# A VIRTUAL INEVITABILITY?: RECONCEPTUALISING THE INTERET VOTING DEBATE WITH EVIDENCE FROM CANADA AND ABROAD

by

Davis Yuzdepski

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## Dedication

This thesis is dedicated to young voters. Keep up the good work.

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**Abstract**

The Internet is changing democracy in many important ways. Though governments have proven willing to leverage technology for service delivery in many instances, perhaps the *most* important democratic act – the casting of ballots during an election – has remained largely unchanged since the mid 19th-century. Trivial to most regular voters, the requirement to cast a paper ballot at a brick-and-mortar polling location may not only disenfranchise those who face barriers of *physical* access, but also, is demonstrated to introduce a variety of *perceived costs* to irregular, inexperienced, first-time-eligible, and youth electors, which may be limiting overall participation. This paper tests claims of Internet voting proponents, including those of increased turnout, and greater voting-habit formation. It weighs these against the noted risks, particularly to security and trust. A synthesis of a variety of literatures demonstrates that there are reasonable grounds for optimism with regards to the implementation of Internet voting.

## List of Abbreviations Used

| | |
|---|---|
| CES | Canadian Election Study |
| E2E-V | End-to-end Verifiability |
| ECSE | Elections Canada Survey of Electors |
| TAM | Technology Acceptance Model |
| UK | United Kingdom |
| US | United States |

# Chapter 1: Introduction

## 1.1 Impetus for Research

It is apparent that the form and function of democracy has changed drastically over time, augmenting and evolving to meet many ends, the most important of which is likely self-preservation (Toots, Kalvet, and Krimmer 2016, 1). At the bedrock of democracy are elections – contests wherein the governed select who will govern, thus demonstrating that rule is not imposed from above, but rather, mandated from below (Kostelka and Blais 2018, 371). Like democracy itself, the form and function of elections have changed substantially, especially over the past two centuries, notably through the long and sordid process of enfranchisement. One aspect of elections, however, has remained virtually unchanged since the mid-19$^{th}$ century: the process by which ballots are cast (Alvarez, Katz, and Pomares 2011, 199). Thus, to this end, measures which seek to improve upon the humble pencil and paper address a peculiar quandary of our time: no longer are large numbers denied the right to vote, but rather, so few appear interested in participating in electoral democracy that the legitimacy of the system itself is, at times, called into question (Barisoff and James 2012, 12; Lust 2018, 67; Oostveen and Van den Besselaar 2004, 65).

At the cutting edge of this process (often described as *electoral modernization*) exists a ballot-casting model utilizing a technology which has penetrated modern society to levels of near-ubiquity: The Internet. Proponents of Internet voting cite a range of benefits: greater turnout – particularly amongst younger voters; enhanced access and thus greater claims at equal opportunity for participation, and greater trust in the electoral system overall (Mugica 2015, 111; Hajnal and Trounstine 2005, 515). The amalgam of

these benefits, in theory, might be more representative leadership, and ultimately, a healthier, more robust, and greater-functioning democracy writ large.

This project seeks to meet two ends. First, it will examine the body of research produced by those who have studied and offered commentary on Internet voting, a field of study where the vast majority of scholarship has been produced in just the past two decades. Scholars from a wide variety of disciplines using an array of investigative techniques have considered potential ramifications which may occur as a result of introducing Internet technology into the electoral process. This is true not only with regards to the form and function of elections themselves, but potential implications may affect the form and function of *democracy* writ large. After two decades of producing and accumulation this highly interdisciplinary research, there now exists a need for amalgamation. This project, therefore, will employ a literature synthesis methodology with the hopes of both reconceptualising the 'state of the field', as well as provide new directions for future study. The second purpose of this research will be to supplement existing Internet voting turnout data amassed from four previous Ontario municipal electoral cycles with *new* data generated from the most recent 2018 municipal election in that province. Through this process, it is possible to identify trends which have emerged since the technology was first adopted at this level of government in 2003.

The remainder of this chapter will provide a full review of the literature, detailing the scope and aims of existing Internet voting scholarship. It will introduce the cases which have been most thoroughly studied, including municipalities in Ontario and Nova Scotia, as well as in several European political contexts. Chapter 2 will introduce the reader to the most common claim of Internet voting proponents: that of a relationship

between the introduction of online balloting and subsequent increases in *voter turnout*. This is a relationship which has been the subject of intense theorization, and, thanks to many real-world examples of Internet voting, a growing amount of empirical scrutiny as well. In chapter 3, two original studies introducing turnout data from the 2018 Ontario Municipal election will be presented. The adoption of Internet voting by 12 Ontario municipalities in 2003 provides five election cycles for study, and thus, an ideal opportunity to identify longitudinal trends. Chapter 4 will examine the role of *trust* in electoral democracy, and specifically, what effect Internet voting might have on this relationship. Crucial to this discussion is the issue of *security*. Though the bulk of this work will focus on the sociopolitical ramifications of Internet voting, an introduction to the more technical aspects of the debate is warranted. Thus, the computer science, telecommunications, and information systems literatures are consulted, and a number of models for secure Internet voting models examined. Chapter 5 will conclude with several recommendations generated from this research process, intended to inform future research and policy agendas.

Ultimately, one must be aware of three key ideas. The first is that no electoral system, be it conducted on paper or over the Internet, is perfect. All systems have flaws, and all are vulnerable to certain abnormalities, anomaly, and even attack (Realpe-Muñoz et al. 2018, 193). Necessarily, therefore, trade-offs are always made in selecting one system over another, including the decision to remain with the status quo. Second, and related to the first, every jurisdiction is unique. What works in some Ontario municipalities may not work in other municipalities, or at other levels of government. Likewise, what works in Estonia or Switzerland may not work in Canada and vice versa.

Political context always matters, and therefore, one must always be cautious about generalizing results. Third, the Internet will affect democracy instrumentally *regardless* of whether or not the ballots themselves are cast online. This should be apparent to anyone even remotely aware of the major political developments of the last two decades.

Given these factors, it would be difficult to defend a conclusion which states simply that Internet voting *ought* or *ought not* be used. What *can* be expounded with confidence is that policymakers must offer, inasmuch as possible, electoral processes which *engender trust* and *provide maximum opportunity for participation*. Though Internet voting is a choice with clear risks and benefits, this paper demonstrates that the status quo is also a choice with risks and benefits (as opposed to the 'default'). Given the importance of the electoral process to democracy writ large, this choice must be thoroughly justified. A discussion of alterative voting models, accordingly, is vastly incomplete without a thorough understanding of Internet voting. This is because, as this research concludes, sufficient evidence of efficacy has accumulated that *virtually all jurisdictions should consider offering Internet voting* as an electoral modernization measure.

## 1.2 Review of the Literature: A Kaleidoscopic Field

The literature on Internet voting is both broad and diffuse. It is broad in that a wide array of fields and disciplines, including computer science, information systems, public administration and political science have contributed to the open-ended, and, as of yet, unanswered question regarding the introduction of technology into electoral processes (Choi and Kim 2012, 434). It is diffuse, given the multitude of methodological

approaches, theories, and instruments used to construct answers to many of the burgeoning questions which have emerged over two decades of study. This review of the literature will proceed, firstly, by justifying the *need* for a study of this nature. This justification rests on the fact that even a cursory survey of the literature, in concert with knowledge of several real-world developments – particularly those within the Canadian context – demonstrates a situation in which the *implementation* of Internet voting is outpacing the *academic study* of the resulting phenomena (Goodman and Pammett 2014, 15; Goodman et al. 2018, 167). Secondly, it will bring the reader 'up to speed' with regards to the research approaches, as well as the proceeding debates which have become commonplace in the Internet voting literature. Finally, it will highlight the hypothesized benefits, as well as the risks of Internet voting implementation, discussing how these hypotheses have been tested, and examining the resultant findings. Through this process, it may be concluded that there is a substantial need for a proliferation of Internet voting scholarship, particularly within the Canadian municipal context, and particularly using methods which look beyond the surface level inquiries of voter turnout and security concerns[1] (Goodman and Smith 2017, 164).

[1] For example, Goodman and Smith (2017, 164) write that the debates "between proponents and opponents of Internet voting in advanced democracies now run along well-worn lines. The same examples are endlessly recycled." This highlights a contradiction in the study of Internet voting, where on the one hand, policymakers continuously cite the need for further research as the primary reason for delaying Internet voting implementation, while on the other hand, new research simply reinforces the view that Internet voting either increases or decreases voter turnout, or that Internet voting is either safer or more vulnerable to security threats than paper balloting. It is likely, therefore, that methodological innovation is needed to advance the field beyond where it currently exists.

Though attempts at a summation of these findings have occurred in both the academic (Hall 2015) and policy literature (Barisoff and James 2012), a synthesis of the anthology of Internet voting study is needed for two important reasons. First, as is clearly demonstrated in the proceeding sections, Internet voting research has produced a kaleidoscopic array of perspectives, approaches, and conclusions. While it is apparent that no phenomenon resulting from the implementation of Internet voting exists in a vacuum, the literature often treats them as such, failing to bridge the relationships found between phenomena, and (perhaps unwittingly) giving readers the impression that these phenomena are unrelated.[2] Second, the rapidly changing nature of Internet technology necessarily means that the study of Internet voting will exist in near constant flux (Stoica and Ghilic-Micu 2016, 55). Though the study of Internet elections is barely two decades old, analyses of Internet-derived political phenomena risk aging extraordinarily quickly, in parallel with advances in both the technology itself, as well as users' relationship with it. It is therefore incumbent upon scholars working in this area to identify which materials remain relevant, and bridge emergent findings with those established in the literature.

The multidisciplinary approach to Internet voting is generally an asset. Many scholars (Germann and Serdült 2017; Gibson 2002, 571; Henry 2003, 202; Mellon, Peixoto, and Sjoberg 2017; Goodman et al. 2018), for example, consider the effects of Internet voting implementation on overall *voter turnout* and other downstream participatory effects. Others (Jaquim, Ribeiro, and Ferreira 2010; Chaum et al. 2010;

[2] For example, *trust*, *perception of cost*, *security concerns*, and *turnout*, though often studied in isolation for methodological purposes, are deeply interwoven in the revolving pastiche of factors which ultimately result in an individual's voting behaviour and patterns.

Hsiao et al. 2017; Choi and Kim 2012; Mercurio 2004), meanwhile, investigate issues related to the security of Internet voting systems, and the democratic concomitant, *trust* in electoral proceedings. Among these two principle research areas (turnout and participation, and security and trust), a multitude of inquiries have emerged, including those concerning voter behaviour (Mendez and Serdült 2017; Nemeslaki, Aranyossy, and Sasvári 2016); how Internet voting might change the nature of political campaigning (Alvarez and Nagler 2001; Goodman and Smith 2017); if the introduction of Internet technology into democratic processes might disenfranchise certain groups by creating a 'digital divide' (Mendez 2010; Smith and Clark 2005); or even if Internet voting might undermine the civic nature of elections by removing them from the public sphere (Unt and Solvak 2017; Birch, Cockshott, and Renaud 2014).

