provide an indication of linkages between trust in the government and RE-voting, but this is of course limited to the cohort sample of 34. However, Fisher and Savani's 2022 survey (n1817) shows a strong correlation between support for public administration of RE-voting and willingness to vote online; who administers RE-voting appears to be significant for UK citizens (2022:17,18).

Ambivalent and sceptical views of the Government fell into two categories: neutrality concerns and competence concerns. Unlike the trusting group, these groups were characterised by concerns over government overreach and few mentions of institutional or independent checks on government power such as the electoral commission, the judiciary or the media. The ability of the civil service to competently administer a national online election was called into question by one participant.

> ST1: I would definitely say over the last year, my faith in the government to administer large scale, electronic databases, etc, is rock bottom. I think it's generally having a lot of family who work in the public sector and seeing how really poorly the public sector responds to new introductions of things and change, for relatively minor things. I've just got no faith in how well they would cope with this.

There was a similarity of 35% between a low level of trust in the government and institutions and scepticism of online voting. A much smaller relationship was found with participants who were ambivalent towards trusting the government, with a 13% similarity score. Both these results are indicative of a link between low levels of trust in government and institutions and low levels of support for online voting. This similarity has been reported in much larger

datasets; Fisher and Savani's 2022 survey found political outsiders with low-trust in government are more likely to be unwilling to vote online (2022:15).

Despite the differences in magnitude between trust scores (50%) and distrust scores (35%), the similarity patterns support the predictions of the technology adoption literature, as well as expanding on the positive relationship between trust in the institutions of the internet and online voting from the structural equation model (β =.40; p>0.00). Trust in institutions and the government plays a significant role in determining support for online voting in national elections.

(2) The majority of participants (21) held a positive view of technology and technological development, 12 were ambivalent on the benefits of technology, and only 2 held a negative view of technology. These values are extremely close to the survey responses to the WVS item 'Science and technology are making our lives healthier, easier, and more comfortable' which had a positive response of 69%, a neutral response of 15% and a negative response of 14%. When included in the structural equation model, the WVS item had an extremely strong positive relationship to 'trust in the institutions of the internet' (β =.72; p>0.00), which itself had a strong positive relationship to support for online voting in national elections. This chain of relationships required further elaboration so an item on general attitudes towards technology was added to the interview.

Participants coded as having a positive outlook viewed the benefits of technological development as outweighing any negative aspects. These answers were coded into four themes in order of their frequency: a broad positive outlook on technological progress, the benefits of increased speed and convenience, coping with the Covid-19 pandemic, and the benefits of telepresence and remote working. The majority of technology-positive participants

referred to the internet and its perceived benefits in their responses: the ease of finding information, the convenience of online forms, and remote working/socialising during the covid-19 pandemic were cited as positive experiences made possible by the internet.

> EV1: Whereas before, it was, like, if you didn't keep up, like, I'm thinking about, back in the day, when my dad was my age, it's like, if you don't keep up with the radio, the TV or like some newspapers, you might be a bit unsure. Whereas now, if you don't keep up with it, like that's no crime, you can be like, Okay, I'm going to sit down, I'm going to go through the manifestos. I'm going to read some interviews or something.

Participants coded as having an ambivalent view of technological development were non-committal in their responses; they discussed both positive and negative aspects of technology, but they could not decide whether technology had a net positive or a net negative impact. Answers to these questions were coded into five thematic response categories, in order of frequency: Fear of manipulation through personal data, concerns over privacy and internet use, addiction and distraction, cynicism of technology solutionism, and competence of implementation.

> SA3: I do definitely think that I'm much more addicted to my phone than I would like to be. I'll wander around my house, like having Netflix on as background noise. Just, Yeah. So you're not alone. And you know, you're cooking and you're listening to a show or something. I don't think that's very good, because you can definitely tell that you're slower. You're doing an activity, but you're being drawn to another one slowly and slowly. I think it's a mixed bag.

Participants coded as having a negative view of technology were unambiguous in their responses. They had a net-negative view of the effects of technological development. Both responses were coded to the theme of 'technology undermining democracy'; the growth of the internet and a perception that social media was undermining democracy was referenced by both participants in their answers. The participants discussed the ease of access to information using the internet and perceived there to be a large amount of misinformation on social media sites.

> LE1: They've brought on information overload. That requires an enhanced ability to sort through that information and sort out the bad info and take in the good info. In, that's a more, I guess, academic and information acquired settings. But, taking it a step further, within the realm of social media. As far as you know, misinformation and disinformation goes, that stuff spreads a lot quicker than just normal, innocuous information. Yeah. So I, I'd say as things stand now, we're not fully equipped as a society to deal with the fruits of technology.

All participants used the internet on a daily basis, whether they had a positive, ambivalent or negative attitude to technology. A sense of being dependent upon mobile devices and the internet emerged from the technology-ambivalent responses; these participants were conscious of the downsides of their internet usage, but engaged anyway because of the benefits it brought.

The three technology response categories broadly correlated with support, ambivalence or scepticism towards online voting; when compared against support for online voting, positive views of technology had a strong similarity score of 40%. Ambivalence to technology and support for online voting only varied by 3 points from this score at 37%. However, with a 0%

similarity score, participants with negative views of technology gave no indication of support for online voting. The inverse of these relationships were much weaker, with only a 16% similarity between negative views of technology and scepticism of online voting, and an 18% similarity between ambivalence to technology and scepticism of online voting. The 40 point difference between positive and negative views of technology, when compared against support for online voting, supports the small positive survey relationship between the WVS faith in technology item and support for online voting (β =.1; p>0.00).

(3) This positive attitude towards technology was mirrored by participants' expectations of RE-voting usage in UK elections. 24 out of 34 participants believed that RE-voting would be introduced in the UK within the next 25-30 years, while 7 participants were unsure whether it would be introduced, and only 3 participants were confident it would not be introduced within this time frame. With a Jaccard coefficient of .43, there was a strong similarity between positive perceptions of technology and the belief that RE-voting would be introduced in the near future. The evidence of a link between ambivalent and negative views and the scepticism of the future of RE-voting was extremely weak by comparison; ambivalence to technological progress and uncertainty about the future of RE-voting had a similarity coefficient of .16, and negative perceptions of technological progress combined with scepticism of RE-voting's future had a similarity coefficient of 0. These results provide an indication that, within the sample, negative perceptions of technological progress are independent of perceptions of the future of RE-voting and its inevitability.

Amongst the affirmative responses, the most frequent justification for the introduction of RE-voting in this timeframe was a general sense of technological progress. 15 of the 24 participants who answered in the affirmative expressed beliefs that technological progress in election systems was inevitable. These participants used words such as 'modernising',

‘inevitable’, ‘progress’, ‘progressing’ and ‘evolving’, and phrases such as ‘the way forward’ ‘logical step’, and ‘everything’s changing’ in their justifications. Their responses distinguished them from their fellow participants who either did not justify why they believed RE-voting would be introduced, or who did not describe the introduction of RE-voting in terms of general progress.

SO2: I think so. Yeah. We're a traditional old country, but I think the world is evolving and we will evolve with it.

These responses are of particular interest because of the insight they provide into the relationship between assumptions of modernity and online voting. For these 15 participants, RE-voting is a natural progression from polling stations and postal ballots. This change to the medium of voting is part of a broader transfer of facilities to the online world which this cohort has grown up with, and which they assume will continue. Greater technological sophistication and the speed and efficiency which this sophistication may bring is both a normal and desirable view of the future for this group.

In summary, an individual’s perception of modernity, their attitude towards technology, and their level of trust in the government are significant for support of RE-voting.

3. Conclusions

Alongside verifying the survey results, the interviews gave an insight into RE-voting systems as motivators for participating in low-salience, low-payoff elections. Peripheral technologies such as centralised candidate manifestos, email reminders, and social media adverts emerged as important motivational aspects of the RE-voting system. Working in combination, these

technologies worked to bypass the apathy of some interview participants; voting became so quick and costless that participants engaged anyway, despite the absence of interest or payoff.

The interview results were only partially congruent with the expectations of the theoretical framework and the structural equation model outputs. Response patterns conformed with survey results in the sections of experience, motivation & convenience, and trust in government and technology: Individuals who are sensitive to the costs of voting in low salience contests, such as SU elections, are more likely to support the use of online voting in national elections; trust in public institutions and positive attitudes to technology have a significant relationship to support for online voting in general elections.

However, responses in the cost, location & publicness of voting section did not conform to expectations. Expressions about the importance of voting cost and effort were only weakly linked to opposition to online voting in general elections, and these views were often held comfortably alongside beliefs about the importance of inclusivity in elections. In complete defiance of expectation, beliefs about the importance of public spaces for elections were linked to greater support for RE-voting, rather than weaker support. In other words, individuals who had a personal connection to the act of voting in-person were more open to RE-voting. This finding echoes Fisher and Savani's correlation between sense of political belonging and willingness to vote online (2022:15-17). High levels of political engagement were not accompanied by gate-keeping attitudes to participation amongst the interview cohort.

The context of the election matters a great deal for individual perceptions of voting cost; the interview results showed a stark divide between interest in national politics and interest in the hyper-local politics of the SU. Despite the vast majority of participants expressing an interest in politics, and having experience of SU elections, nearly half of the participants were sensitive to

the costs of voting in SU elections. This high level of sensitivity was congruent with the survey results, where experience of online voting was positively correlated with sensitivity of the cost of voting in SU elections. This was not a paradoxical position; these participants viewed SU politics as entirely separate to their interest in national politics, and, for this group, participation in SU elections was almost a passive experience which they were nudged into performing by the SU's email reminders.

Though this experienced group comprised a significant proportion of the interview sample, reluctance to participate in an offline SU election was much greater amongst survey respondents with experience of SU elections; 45% of experienced survey respondents felt they would not participate in offline SU elections, with a further 40% expressing ambivalence about whether they would still participate, and yet all 145 of these respondents had recently voted in an SU election. Just like the interview participants who expressed ambivalence towards SU politics, these young people voted anyway. Responses such as 'why not' or 'I might as well do it' explain the large numbers of survey respondents who voted in their SU elections, despite being unwilling to vote offline. This 'bypassing' of voter apathy through online systems is significant finding as it highlights the efficacy of low barriers to entry combined with frequent personal reminders to vote.

RE-voting in national elections remained a popular option. As in the survey, the majority of participants (20/34) were in favour of online voting being used in general elections in the UK. Perceptions of increased convenience, a sense of modernity in which paper voting is anachronistic, and the possible benefits of maximising participation in elections were all cited as reasons for favouring online voting. 33 participants were in favour of removing barriers to voting in principle, and specifically agreed that voter registration should be easier, and 25 participants were concerned that general election voter turnout was too low. However, there

was a tension between maximising participation and the means through which it should be achieved.

Fears of uninformed or thoughtless voting characterised participants worries about RE-voting's speed and convenience. Some participants felt that online voting would decrease the significance of the voting act by making it more 'like a shopping list', rather than the consequential act which they believed it was. Others were indifferent to voting cost arguments, but felt that the security weaknesses of online voting were too great to risk using it for national elections, and that it amounted to 'overengineering' a system which worked well already. These objections to online voting run counter to popular assumptions about the predilections of 'digital native' 18-24 year olds.

For future interview work, more work is required to create an interview sample representative of the survey sample. In this interview cohort, the vast majority of participants had experience with online voting (33/34), a majority were in favour of online voting in national elections (19/34), and only one participant had no experience of voting online, skewing the interview results away from the majority of survey respondents (253) who had no experience of online voting. As a result, the interview cohort represents a particularly engaged section of the survey sample which is an obstacle to accurately representing the sample. In future, greater work on incentives for interview respondents may deliver a more representative sample.

Chapter 8, Life with the Online Ballot: Conclusions and Future Directions

1. Introduction

This project investigated whether experience of online voting in low-salience and low-risk elections have an effect on support of the technology in high-salience contexts, such as national elections. The investigation occurred against a background of increased security reforms in UK government elections, reducing voter convenience, and the frequent use of RE-voting technology in non-governmental elections, including student union elections. These situations highlight the widening gap between RE-voting use in civil society and the Governments emphasis on maintaining paper based elections, whether by post or in the polling station.

The main research question was directly answered; direct experience of RE-voting does not have a significant effect on support for RE-voting in national elections. Some belief constructs which relate to attitude towards RE-voting do vary by experience level: Perceptions of the usefulness of RE-voting are stronger amongst experienced participants, and beliefs about the importance of uniform voting are weaker. However, these belief constructs do not significantly affect support for RE-voting in national elections in any of the regression models with experience interaction effects; levels of support for RE-voting in national elections do not significantly vary according to level of experience.

This question was answered by accomplishing three overlapping objectives: (i) establish salient beliefs about voting and technology at the level of the individual and within the national legislature; (ii) determine whether the three salient belief clusters, trust, virtue, and perceived usefulness, relate to support for the use of RE-voting technology in national elections, and (iii)

determine whether experience of RE-voting in lower-salience elections is positively associated with support for the extension of RE-voting to national elections, and whether the belief clusters are affected by level of RE-voting experience.

i) Exploring attitudes towards RE-voting

The survey and interview data show a collision of traditional 'virtue of voting' beliefs with an openness to new voting technology, alongside a significant minority's scepticism of RE-voting. The 18-24 year old participants of this study were largely supportive of RE-voting technology in national elections, though just over a third of participants believed it could be harmful for democracy.

Paired with this openness to technology, participants also held strong views on the more traditional aspects of voting such as the use of public venues for polling stations and the perception of voting as a duty rather than a right. The belief in voting from public spaces was not seen as anathema to support for RE-voting, despite the technology permitting voting in private spaces, and strong beliefs about voting duty had no relationship to attitudes towards RE-voting technology whatsoever. The same was true for strong support for voting secrecy; participants who felt strongly that their voting choice should remain a secret had no clear pattern of support for RE-voting. The combination of these attitudes appears paradoxical, but the pattern of technology acceptance alongside 'traditional' attitudes towards voting was consistent across survey and interview results.

Concerning attitudes towards RE-voting, the vast majority of participants perceived RE-voting to be a useful technology (93%), but only 69% approved of it as an option at national elections, and only 66% considered it to be beneficial for democracy in the UK. The differences between these statistics combined with the SEM model outputs show that young people's support for

online voting is affected by issues other than personal convenience. Trust in the internet and normative beliefs about the cost of voting have a greater effect on support than just the perception of usefulness and increased convenience.

Concerning attitudes towards the conduct of voting in national elections, the majority of 18-24 participants viewed voting as an individual activity which should take place in public spaces, which should be easy to do, and which is a duty to carry out. More specifically, the majority believed that voting should not carry a cost, that voting is an individual experience rather than a community experience, but that it is important for voting to take place in public spaces such as schools and rather than in private spaces. The majority of participants believed that voting was a duty which must be performed, rather than a right which they could opt out of. There was no clear majority on whether voting choice should remain secret after voting, with participants evenly split between being comfortable with sharing their choice and wanting to keep it a secret. Out of these aspects, Belief in cost/effort was the only normative aspect of voting which yielded a super majority; 73% of participants were opposed to voting requiring some form of personal cost. Although only 65% of participants believed that voting effort should be reduced.

SU elections payoffs were not sufficient for a significant number of students in the survey and interviews to consider voting in offline SU elections. This was a significant descriptive finding, as it assessed the ability of RE-voting to reduce the perceived direct costs of voting (Blais, 2019). Survey and interview participants were posed questions on whether they would participate in a counterfactual offline SU election. A slim majority of survey participants were sensitive to the costs of voting to the point that they would not vote in an offline SU election; 47% would not vote offline, while 43% would vote offline and 9% remained ambivalent on the issue.

A reversal of this split was observed in the interviews, with 11 participants stating they would not vote in offline SU elections, 15 stating they would continue to vote offline, 5 unsure of whether they would, and 3 declaring no interest whatsoever. A theme of apathy to SU elections emerged amongst some interview participants who had voted anyway. They held a passive attitude towards the elections, and gave examples of being prompted to vote by emails from the SU and social media reminders. These reminders combined with the convenience of RE-voting 'bypassed' the apathy expressed by these participants. They voted anyway, despite acknowledging that they felt no duty or obligation, had no stake in maintaining the SU's legitimacy, and received material or expressive payoff for voting (Downs, 1957:36,37: Riker and Ordeshook, 1968:28).

RE-voting's mobilisation of the 18-24 cohort despite their apathy to SU politics is a significant observation. The survey results show that participants with an aversion to voting cost in SU elections also had positive perceptions of the usefulness of RE-voting technology. This survey finding was further expanded by the interview results, where a third of participants stated that they would be unlikely to vote in an offline SU election, and that they appreciated the convenience of RE-voting. Despite much discussion of RE-voting's potential to drive participation amongst 18-24 year olds, there is little evidence for this from studies of national contests RE-voting (Vassil and Weber, 2011). This is the first UK study of which the author is aware, to investigate the perceived costs of RE-voting in a low-salience election. The survey and interview data shows a clear link between positive perceptions of RE-voting technology and high levels of perceived cost for SU elections, indicating that individuals who are averse to voting costs in SU contests are more likely to view RE-voting as a useful technology, and to consider themselves unlikely to continue voting without it. This finding of practical use for any organisation interested in increase youth participation in similar low-salience contests.

ii) Identifying constructs which affect support for RE-voting in national elections

The relationships between the attitudes outlined by the first aim are effective at predicting support for the use of RE-voting in national elections. Having established that acceptance of RE-voting technology is held comfortably alongside some traditional views of voting conduct, analysis of the survey data using structural equation modelling identified the patterns between attitudes to technology and normative voting attitudes. Some attitudes, such as belief in voting cost predicted a strong negative response to RE-voting in national elections.

Support for RE-voting in general elections is associated with three belief constructs: the normative belief in voting cost, institutional trust in the internet, and perceptions of usefulness and aversion to voting costs. These constructs correspond to the three broad clusters of voting beliefs established in the theoretical framework chapter: the virtue of voting, the integrity of voting, and the convenience of voting. Amongst 18-24 year olds, the three constructs are reliable indicators of support for RE-voting in national elections.

No participants expressed concerns about RE-voting being used for non-governmental purposes, but 31% of survey respondents were either opposed or ambivalent to the use of RE-voting in national elections. The findings were further supported by the interview results, where aversion to voting in low salience offline elections, opposition to voting cost, and trust in technology were positively associated with support for the use of RE-voting in general elections. Interview participants also made a clear distinction between the use of RE-voting in non-governmental elections and in national governmental elections. Use in the former was unproblematic, but the latter was a cause for scepticism or ambivalence for 15 of the 34 interview participants.

Despite the ubiquity of the internet in their lives, only 26% of survey participants believed that the institutional safeguards and security measures could protect them online. Trust or scepticism of institutional protections was the strongest indicator of support for RE-voting in national elections (Mcknight and Chervany, 2001; Mcknight and Harrison, 2005). The caution expressed by the survey and interview participants shows that positive attitudes to online technology are complex amongst a generation who have been using the internet from a young age. 100% of 18-24 year olds surveyed by the Office for National Statistics (ONS) reported using the internet daily or 'almost every day' (2019). This low level of institutional trust conflicts with Mcknight, Choudhury and Kacmar's assertion that institutional trust would increase with continued experience of the internet (2000:533). The long-term online experience of the cohort and their experience of RE-voting systems was expected to contribute to high levels of institutional trust in the internet, and trust in RE-voting. This finding suggests that frequent use of the internet does not necessarily build a sense of institutional trust, at least in the context of national elections.

This was followed by belief in voting cost, a normative component which measured the level of opposition to reducing the amount of effort required for voting. Support for belief in voting cost was the next strongest predictor of opposition to RE-voting in general elections. The last significant predictor of support was perceived usefulness, which assessed the participants perception of RE-voting as a convenient, easy to use, and time-saving technology. Agreement with the perceived usefulness component reliably predicted support for RE-voting in general elections.

Survey analysis showed that trust in the institutional safeguards of the internet has the largest effect on support for use of RE-voting in national elections. Belief that voting ought to have a cost negatively affects support for RE-voting in national elections, and the perception of RE-voting technology as useful increases has a positive influence on support for RE-voting in

national elections. This attitudinal data is valuable for any future implementation of RE-voting in the UK. Any attempt by the UK Government or the Electoral Commission to introduce RE-voting will require an understanding of the integrity objections, normative objections and personal appeals of the technology.

The model stripped away a number of potential explanations for support/opposition to RE-voting: normative beliefs about the importance of publicness and uniformity when voting, and the perception of voting as a duty. This narrowing of explanations led to a list of three relevant belief components: institutional trust in the internet, normative support/opposition to voting cost, and perceived usefulness.

A practical application for these components could be for counteracting scepticism for online voting. For example, an individual with low trust in institutional safeguards of the internet, who does not believe that voting should be made easier for the public, and who does not regard RE-voting as a useful technology is likely to oppose RE-voting's use in national elections. These objections are qualitatively distinct and require different arguments and forms of evidence to counteract them. A programme to implement RE-voting at the national level will need to address objections and build trust around the new system. The model is useful in this context since it shows the level of association between these beliefs and support for/rejection of RE-voting.

iii) The effects of experience on salient beliefs and support for RE-voting in national elections

The 18-24 cohort's attitudes towards RE-voting in national elections cannot be differentiated according to level of experience. Despite significant evidence that direct-experience of an attitude-object results in stronger attitudes towards that object, attitudes towards RE-voting

technology do not appear to extend beyond the context of the original experience. This finding suggests three possible explanations: (1) highly developed attitudes towards RE-voting across experience levels, prior to direct-experience; (2) highly developed attitudes towards the internet which act as a proxy for attitude to RE-voting; (3) RE-voting experience is context specific, so will not affect attitudes outside of the context of SU and other low-salience contests.

According to the first explanation, attitudes to RE-voting in national elections are already extremely well developed amongst 18-24 year olds to the extent that direct-experience does not alter them. The cohort's highly developed attitudes towards RE-voting could be explained by the prevalence of RE-voting in the 2020s; experienced participants recalled numerous RE-voting events which took place in secondary schools, sports clubs, universities, and local political parties. These included school prefect elections, voluntary organisation elections, course representative elections, and local party executive elections. The prevalence of RE-voting outside of government elections may have normalised this technology.

For the second explanation, direct-experience of the internet acts as a proxy for direct-experience of RE-voting. If attitudes towards use of the internet are positive, then attitudes to RE-voting in national elections will also be positive, regardless of the level of experience with RE-voting in low-salience elections. Since the 18-24 cohort are true 'digital natives' their level of experience using the internet is extremely high. This high level of experience may have 'acclimated' them to online systems, and they may be less risk-averse and more trusting of new technologies as a result.

In the third explanation, attitudes to RE-voting extension are not well developed amongst the cohort, and direct-experience of RE-voting only affects context-specific attitudes. The

experience of RE-voting in SU elections and other low-salience contests is so radically different from voting in national elections that participants do not transfer their experience into this different context. The experiments which established direct-experience as a moderator of attitude assessed attitudes towards the object of the direct-experience experiment, rather than attitudes towards a related object (Fazio and Regan, 1977; Fazio and Zanna, 1978, 1981; Fazio et al, 1982). In this study, RE-voting in national elections may be too far removed, or too abstracted, from the RE-voting experiences of the cohort.

The lack of statistical confirmation combined with the interview explanations implies that it is the seriousness of national elections which breaks the link between small-scale experience and trust at a higher level. The consequences of election fraud in a national contest are obviously wide-reaching and may pose an existential threat to sections of the electorate.

2. Continuity of beliefs: the voting literature, belief clusters, and the structural equation model

The three themes, virtue of voting, integrity of voting, and the usefulness and convenience of voting, are woven throughout this study. The tension between these beliefs is seen in different quantities across venues: in the academy, in the national legislature, and in the responses of the study's youth cohort.

The structural equation model indicated relationships between the three belief clusters and support for RE-voting technology in national elections: normative beliefs about cost and uniformity of voting, trusting beliefs, and beliefs about the usefulness and convenience of RE-

voting. Despite the absence of anticipated constructs such as 'belief in the publicness of voting', belief constructs within the three clusters corresponded with the predictions set out by the theoretical framework and were positively associated within their cluster.

These associations were robust across non-parametric tests, Spearman's rank correlation coefficient and Kendall's Tau, and when using Pearson's correlation coefficient in parametric testing. The majority of these predictions were informed by the debates in the academic literature and in the UK legislature. The only items from the theoretical framework which were already confirmed by prior factor analyses were institutional trust in the internet and perceived usefulness (Davis, 1985; Schaupp and Carter, 2005; Nemeslaki, Aranyossy and Sasvári, 2016).

The theoretical framework's three belief clusters are directly linked to the procedural aspects of UK election law established in chapter two: the challenge of voting technology to the traditions of in-person voting; the challenges posed by technology to the security and secrecy of elections; the opportunities offered by technology to increase the convenience and accessibility of elections, and therefore to expand the electorate.

These three debates have abstract elements, but the elements which could be described at the concrete level of individual beliefs were included in the theoretical framework: Trust in the internet and RE-voting technology, as well as concerns over compromised secrecy, directly relate to the higher-level discourse over the integrity of online elections (Jones, 2001; Birch and Watt, 2004; Springall, 2014). Individual beliefs about the effort required by voting, attitudes towards public and private voting, and the uniformity of the voting experience, relate directly to the virtue of voting discourse and the normative expectations of 'good' voting (Mill, 1861; Barber, 1984; Buchstein, 2004).

The Individual's perception of the usefulness of RE-voting and the individual's aversion to voting cost relate to the higher-level debates over voter turnout and methods to improve turnout (Gray and Caul, 2000; Putnam, 2000; Blais, 2000; Norris, 2003). The individual's perception of voting cost and the academic discussion of improving voter participation are on opposite sides of the 'supply and demand' of voting. However, they are ultimately concerned with the same thing, which is whether an individual participates in an election or not.

Accessibility for disabled citizens was a significant element of the procedural aspects covered in chapter two, but which was omitted by the theoretical framework. Personal convenience was prioritised in the theoretical framework over normative beliefs about improving the accessibility of elections as there was an established literature on technology adoption and perceived usefulness in relation to predicting behaviour (Davis, 1985; Davis, Bagozzi and Warshaw, 1989; Lee, Kozar and Larsen, 2003).

It was also clear from the literature review that there was no tension in the legal or academic discourse over using RE-voting to improve access for disabled voters. Birch and Watt, who oppose RE-voting technology on integrity and normative grounds, were not opposed to exceptions being made for disabled voters (2004). There are also no counter-arguments against improving accessibility for disabled voters in the normative RE-voting literature, despite the existence of arguments questioning improved convenience for non-disabled voters (Barber, 1984; Buchstein, 2004; Birch and Watt, 2004).

Because of accessibility's excepted status from arguments against RE-voting technology, it was also excepted from the theoretical framework chapter. A belief construct concerning accessibility for disabled voters was drafted for the pilot survey, but was excised for the sake of

brevity. It was expected to relate strongly to beliefs about inclusivity and for support for RE-voting in national elections, and could be used to expand the scope of the belief clusters in future research.