### 1.2.1 Why Here? Why Now?

There are several factors that make Internet voting a worthwhile and important area of study for political scientists. In the broadest sense, "[e]lections are where the public makes primary decisions that affect all citizens and all administrators. It is where public preferences manifest themselves in decisions about who will run all levels of government and, through the initiative and referenda process, even how the government will be run" (Alvarez and Hall 2006, 491). The Internet is fundamentally changing how most day-to-day life is conducted, and, say Barisoff and James (2012, 9), is therefore "changing citizen *expectations* around the speed and convenience with which all government services and elections should be delivered" (emphasis added). Thus, governments at all levels in many countries around the world have proven quite eager to

bring elections into the digital realm, hoping to reduce costs (both those accrued administering the election itself, and those perceived by voters), increase participation by eliminating barriers to access, and perhaps, bring increasing numbers of the voting-eligible Internet generation into the democratic process (Oostveen and Van den Besselaar 2004, 61). To many commentators, however, these claims remain deeply understudied, with much of the debate surrounding Internet voting relying overwhelmingly on unempirical assumptions (Beroggi 2014, 44).

As with all policy decisions, both the Internet voting option, as well as the paper ballot brick-and-mortar status quo, carry certain risks and benefits. With regards to the latter, the process of casting a paper ballot at a physical location has "remained virtually unchanged since the enactment of universal and secret suffrage at the end of the 19th century" (Alvarez, Katz, and Pomares 2011, 199). In fact, many scholars (Yao et al. 2006, 34; Johnson 2004, 107; Stromer-Galley 2003, 727; Smith and Clark 2005, 513; Atkeson and Saunders 2007, 655) point to the 2000 United States Presidential Election, and specifically, the fiasco which unfolded in Florida, as the original catalyst for the early study of Internet voting. Write Barisoff and James (2012, 12), "[e]lections are a cornerstone of democracy. The successful and accurate completion of each and every voting transaction is critical to public confidence in the integrity of elections, and ultimately, the legitimacy of those elected." As the Florida case demonstrates, 'doing nothing' is a policy choice with its own set of risks. Furthermore, given that a number of scholars see trust in democratic institutions as having diminished severely over time in a variety of political contexts (Nemeslaki, Aranyossy, and Sasvári 2016, 710), interventions which make voting – the "foundation of our democracy" (Alvarez and Hall

2006, 505) – easier, more accessible, and potentially more credible in the eyes of electors, ought to be closely scrutinized, and carefully considered.

If voter turnout – an important metric of electoral and democratic health – had remained relatively stable over the past half century, it stands to reason that Internet voting would not have received nearly the attention it has, both by researchers and in the media. However, to the contrary, it is widely understood by political scientists that turnout rates have decreased in most advanced democracies, at all levels of government[3] (Germann and Serdült 2017, 1; Bélanger and Carter 2010, 203). Blais and Loewen (2009, 12) illustrate this fact by comparing participation levels of first-time voters in Canadian federal elections over time, with rates falling from about 70% of newly eligible voters casting a ballot in the 1960s, to barely 30% doing so in 2004. In other words, "[a]t least two-thirds of new voters would cast a ballot in the 1960s; by 2004, it was about one-third" (Blais and Loewen 2009, 12). Thus, the voter turnout metric exists at the core of the Internet voting literature *precisely* because offering the ability to vote online is viewed as an intervention which may increase electoral participation, with a particular emphasis on mobilizing youth. Germann and Serdült (2017, 2), accordingly, claim that the "main contribution political scientists can deliver is evidence regarding the turnout effects of i-voting." Though as this research will demonstrate, contextual factors matter

[3] In Canada, more precisely, turnout has generally diminished over the past 60 years at the Federal and provincial levels, while municipalities are typically associated, historically, with low levels of turnout. Though even at this level of government, turnout has diminished over time (Goodman and Stokes 2016, 3). Within the American context, this issue is framed somewhat more alarmingly by Gerber, Green, and Shachar (2003, 549), who write, "[s]leepy local elections… are akin to gateway drugs, eroding citizens' sense of themselves as involved participants in election."

greatly to turnout effects, and thus, general theorizing about Internet voting's impact on this metric has tended to be extremely difficult.

Turnout effects further highlight why the study of Internet voting is in constant flux. The early literature, for example, noted that Internet voting would likely disenfranchise those lower on the socio-economic scale. Alvarez and Nagler (2001, 1152) speculated in the early 2000s that "Internet voting would be the equivalent of 'motor voter: for luxury car drivers only'." This concern, characterized as an emergent 'digital divide' is a common theme within the literature (Bélanger and Carter 2010, 204; Delwit, Kulahci, and Pilet 2005, 155). However, evidence exists that this concern may have become less palpable over time, given that as of 2012, only 2 percent of Americans aged 18-29, and 8 percent of those aged 30-49 were not active online (Hall 2015, 109; Cohen et al. 2012). Furthermore, within the Canadian context, Pammett and Goodman (2013, 15) note that "Canadians are the most frequent Internet users worldwide, spending an average of 45 hours per week using the Internet." What's more, Statistics Canada reported in 2009 that around 80 percent of Canadians used the Internet regularly, and among this group, 96 percent had Internet access in their homes (Pammett and Goodman 2013, 15). Substantial Internet penetration does not eliminate the potential for a digital divides to emerge however (Carter and Campbell 2011, 29), and thus, the issue remains an important subfield within an ever-changing Internet voting literature. Chapter 2 will examine turnout effects and the digital divide closely.

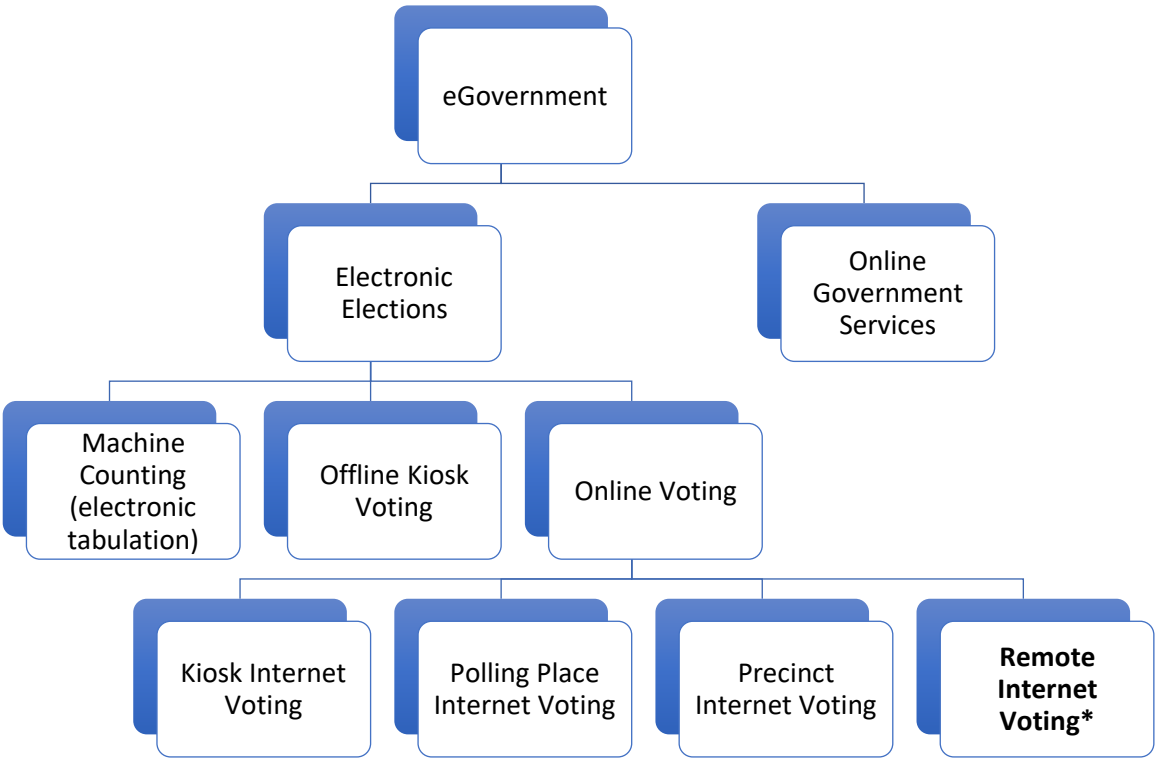
### 1.2.2 Ontario Municipalities: Political Science Laboratories

Internet voting fits within a suite of electoral options which fall under the broad label of 'electronic voting' (Fig 1). Electronic voting itself fits within a constellation of efforts to bring a wide array of government services into the digital realm, generally described as eGovernment (Warkentin et al. 2018, 195). Given the many different forms in which *electronic* voting can manifest, and further, the many ways in which *Internet* voting is deployed, a brief push for conceptual clarity is warranted.

At its core, electronic voting is a widely-encompassing term for any "voting methods that operate using electronic technology" (Goodman, Pammett, and DeBardeleben 2010b, 13). Included within this umbrella term are machine-counted paper ballots (often referred to as electronic tabulators or optical scanners), offline kiosk voting, and online voting (Goodman, Pammett, and DeBardeleben 2010b, 13). Unpacking online voting further, the literature generally describes four types: "kiosk Internet voting, polling place Internet voting, precinct Internet voting and remote Internet voting" (Goodman, Pammett, and DeBardeleben 2010a, 13). The literature often further delineates between 'E-voting', referring to the actual casting of digital ballots, 'e-elections' which describes the activities or interactions between campaigns and voters during digital election periods, and 'e-politics' which denotes the "wider penumbra of politically related activities surrounding" digital politics (Crothers 2015, 126). All of the aforementioned e-voting methods juxtapose against classical 'paper-and-pencil' voting, in which ballots are cast at a physical polling location, and then counted by hand (Sebé et al. 2010, 667; Caporusso 2010, 65; Mugica 2015, 114). This research focuses on the introduction of *remote Internet voting* (described in this work simply as 'Internet voting'), unique among

this suite of electronic voting options because electors have the ability cast ballots on personal devices *from any location*.