3. A clash of reforms – the incongruous priorities of UK election law

The debates around virtue, integrity and convenience encompasses the legal sphere and is reflected in the changing nature of electoral law, a significant part of the United Kingdom's constitutional arrangements. Chapter two outlines the long periods of dormancy in UK election law, punctuated by often dramatic reforms. The cumulative result of these reforms is a layered mix of laws with rivalrous priorities for the conduct of elections. The introduction of qualified postal voting (1945), the extension of polling hours(1912,1969), the introduction of the universal postal vote (2000), and the introduction of photo-ID in Northern Ireland (2003) and the rest of the UK (2022) being examples of significant shifts in the landscape of election administration.

The incongruous procedural priorities of UK election law pose challenges and opportunities for the introduction of RE-voting. This chimerical mix is due to the lack of an overarching strategy or long term plan for election law. Successive Governments have shaped election law according to their own priorities and in response to dysfunctional electoral events such as the Tower Hamlets scandal (2014). The creation of the Electoral Commission (2001) has not changed this approach, since the commission can only make recommendations to the Government on electoral administration. This process has been largely additive, with new procedures added by the Government of the day, rather than undoing the work of previous Governments.

Over the last 25 years, convenience procedures have been expanded and then indirectly reduced as security legislation became prioritised by the 2015 and 2019 Conservative Governments. Postal and proxy voting were not repealed, but barriers to voting were erected in other theatres. The procedures introduced by the Elections Act 2022 are the fruits of this shift in interest towards securing elections. Alongside reforms to convenience and security there has been a creeping expansion of accessibility procedures, though with RE-voting kept away from the accessibility agenda (Martin, 2018). The latest expansion was also delivered by the Elections Act 2022, giving returning officers the power to determine their own accessibility equipment, with guidance from the electoral commission. This legislation, combined with the 2021 trials of audio devices show the influence of Andrew's judicial review (2019). It is unclear whether improvements to polling station accessibility are the result of shame from the judicial review, an ideological focus on polling stations, or a manoeuvre to reduce calls for remote solutions such as RE-voting. The outcome of the 2022 accessibility reforms is a renewed emphasis on the polling station as the focus of elections and by proxy the importance of the polling station as a civic space.

This emphasis on the polling station does not provide fertile soil for RE-voting advocates. Another significant obstacle to RE-voting arises from transparency procedures. In light of social media enabled conspiracies such as the Brexit referendum pencil meme, transparency procedures are arguably even more important for the networked world as a means to maintain trust in the election count, and as a means to challenge the spread of conspiracy theories (Dobreva, Grinnell and Innes, 2020). These relatively new applications for transparency procedures, combined with the 2022 Government's interest in polling station observation to challenge group-voting, also pose a high bar for the introduction of voting systems in the near future (Lord Hayward in HL Deb 10 March 2022). Considering these reforms, the introduction of RE-voting under a Conservative Government appears unlikely.

4. Theoretical contributions

The theoretical contribution of this thesis to the electoral administration and voter turnout literature is twofold: (1) the creation of a triad typology of voting system discourse (2) the creation of a normative framework for the 'virtues' of in-person voting.

(1) The triad typology of voting system discourse aggregates the discussions around voting systems into three categories: integrity, participation and the virtue of voting. These three categories emerged from a review of electoral administration literature, normative democracy theory, and popular discourse on voting systems.

Each category of the triad aggregates associated discourses together under its umbrella. Integrity of voting encompasses discussions over physical security, voter secrecy, and the efficiency and accuracy of the voting system. Usefulness and convenience aggregates discussions about the benefits of increasing voter turnout, voter convenience and the costs of voting. The virtue of voting category aggregates discourse surrounding the experience of voting, voting as a ritual, and the act's links to civic identity. Normative arguments concerning the ease of the voting, the quality of voting, the publicness of voting, and the uniformity of the voting are collected under this category.

Much of the discussion of voting revolves around integrity and participation arguments. This discourse treats voting as a largely instrumental act and glosses over the expressive and ritualistic elements of voting. These elements suggest that the act of voting has an intrinsic

value, beyond selecting a new government, which may be transformed by changes in voting technology. This typology acknowledges the importance of the expressive element of voting and its role as a civic ritual, placing these arguments on the same level as integrity and participation arguments.

As an analytical tool, the typology allows for the identification of discourse 'fault lines' where different views on democracy and voting technology collide. These discourse fault lines exist at the elite level of academic discourse, which the literature was drawn from, but they also exist amongst the 18-24 year olds surveyed and interviewed for this study. Arguments about voting integrity, participation, and the virtues of voting were expressed by 18-24 interview participants who were unfamiliar with theories of democracy or the electoral administration literature.

(2) The virtue of voting is a new category of voting discourse, distinct from integrity or participation arguments in its focus on the intrinsic value of the voting. For inclusion in the theoretical framework, it was necessary to organise arguments which stressed the intrinsic importance of the voting act into three categories: belief in voting cost, belief in the publicness of voting, and belief in voting uniformity. Despite the existence of 'virtue of voting' discourse across multiple texts, there is no literature which attempts to collect together and operationalise the different types of argument. Exploration of voting as public ritual and the importance of the voting location can be found in the work of Mill (1861), Edelman (1964), Lukes (1975), Barber (1984), Nimmo (1985), Buchstein (2004, 2015), Monnoyer-Smith (2006), Coleman (2013), Orr (2015, 2016), and Bruter and Harrison (2017).

Elements of these works were used for the creation of the three categories, and to operationalise the concepts for the survey. While the three concepts were useful for the

theoretical framework, the survey items created to represent them did not all survive principal component analysis. Of the three survey constructs, only the belief in voting cost items successfully loaded to a component with an eigenvalue >1. Belief in the publicness of voting items did not load strongly to any component, and so were cut from the list of concepts with a possible relationship to the dependent variable. Only one belief in the uniformity of voting item loaded strongly to a component. This single item component was retained for the model, but only to show its positive covariance with the belief in voting cost component. More experimentation with question wording and style is required to fully tap into belief in the publicness of voting and belief in uniformity of voting.

5. Empirical contributions

The survey and interview chapters of this thesis make four empirical contributions to the political science and technology acceptance literature: (1) experience with RE-voting in low-salience elections does not affect support for RE-voting in national elections, but there is an indication of an association between experience level and two belief constructs; (2) establishing an order of effect size for the three belief clusters: integrity, usefulness and convenience and the virtue of voting; (3) an extension of the technology adoption survey tools through the inclusion of normative attitudinal items robust multi-item survey constructs which measure belief in voting cost, aversion to voting cost in low-salience elections, and voting duty; (4) A technology-linked explanation for participation in low-salience elections despite low motivations.

(1) Experience level did not affect support for RE-voting in national elections. However, the belief constructs perceived usefulness, aversion to voting cost and belief in voting uniformity differed according to experience with RE-voting. These differences were robust across ANOVA testing using a 0-3 experience level variable, and across difference of means tests using a 0-1

experience level variable. These patterns could not be attributed to any of the control variables; the same patterns were not observed in ANOVA tests with control variables civic voluntarism and interest in politics substituted for experience level. The lack of control effects suggests that either experience level, or another intervening variable which was not controlled for, is responsible for these differences.

The pattern indicates that perceived usefulness and aversion to voting cost increases according to experience, while belief in the uniformity of voting reduces according to experience. This is a partial confirmation of the expectation that experience would amplify constructs from the usefulness and convenience cluster and weaken virtue of voting constructs. This pattern is significant since it provides partial evidence for a RE-voting experience effect; experience of the technology in a small-scale election affects beliefs about the technology which may have an influence on perceptions of RE-voting in national elections. This effect could be investigated further using an experiment design to test for within-individual differences in beliefs about voting and technology before and after RE-voting experiences.

(2) The structural equation model and associated regression tests established the order of effect size for constructs from the three belief clusters; institutional trust in the internet had the strongest effect on the DV, followed by belief in voting cost, and perceived usefulness. This pattern was observed across multiple regression conditions. The difference in effect magnitude provides an indication of the priority which these belief clusters are given when use of RE-voting in national elections is evaluated; integrity of elections is the primary concern, followed by normative concerns over the reduced costs of voting, and then by the appeal of the technology's convenience. This ordering may be useful as a rubric for future studies investigating attitudes towards voting technology.

(3) Prior to this study, there was no survey data on attitudes towards the virtues of voting modes. From the author's review of the literature, belief in voting cost, in belief in the publicness of voting, and belief in voting uniformity have not been used before as survey constructs. Survey measures of duty and civic obligation have existed since the 1950s, and while these have interrogated the feeling of election day, they have not measured beliefs about how voting 'ought' to be conducted (Campbell, Warren and Miller, 1954; Dennis, 1970). The 'virtue of voting' cluster and its belief constructs were developed from Benjamin Barber's discussion of participatory democracy (1984), Hubertus Buchstein's critiques of internet voting (2004), and Graeme Orr's descriptions of election day (2015). Bruter and Harrison's work on the ergonomics of voting also had an influence on the development of the virtue of voting items (2017,2020).

This thesis adds original measures to the voting choice literature and expands upon existing measures of political choice: Belief in voting cost, aversion to voting cost in low-salience elections, and belief in voter uniformity.

(4) The interviews provide an insight into how RE-voting facilitates participation in low-salience elections. The reduced costs of voting bypassed apathetic feelings and led to a 'why not vote' attitude amongst a quarter of the interview participants with SU voting experience. The majority of interview participants did not perceive SU elections as having a significant outcome or effect on their lives. They acknowledged that SU elections differ in salience when compared against council, mayoral, or general elections. However, 28 out of 34 participants had experience of SU elections; they participated in these contests despite a belief in their lack of consequence.

Some participants wanted to support their friends' campaigns, but the most frequent explanation for participating in SU elections was convenience. As detailed in the experience section of the interview chapter, these participants held a 'why not' attitude towards voting in their SU elections. This group felt online voting was such a costless activity, that when they received an email reminder from their SU to vote, they thought 'why not'. They clicked on the hyperlink and were taken to their SU's voting page, where they could read the candidate's manifestos, if they so wished, and cast their vote. Voting 'only takes a few minutes' recalled one participant.

The speed of voting and use of reminder emails emerged as significant motivators for student participation in elections which the majority were not particularly interested in. This 'bypassing' or 'compartmentalising' of voter apathy conflicts with Berinksy's postal voting studies which found that politically engaged voters were amongst the main adopters of postal ballots (2001, 2005). In this study, disengaged voters admitted to participating anyway. A minority of participants reported that their SU had created a sense of duty or intrinsic motivation for them to vote. This finding is likely unique to low-salience elections, but it poses new questions about what drives the 'why not' feeling. The effects of peripheral elements of the voting system, such as centralised candidate manifestos and the use of email reminders, require more investigation.

These descriptions of online voting and convenience were paralleled by the survey results (n445). 38.5% of interview participants strongly agreed that they would not participate in an offline SU election and 43.5% were ambivalent about whether they would still participate in an offline election. Only 18% of survey respondents strongly disagreed with this statement. This minority were confident that they would still participate in an offline SU election.

SU elections were not compelling contests for the majority of this study's participants; 68% of survey participants had never voted in an SU election, and only 43% had ever voted online. However, the vast majority of interview respondents had experience of SU elections, despite the majority admitting that they were not invested in the results. This finding suggests that low-salience elections can attract voters, despite the voters' own disinterest. Student Unions make this attraction possible by reducing the costs of voting to near zero, and frequently reminding voters of the contest via emails and social media. The expressed apathy of the study's participants was bypassed by the effectiveness of their SU's online voting system. If this bypassing of apathy is possible for an SU election, it may also be possible for sub-national elections with poor levels of voter participation.

Borough, county, and police and crime commissioner elections are prime examples of sub-national elections with relatively low levels of interest, despite the significant powers the offices carry, English council elections frequently have turnout levels below 35% (Uberoi, 2019:18). The 2021 Police and crime commissioner elections had an average turnout of 33.2% (Danechi, 2021:14). These offices hold power and resources far beyond an SU sabbatical officer election, but they experience the same low levels of interest from their eligible audiences. If RE-voting can overcome the low-motivation of a section of the interview cohort, its application to other apparently 'low-interest' elections may significantly improve voter participation.

6. Limitations of the study

There are a number of methodological limitations to this study which could be improved in future. These are largely prosaic issues which concern the administration of the survey and interviews: the drawing of paired institutions; improving the diversity of survey sample; greater use of interviews to inform survey design; use of implicit measures of attitude

strength; improving recruitment of interview participants; conducting research during a global pandemic.

During the survey planning stage, drawing pairs of universities from HESA's student retention quintiles would have created a redundancy in case of non-cooperation. The lack of responses from the university of South Wales left a gap in responses from the 4th quintile of the student retention table. This gap could have been avoided by gathering the contact information of staff at another institution from the same quintile.

Students from quintiles 1-2 of the HESA's student retention table are overrepresented in the survey data. This situation could have been avoided by anticipating a higher rate of response from the students of these institutions, and increasing the number of institutions sampled from quintiles 3-5 of the retention table.

Multiple pilot studies were used to gather feedback on the belief constructs. However, a longer period of informal interviewing to gather salient beliefs would have benefited the survey design. During the post-survey interviews, participants elaborated on their motivations for participating in SU elections, their beliefs about elections as events, and importance of 'embodied presence'. These beliefs would have improved the design of the aversion to voting cost survey items, and some of the virtue of voting cluster items. Thurstone's method of collecting and organising salient beliefs from participants before designing survey scales would have likely strengthened the factor loadings of certain items (1928:544).

Implicit measures of attitude strength, instead of explicit measures, could have been employed for the survey. Attitude strength was identified explicitly from responses tending towards the minimum and maximum ends of the 1-7 Likert scale. This is one method for assessing strength

of belief. However, it cannot assess the accessibility of a belief or attitude to a participant (Fazio, Powell and Herr, 1983). Measuring the speed of response to survey items can be used to infer the accessibility of the belief, and therefore the strength of the belief (Eagly and Chaiken, 1993). Survey packages such as Qualtrics have the facility to measure response times to survey items and could be used in future.