Figure 1. Positioning Remote Internet Voting Within Electronic Elections




*Election type examined in this study

Canada's most populous province provides a fascinating political environment in which to study phenomena related to election type, given that over the past two decades, Ontario's 444 municipalities have deployed virtually *every* balloting method above

described.[4] The 1996 *Municipal Elections Act* gives Ontario municipal clerks "the independent authority to determine how the election is administered, providing… some election aspects such as the voting method, the length of the advance voting period, and voting hours… [are] approved by city councils before the administration can move forward" (Goodman and Pammett 2014, 14). As a result, the mosaic of municipal elections in Ontario is often described as a "patchwork" system, not only featuring all of the aforementioned balloting methods, but also a variety of features meant to increase accessibility (such as audio, magnified font, and braille ballots), as well as a high degree of diversity in other aspects such as election period lengths and verification requirements (Goodman and Pammett 2014, 15).

Although the supportive legislative framework is in some ways responsible for this mosaic of electoral models, it should be noted that in addition to Ontario, five other provinces including Alberta, British Columbia, New Brunswick, Nova Scotia, and Saskatchewan have passed similar provisions allowing for the use of alternative voting methods in municipal elections (Goodman and Smith 2017, 168). Of these, only Nova Scotian municipalities have joined those in Ontario in endeavoring to experiment with online-enabled remote voting. This highlights the fact that while the implementation of Internet voting is sometimes framed as something of an inevitability in Canadian media (Baxter 2018), many remaining anxieties and/or a lack of enthusiasm in other

[4] Not all municipalities hold regular elections. For example, some 'upper tier' municipal governments (counties, districts, and some regions) are comprised of officials elected via the contests held in lower tier municipalities (AMO 2018a). Thus, of Ontario's 444 total municipal jurisdictions, 417 held electoral contests in 2018. Within these, some candidates run unopposed, and thus are 'acclaimed' leadership. In rare cases, this occurs for every council position.

jurisdictions means that those municipalities in Ontario and Nova Scotia have taken on a leading role. As a result, the results tend to be closely monitored by election officials around the world (Barisoff and James 2012).

Much of this research (including the original empirical studies in Chapter 3) will focus on the Ontario municipal experience with Internet voting, which was first deployed in binding elections in 2003. Since these early trials were first conducted, the technology has proliferated dramatically over the subsequent four election cycles. In 2003, just 12 municipalities offered Internet voting, either as a supplement to other forms of balloting, or, in some cases, as a complete replacement of existing methods (Goodman and Pammett 2014, 15; Goodman et al. 2018, 165). For the 2006 election, the number of municipalities offering Internet voting increased to 20 (Goodman 2012, 23). In 2010, this figure increased once again to 44, representing about 800,000 potential voters – 10 percent of the provincial electorate (Goodman 2014, 10). For the 2014 election, 97 municipalities offered Internet voting, of which 59 eliminated paper balloting entirely (Goodman and Smith 2017, 168). Finally, for the most recent municipal election held in October 2018, 178 of 417 municipalities – representing some 5 million electors – offered Internet voting, with 135 of these eliminating paper ballots altogether[5] (AMO 2018a).

Ontario municipalities, along with municipalities in Nova scotia and a number of jurisdictions around the world are undergoing an epochal shift in the way representatives are elected, providing an opportunity for both election officials and researchers alike to study the costs and benefits of radically upending the status quo for conducting elections.

[5] Though in many of these cases, municipalities retained a telephone voting option, in addition to other accessibility measures.

No electoral campaign, nor candidate, nor party, nor voter is immune to the changes that Internet voting might bring (Trechsel and Gasser 2013, 53; Goodman 2011, 13). The experiment is ongoing, however, and with each new election cycle, new data is generated, thus providing new opportunities for hypothesis testing. As Hall (2015, 103) astutely observes, "[o]ver the past two decades, the debate over Internet voting has developed from one centred on the theoretical benefits and perils to its adoption to a debate where actual data can be used to inform this discussion." The 'policy laboratories' that are Ontario municipalities offer an ideal environment to continue this important process.

### 1.2.3 The State of the Field: The Study of Internet Voting

Although later chapters will examine in finer detail both the methodologies and findings of those researchers who have explored Internet voting in various capacities, it is still necessary to understand the full *scope* of the field. This section, therefore, will examine both where Internet voting has been trialed, as well as where it is used in binding elections, including in cases *beyond* the Canadian context. It will highlight how researchers have approached these cases, and, perhaps most importantly, if early conclusions have held up to continued study, given the generation of new data through subsequent election cycles. Antecedent to this discussion, one should note the rather dichotomous tone of the Internet voting literature throughout the past two decades. Bochsler (2009, 3), on the one hand, describes the general body of scholarship as presenting a "particularly 'cyber-optimistic' picture." Many authors however, on the other hand, exude a strong sense of cyber-pessimism.[6] To the extent that either of these

[6] For example, see Lust (2015; 2018), King and Hancock (2012), and Watt (2003).

rather polarized views can be substantiated by empirical study is, in large part, the focus of this research.

The country of Estonia is a frequently-studied case within the Internet voting literature. It is considered by many commentators (Unt and Solvak 2017; Vassil and Weber 2011; Toots, Kalvet, and Krimmer 2016; Lust 2015; 2018; Reiners 2017) to be a pioneer, not just in Internet voting, but in eGovernment as well.[7] It was "the first country in the world to offer unlimited nationwide remote Internet voting" (Unt and Solvak 2017, 2), offering online balloting for national parliamentary elections in 2007 and European Parliamentary elections in 2009, after first trialing it at the municipal level in 2005 (Goodman, Pammett, and DeBardeleben 2010a, 34). When Internet voting was initially offered at the national level in Estonia, it was used to cast just 1.85 percent of the country's total ballots (Solvak and Vassil 2018, 5). For the 2015 national parliamentary election, just a decade after its introduction at the municipal level, nearly one in three (31 percent) electors chose Internet voting as the preferred voting method (Lust 2018, 66). Estonia remains the only country in the world with nationwide Internet voting (Solvak and Vassil 2018, 5).

The rapid uptake of Internet voting was facilitated by several unique factors within the Estonia political context. For example, say Vassil and Weber (2011, 1340),

> The feasibility of e-voting in Estonia is based on the widespread internet penetration and the use of electronic ID cards. These credit card size personal identification documents allow citizens to digitally sign documents, use private and governmental online services requiring secure authentication, etc. They also allow citizens to cast legally binding digital votes at a high security level.

[7] For a detailed history of "e-democracy" in Estonia, including e-voting, see Toots, Kalvet, and Krimmer (2016).

Digital ballots are cast using a process similar to that of the 'double-envelope' system of postal voting[8] through a client application, which is accessed on Internet-connected devices via electronic ID card verification (Unt and Solvak 2017, 2). Compared to physically voting at a polling station, the Internet voting process in Estonia is very fast, with one study finding the median Internet voting speed to be between 1:21 and 1:36 in 2015 (Unt and Solvak 2017, 2).

Several empirical works have sought to determine if Estonia's Internet voting system can ultimately be considered a 'success' or not. For example, using "success criteria often employed in information systems, e-participation and e-democracy literature," Toots, Kalvet, and Krimmer (2016, 2) measure aspects of the system such as 'level of use', 'user diversity', 'stakeholder satisfaction', and 'impact on the political process'. Similarly, Alvarez, Hall, and Treschsel (2009, 498) use both quantitative and qualitative data in order to ascertain "who voted over the Internet, how Internet voting has been used in Estonian elections, and the political implications of the voting platform." Utilizing parliamentary debate and court case records, Lust (2015, 314), "analyzes the sociology and politics of online voting in Estonia." Similarly, Reiners (2017, 41) seeks to determine what specific structural, institutional, cultural, or legislative factors "catapulted the Estonian state into the leading position in this field."

Though the specific measures of success will be further elaborated in later chapters, a wide survey of the literature generally yields mixed impressions about the

[8] As described by Unt and Solvak (2017, 2), "[v]oting itself happens through an e-voting client application where after authentication the candidate list is downloaded and the voter can select the preferred candidate and digitally sign the vote. The inner envelope with the vote is encrypted by the client application and the outer envelope is digitally signed by the voter to be cast over the Internet to the vote receiving server."

success of Estonia's Internet voting experience.[9] On the one hand, Reiners (2017), Alvarez, Hall, and Treschsel (2009), and Solvak and Vassil (2018) tend to hold the 'cyber-optimist' view to varying intensities, while Lust (2015, 314) remains deeply pessimistic, describing Estonia's Internet voting model as a "partisan project" which "is a bad thing for democracy" and thus should be discontinued. Both of these perspectives will be examined further by considering specific variables such as voter turnout, electoral behaviour, and perceptions of security.

### 1.2.4 Other Cases of Internet Voting

In addition to municipalities in Ontario and Nova Scotia as well as Estonia, several other jurisdictions have experimented with Internet voting in binding political contests. In fact, examples of alternative voting systems utilizing Internet communications technologies exist in virtually all parts of the world, providing a rich diversity of cases for researchers to study the effects of implementing various models within unique political, institutional, and cultural contexts. For example, globally, two of the largest democracies in the world – Brazil and India – are considered to exist on the cutting edge of automated voting systems (Alvarez, Katz, and Pomares 2011, 199; Zucco and Nicolau 2016). Within the European context, numerous Internet voting trials have

[9] Lust (2015, 313), a stern critic of Estonia's Internet voting system, assesses the tone of the literature by claiming that "[m]ost studies paint a highly favourable picture of online voting in Estonia." However, the impression gleaned from this review of the literature was one where conclusions to this end are more mixed.

been carried out in Britain, France, the Netherlands, Norway, Finland, Portugal, Spain, and Greece[10] (Svensson and Leenes 2003; Lust 2018, 65-6). Goodman et al. (2018, 167) find Internet voting advancing beyond the trial stage and implemented for regular use at various levels of government in Armenia, Australia, Mexico, and Panama. Implementation has also occurred in New Zealand (Crothers 2015, 140), in many parts of the developing world (Inuwa and Oye 2015), and within a number of Indigenous communities in Canada (Gabel, Goodman, and Budd 2016).

Internet voting implementation occurs in a wide variety of political contexts, and under a variety of circumstances, at times intended for full use at certain levels of government, and in other cases only for use in particular situations, such as during military deployment (Hall 2015, 105). Some researchers (Goodman, Pammett, and DeBardeleben 2010a, 7; Stoica and Ghilic-Micu 2016, 56) have therefore cautioned against generalizing the lessons learned from each specific case. One political context which Canada *may* be able to share lessons with, however, is that of Switzerland[11], a highly decentralized federal system widely considered to be a successful pioneer in Internet voting implementation (Trechsel and Gasser 2013, 53). Full generalization of postal voting increased Swiss voter turnout by 20 percent in 1995 (Chevallier, Warynski, and Sandoz 2006, 56), indicating that 'bringing the election to the voters' might substantially increase overall participation. Although there are key differences between

[10] Many of these trials have been considered unsuccessful for a variety of reasons, and thus, were delayed or abandoned altogether (Smith 2016, 68). Two prominent examples have been the United Kingdom (Goodman, Pammett, and DeBardeleben 2010a, 39), and Norway (Goodman and Smith 2017, 164).