18-24 year olds with experience of RE-voting dominated the interview sample (32/34). This over -representation was initially difficult to explain. Experienced participants were in the minority amongst the survey cohort (192/445), and it was anticipated that interview participants would comprise 5-10% of the survey cohort, proportionate across experienced and inexperienced participants. Instead, 7% of respondents were experienced and 1.5% were inexperienced. The reluctance of the inexperienced cohort may be explained by a lack of interest in the topic, or a feeling of not having anything to contribute. This low response rate was not affected by the inclusion of a reimbursement of £10 value. A future remedy for this could be to increase the size of the reimbursement and consult more on the design of the invitation. Increasing the overall size of the survey sample may have an effect, but it would not address the mismatch between volunteer proportions.

The 2020 Covid-19 pandemic has undoubtedly had an influence on the perception of technologies which reduced embodied presence. Participants would likely have been more reliant upon telepresence technologies such as video-calling during this time, and may have increased their usage of remote technologies for socialising, shopping, and entertainment. Conducting the survey and interviews with an 18-24 cohort who are not in the middle of a pandemic lockdown, and the dependence on technology which accompanies it, may result in different responses to RE-voting. This is something to consider for future studies.

7. Personal reflections and thoughts on the future of RE-voting

The author has normative reservations about the use of RE-voting technology in UK elections. Accessibility concessions for disabled voters are highly desirable, but the introduction of universal RE-voting should be treated with caution. The ritual of election day is important – moving public elections deeper into private spaces has the potential to increase the civic atomisation of the electorate.

Prioritising convenience above other aspects of the voting experience undermines the civic ritual of election day, and the sense of an accountable 'public' coming together to decide becomes further fragmented. This is not sentimental conjecture – voting medium experiments indicate the benefits of in-person voting: a greater sense of self-reported excitement and engagement, higher voter turnout relative to remote-voting options, and lower support for extreme-right parties relative to remote voting (Cammaerts et al, 2016; Bruter, 2019; Bruter and Harrison, 2020). These findings also point to a therapeutic benefit of in-person voting, which goes beyond the instrumental act of choosing a candidate.

The public sphere created by the internet and social media already inhabits private living rooms, where the public realm could not easily reach before, but this mediated public sphere is not a substitute for the effect of gathering in physical public spaces, such as libraries, theatres, and polling stations. If RE-voting were to be introduced, measures to boost engagement in the election process in advance of election day may help reduce this sense of atomisation. Increased funding for public hustings and debates may be a part of the compromise, should RE-voting be introduced.

In addition to the challenge to the ritual of elections, the black-box nature of RE-voting systems creates a barrier to trust, and inevitably gives cover to conspiracy theorists and self - identified political outsiders who suspect foul-play in government elections. Paper technologies are comprehendible to the general public, are easily auditable by candidates and counting agents, and the audit process itself can be observed and understood by the public. VVPAT technologies are a solution to this transparency argument, but they undermine the time efficiencies created by electronic voting systems, undoing the cost/time saving measures. The roll-back of electronic voting in Germany, post the BFERG's 2009 ruling exemplifies this problem.

The author would welcome greater investment in election day itself, going beyond spending on ballot technologies. Suggestions to promote the event of election day as a bonding experience include marking general elections as public holidays, making polling stations even more accessible for disabled voters, including the introduction of computer assisted voting, provision of free public transport to polling stations, and greater investment in the layout and design of polling stations to increase the 'prestige' of the event. Some of these items are untested,

The decline of national RE-voting experiments in Western Europe appears at odds with the 18-24 cohort's openness to RE-voting and level of immersion in the online world. In the UK, the development of voting convenience procedures has paused, but concessions towards increasing access for disabled voters may provide avenues for the introduction of RE-voting in the longer term. As the popularity of postal voting demonstrates, it is difficult to return the genie of convenience to the bottle; reforms which expand the convenience of voting are quickly accepted and become a normal part of elections.

For the majority of the 18-24 cohort, voting over the internet in national elections is uncontroversial. The majority of interview participants believed that internet voting will be introduced within the next 25 years. For this group of young people, elections in the near future will be just another function of the internet. Reducing barriers to participation and improving the inclusivity of elections was a key priority for these pro-RE-voting participants; the more an individual identified voting as a duty rather than a right, the stronger were their views about strengthening the inclusivity of elections. The normalisation of RE-voting technology in UK civil society, combined with a rising generation of 'digital natives' and a future government open to voting system reform, may spur a second wave of RE-voting experiments. The UK population's growing exposure to the risks of the online world will likely play a role in any future public acceptance of RE-voting, as indicated by Fisher and Savani's observation of a relationship between exposure to online risks, information about RE-voting, and willingness to vote online (17:2022).

The near future of RE-voting in the UK is uncertain. If it is used in the near future, it will likely arrive through experiments in devolved municipal elections, or through pressure to further improve accessibility provisions for disabled voters. Devolution of the administration of municipal elections has created an avenue for the use of RE-voting technology. Although the UK government currently has no plans for RE-voting trials, the Welsh Parliament and Scottish Parliament both indicated a willingness to trial RE-voting in municipal elections (Sky News 2018; BBC News, 2018). Wales has not visibly progressed with legislation for RE-voting technology. However, the Scottish Elections Act 2020 laid the enabling legislation for use of RE-voting in municipal elections, though this use has not yet been realised.

Improved accessibility for voters wishing to vote remotely or who cannot attend the polling station also offers a credible route for the introduction of RE-voting. Considering the

developments in accessibility provisions prompted by Rachel Andrew's case (2019), proponents of RE-voting in the UK may have to reframe their arguments around increasing accessibility for disabled voters, and compete with the expanded accessibility provisions of the Elections Act 2022. The act makes clear that the Government's focus is on accessibility within the polling station, rather than on remote solutions. The digital democracy predictions of the late 1990s have not been realised, and RE-voting is conclusively not the silver bullet for declining voter turnout in post-industrial democracies. However, a reframing of online voting arguments to focus on improving accessibility for disabled voters, rather than increases to aggregate turnout may be more successful in the near future.

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Appendices

Appendix 4.1, Full questionnaire, question codebook and survey data

Link to the online version of the questionnaire: https://forms.gle/XUqi227yb4utoiNs9

A printable version of the survey can be found in the link below:

https://drive.google.com/file/d/1w-7l_tYKj1IDku931c7qSTa8Ea4Ljvs8/view?usp=sharing

Survey data and do files available at this link:

https://drive.google.com/drive/folders/1DK37QITP1EAm_jvWXs8S0nEO5cUDEy3F?usp=sharing

Survey Codebook

#	Question Code	Question Response Format	Question Wording
1	EXP1	Categorical dichotomous (Yes/No)	EXP1.1 ‘Have you ever voted online in student union elections?’
2	EXP1.1	Categorical dichotomous (Yes/No)	EXP1.2 ‘Have you ever voted in any online elections?

3	EXP2	Checkboxes	EXP2 Have you voted in any other online elections?
4	EXP3	Radio buttons (1-6 or more)	EXP3 How many online student union elections have you voted in so far? (Radio buttons: 1-6 or more)
5	EXP4	Checkboxes	EXP4 What have you used to vote online?
6	EXP5	Radio buttons (University of study or open response category)	EXP5 Where did you most recently vote online?
7	EXP6	Likert Scale (1-7)	EXP6 How strongly do you agree/disagree with the statement: 'The voting system was easy to use'
8	EXP7	Likert Scale (1-7)	EXP7 How satisfied were you with the experience of online voting?
9	EXP8	Categorical dichotomous (Yes/No)	EXP8 Did you experience any technical problems?
10	EXP9	Open response	EXP9 If yes, could you describe the problems you experienced?
11	PU1	Likert Scale (1-7)	PU1 How strongly do you agree/disagree with the statement 'Online voting enables me to vote quickly'
12	PU2	Likert Scale (1-7)	PU2 How strongly do you agree/disagree with the statement 'Online voting fits in with a busy lifestyle'
13	PU3	Likert Scale (1-7)	PU3 How strongly do you agree/disagree with the statement 'Online voting makes voting more efficient for me'
14	PC1	Likert Scale (1-7)	PC1 How strongly do you agree/disagree with the statement 'Voting online takes much less effort than voting in person'
15	PC2	Likert Scale (1-7)	PC2 How strongly do you agree/disagree with the statement 'Voting in a Student Union polling station would take too much time out of my day'
16	PC3	Likert Scale (1-7)	PC3 How strongly do you agree/disagree with the statement 'If I could not vote online in Student Union elections, I would rather stay at home than vote'
17	BVC1	Likert Scale (1-7)	BVC1 How strongly do you agree/disagree with the statement Voting should not be made too easy'
18	BVC2	Likert Scale (1-7)	BVC2 How strongly do you agree/disagree with the statement 'Travelling to the polling station shows a commitment to democracy'
19	BVC3R	Semantic Differential Scale (1-7)	BVC3R 'Voting should involve some effort/Voting should be effortless'
20	BVU1	Likert Scale (1-7)	BVU1 How strongly do you agree/disagree with the statement 'Everyone should vote on the same day '
21	BVU2	Likert Scale (1-7)	BVU2 How strongly do you agree/disagree with the statement 'It is important that everyone votes using the same tools, such as a paper ballot'

22	BVU3R	Semantic Differential Scale (1-7)	BVU3R 'I like to keep my voting choice a secret/I like to share my voting choice with others'
23	BVU4R	Semantic Differential Scale (1-7)	BVU4R 'Voting should be compulsory for everyone/Voting should be optional for everyone'
24	BPV1	Likert Scale (1-7)	BPV1 How strongly do you agree/disagree with the statement 'It is important that voting occurs in public spaces, such as schools, community centres, and churches etc'
25	BPV2	Likert Scale (1-7)	BPV2 How strongly do you agree/disagree with the statement 'I like to be around people on polling day'
26	BPV3R	Likert Scale (1-7)	BPV3 How strongly do you agree/disagree with the statement 'People don't need to be physically present to vote because you can do everything over the internet now'
27	BPV4	Semantic Differential Scale (1-7)	BPV4R 'Voting is an individual act/Voting is a community act'
28	TT1	Likert Scale (1-7)	TT1 How strongly do you agree/disagree with the statement 'Science and technology are making our lives healthier, easier, and more comfortable'
29	TT2	Likert Scale (1-7)	TT2 How strongly do you agree/disagree with the statement 'In general, the internet is now a robust and safe environment in which to vote over'
30	TT3	Likert Scale (1-7)	TT3 How strongly do you agree/disagree with the statement 'I feel assured that legal and technological structures adequately protect me from problems on the internet'
31	TT4R	Semantic Differential Scale (1-7)	TT4R 'In general most people can be trusted/You can't be too careful in dealing with people'
32	PERS1R	Likert Scale (1-7)	PERS1R Research before voting scale (Research positive)
33	PERS2	Semantic Differential Scale (1-7)	PERS2 'Voting is a right which I can take or leave/Voting is a duty which I must carry out'
34	PERS3	Semantic Differential Scale (1-7)	PERS3 'Progress is important to me/Tradition is important to me'
35	PERS4R	Semantic Differential Scale (1-7)	PERS4R 'I avoid taking risks/I enjoy taking risks in life'
36	IDEM1	Likert Scale (1-7)	IDEM1 How strongly do you agree/disagree with the statement 'Online voting should be an option in every UK General Election'
37	IDEM2	Likert Scale (1-7)	IDEM2 How strongly do you agree/disagree with the statement 'Online voting is beneficial for me'
38	IDEM3	Likert Scale (1-7)	IDEM3 How strongly do you agree/disagree with the statement'Online voting is beneficial for society'
39	IDEM4	Semantic Differential	IDEM4 'Our democracy would be harmed by online voting/Our

		Scale (1-7)	democracy would be improved by online voting'
40	CTRL1	Categorical (0-7 days)	CTRL1 During the last week, on roughly how many days did you talk about politics with other people?
41	CTRL2	Categorical (1-16+ hours)	CTRL2 How many hours a week do you spend volunteering?
42	D1	Categorical list	D1 What is your year of birth?
43	D2	Categorical list	D2 Are you male or female?
44	D3	Categorical list	D3 Do you have any long-term illness, health problem or disability which limits your daily activities or the work you can do?
45	D4	Categorical list	D4 What type of course are you doing?
46	D5	Categorical list	D5 What subject area are you studying?
47	D6	Categorical list	D6 To which of these groups do you consider you belong?

Appendix 4.2, Survey Invitation Letter with mail merge fields (paper and electronic)

Dear {{Title}} {{Last Name}},

I am a PhD candidate with the Department of Politics and International Relations at Royal Holloway, and I'm conducting a national survey into the online voting experiences of young people. If you could share my survey with your {{Course (xxxx Students)}} students, I would be extremely grateful. Students attending {{University}} are a significant part of the survey sampling frame.

The survey can be shared using this link: {{Unique Survey Link, Google}} You should also have a copy of this invitation by post.

You can read a summary of my research here: https://theinternetvotingstudy.com/

If you have any questions at all, please contact me at nick.hatton@rhul.ac.uk or on 07962857788. My project is supervised by Dr Kaat Smets who can be reached at kaat.smets@rhul.ac.uk.

Many thanks in advance for your help.