[11] For a thorough explanation of Switzerland's Internet voting system, including how voters cast a ballot online, network infrastructure used, security features, and observations regarding scalability, see Chevallier, Warynski, and Sandoz (2006, 57-9).

Swiss and Canadian democracy[12], Trechsel and Gasser (2013, 55) note that the implementation of Internet voting in Switzerland has benefitted from "a coordinated, but decentralized and bottom-up approach to the introduction of Internet voting," similar in many respects to the rollout among increasing numbers of Canadian municipalities.

## 1.3 Concluding Remarks

As this review of the literature has sought to demonstrate, investigations of Internet voting have resulted in a broad and diffuse field of study. It is approached from a wide variety of scholarly backgrounds, and employs an array of methodological techniques to investigate the many instances where jurisdictions have introduced Internet communications technology into the electoral process. Notwithstanding the well-worn contentions of supporters and opponents of Internet voting (Goodman and Smith 2017, 165), important questions remain unanswered, not least of which is the central impetus for this research: *can Internet voting increase participation and trust, broadly defined, within democratic systems*?

While the remainder of this project will examine this important inquiry at a granular level, broad conclusions may be offered here. Firstly, while any change to an electoral system does indeed risk decades, if not centuries of democratic achievements, declining levels of participation, a widespread disenchantment with politics, and the continuous need to maintain the legitimacy of the electoral system presents a reality

[12] For example, Swiss direct democracy necessitates that active citizens vote as many as three to four times a month on various referendum questions (Chevallier, Warynski, and Sandoz 2006, 55). While this is not the case in Canadian politics, it may provide evidence towards Internet voting facilitating greater citizen involvement.

wherein the status quo may carry equal, if not greater risk (Schürmann 2011, 27-8; Reiners 2017, 44-5). While popular claims sometimes frame the spread of Internet voting as a virtual inevitability (Baxter 2018), the technology is still very much in an experimental phase, and thus, an ever-present need for further study remains. Moreover, activities at the nexus of technology and democracy, more broadly, ought to be squarely in the purview of political scientists. As many commentators adroitly observe (Chevallier, Warynski, and Sandoz 2006, 55; Gibson et al. 2016, 280), Internet election are not simply a matter of technical achievement. Rather, it is a socio-political undertaking that might fundamentally alter participatory behaviour, and thus democracy itself (Nemeslaki, Aranyossy, and Sasvári 2016, 705; Stoica and Ghilic-Micu 2016, 55).

Ultimately however, one must keep the scale of potential change in mind. Say Oostveen and Van den Besselaar (2004, 62), "[i]t is also important to acknowledge that new voting technologies alone will not bring about major changes to our democracies." Likewise, it is important to note that *the Internet will fundamentally alter politics and democracy regardless of whether votes are cast via that medium or not* (Pammett, and DeBardeleben 2010b, 20-21). Perhaps the most important lesson learned from twenty years of study is that Internet voting will not be a panacea for declining participation and trust in democratic or electoral institutions (Goodman, Pammett, and DeBardeleben 2010b, 20; Mellon, Peixoto, and Sjoberg 2017, 21; Crothers 2015, 140). It is likely, conclude Goodman, Pammett, and DeBardeleben (2010b, 20), that both the overtly cyber-optimistic and cyber-pessimistic positions are over-embellished. And yet, it is equally clear that the proliferation of Internet voting systems has exceeded the academic

study of the resulting political phenomenon. A synthesis of established findings, as well as continued study, are therefore both needed and thoroughly justified.

## Chapter 2: Turnout, Convenience, and Access

### 2.1 Internet Elections and the Promise of Increasing Voter Turnout

Even a cursory introduction to the Internet voting literature makes one matter eminently clear: that increasing voter turnout has long been held to be the *principle goal* of moving elections online (Gibson 2002, 571). Voting, broadly, is "one of the fundamental acts of democratic politics," and as such, an expansive literature has been produced in the pursuit of better understanding both the action itself and the surrounding phenomena (Aldrich, Montgomery, and Wood 2011, 535). Says Henry (2003, 193), "A high turnout in an election is an indication that the electorate is engaged with the political process and gives elected officials a stronger mandate in office." It is understandable, therefore, why Internet voting is sometimes spoken about in epochal terms – a democratic intervention with the potential to be borderline revolutionary (Mercurio 2004, 410).

Internet voting is far from the first intervention which has sought to make voting more accessible, and in fact, exists at the cutting edge of a long academic and political legacy of attempting to lower the 'costs' of voting, and thus increase overall turnout (Burden et al. 2014, 96). A sizable literature examining these costs has uncovered "dozens of variables that affect individuals' propensity to vote" (Blais et al. 2019, 145), with many researchers attempting to measure their impact on voting (or non-voting) behaviour. Proponents contend that Internet voting "has the most potential to lower traditional opportunity costs for electors and enhance accessibility, and is most consistent with other technological developments in society" (Goodman, Pammett, and DeBardeleben 2010, 13). Thus far, however, results on this front have been mixed, with some studies of Internet voting seemingly demonstrating increased participation

(Goodman et al. 2018, 167), and others claiming that turnout effects have failed to live up to expectations (Lust 2018, 66). Though as the following sections will demonstrate, establishing causal linkages between Internet voting and turnout effects is often a very challenging endeavor.

This chapter will examine the issue of voter turnout closely, considering the effect that Internet voting might have on relationships established in the broader literature between costs and turnout. It will first look at the issue of declining turnout, both globally and within the Canadian context, uncovering the impetus for *why* governments have chosen to pursue Internet voting as a policy priority. To buttress this analysis, it will consider variables tested in empirical research which are associated with electoral participation, and perhaps more importantly, with *nonparticipation*. It will examine the political behaviour approach to studying voting costs, establishing common characteristics of voters and non-voters, ultimately asking the important question: *can Internet voting mobilize non-voters?* Finally, this chapter will consider the important issue of youth turnout through the lens of *consuetude*, referring to the clear habit-forming propensities of both participation and nonparticipation. Voter turnout is one of the most common – though most misconstrued – variables in the Internet voting literature, and thus, it is critical that both policymakers and researchers understand the full breath of the phenomenon.

## 2.2 The Issue of Declining Voter Turnout in Electoral Democracy

For two decades, falling and/or low voter turnouts have been squarely in the purview of many political scientists and policymakers. Writing in the early 2000s,

Pammett and LeDuc (2003, 7) noted a rather precipitous declination in voter participation over three federal cycles: 70 percent in 1993, 67 percent in 1997, and finally to just over 61 percent in the 2000 general election. In the five election cycles since, turnout has remained at just over 60 percent, reaching a high of 68.3 percent in 2015, and a low of 58.8 percent in 2008 (Elections Canada 2019). Turnout trends from other jurisdictions, including the UK and US, paint a similar picture to Canada (Mendez 2010, 466; Henry 2003, 202). The case of American presidential elections encapsulates the problem: only 50 to 60 percent of potential voters cast a ballot, and the winner never receives more than 60 percent of those votes cast (Bélanger and Carter 2010, 203). Thus, barely a quarter of voting-aged adults are responsible for electing the President of the United States.[13] Worryingly, one must consider that it is the presidential election which garners more participation than any other within that country (Bélanger and Carter 2010, 203).

For Lust (2018, 67), declining or dormant turnout levels might be symptomatic of larger structural issues in established democracies for two reasons:

> First, even with the rise of issue-based political campaigns and community-based activism, voting remains the most common way for citizens to participate in politics. If people do not vote, they will have little influence over who gets elected to office and what policies office-holders will pursue… Second, voting has an important symbolic dimension. When citizens enter the voting booth on election day, they demonstrate that they believe that their votes matter and that political leaders and institutions deserve their trust. If large numbers of citizens withdraw from politics, the legitimacy of the political system can be called into question.

[13] Of course, this is also an issue with first-past-the-post electoral systems. However, on this note, write Goodman and Stokes (2016, 11), "[t]o more fully counter turnout declines, reformers should consider more complex models than cost alone to explain why citizens increasingly fail to vote. That said, *our research suggests internet voting can deliver turnout payoffs similar in magnitude to larger and more difficult electoral reforms*" (emphasis added).

Internet voting, above all else, is seen as a way of both countering the trend of declining turnout in some cases, and boosting turnout numbers in others, including for specific segments of the population who typically do not vote in large numbers (Oostveen and Van den Besselaar 2004, 64; Vassil and Weber 2011, 1336). If low voter turnout truly does call democratic legitimacy into question (Goodman and Stokes 2016, 1), then an intervention which is argued to enhance participation is worthy of serious consideration.

## 2.3 Turnout: The Standard-Bearer of Internet Voting Evaluation

Given the agitation over dwindling participation, it would come as no surprise that the factors which are thought to cause both participation and nonparticipation have received extensive attention from political scientists (Anderson, Loewen, and McGregor 2018, 1089). Many perspectives have been considered, including those from the rational choice, sociological, and psychological schools, to explanations as broad as genetic variation, and even rainfall (Smets and Van Ham 2013, 344). Though these specific variables will be examined much more closely in later parts of this chapter, the overarching understanding of electoral behaviour is informed by the *rational choice model*, which says simply that nonvoters do not cast ballots because the costs are seen as too great to make the action meaningful (the benefit), especially amongst hundreds or thousands – or even millions – of other voters (Aldrich 1993, 246).

Thus, a central challenge of election studies has been finding novel ways to make this calculus of voting as favourable as possible. This is generally done in one of two

ways. The first is electoral reform – changing the electoral system as a whole[14] – which may affect the "benefit" side of the rational choice calculation by making individual votes seem more meaningful in the eyes of some non-voters (Goodman and Stokes 2016, 1). The second – and the option which is the focus of this research, is far simpler: reduce the *cost* by increasing the *convenience* (Goodman and Stokes 2016, 1). To this end, jurisdictions have experimented with early voting (Burden et al. 2014, 98; Prevost and Schaffner 2008, 511), extended polling hours (Burden et al. 2014, 95; Goodman and Stokes 2016, 1), postal and telephone voting (Prevost and Schaffner 2008, 511), as well as a number of accessibility measure which make *physically* getting to the polling station less demanding. Internet voting, facilitated by devices and technology most Canadians, and importantly, young people, are already extremely comfortable using (Goodman, Pammett, and DeBardeleben 2010a, 51), removes the time spent mailing in a ballot or physically travelling to a polling station – a significant cost to many – reducing voting time to mere minutes (Unt and Solvak 2017, 2), and thus pushing the cost of voting for those who are connected and relatively comfortable using the Internet to essentially nil (Birch, Cockshott, and Renaud 2014, 188-9).

Apart from cost, some commentators have blamed a general 'disenchantment' with the political system; either with the performance of the political actors themselves, or the institutions which exist at each level of government, as the reason for low turnout (Pammett and LeDuc 2003, 10). Although, conclude Pammett and LeDuc (2003, 10), it would be difficult to find research *empirically* demonstrating that politicians or the

[14] Such reforms may include adopting some form of proportional representation, introducing compulsory voting, or creating a system of universal voter registration, among others.

actions of government have become objectively worse, writing, "[a]fter all, citizens have complained about politicians and governments for a long time." Others meanwhile, claim that abstention might be explained by "a degree of satisfaction with the way things are" (Chevallier 2009, 42). And cost is always a factor. It is feasible that two voters, each with identical levels of satisfaction with "the way things are," might demonstrate different levels of participation depending on the perceived cost of voting[15] (Blais et al. 2019, 145). Thus, the challenge of studying turnout becomes evident: it can be speculated that participation might diminish if citizens believe the system is failing, or that it is functioning ideally, and both may be correct. Predicting the success or failure of Internet voting implementation, therefore, is incumbent upon a far more thorough understanding of the factors which affect electoral participation.

## 2.4 Why Implementing Internet Voting Might Increase Turnout

Given the guiding hypothesis which is the subject of this chapter (that Internet voting increases turnout), it is important to establish where this proposed causal relationship has been claimed within the literature, as well as demonstrate how the claim has been tested. Once again, it should be noted that, to a great extent, 'interest in political issues', as opposed to the method used to cast a ballot, will drive the bulk of participation (Beroggi 2014, 44). However, even this conclusion is a largely assumed (as opposed to empirically demonstrated), highlighting the difficulty in both detecting and weighing variables which might contribute to an individual's propensity to participate (Barisoff and James 2012, 24).

[15] This idea is explored further later in this chapter.

Despite this fact, proponents do tend to frame Internet voting as a broadly positive policy option. Vassil et al. (2016, 458) write that the technology "has the potential to bridge societal divisions and ease political participation, not only for the already connected and resourceful, but also for the less privileged, who have fewer resources and remain at the periphery of using modern technologies." Goodman et al. (2018, 165), presents a number of turnout studies, some of which find "modest impacts of less than three percent," others which find larger increases, as well as plenty which find "null or no effects." This is likely, as Aldrich (1993, 274) noted two and a half decades previously, "because anything that affects benefits or costs even slightly can change individuals' choices." Therefore, the fact that "small forces can be just enough to make the difference" means that it may quite well be impossible for any methodology to *completely* map the mélange of individual-level factors which effect participation (Aldrich 1993, 274).

Additional challenges with measuring Internet voting-stimulated turnout effects relate to the contextual nature of *how* the technology is implemented. Pilot projects, for example, may not at all reflect how participation levels will appear after multiple elections cycles (Hall 2015, 105). In the short run, on the one hand, turnout may increase due to the occurrence of a 'novelty effect', where voters are drawn to using novel technology in some form (Mendez 2010, 466). Or, on the other, turnout may decrease should electors find certain new processes associated with Internet voting, such as registration or authentication, too burdensome (Hall 2015, 105).

Still others paint a generally positive picture of moving elections online, even making such observations nearly two decades ago. Internet voting was trialed in a 2000

Arizona Democratic primary, and subsequently, the state "exceeded increases in voter turnout in every state that had Democratic and/or Republican primary elections during that year" (Solop 2001, 292). Says Gibson (2002, 581) of these early American trials, "a significant number of voters do trust the new technology, turnout was boosted, and the security of the system was not fatally compromised." When Internet voting was first trialed in Canada, post-election surveys of electors within the original twelve municipalities found that every single voter – one hundred percent – who cast a ballot online said they would do so again in the future (Goodman, Pammett, and DeBardeleben 2010b, 16).

Some commentators (Mendez 2010, 464; Goodman et al. 2018, 179; Mellon, Peixoto, and Sjoberg 2017, 20) have expressed concern that the implementation of Internet voting might change participation demographics in a significant enough way that election results may be biased in favour of one political orientation over another, and therefore certain political actors or parties over others. No doubt the introduction of Internet voting has the potential to change the composition of the electorate in important ways[16], including by favouring those who are more comfortable with technology use writ large (Prevost and Schaffner 2008, 525; Solop 2001, 292; Willemson 2017, 292-3). However, several scholars have found online balloting to be neutral with regards to broadly favouring one political orientation over another. Says Beroggi (2014, 47), for example, "[w]e could not confirm the concern (expressed mainly in conservative circles) that Internet voting would attract more progressive and liberal voters. Results indicate that Internet voting is largely politically neutral." Likewise, writes Lust (2015, 314),

[16] For example, see section 2.8 of this chapter regarding the 'digital divide'.

"online voting does not discriminate politically: left and right parties do equally well online and offline, at least when we control for demographic variables." To this end, while early studies (I.e. Solop 2001) expressed grave concern that Internet voting would favour the most well-educated, highest-income, and youngest demographics at the cost of others, these biases (of which the former two apply to paper voting as well) are demonstrated to largely disappear over time, especially given that Internet use has proliferated to the point of near-ubiquity[17] (Lust 2015, 314).

Ultimately, the most robust studies of Internet voting implementation would seem to maintain the promise that Internet voting might increase participation. Goodman and Stokes (2016, 1), employing original panel data from four Ontario municipal election cycles where online voting was offered (2003, 2006, 2010, 2014), conclude that "internet voting can increase turnout by 3.5 percentage points." This result may be altered if subject to a variety of contextual factors however, including *doubling* in jurisdictions where of mail-in voting is not already an established method[18], or diminishing slightly given the presence of relatively stricter registration requirements of some larger municipalities (Goodman and Stokes 2016, 1). Using Rio Grande do Sul's June 2014

[17] "Ubiquity" is here used in the sense that for countries like Canada, significantly more people are regular Internet users than regular voters (Goodman, Pammett, and DeBardeleben 2010a, 51). Furthermore, in most jurisdictions, electors who neither have private Internet access nor personal devices can still cast a ballot online in several ways, even when paper balloting stations are phased out. These include at public libraries, at polling stations which provide Internet-accessible devices for voters, or in special circumstances such as retirement residences, devices can be brought in for use by electors with mobility issues (Vassil et al. 2016, 453).

[18] The researchers speculate that this may be why studies of Internet voting implementation in Switzerland, where mail-in voting is heavily used, often concludes that turnout remains unaffected (Goodman and Stokes 2016, 8). Say the authors of their results, "if VBM [vote by mail] is already in use as a convenience method, internet voting's effect on turnout is meaningfully dampened" (Goodman and Stokes 2016, 8).

'non-electoral participatory budget process' as a case study, Mellon, Peixoto, and Sjoberg (2017, 20) conclude that the introduction of online voting "increases turnout across the electorate," and in addition, allowed for participation amongst those who would otherwise have been unable to do so. This last aspect – mobilizing non-voters – is often considered the holy grail of electoral studies.

### 2.4.1 Variables of Participation

This section will examine the reasons uncovered in the literature which are thought to *cause* individuals to choose to vote in elections, and, perhaps more importantly, cause non-voters to choose (sometimes actively, and sometimes passively) electoral nonparticipation. In doing so, it may be elucidated to what extent an Internet voting intervention may yield greater participation, and in what specific contexts this yield might manifest. As is often speculated, the non-voting population might very well include a small, yet significant number of individuals who do not participate simply because the act of voting by paper at a polling station is viewed as overly cumbersome, and the extent to which technology may act as an enabler to participation, or alternatively, a new type of hurdle, is subject to substantial scholarship (Vassil et al. 2016, 458-9; Dyck and Gimpel 2005, 531).

The scope of turnout research can be staggering and highly complex. Smets and Van Ham (2013, 356) make this abundant clear in conducting a meta-analysis of 90 empirical articles, uncovering 170 independent variables demonstrated to 'explain' participation. Of these, *zero* variables were included in all 90 articles, and, perhaps surprisingly, only 8 were found in at least 25 percent: "education, age, gender, race,

income, marital status, party identification and political interest" (Smets and Van Ham 2013, 356). Say Smets and Van Ham (2013, 356), "[e]ven the two most common independent variables – age and education – were included in only 72% and 74% of studies respectively." This would seem to imply that, despite political participation remaining "one of the most widely studied topics in American political science today" (Dyck and Gimpel 2005, 531), no *core model* fully explains the phenomena of voter turnout. With this in mind, it may be somewhat surprising that one crucial factor – the *perceived* costs of voting – has received relatively little scholarly attention (Blais et al. 2019, 146). It is the centrality of these factors to Internet elections participation (vis-à-vis paper election *nonparticipation*) which necessitates further exploration of this crucial element (Blais et al. 2019).

### 2.4.2 The Costs of Voting

The cost associated with casting a ballot, and the decision-making which exists at the nexus of *convenience*, *required effort*, and *perceived reward* is described thoroughly by Mellon, Peixoto, and Sjoberg (2017, 14), who write,

> The promise of convenience voting grows from a rational choice calculation of voter turnout that considers both the costs and benefits of voting. By making voting more convenient, the cost of voting is lower while all other factors are held constant (e.g., the benefits). This calculus predicts increased turnout as the cost of voting falls. As Internet access has increased around the world, i-voting has been highlighted as potentially increasing turnout by reducing the costs of voting.

Birch, Cockshott, and Renaud (2014, 188-9) quantify the cost in literal dollar amounts. By this rationale, the entire process of finding out where to vote, informing oneself about current registration procedures, leaving the house and travelling to the polling station, (potentially) waiting in line, entering the voting booth, filling out a paper ballot and

submitting it, then ultimately returning home, could cost voters at least an hour of their time, and more if they are unsure, uncomfortable, or experience delays with any of these proceedings. In Ontario, this would, at minimum, cost each voter 14 dollars.

Though any of these actions or the exercise in its entirety may seem trivial to those who regularly participate, spurred on by a sense of civic duty or otherwise, it is the more marginal and infrequent participants who may perceive these costs differently, and thus capture the attention of many electoral scholars. Carter and Campbell (2011, 30), compile a list of the ten most frequently-cited reasons for abstention within the context of American federal elections (Table 1), noting in particular how many could be *immediately* addressed by introducing an online ballot.