Best wishes,

Nick Hatton

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Appendix 4.3, Participant Consent Form, Interviews

Interview Information and Consent Sheet

Title of Project: Attitudes to voting, offline and online

Researcher: Nick Hatton, nick.hatton@rhul.ac.uk

Research supervisor: Kaat Smets, kaat.smets@rhul.ac.uk

Introduction

You have been invited to take part in a research study. Before you decide whether to take part it is important that you know why the research is being done and what it will involve. Please take time to read the following information, and please ask if there is anything that is not clear or if you would like more information.

What is the study about?

The study examines how people think about voting and online voting, what their attitudes are towards how we vote, and what they want from a voting system. Voting and elections are an

integral part of democratic society, but we know very little about what people in the UK think about the act of voting and how they feel about advances in voting technology.

What does the interview involve?

The interview will be a structured 40 minute conversation with the interviewer. The interviewer will have a set of questions and talking points for you to discuss. There are no wrong answers and the interview is not a test of your knowledge. It will take place over the internet using Zoom, so you can participate from home. You will need a microphone and camera on your computer or phone to participate. The interview audio will be recorded and transcribed, but you will not be identified in any research. Names and identifying information will be redacted in all notes and published work.

Why have I been chosen?

You have been invited to participate in this study because you may have had the opportunity to vote online in the past 12 months. However, you do not need experience of online voting to participate in this study.

Do I have to take part?

It is your decision to participate. If you decide to participate, but later wish to withdraw from the study - you may do so and your contribution to the interview will be deleted.

Will my taking part in this study be kept confidential?

To ensure your data is protected, data collected by the study will be stored on a drive protected by two-factor authentication. Any duplicate files or files which became surplus to requirement will be deleted. You also have the right to withdraw from the study and have your data removed from the database. The project conforms to the Data Management Policy of Royal Holloway, University of London (Research data management and open data - Royal Holloway Staff Intranet).

What will happen to the results of the research study?

The study will be published as a PhD thesis, with the possibility of future articles and reports.

Who is organising and funding the research?

The research is organised by the department of politics and international relations at Royal Holloway, University of London, and is funded by the Leverhulme Trust.

Who has reviewed the study?

The research design was risk assessed within the researcher's home department, and was registered and self-certified with Royal Holloway's Ethics Committee.

Reimbursement

You will be reimbursed for your time with a £10.00 shopping voucher (Amazon/Apple/ASOS/Google Play/Steam/Waterstones).

Contact for Further Information

My supervisor can be contacted at kaat.smets@rhul.ac.uk

Thank you for participating in this research project.

Consent Section

If you are happy to participate in this study, please print your name below and return this form by email to nick.hatton@rhul.ac.uk

Name:

Date:

Appendix 4.4, Royal Holloway Ethics Certificate

https://drive.google.com/file/d/1SqArOAQwfe5Mh3HaMb60U4GfzIn32ZSX/view?usp=sharing

Appendix 5.1, KMO Results Table, all 25 IV Likert items

Question wording	Item code	KMO score
PU1 'Online voting enables me to vote quickly'	PU1	0.78
PU2 'Online voting fits in with a busy lifestyle'	PU2	0.81
PU3 'Online voting makes voting more efficient for me'	PU3	0.81
PC1 'Voting online takes much less effort than voting in person'	PC1	0.85
PC2 'Voting in a Student Union polling station would take too much time out of my day'	PC2	0.75
PC3 'If I could not vote online in Student Union elections, I would rather stay at home than vote'	PC3	0.71
BVC1 Voting should not be made too easy'	BVC1	0.75
BVC2 'Travelling to the polling station shows a commitment to democracy'	BVC2	0.75

BVC3R Effort and Voting SDS (Effort Positive)	BVC3	0.76
BVU1 ‘Everyone should vote on the same day ’	BVU1	0.53
BVU2 'It is important that everyone votes using the same tools, such as a paper ballot'	BVU2	0.73
BVU3R Secrecy and voting SDS (Secrecy Positive)	BVU3R	0.58
BVU4R Compulsory voting SDS (Compulsory Positive)	BVU4R	0.53
BPV1 ‘It is important that voting occurs in public spaces, such as schools, community centres, and churches etc’	BPV1	0.70
BPV2 'I like to be around people on polling day'	BPV2	0.69
BPV3R 'People don't need to be physically present to vote because you can do everything over the internet now'	BPV3R	0.88
BPV4 Community voting SDS (Community Positive)	BPV4	0.64
TT1 'Science and technology are making our lives healthier, easier, and more comfortable'	TT1	0.80
TT2 ‘In general, the internet is now a robust and safe environment in which to vote over’	TT2	0.67
TT3 ‘I feel assured that legal and technological structures adequately protect me from problems on the internet’	TT3	0.64
TT4R Generalised Trust SDS (Trusting Positive)	TT4R	0.72
PERS1R Research before voting SDS (Research Positive)	PERS1R	0.57
PERS2 Voting duty SDS (Duty Positive)	PERS2	0.53
PERS3 Tradition SDS (Tradition Positive)	PERS3	0.69
PERS4R Risk aversion SDS (Risk Aversion Positive)	PERS4	0.56
	KMO average	0.73

Appendix 5.2, Alternative PCA test including DV and DV adjacent items

PCA Summary Table					
Component	**Comp Title**	**Eigenvalue**	**Difference**	**Proportion of variance**	**Cumulative variance**
1	Comp1, Support for extension of online voting	5.89	3.52	0.20	0.20
2	Comp2, Perceived usefulness	2.37	0.22	0.08	0.28
3	Comp3, belief in voting cost	2.15	0.24	0.07	0.36
4	Comp4, Trust in technology	1.91	0.25	0.07	0.42

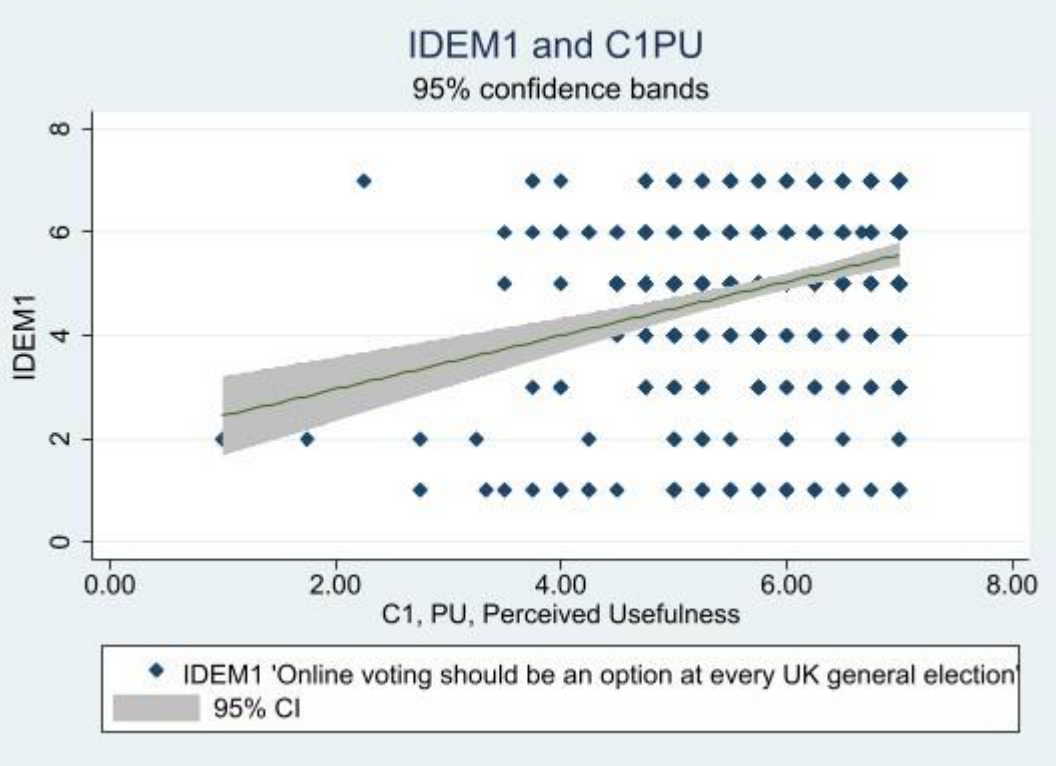
5	Comp5, Belief in secrecy	1.66	0.32	0.06	0.48
6	Comp6, Perceived Cost	1.34	0.03	0.05	0.53
7	Comp7, Belief in voting duty and compulsory voting	1.31	0.24	0.05	0.57
8	Comp8, Research before voting and tradition	1.07	0.05	0.04	0.61
9	Comp9, Belief in voting uniformity	1.03	0.10	0.04	0.65

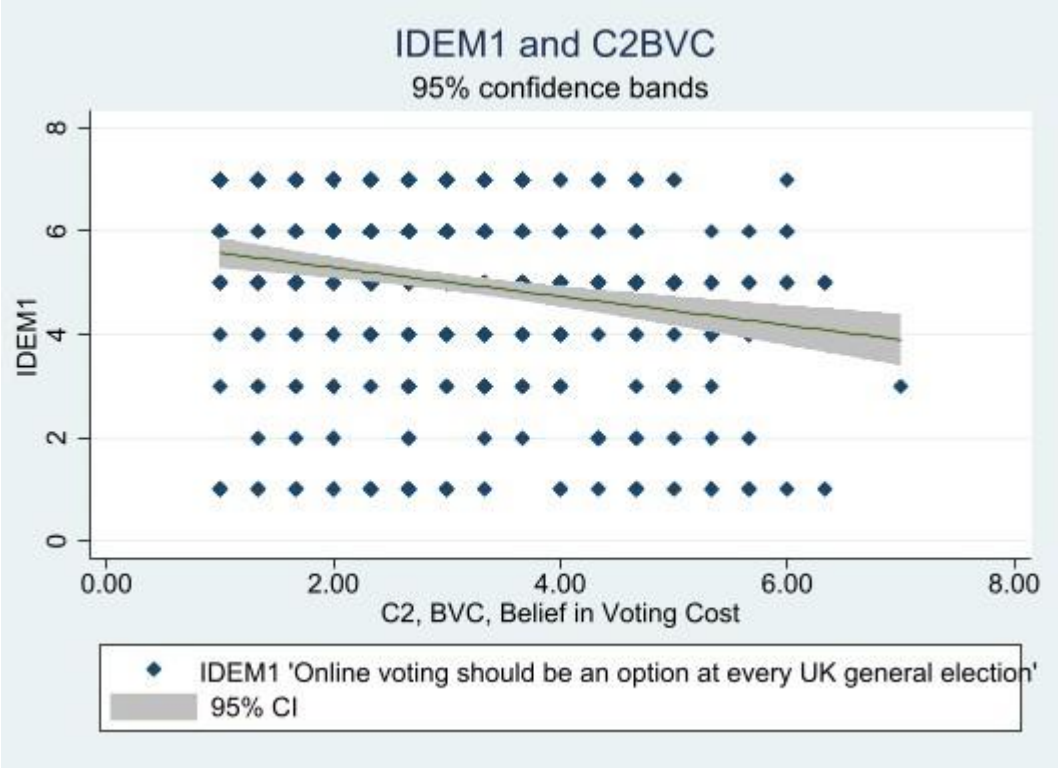
PCA Loading Table

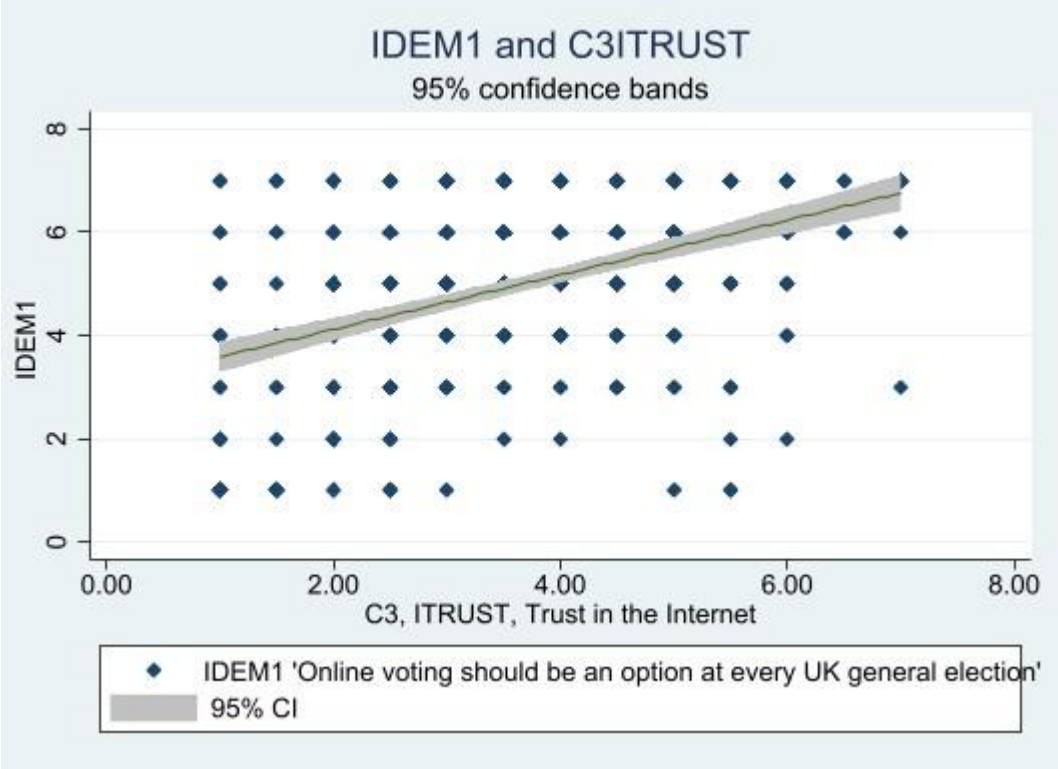
Survey Item	Comp 1	Comp 2	Comp 3	Comp 4	Comp 5	Comp 6	Comp 7	Comp 8	Comp 9	Unexplained
PU1	-0.03	**0.51**	0.00	-0.04	-0.01	-0.05	0.07	-0.01	0.00	0.33
PU2	0.00	**0.49**	-0.02	-0.03	-0.08	0.04	0.00	0.03	0.03	0.29
PU3	0.01	**0.48**	0.04	0.05	0.01	-0.01	-0.06	-0.02	-0.05	0.27
PC1	0.02	**0.40**	0.01	0.00	0.01	0.12	0.00	-0.02	0.04	0.43
PC2	-0.03	0.07	-0.04	-0.01	0.08	**0.57**	-0.04	-0.01	-0.03	0.35
PC3	0.00	-0.03	-0.02	0.05	0.01	**0.59**	-0.02	0.01	0.00	0.38
BVC1	0.00	-0.02	**0.50**	0.03	0.12	0.06	-0.08	0.03	0.03	0.35
BVC2	-0.15	0.08	**0.37**	0.24	-0.09	-0.13	0.09	-0.10	-0.02	0.44
BVC3R	0.07	0.02	**0.52**	-0.19	0.04	-0.08	-0.07	-0.11	-0.03	0.32
BVU1	0.02	0.01	-0.03	0.02	-0.07	-0.05	-0.01	0.09	**0.76**	0.26
BVU2	-0.09	-0.02	0.27	0.09	0.07	0.05	0.02	0.03	**0.39**	0.44
BVU3R	-0.02	-0.06	0.11	0.02	**0.57**	0.13	0.12	0.03	-0.11	0.41
BVU4R	0.07	-0.04	-0.02	-0.06	0.09	0.03	**0.69**	0.01	0.01	0.22
BPV1	-0.08	-0.06	0.26	0.06	-0.18	0.31	0.15	0.23	-0.18	0.45
BPV2	0.00	0.04	0.27	0.00	-0.40	-0.03	0.01	0.17	-0.15	0.43
BPV3R	0.30	0.08	-0.09	0.05	-0.02	0.05	-0.09	-0.06	0.09	0.42
BPV4	-0.07	-0.03	-0.06	0.03	-0.50	0.09	0.09	0.00	0.08	0.54
TT1	-0.22	0.07	-0.18	**0.56**	0.02	0.03	-0.04	-0.02	-0.06	0.38
TT2	0.21	-0.04	0.07	**0.48**	-0.03	0.00	0.00	-0.04	0.02	0.22
TT3	0.16	-0.09	0.10	**0.52**	0.02	0.04	0.00	-0.03	0.10	0.25