Table 1. Top Ten Reasons for Not Voting (Carter and Campbell 2011, 3).

| | Reason | Percent | Potential I-voting Impact |
|---|---|---|---|
| 1. | Conflicting work or school schedule | 22.6% | YES |
| 2. | Illness or disability | 16.0% | YES |
| 3. | Not interested | 13.2% | NO |
| 4. | Out of town | 11.0% | YES |
| 5. | Didn't like candidates or issues | 8.3% | NO |
| 6. | Problems with registration | 7.4% | NO |
| 7. | Forgot to vote | 4.3% | NO |
| 8. | Inconvenient polling place, hours and lines | 2.8% | YES |
| 9. | Problems with transportation | 2.6% | YES |
| 10. | Bad weather | 0.7% | YES |

Contrary to the 'democratic disillusionment' hypothesis, these authors demonstrate that, in fact, three of the top four reasons for abstention – accounting for half of the total responses given for not voting – could be solved by the introduction of Internet voting.[19] Whether this reduces the cost to a level where these same respondents could be 'flipped'

[19] Elections Canada finds, similarly, that 'everyday life issues' constitute the largest category of non-voter responses. These include "being too busy, out of town, illness or disability, weather conditions, or transportation problems" (Goodman 2016, 40).

towards voting is unknown, however.[20] Undoubtedly these answers may shift somewhat if the same survey was administered at the municipal level, where elections are "notoriously low salience, with consequent low turnout" (Goodman and Stokes 2016, 10).

Burden et al. (2014, 97) theorize that costs are imposed in two ways: first, through the *direct costs* associated with state action, such as the electoral system itself, balloting procedures, registration requirements, and others; second, through *indirect costs* – those imposed beyond the state's purview such as media, the behaviour of campaigns, actions of interest groups, or the levels of interest demonstrated by friends and family (Burden et al. 2014, 97). These factors, interrelated with the direct costs though they may be, are considered by the researchers to be of greater importance to an individual's propensity to vote, given their ability to both provide information as well as generate social incentives, the latter of which is demonstrated to have a powerful effect on individual voting propensity (Burden et al. 2014, 95).

Research by Blais et al. (2019) demonstrates (perhaps surprisingly given the above information) that by and large, citizens "do not think that voting is costly." Similar to Burden et al. (2014), Blais et al. (2019, 150) distinguish between 'direct costs' and 'information/decision costs', finding the latter to be a factor with greater weight in an individual's rational choice calculus. While they note that the association between

[20] For example, it might be a combination of conflicting schedules *and* a perceived ineffectiveness of voting which ultimately results in non-voting. Only the former can be reduced or eliminated by lowering the cost of voting, and ultimately, this still may not be enough to change many non-voters into voters. Further, one might speculate that observer effects play a certain role in biasing the responses of non-voters. It is possible, for example, that the "Not interested" category is, in reality, much larger, while the 'inconvenience' reasons are artificially inflated.

perceived costs and turnout has stood up to continuous empirical scrutiny, the "substantive impact is fairly small and comparatively less important than the effects of other determinants of turnout" (Blais et al. 2019, 150-1). These findings have potentially major policy implications, considering that Internet voting is an intervention meant to lower costs, which, according to Blais et al. (2019) are already perceived to be quite low. From this, one might conclude that critics who proclaim that a given system has *failed* because of insufficient increases in turnout (as was the case in the UK) had unrealistic expectations about the performance of the intervention in the first place. Further, Blais et al. (2019, 151) raise a point which is strongly concurred by this research, that though decreasing costs may not affect many electors drastically, "attempting to increase turnout by a few percentage points is a noble and worthy task." The authors conclude, "[w]hile few citizens indicate that voting has a meaningful cost, these perceptions matter" (Blais et al. 2019, 150).

As a final note, although this chapter has used the term *participation* as synonymous with *electoral participation*, it is evident that many people find meaningful political engagement with activities other than voting, such as attending rallies, starting or signing petitions, working for non-profits, or participating in online advocacy of some kind. While in general, participating in some form of political activism substantially increases the likelihood that an individual will also vote (Cohen et al. 2012, viii), there may be many who fit in the former, but not the latter participatory category. This may be especially true of youth, who are demonstrated to be politically active at high rates, but this activity does not tend to translate into high levels of electoral participation (Anderson and Goodyear-Grant 2008, 710; Cohen et al. 2012). Younger people especially may

possess apprehensions about the procedural aspects of voting or view polling stations the domain of experts only (Gerber, Green, and Shachar 2003, 548). Further sections of this chapter will closely examine if Internet voting might appeal to *politically engaged, non-voting youth*, which some research (Cohen et al. 2012) indicates may be a rather sizable cohort.

### 2.4.3 Behavioural Elements of Voter Turnout

The political behavior model offers a number of explanations for voter turnout. Theories of mobilization frame electoral participation as a social activity, "guided by norms and sanctions," often concluding that it is the participatory behaviour of one's family and peers – and therefore relatively intense social pressure – which engenders a propensity to vote (Smets and Van Ham 2013, 344). Sociological models stress the role of *parents*, *learning*, and the processes of *habit formation*. For example, one experiment (Gerber, Green, and Larimer 2008) measured a control group of households against one test group of households which were mailed *their own* voting record from past elections, and another which were mailed records of both *their own and their neighbors'* voting habits. While the former test group saw a sizable increase of 4.8 percent, the latter saw turnout increase an incredible 8.1 percent (Gerber, Green, and Larimer 2008, 39), indicating that a strong relationship exists between social pressure and voter turnout. Similarly, political psychology models examine variables including "political interest, partisanship, and political efficacy in explaining voter turnout" (Smets and Van Ham 2013, 344). Many of these models attempt to quantify the "sense of duty" commonly offered as an explanation for participation, integrating these effects into their respective

orientation (Gerber, Green, and Larimer 2008, 39; Unt and Solvak 2017, 1; Birch, Cockshott, and Renaud 2014, 190). All of these factors are likely to be augmented to some degree by changing the system of casting ballots.

The most reliable predictor of voting identified within the broader behavioural literature is quite intuitive, and yet is often overlooked: past voting habits (Plutzer 2002, 42; Gerber, Green, and Shachar 2003, 540; Green and Shachar 2000). Voting is demonstrated to be powerfully habitual, a pattern often labelled *consuetude*, which refers to a phenomenon whereby, "if, other things being equal, merely engaging in the activity today makes it more likely that one will engage in the same activity in the future" (Green and Shachar 2000, 561-2). This understanding has several important implications, none more so than highlighting the risk of choosing a status quo policy direction (I.e. paper balloting) which might be unappealing to young voters, as indicated by a dramatic decrease in those casting a ballot in the first election in which they are eligible to vote (Blais and Loewen 2009, 12). This is because, just as voting can engender consuetude, non-voting too is a habit which begins forming with the *very first missed opportunity to cast a ballot* (Anderson and Goodyear-Grant 2008, 697; Plutzer 2002, 42). Due to this reality, the issue of youth participation, and the claim that Internet voting may bring those 18-25 year olds who vote at extremely low levels into the ranks of regular voters, are of monumental importance to the future function and legitimacy of elections, and therefore democracy writ large (Bélanger and Carter 2010, 203; Vassil and Weber 2011, 1338; Macintosh et al. 2003; Goodman 2011, 12).

## 2.5 Who Votes Online?

It is imperative that researchers understand the profile of those electors who choose to cast ballots via the Internet. If a large shift in demographics occurs as a result of Internet voting being introduced into the electoral process, it may have ramifications with regards to the type of political actor which ultimately has the best chance for success in elections. In general, say Vassil et al. (2016, 453), the introduction of technology into virtually any system will benefit "young, technology savvy, well-resourced, and connected people." Other commentators point out that Internet use itself is not neutral, but rather is a socially selective phenomenon, which skews predominantly male, young, well-off and well-educated (Bochsler 2009, 4; Solop 2001, 292), though still more contend that these gaps are fast shrinking (Cohen et al. 2012; Hall 2015, 109). Vassil et al. (2016, 456), for example, demonstrate findings from Estonia which "clearly show that the effect of age flattens gradually over time." Say the authors,

> [t]he likelihood of internet voting was initially highest among 40 to 50 year olds, and lowest for the young and older. However, this once strong relationship started to gradually disappear after the third e-enabled election in 2009, flattening and losing its predictive power entirely by the fourth election (Vassil et al. 2016, 456).

This would seem to indicate that when Internet voting is introduced, usage patterns largely reflect paper balloting, but then gradually allow greater numbers of those age cohorts who typically vote in low numbers to enter the electoral process.

In line with many of the above claims, a multitude of post-election surveys indicate that online voters choose Internet voting primary because of convenience (Goodman and Pyman 2016, 21; Mendez and Serdült 2017, 520). Goodman and Pyman (2016, 21), for example, administered a post-election survey to 43 Ontario municipalities after the 2014 election. Only 10 percent of respondents said that Internet voting was the

'only option' (along with telephone voting in most cases), despite this being the case in 31 (72 percent) of the municipalities that participated in the study, instead opting to select 'convenience' (66 percent), which was the most chosen option by a considerable margin. Other potential responses included 'added accessibility' (6 percent) and 'try something new' (6 percent) (Goodman and Pyman 2016, 21). This would seem to demonstrate that far more electors perceived the Internet voting method as adding convenience, rather than being something forced upon them. This convenience factor should not be overlooked, not only if it provides a reasonable alternative for established electors, but especially if it encourages new participation (Oostveen and Van den Besselaar 2004, 64). Accordingly, Vassil and Weber (2011, 1339) speculate that increasing electoral convenience by offering an online ballot may have the double effect of, on the one hand, providing a comfortable method for regular voters, as well providing an avenue for technology savvy non-voters to overcome many of the cost considerations of paper balloting.

With paper voting, older electors express far greater levels of comfort and confidence with the process, whereas the reverse is generally true for Internet voting (Smith 2016, 70). Using responses from the Canadian Election Survey (CES), Barrette (2013, 2) found that in 2011, 80 percent of those aged 18-to-34, 65 percent of those aged 35-to-64, and 46 percent of those aged 65-plus reported a high likelihood of using the Internet to vote. Interestingly, even though the 65-plus demographic is the *least likely* to respond in the affirmative when asked if they are likely to vote online, this cohort has seen the *largest rise* in positive responses since 2004, again, indicating that the absolute number of those who might be negatively affected by the implementation of Internet voting diminishes as overall connectivity and comfort with the Internet increases

(Barrette 2013, 2). These figures represent considerable increase from CES data in 2000, where only 33.1 percent of *all voters* said that they would be 'Very likely' to cast a ballot online (in addition to 14.2 percent who said that they would be 'Somewhat likely' to do so) (Pammett and LeDuc 2003, 58). Finally, polarization towards Internet voting seems to have diminishes as well, as indicated by a gradual shift out of the "Not at all likely" response category since 2000 (Barrette 2013, 2).

## 2.6 Can Internet Voting Mobilize Non-Voters?

The issue of mobilizing non-voters exists at the core of electoral research, and accordingly, is central to the claim that introducing Internet voting will increase overall turnout. In order for this notion to be substantiated, it needs to be demonstrated that voters participate in Internet elections who *would not have* participated if voting was carried out on paper ballots at physical locations. Thus, the following section examines research findings with the aim of providing evidence towards the following important hypothesis:

> $H_1$: *The introduction of an online ballot option can turn non-paper voters into Internet voters.*

Goodman and Pyman (2016, 24), though acknowledging (like many Internet voting researchers) that online balloting primarily provides a convenient outlet for those who already participate, find that 11 percent of Ontario municipal Internet voters surveyed in 2014 had not participated in the previous election. This is in line with research conducted by Goodman, Pammett, and DeBardeleben (2010a, 48), who note that, "where data is available, we see electors voting on-line who previously classified

themselves as abstainers or said they would not have been likely to vote otherwise." Studying Internet voting in Estonia, Alvarez, Hall, and Treschsel (2009, 502), note similar findings to Goodman and Pyman (2016), writing

> …there is some evidence from our surveys that [Internet voting] may mobilize more casual voters – those individuals who state that they either vote 'from time to time' or never. Small but significant percentages of the voters (~11%) who cast ballots online stated that they 'probably wouldn't have' or 'for sure wouldn't have' if Internet voting had not been an option. Importantly, much more than 20% of Internet voters in 2005 fell into these two categories.

Post-election research of Ontarian municipal *non-voters* largely aligns with the reasons compiled by Carter and Campbell (2011, 30; Table 1) for American non-participation in Presidential elections. Ontario municipal voters selected 'too busy' (23 percent), 'not sufficiently informed to vote' (21 percent), and 'not present in the municipality' (20 percent) as the top reasons for abstention in 2014 (Goodman and Pyman 2016, 24). While Internet voting cannot address the information deficiency issue, if the technology compels even just a quarter of the non-voters from the other two categories to participate, meaningful increases in turnout may be achieved. An examination of municipal turnout data from 2018 in Chapter 3 explores if this has generally manifested.

Further findings from Ontario municipalities would seem to support the above hypothesis. In Markham, one of the original adopters of online elections in Canada, "9% of Internet voters in 2010 reported having not voted in 2006," "21% of 2006 voters claimed they had not voted in 2003," and "25% of 2003 online voters said they did not vote in the 2000 municipal election" (Goodman 2014, 18). Considering municipal elections typically achieve voter turnout rates of around 25 to 50 percent, mobilizing a large number of non-participants might pay significant dividends down the road in the form of a more engaged local citizenry.

Herein lies the greatest promise of Internet voting. It ought not be mistaken as a tool to mobilize the disinterested or motivate the apathetic (Goodman and Stokes 2016, 3). What it may do, however, is firmly ensconce 'infrequent' or 'occasional voters' – those voters to whom the quotidian costs of the status quo may be substantial enough to result in nonparticipation – into the ranks of reliable voters[21] (Chevallier 2009, 35). It may do this not only with working-aged occasional voters, but with young people as well, many of whom are first-time voters (demonstrated to be associated with certain additional perceived costs by Gerber, Green, and Shachar [2003, 548] and Plutzer [2002, 42]). For the 2010 Ontario municipal election, for example, Goodman (2011, 12) found that "[s]lightly more than a third of young people aged 18 to 24 say they either probably wouldn't or definitely wouldn't have voted had Internet voting not been an option." Put another way, says Chevallier (2009, 34), "the less one votes, the more one votes online."

Perhaps in some contradiction with this sentiment, a study of Estonian electors conducted by Vassil and Weber (2011, 1351) attempts to distinguish between the 'impact' and 'usage' of Internet voting, presenting a 'bottleneck' model which contends that "e-voting fails to increase turnout because its impact is highest among those citizens who are unlikely to use it… [t]he higher the likelihood of e-voting, the lower the expected impact on turnout." In other words, 'peripheral' citizens with whom Internet voting might have the highest impact (I.e. mobilization effects) remain the lowest probability users, while the highest users (I.e. those who already vote regularly) are

[21] Regarding this distinction, remark Burden et al. (2014, 97), "[f]or people near the voting threshold, it is axiomatic that small changes have the highest likelihood of turning nonvoters into voters… we can distinguish between voting reforms that bring in new voters and therefore increase turnout and those reforms that simply provide alternative opportunities for voters who would cast a ballot under almost any set of rules."

impacted the least by the implementation of convenience measures into the electoral process. Thus, contend the authors, simply moving elections onto a platform with which young people are very familiar may not yield expected turnout effects among this demographic, because "it is not the young and educated who are being mobilized into political life by the new technology; frequent [Internet] usage in this group does not lead to high [voter turnout] impact" (Vassil and Weber 2011, 1350). The same study, however, does indicate that some mobilization effect may occur among these peripheral citizens, with 46.91 percent of respondents saying that online voting positively affected their motivation to participate in the most recent election cycle, 8.41 percent selecting "I would rather have abstained," and 7.27 percent selecting "I would have abstained" (Vassil and Weber 2011, 1346).

Other research presents rather more pessimistic conclusions in assessments of the mobilization effects of Internet voting. Solvak and Vassil (2018, 5) conclude that initial hopes regarding turnout have given way to sobering conclusions, which demonstrate that it is *established paper voters* who most comfortably make the switch to Internet ballots, and that "only a negligible share of previous nonvoters are being mobilized by this voting mode." While a wide survey of the literature suggests that most researchers maintain Internet voting might act as a bridge for non-participants to become voters (Chevallier 2009, 34), this question, ultimately, remains unanswered. Notably, there is no guarantee that positive responses of non-voters on surveys will translate into actual electoral participation (Chevallier 2009, 35). Mobilizing non-voters ought to remain at the forefront of electoral research, however, given, as Gerber, Green, and Shachar (2003, 549) demonstrate, that numerous studies have "posited a reciprocal causal link between

political participation and broad political attitudes." In other words, say the researchers, "[t]he more one participates, the more likely one is to feel that one's participation is meaningful and important. And the more efficacious one feels, the more likely one is to go to go to the polls." Thus, mobilization efforts have a dual effect: not only do they increase the chance of boosting turnout in any single election, but also of greatly increasing the chance of engendering voting habits in those who do ultimately participate.

### 2.6.1 Mobilizing the Youth Vote

If mobilizing non-voters is the holy grail of electoral research, then engaging those who fall within the 18-25 demographic is the fountain of youth. The Internet voting literature is awash with promises of increasing youth turnout in electoral contests (Goodman, Pammett, and DeBardeleben 2010a, 15; Alvarez, Hall, and Treschsel 2009, 497; Reiners 2017, 45; Vassil and Weber 2011, 1338; Bélanger and Carter 2010, 203). Of course, antecedent to the claim that Internet voting might increase youth voting rates, is the phenomenon of youth voting more broadly, an indicator of democratic health which many electoral scholars view with unease. Pammett and LeDuc (2003, 23), for example, write that "[t]he differences in voting among the age cohorts are extraordinary. The drop-off in electoral participation steadily increases as the cohorts get younger." Blais and Loewen (2009, 3) too find electoral engagement not only low to begin with, but declining as well. However, say the authors, despite commanding the focus of a great deal of elections research, "we do not know much about the causes of this decline" (Blais and Loewen 2009, 3).

Turning once more to the rational choice literature, several intimations are offered

towards the quandary of low youth electoral turnout. For example, the first opportunity for young people to vote provides a flashpoint for parental, demographic, social, personal and other factors to manifest. Simply guided by turnout figures, it can be concluded, broadly, that some young people vote at the first opportunity and develop the habit of doing so, but says Plutzer (2002, 42), "most will not and are likely to remain nonvoters in subsequent elections." The issue of perceived costs, though palpable as they may be to irregular adult voters, are only magnified as young people confront their first election, given, continues Plutzer (2002, 42), that

> they have never gone through the process of registration, may not know the location of their polling place, and may not have yet developed an understanding of party differences and key issues. Moreover, their peer group consists almost entirely of other nonvoters: their friends cannot assure them that voting has been easy, enjoyable, or satisfying.

No doubt this is why Plutzer (2002, 48) concludes that that the most powerful factor in predicting first-time voting among young people is their parents' reported turnout, offering the sobering conclusion that those parents who do not participate "leave their offspring substantially behind in the acquisition of the habit of voting."[22]

Internet voting might alleviate this relationship in two ways: first, if voting is more convenient and brings more adult irregular voters into the ranks of regular voters, it stands to reason that their offspring would, therefore, have a greater chance of also

[22] In this experiment, Plutzer (2002, 48), controlling for sex and race variables, found that parents who voted in the 1964 US Presidential Election increased the probability of their offspring casting ballots at the first opportunity from 0.45 to 0.66. One must be cautious in generalizing these findings (given, for example, that turnout in US presidential elections has dropped precipitously since 1964), however, the well-known sociological relationship between parent and offspring behaviour makes this finding rather intuitive. Further study should examine this relationship at the municipal level, where the starting rates of turnout are very low, even amongst adult voters.

becoming regular voters. Second, if the potential intimidation of casting a ballot at a physical location can be removed, and instead replaced by the familiarity of Internet use, it may be assumed that a certain number of politically-active youth could *bypass* their non-voting parents, and cast a ballot *regardless* of the participatory status of those within their sociological environment. While this possibility remains speculative, it could prove to be one antidote to declining turnout among *all* age cohorts in the long-run, given, as Anderson and Goodyear-Grant (2008, 697) observe, that "[i]nitial turnout decisions made by those aged 18-30, approximately, set a course for their political engagement in adulthood."

The possibility of young people bypassing non-voting parents in order to cast ballots online would, of course, need to be substantiated by the antecedent that youth are indeed politically engaged at reasonably high rates, but that these rates do not translate into high levels of electoral participation. To this end, evidence does seem to suggest that this is the case. In one of the very few political surveys administered to non-voting age (<18) Canadian respondents, Anderson and Goodyear-Grant (2008, 710) find that youth do indeed report wanting to vote at very high levels, and yet, "when the time comes, young adults have abstained in surprisingly great numbers." Furthermore, a large-scale, nationally-representative study of American youth produced by Cohen et al. (2012, vii) found that young people "are taking advantage of an expanded set of participatory practices in the political realm in ways that amplify their voice and sometimes their influence, thus increasing the ways young people participate in political life." The

researchers note that American youth report near-ubiquitous Internet access,[23] and many are using this channel to find political information, or participate politically in some fashion. What's more, such forms of participation are demonstrated to translate into voting, with those "who engaged in at least one act of participatory politics… almost twice as likely to report voting in 2010 as those who did not" (Cohen et al. 2012, viii), though this level is still well below what the authors deem ideal.