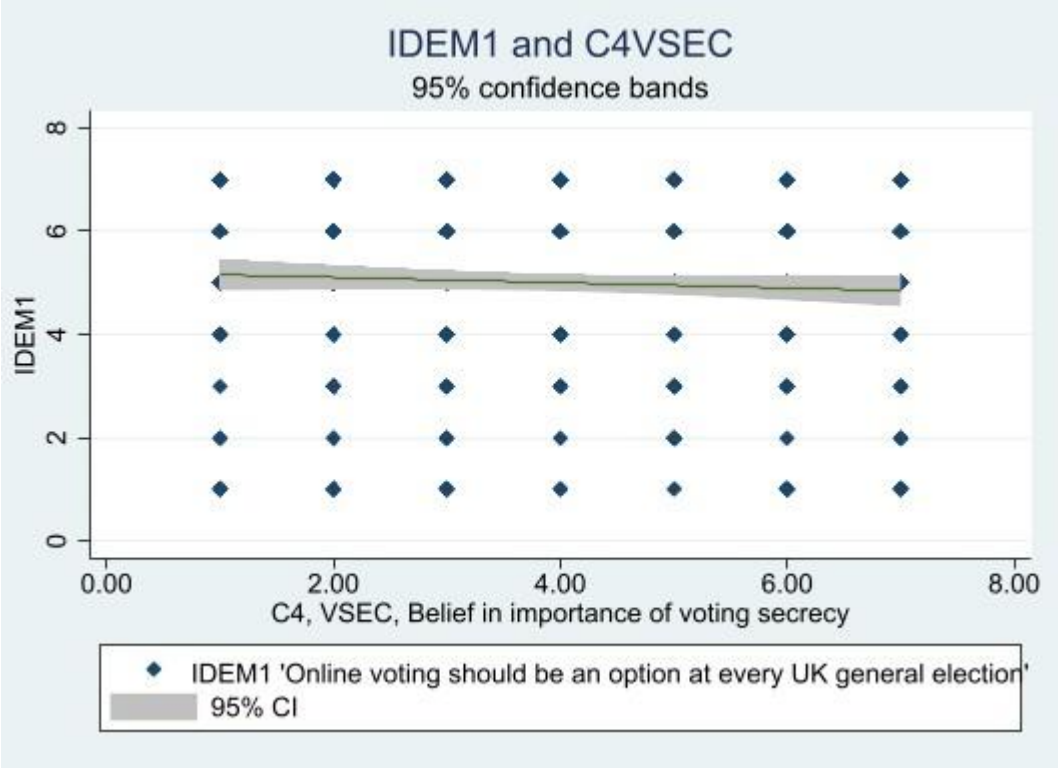
TT4R	0.08	0.02	-0.01	0.15	-0.08	-0.20	-0.07	0.20	-0.40	0.54
PERS1R	0.04	-0.06	-0.12	-0.04	-0.11	0.11	-0.05	**0.67**	0.03	0.34
PERS2	-0.06	0.06	-0.03	0.05	-0.07	-0.07	**0.65**	-0.03	0.00	0.24
PERS3	-0.02	0.08	0.12	-0.01	0.18	-0.14	0.03	**0.59**	0.10	0.36
PERS4R	-0.21	0.07	-0.15	0.18	0.30	-0.21	-0.01	0.19	-0.02	0.56
IDEM1	**0.49**	0.00	0.03	-0.02	0.05	-0.05	0.04	0.03	0.00	0.20
IDEM2	0.24	0.22	0.00	0.00	0.16	0.13	0.03	0.06	-0.02	0.38
IDEM3	**0.44**	0.02	-0.02	0.04	-0.03	-0.01	0.04	0.02	-0.02	0.21
IDEM4	**0.44**	-0.03	-0.02	0.04	-0.03	-0.04	0.02	0.02	-0.03	0.26

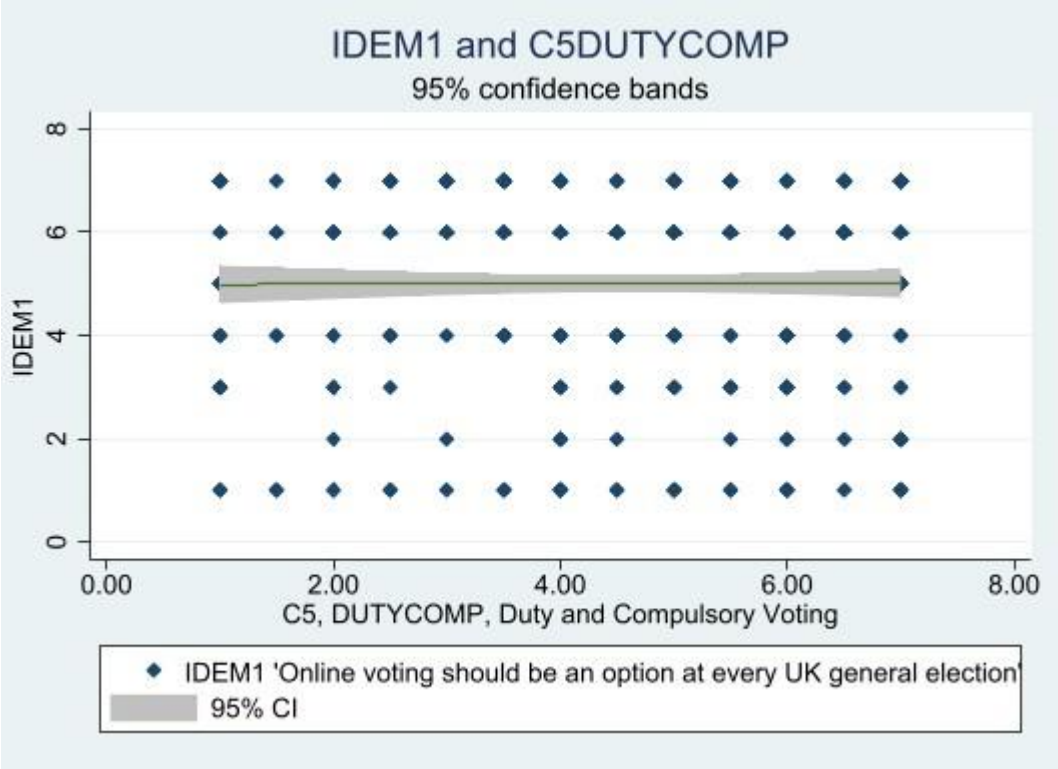
Appendix 5.3, Scatterplots for component 1-8 regressed against the DV (IDEM1, Support for the extension of RE-voting to national elections).

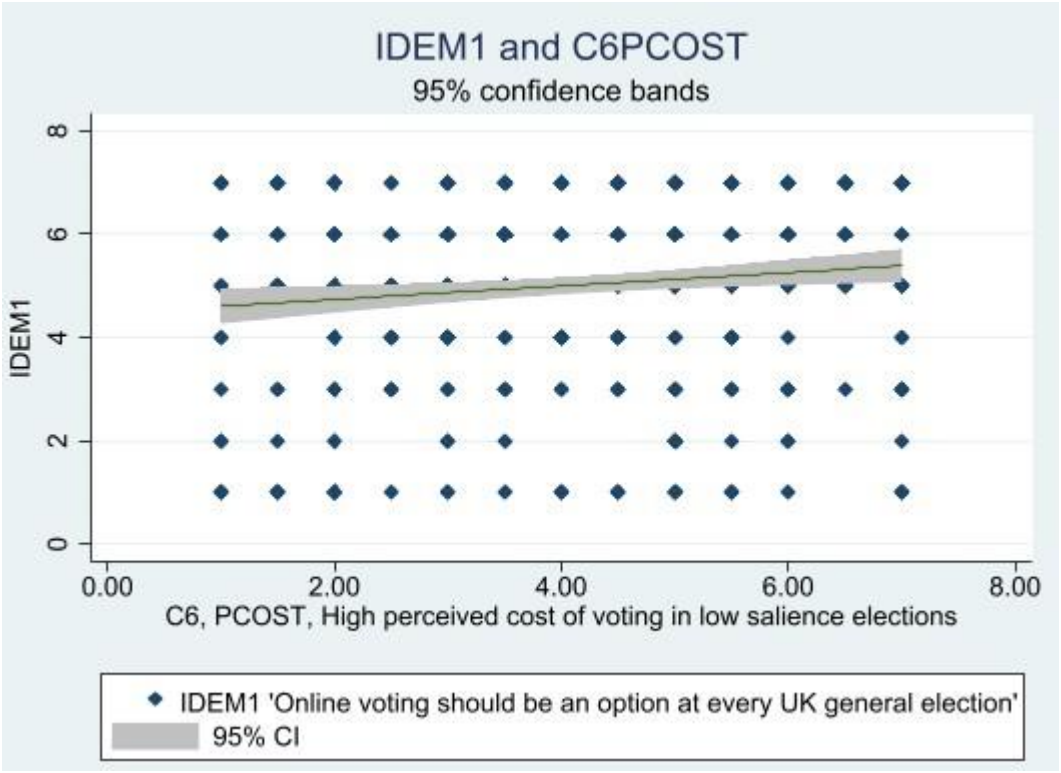


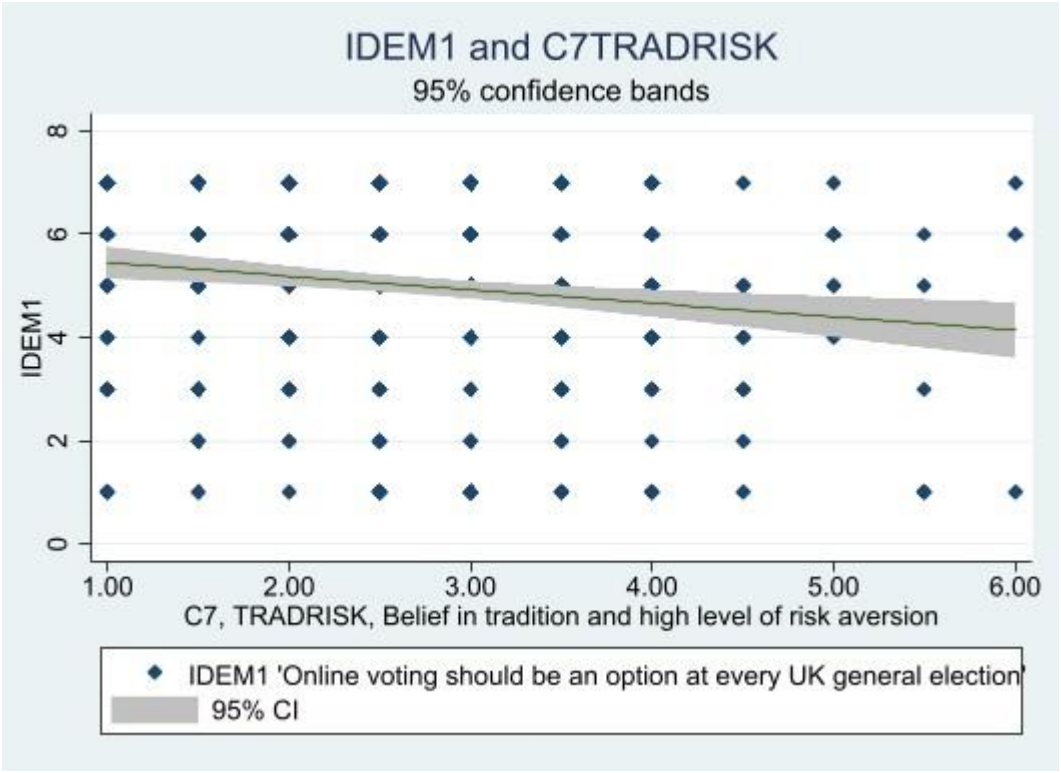

IDEM1 and C2BVC
95% confidence bands
IDEM1
0
2
4
6
8
0.00
2.00
4.00
6.00
8.00
C2, BVC, Belief in Voting Cost
IDEM1 'Online voting should be an option at every UK general election'
95% CI

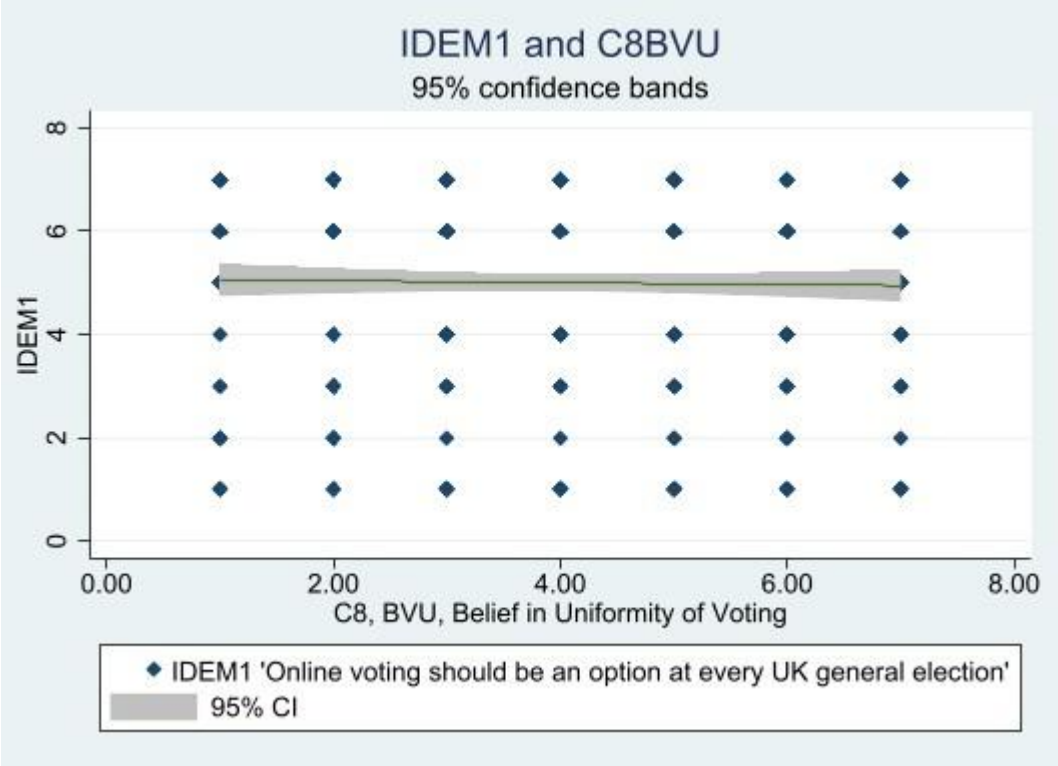

IDEM1 and C3ITRUST
95% confidence bands
IDEM1
0
2
4
6
8
0.00
2.00
4.00
6.00
8.00
C3, ITRUST, Trust in the Internet
IDEM1 'Online voting should be an option at every UK general election'
95% CI


IDEM1 and C4VSEC
95% confidence bands
IDEM1
0
2
4
6
8
0.00
2.00
4.00
6.00
8.00
C4, VSEC, Belief in importance of voting secrecy
IDEM1 'Online voting should be an option at every UK general election'
95% CI


IDEM1 and C5DUTYCOMP
95% confidence bands
IDEM1
0
2
4
6
8
0.00
2.00
4.00
6.00
8.00
C5, DUTYCOMP, Duty and Compulsory Voting
IDEM1 'Online voting should be an option at every UK general election'
95% CI


IDEM1 and C6PCOST
95% confidence bands
IDEM1
0
2
4
6
8
0.00
2.00
4.00
6.00
8.00
C6, PCOST, High perceived cost of voting in low salience elections
IDEM1 'Online voting should be an option at every UK general election'
95% CI


IDEM1 and C7TRADRISK
95% confidence bands
IDEM1
0
2
4
6
8
1.00
2.00
3.00
4.00
5.00
6.00
C7, TRADRISK, Belief in tradition and high level of risk aversion
IDEM1 'Online voting should be an option at every UK general election'
95% CI



Appendix 5.4, Structural Equation Model summary table

Structural Variables (Indicated by straight arrows in SEM diagram)						
Variable	**Standardised Coefficient**	**Standard Error**	**z score**	**P>|z|**	**Lower confidence interval**	**Upper confidence interval**
IDEM1, Online voting should be an option at every UK general election-						
C3ITRUST Trust in the Internet	0.40	0.04	10.31	0.00	0.33	0.48
C1PU Perceived Usefulness	0.15	0.04	3.64	0.00	0.07	0.24
C7TRADRISK Belief in tradition and Risk Aversion	-0.09	0.04	-2.25	0.02	-0.17	-0.01

C2BVC Belief in Voting Cost	-0.17	0.04	-4.10	0.00	-0.25	-0.09
Constant	1.63	0.31	5.26	0.00	1.02	2.23
Variable Means (Figures on top right SEM diagram boxes)						
Variable	**Standardised Coefficient**	**Standard Error**	**z score**	**P>|z|**	**Lower confidence interval**	**Upper confidence interval**
mean(C3ITRUST Trust in the Internet)	2.42	0.09	25.68	0.00	2.24	2.61
mean(TT1 Science and technology are making our lives easier)	3.58	0.13	27.65	0.00	3.33	3.83
mean(TT4R Generalised Trust)	2.37	0.09	25.52	0.00	2.18	2.55
mean(C6PCOST High Perceived Cost)	2.43	0.09	25.68	0.00	2.24	2.61
mean(C1PUPerceivedUsefulness)	5.81	0.20	28.89	0.00	5.41	6.20
mean(C7TRADRISKBeliefintradition)	2.59	0.10	26.08	0.00	2.39	2.78
mean(C2BVCBeliefinVotingCost)	2.27	0.09	25.22	0.00	2.09	2.44
mean(C8BVUBeliefinUniformityof)	2.17	0.09	24.89	0.00	2.00	2.34
mean(C4VSECBeliefinimportanceof)	2.07	0.08	24.56	0.00	1.91	2.24
mean(BPV4RCommunityvotingSDSIndiv)	2.21	0.09	25.03	0.00	2.03	2.38
mean(BPV2Iliketobearoundpeople)	2.40	0.09	25.63	0.00	2.22	2.59
Unexplained Variance Report (Figures on bottom right of SEM diagram boxes)						

Variable	Standardised Coefficient	Standard Error	z score	P>|z|	Lower confidence interval	Upper confidence interval
var(e.IDEM1Onlinevotingshouldbean)	0.72	0.04			0.65	0.79
var(C3ITRUSTTrustintheInternet)	1.00	.			.	.
var(TT1Scienceandtechnologyarem)	1.00	.			.	.
var(TT4RGeneralisedTrustTrustEmp)	1.00	.			.	.
var(C6PCOSTHighperceivedcosto)	1.00	.			.	.
var(C1PUPerceivedUsefulness)	1.00	.			.	.
var(C7TRADRISKBeliefintradition)	1.00	.			.	.
var(C2BVCBeliefinVotingCost)	1.00	.			.	.
var(C8BVUBeliefinUniformityof)	1.00	.			.	.
var(C4VSECBeliefinimportanceof)	1.00	.			.	.
var(BPV4RCommunityvotingSDSIndiv)	1.00	.			.	.
var(BPV2Iliketobearoundpeople)	1.00	.			.	.
Covariance Reports (Indicated on curved arrows)						
Variable	**Standardised Coefficient**	**Standard Error**	**z score**	**P>|z|**	**Lower confidence interval**	**Upper confidence interval**
cov(C3ITRUSTTrustintheInternet,						
TT1Scienceandtechnologyarem)	0.32	0.04	7.45	0.00	0.23	0.40

cov(C3ITRUSTTrustintheInternet,						
TT4RGeneralisedTrustTrustEmp)	0.16	0.05	3.45	0.00	0.07	0.25
cov(TT1Scienceandtechnologyarem,						
TT4RGeneralisedTrustTrustEmp)	0.09	0.05	1.99	0.05	0.00	0.19
cov(C6PCOSTHighperceivedcosto,						
C1PUPerceivedUsefulness)	0.30	0.04	6.95	0.00	0.22	0.39
cov(C6PCOSTHighperceivedcosto,						
BPV2RIliketobearoundpeople)	0.11	0.05	-2.33	0.02	0.02	0.20
cov(C1PUPerceivedUsefulness,						
BPV2RIliketobearoundpeople)	0.10	0.05	-2.04	0.04	0.00	0.19
cov(C7TRADRISKBeliefintradition,						
C2BVCBeliefinVotingCost)	0.14	0.05	3.11	0.00	0.05	0.24
cov(C7TRADRISKBeliefintradition,						
C8BVUBeliefinUniformityof)	0.10	0.05	2.13	0.03	0.01	0.19
cov(C7TRADRISKBeliefintradition,						
C4VSECBeliefinimportanceof)	0.18	0.05	3.82	0.00	0.09	0.27
cov(C7TRADRISKBeliefintradition,						
BPV4RCommunityvotingSDSIndiv)	0.14	0.05	3.09	0.00	0.05	0.24
cov(C2BVCBeliefinVotingCost,						
C8BVUBeliefinUniformityof)	0.14	0.05	2.93	0.00	0.05	0.23
cov(C2BVCBeliefinVotingCost,						
BPV2RIliketobearoundpeople)	-0.30	0.04	6.83	0.00	-0.38	-0.21

cov(C4VSECBeliefinimportanceof,						
BPV4RCommunityvotingSDSIndiv)	0.22	0.05	4.93	0.00	0.13	0.31

Appendix 6.1, Experience as a factor interaction variable, five interaction models

Perceived Usefulness Interaction Model					
(DV) IDEM1	**Coefficient**	**Std. err.**	**t**	**P>t**	**Standardised Coefficient**
C1PU, Perceived Usefulness	0.26	0.09	2.81	0.01	0.15
C2BVC, Belief in Voting Cost	-0.21	0.05	-3.82	0.00	-0.16
C3ITRUST, Trust in the Internet	0.46	0.05	9.41	0.00	0.40
C6PCOST, Aversion to Voting Cost	-0.02	0.04	-0.52	0.60	-0.02
C7TRADRISK, Belief in Tradition and Risk Aversion	-0.16	0.07	-2.25	0.03	-0.09
C8BVU, Belief in Voting Uniformity	-0.01	0.04	-0.28	0.78	-0.01
1.VOEXPALL, Experience Level (0/1)	-0.83	0.87	-0.95	0.34	-0.24
VOEXPALL#c.C1PU 1	0.09	0.14	0.64	0.52	0.16
constant	3.12	0.61	5.09	0.00	.
Adjusted r squared= 0.27					

Source	**SS**	**df**	**MS**	**Number of obs**	443
Model	386.28	8	48.28	**F(8, 434)**	21.84
Residual	959.64	434	2.21	**Prob > F**	0
Total	1,345.92	442	3.05	**R-squared**	0.29
				Adj R-squared	0.27

				Root MSE	1.49

Belief in Voting Cost Interaction Model					
(DV) IDEM1	**Coefficient**	**Std. err.**	**t**	**P>t**	**Standardised Coefficient**
C1PU, Perceived Usefulness	0.30	0.08	3.96	0.00	0.17
C2BVC, Belief in Voting Cost	-0.27	0.07	-3.86	0.00	-0.21
C3ITRUST, Trust in the Internet	0.46	0.05	9.53	0.00	0.40
C6PCOST, Aversion to Voting Cost	-0.02	0.04	-0.48	0.63	-0.02
C7TRADRISK, Belief in Tradition and Risk Aversion	-0.16	0.07	-2.32	0.02	-0.10
C8BVU, Belief in Voting Uniformity	-0.01	0.04	-0.34	0.73	-0.01
1.VOEXPALL, Experience Level (0/1)	-0.71	0.36	-1.96	0.05	-0.20
VOEXPALL#c.C2BVC 1	0.14	0.11	1.28	0.20	0.14
constant	3.06	0.54	5.65	0.00	.
Adjusted r squared= 0.28					

Source	**Sum of squares**	**Degrees of Freedom**	**Mean of Squares**	**Number of observations**	443
Model	388.98	8	48.62	**F(8, 434)**	22.05
Residual	956.94	434	2.20	**Prob > F**	0
Total	1,345.92	442	3.05	**R-squared**	0.29
				Adj R-squared	0.28
				Root MSE	1.48

Institutional Trust in the Internet Interaction Model					
(DV) IDEM1	**Coefficient**	**Std. err.**	**t**	**P>t**	**Beta**
C1PU, Perceived Usefulness	0.29	0.08	3.87	0.00	0.17
C2BVC, Belief in Voting Cost	-0.21	0.05	-3.90	0.00	-0.16
C3ITRUST, Trust in the Internet	0.45	0.06	7.15	0.00	0.40
C6PCOST, Aversion to Voting Cost	-0.02	0.04	-0.51	0.61	-0.02
C7TRADRISK, Belief in Tradition and Risk Aversion	-0.15	0.07	-2.24	0.03	-0.09

C8BVU, Belief in Voting Uniformity	-0.01	0.04	-0.27	0.79	-0.01
1.VOEXPALL, Experience Level (0/1)	-0.34	0.38	-0.90	0.37	-0.10
VOEXPALL#c.C3ITRUST 1	0.01	0.09	0.15	0.88	0.02
constant	2.95	0.55	5.37	0.00	.
Adjusted r squared= 0.27					

Source	**Sum of squares**	**Degrees of Freedom**	**Mean of Squares**	**Number of observations**	443
Model	385.43	8	48.18	**F(8, 434)**	21.77
Residual	960.49	434	2.21	**Prob > F**	0
Total	1,345.92	442	3.05	**R-squared**	0.29
				Adj R-squared	0.27
				Root MSE	1.49

C6PCOST, Aversion to of Voting Cost Interaction Model					
(DV) IDEM1	**Coefficient**	**Std. err.**	**t**	**P>t**	**Standardised Coefficient**
C1PU, Perceived Usefulness	-0.42	0.39	-1.06	0.29	-0.12
C2BVC, Belief in Voting Cost	0.29	0.08	3.87	0.00	0.17
C3ITRUST, Trust in the Internet	-0.21	0.05	-3.91	0.00	-0.16
C6PCOST, Aversion to Voting Cost	0.46	0.05	9.45	0.00	0.40
C7TRADRISK, Belief in Tradition and Risk Aversion	-0.15	0.07	-2.16	0.03	-0.09
C8BVU, Belief in Voting Uniformity	-0.01	0.04	-0.28	0.78	-0.01
1.VOEXPALL, Experience Level (0/1)	-0.04	0.06	-0.63	0.53	-0.03
VOEXPALL#c.C6PCOST 1	0.03	0.09	0.36	0.72	0.04
constant	2.97	0.54	5.46	0.00	.
Adjusted r squared= 0.27					

Source	**Sum of squares**	**Degrees of Freedom**	**Mean of Squares**	**Number of observations**	443
Model	385.67	8	48.21	**F(8, 434)**	21.79
Residual	960.25	434	2.21	**Prob > F**	0
Total	1,345.92	442	3.05	**R-squared**	0.29

				Adj R-squared	0.27
				Root MSE	1.49

C8BVU, Belief in Voting Uniformity Interaction Model					
(DV) IDEM1	**Coefficient**	**Std. err.**	**t**	**P>t**	**Standardised Coefficient**
C1PU, Perceived Usefulness	0.29	0.08	3.87	0.00	0.17
C2BVC, Belief in Voting Cost	-0.21	0.05	-3.92	0.00	-0.17
C3ITRUST, Trust in the Internet	0.46	0.05	9.45	0.00	0.40
C6PCOST, Aversion to Voting Cost	-0.02	0.04	-0.51	0.61	-0.02
C7TRADRISK, Belief in Tradition and Risk Aversion	-0.15	0.07	-2.24	0.03	-0.09
C8BVU, Belief in Voting Uniformity	-0.01	0.05	-0.23	0.82	-0.01
1.VOEXPALL, Experience Level (0/1)	-0.30	0.34	-0.87	0.38	-0.08
VOEXPALL#c.C8BVU 1	0.00	0.08	0.04	0.97	0.00
constant	2.93	0.55	5.30	0.00	.
Adjusted r squared= 0.27					

Source	**Sum of squares**	**Degrees of Freedom**	**Mean of Squares**	**Number of observations**	443
Model	385.38	8	48.17	**F(8, 434)**	21.77
Residual	960.54	434	2.21	**Prob > F**	0
Total	1,345.92	442	3.05	**R-squared**	0.29
				Adj R-squared	0.27
				Root MSE	1.49

#

Appendix 6.2, Average marginal effect reports

C1PU, Perceived Usefulness						
Experience Level (0/1)	**Margin**	**Delta-method standard error**	**t**	**P>t**	**Lower confidence interval (95%)**	**Upper confidence interval (95%)**
1 0	3.80	0.44	8.57	0.00	2.93	4.67
1 1	3.17	0.60	5.28	0.00	1.99	4.35
2 0	4.07	0.36	11.42	0.00	3.37	4.77
2 1	3.51	0.49	7.23	0.00	2.55	4.46
3 0	4.34	0.27	16.00	0.00	3.80	4.87
3 1	3.84	0.37	10.34	0.00	3.11	4.58
4 0	4.61	0.19	24.25	0.00	4.23	4.98
4 1	4.18	0.26	15.98	0.00	3.67	4.70
5 0	4.88	0.12	40.35	0.00	4.64	5.11
5 1	4.52	0.16	27.83	0.00	4.20	4.84
6 0	5.15	0.10	53.99	0.00	4.96	5.33
6 1	4.86	0.11	44.90	0.00	4.65	5.08
7 0	5.42	0.14	38.77	0.00	5.14	5.69
7 1	5.20	0.16	33.22	0.00	4.89	5.51

C2BVC, Belief in Voting Cost						
Experience Level (0/1)	**Margin**	**Delta-method standard error**	**t**	**P>t**	**Lower confidence interval (95%)**	**Upper confidence interval (95%)**
1 0	5.65	0.17	33.14	0.00	5.32	5.99
1 1	5.10	0.20	25.05	0.00	4.70	5.50
2 0	5.40	0.12	45.30	0.00	5.16	5.63
2 1	4.97	0.14	35.46	0.00	4.70	5.25
3 0	5.14	0.09	54.47	0.00	4.96	5.33
3 1	4.85	0.11	44.69	0.00	4.63	5.06
4 0	4.89	0.12	42.47	0.00	4.66	5.11
4 1	4.72	0.13	35.49	0.00	4.46	4.98

5 0	4.63	0.16	28.10	0.00	4.31	4.96
5 1	4.60	0.19	23.74	0.00	4.22	4.98
6 0	4.38	0.23	19.44	0.00	3.94	4.82
6 1	4.47	0.27	16.76	0.00	3.95	5.00
7 0	4.12	0.29	14.24	0.00	3.55	4.69
7 1	4.35	0.34	12.62	0.00	3.67	5.02

C3ITRUST, Institutional Trust in the Internet						
Experience Level (0/1)	**Margin**	**Delta-method standard error**	**t**	**P>t**	**Lower confidence interval (95%)**	**Upper confidence interval (95%)**
1 0	3.90	0.19	20.38	0.00	3.52	4.27
1 1	3.60	0.22	16.03	0.00	3.16	4.04
2 0	4.36	0.14	31.14	0.00	4.08	4.63
2 1	4.07	0.17	24.60	0.00	3.74	4.39
3 0	4.82	0.10	46.92	0.00	4.61	5.02
3 1	4.53	0.12	37.56	0.00	4.29	4.77
4 0	5.28	0.10	54.25	0.00	5.08	5.47
4 1	4.99	0.11	45.29	0.00	4.77	5.21
5 0	5.74	0.13	44.88	0.00	5.48	5.99
5 1	5.45	0.14	38.43	0.00	5.18	5.73
6 0	6.19	0.18	35.09	0.00	5.85	6.54
6 1	5.92	0.20	30.15	0.00	5.53	6.30
7 0	6.65	0.23	28.65	0.00	6.20	7.11
7 1	6.38	0.26	24.60	0.00	5.87	6.89

C6PCOST, Aversion to Voting Cost						
Experience Level (0/1)	**Margin**	**Delta-method standard error**	**t**	**P>t**	**Lower confidence interval (95%)**	**Upper confidence interval (95%)**
1 0	5.25	0.19	27.39	0.00	4.87	5.62
1 1	4.86	0.25	19.13	0.00	4.36	5.36

2 0	5.21	0.14	35.99	0.00	4.92	5.49
2 1	4.86	0.19	25.00	0.00	4.47	5.24
3 0	5.17	0.11	47.81	0.00	4.96	5.39
3 1	4.85	0.14	34.04	0.00	4.57	5.13
4 0	5.14	0.09	54.30	0.00	4.95	5.32
4 1	4.85	0.11	43.69	0.00	4.63	5.07
5 0	5.10	0.11	45.31	0.00	4.88	5.32
5 1	4.84	0.12	41.36	0.00	4.61	5.07
6 0	5.07	0.15	33.49	0.00	4.77	5.36
6 1	4.84	0.16	30.90	0.00	4.53	5.15
7 0	5.03	0.20	25.29	0.00	4.64	5.42
7 1	4.83	0.21	22.86	0.00	4.42	5.25

C8BVU, Belief in Voting Uniformity						
Experience Level (0/1)	**Margin**	**Delta-method standard error**	**t**	**P>t**	**Lower confidence interval (95%)**	**Upper confidence interval (95%)**
1 0	5.17	0.20	26.51	0.00	4.79	5.56
1 1	4.88	0.19	25.50	0.00	4.50	5.26
2 0	5.16	0.15	34.01	0.00	4.86	5.46
2 1	4.87	0.15	33.11	0.00	4.58	5.16
3 0	5.15	0.12	44.51	0.00	4.92	5.38
3 1	4.86	0.12	41.98	0.00	4.63	5.09
4 0	5.14	0.10	53.78	0.00	4.95	5.33
4 1	4.85	0.11	44.43	0.00	4.64	5.07
5 0	5.13	0.10	50.61	0.00	4.93	5.32
5 1	4.84	0.13	36.94	0.00	4.59	5.10
6 0	5.11	0.13	39.49	0.00	4.86	5.37
6 1	4.84	0.17	28.29	0.00	4.50	5.17
7 0	5.10	0.17	30.13	0.00	4.77	5.44
7 1	4.83	0.22	22.04	0.00	4.40	5.26

Appendix 7.1 Interview question list

Interview Section	#	Question Theme	Question text
1) Experience & Motivation	1	Experience, online elections	Have you ever voted online, in any election?
	2	Online election motivation	What motivated you to vote in that online election?
	5	Counterfactual voting question	Would you still have voted if the online election was held offline?
	3	Experience, higher elections	Have you ever voted in a council/regional/national government election?
	4	Higher election motivation	What motivated you to vote in the council/regional/national government election?
2) Attitude to voter participation	6	Compulsory voting	In Australian elections, voting is compulsory. What do you think about compulsory voting being used in the UK?
	7	Voting duty	Do you think people have a duty to vote?
	8	Perception of voting effort	Do you think of voting as being a low-effort, or high-effort activity?
	9	Perception of voter turnout	Without knowing the figures, do you feel enough people are voting in general elections in the UK?
	10	Attitudes to online voting	Do you consider online voting to be an important development for democracy in the UK?
	11	Ease of voting	Groups like the Electoral Reform Society want to make voting much easier. How do you feel about making it easier for people to vote?
3) Voting cost/effort and location of voting	12	Minimum effort and voting	Some people believe that voting should require some minimum amount of effort from the voter - what do you think about this?
	13	Embodied presence	Do you feel that voting from a polling station has any benefits, other than casting a vote?
	14	Public/Private Voting	Is it important that we vote in public and are seen by each other when we vote?
4) Trust in institutions and technology	15	Political advantage	Do you think that online voting would give an advantage to any of the UK's political parties
	16	Trust in government	Do you trust the government to administer online elections?

	17	General attitude to technology	Do you feel that technology solves our problems more often than not?
	18	Future of online voting	Do you think that voting online will be used in general elections within the next 25 years?

Appendix 7.2 Interview participant and method summary table

Interview number	Participant identity code	Interview date	Interview duration (minutes)	Interview Medium	Recording Method
1	JA1	03/05/2021	44	Video call	Audio Recording
2	FR1	05/05/2021	35	Video call	Audio Recording
3	OS1	05/05/2021	25	Video call	Audio Recording
4	CA1	07/05/2021	33	Video call	Audio Recording
5	PO1	09/05/2021	44	Video call	Audio Recording
6	AN1	12/05/2021	37	Video call	Audio Recording
7	EV1	12/05/2021	65	Video call	Audio Recording
8	MA1	12/05/2021	36	Video call	Audio Recording
9	EL1	13/05/2021	38	Video call	Audio Recording
10	LE1	13/05/2021	74	Video call	Audio Recording
11	OL1	13/05/2021	53	Video call	Audio Recording
12	BE1	14/05/2021	36	Video call	Audio Recording
13	LA1	14/05/2021	36	Video call	Audio Recording
14	ST1	14/05/2021	51	Video call	Audio Recording
15	HA1	19/05/2021	55	Video call	Audio Recording
16	SA1	19/05/2021	31	Video call	Audio Recording
17	AI1	20/05/2021	46	Video call	Audio Recording
18	RO1	20/05/2021	36	Video call	Audio Recording
19	SO1	20/05/2021	36	Video call	Audio Recording
20	LU1	21/05/2021	46	Video call	Audio Recording
21	PA1	21/05/2021	62	Video call	Audio Recording
22	RA1	23/05/2021	28	Video call	Audio Recording
23	RI1	26/05/2021	60	Video call	Audio Recording
24	CA2	31/05/2021	34	Video call	Audio Recording

25	NA1	31/05/2021	46	Video call	Audio Recording
26	SO2	31/05/2021	65	Video call	Audio Recording
27	JA2	02/06/2021	34	Video call	Audio Recording
28	ST2	02/06/2021	42	Video call	Audio Recording
29	AN2	20/06/2021	41	Video call	Audio Recording
30	RO1	20/06/2021	32	Video call	Audio Recording
31	SA2	20/06/2021	42	Video call	Audio Recording
32	AN3	23/06/2021	49	Video call	Audio Recording
33	SU1	30/06/2021	30	Video call	Audio Recording
34	AL1	01/07/2021	44	Video call	Audio Recording