Of course, many voices are offered in the literature urging caution with treating Internet voting as a panacea for engaging youth (Hall 2015, 113). Goodman (2014, 14) notes of Markham, one of the earliest adopters of Internet voting, that even though young people report having the greatest *interest* in voting online, as well as being generally more comfortable using the Internet, it is still middle-aged electors which are the primary Internet *voters* by a wide margin (as is the case in paper voting systems). Posits Goodman (2014, 14), "[i]t may be that a high level of use and familiarity with the Internet are not such powerful preconditions to using online voting." Accordingly, so do Cohen et al. (2012, 37) conclude that "[o]ne should not assume that the new digital media or the alternative paradigm of participatory politics will organically expand youth political engagement." Further study should closely explore the effect of Internet voting implementation on youth turnout, particularly in the Canadian context, and especially noting if the relationship between parents' voting records and first-time participation rates is as strong as it is in traditional paper ballot elections.

[23] Specifically, the study finds that "[o]verwhelmingly, white (96 percent), black (94 percent), Latino (96 percent), and Asian American (98 percent) youth report having access to a computer that connects to the Internet" (Cohen et al. 2012, vii).

## 2.7 The Faithfulness Effect

Several authors present evidence towards a "faithfulness" (at times, perhaps less appealingly described as "stickiness") towards Internet voting once electors choose this channel (Goodman, Pammett, and DeBardeleben 2010a, 35; Crothers 2015, 142; Chevallier 2009, 35; Solvak and Vassil 2018, 6; Alvarez, Hall, and Treschsel 2009, 502). Goodman, Pammett, and DeBardeleben (2010a, 48) observe that "electors who opt to vote on-line will continue to do so in subsequent elections if given the opportunity."[24] Similarly, Crothers (2015, 142), using Swiss case studies of referendum votes held between 2001 and 2005, concludes that online voting "might well be addictive," prescribing the general rule: "once e-voted, always e-vote." Looking at the city of Geneva specifically, Chevallier (2009, 35) notes that 9 out of 10 residents who had voted online at least once before a specific September 2004 referendum also used the Internet again for that opportunity. Thus, says the author, not only does using Internet voting drastically reduce the chance that electors will vote by paper in the future, but also the chance that new electors will revert to *nonparticipation*, writing "once this channel is chosen, there is no way back to abstention, as the persistence of turnout increase shows" (Chevallier 2009, 35).

Research conducted by Alvarez, Hall, and Treschsel (2009, 502), surveying Estonian electors after local elections in 2005 and 2007, found that 100 percent of those who voted via the Internet in 2005 did again in the following election cycle. This would

[24] Recall from section 2.4 that Goodman, Pammett, and DeBardeleben (2010b, 16), found that "[o]ne hundred percent of those who voted on-line in 2003 reported that they would vote on-line again in the future and 91 percent in the 2006 survey indicated they would be 'very likely' to do so."

appear to reveal, without reference to the underlying reasons, that electors who use Internet voting are satisfied enough by the process to do so again to a nearly ubiquitous degree. Not all scholars are in agreement with the 'faithfulness effect' hypothesis however. Mendez and Serdült (2017, 518), for example, also surveying a sample of Genevan electors, find that "only one third of voters remained loyal to the iVoting channel. The remaining two–thirds either abandoned iVoting or exhibited hybrid patterns in selecting among the available voting channels in subsequent voting events." The authors speculate as to the possible divergence between their work and that of Chevallier (2009), suggesting that many Genevan electors see postal voting (a method very well-established and widely used) and Internet voting as essentially interchangeable, with equal effort required for both[25] (Mendez and Serdült 2017, 518).

Finally, Solvak and Vassil (2018) recently tested the faithfulness effect of Internet voting vis-à-vis that of paper balloting in Estonia. Using "cross-sectional survey data from five e-enabled elections over a six-year period and path analysis," the authors determine (in line with many findings in the Internet voting literature) that online voting is "strongly persistent, with clear evidence of habit formation" (Solvak and Vassil 2018, 6). However, the authors add an extra prognostication in that even if the technology does not yield substantial increases in overall turnout, it may serve "at least to arrest its continuing decline in Western democracies, due to its self-reinforcing character" (Solvak and Vassil 2018, 6). Though they share mechanical similarities (in that voting is

[25] In this case, it is possible that amongst the Genevan electorate, which is very accustomed to postal voting, the extra time effort involved in casting a postal ballot (versus the time required to cast an online ballot) is offset by most voters' established experience voting via this method. Future research should note carefully if there is a large-scale migration from postal voting to Internet voting.

powerfully habitual in both cases), Internet voting behaviour appears to engender *greater* degrees of habit formation than paper voting, thus,

> arresting turnout decline by keeping those who participate participating might be one realistic goal that e-voting is able to achieve. We clearly see that once it has been adopted by the voter it leads to higher rates of repetitive behaviour than paper or nonvoting do. Furthermore, if the technology not only induces repetitive behaviour, but makes it more habitual, then we might just make turnout somewhat more resilient to short term feelings of political discontent (Solvak and Vassil 2018, 16-7).

Even though ample evidence shows that political issues writ large are the main drivers of turnout, one might conclude from the above evidence that Internet voting at the very least may serve to buttress the 'bottom levels' of voter turnout, including in those low-salience elections which are most common at the municipal level.

## 2.8 The Digital Divide

At several points in the literature, an issue is raised with Internet voting which calls into question one of its central democratic claims: that of reducing barriers to access. Instead, a concern is levied which says that rather than lowering barriers writ large, Internet voting is more likely to lower barriers for *some*, while increasing them for *others*. The extent to which the introduction of Internet technology into the electoral process might disenfranchise some on this basis is described as the *digital divide* (Goodman, Pammett, and DeBardeleben 2010a, 16; Barisoff and James 2012, 31; Gibson 2002, 567; Delwit, Kulahci, and Pilet 2005, 155; Realpe-Muñoz et al. 2018, 182).

The digital divide can manifest in a variety of ways. Early Internet voting scholars such as Gibson (2002, 567) highlighted a substantial difference in *connectivity*, specifically with regards to the differences between those who typically had access to

personal computers and those who did not. Certainly, if only those affluent enough to afford the technology on which votes are cast can participate, it would be impossible to conclude that such a system increases access, let alone that such a system is even democratic. However, as other early commentators such as Alvarez and Nagler (2001, 1152) predicted, a near-ubiquity in Internet penetration rates (and thus a vast reduction in certain connectivity gaps) has called claims of a palpable digital divide into question (Carter and Campbell 2011, 29; Cohen et al. 2012, vii). Even as Internet use has proliferated virtually worldwide, however, its use remains a socially selective phenomenon (Bochsler 2009, 4), and therefore, write Goodman, Pammett, and DeBardeleben (2010a, 16), "the extension of Internet voting has the potential to create divides with respect to many socioeconomic variables, namely income, education, gender, geography and race and ethnicity." Given the many ways participation may be affected along these lines, potentially even changing the composition of the electorate itself, the digital divide remains an issue which should still be well understood by both researchers and policymakers.

In 2010, the Canadian Human Rights Tribunal ruled in favour of elector James Peter Hughes, who had been unable to vote in a 2008 federal by-election, and then again unable to vote in the subsequent general election due to disability (Pammett and Goodman 2013, 13). Among a suite of recommendations, the Tribunal ruled that Elections Canada "make efforts to improve facility accessibility for potential voters" (Pammett and Goodman 2013, 13). The case of James Peter Hughes highlights two realities: the first is that some would-be voters are *de facto disenfranchised* due to the status quo which requires electors to *physically* be at a public polling station in order to

cast a ballot[26]; and second, that public elections bodies are concerned with making elections as widely and equally accessible as possible.

Another trend of note, speaking once more to connectivity concerns highlighted earlier, is that of Internet penetration, both generally, and in Canada in particular. Pammett and Goodman (2013, 8) note, broadly, that "[w]hile it took radio 38 years to reach 50 million users, the Internet amassed the same user base in a mere four years," with the new medium claiming a global base of regular users of more than 2.3 billion by 2012.[27] Even as of 2003, Pammett and LeDuc (2003, 58) found that just 26.5 percent of a representative sample of Canadians reported having *no* Internet access at home or at work. In the United States too, rates of Internet penetration have changed dramatically in the past two decades. What was once an American digital divide deeply characterized by race (Gibson 2002, 567), the gap in connectivity has narrowed substantially (Hall 2015, 109). This narrowing is particularly apparent among young people. Cohen et al. (2012) note, for example, that, just 2 percent of American respondents aged 18-29, and 8 percent of respondents aged 30-49 were not active Internet users."

Connectivity rates in Canada, likewise, are impressive. The 2011 *Elections Canada Survey of Electors* (ECSE) demonstrated that 86 percent of eligible voters reported having Internet access in their home, an increase of 5 percent from 2008, and 22 percent from 2003 (Laronde 2012, 2). In fact, Canada ranks among the most

[26] There are exceptions to this, notably, the ability in some cases for others to cast ballots on an elector's behalf who cannot go through this process (absentee balloting). Though, of course, in order to exercise this option, the elector must, in some cases, sacrifice their right to a secret ballot (Mercurio 2004, 425).
[27] Though this figure has no doubt increased, even since 2012. Monthly active Facebook users alone, for example, hit 2.27 billion as of October 2018 (Abbruzzese 2018).

"technologically advanced countries in the world," (Goodman, Pammett, and DeBardeleben 2010a, 9) and, perhaps not surprisingly therefore, Canadians hold top spot as the heaviest Internet users worldwide (Pammett and Goodman 2013, 15). Despite these substantial connectivity rates, however, one should still exercise caution in too readily accepting that the gaps which comprise the digital divide have all but closed. For example, says Laronde (2012, 2), the ECSE showed that "Aboriginals were less likely to say they have Internet at home (68 percent)," an access rate nearly 20 percent lower than Canada as a whole. Thus, while access to the Internet has proliferated tremendously over the past two decades (Vassil et al. 2016, 459), certain usage gaps still exist and simply must be accounted for within the discussion of Internet voting.

The issue of access to technology is just one of two components of the digital divide. The second aspect is a *skills divide*, which, although integrally related to the access divide, presents a unique set of challenges, and thus poses unique risks to some groups more than others (Bélanger and Carter 2010, 204). First, Internet voting does require citizens to possess *some* computer-related skills, and each juncture of the voting process which requires a different skill (logging on to a client platform, authentication processes, submitting the ballot etc.) presents an opportunity to alienate (and therefore disenfranchise) some electors (Carter and Campbell 2011, 29).

Older electors, in particular, come to mind in discussions regarding moving elections onto technical platforms (Powell et al. 2012, 369). Older electors, at minimum, have more experience and more confidence than younger electors casting paper ballots at polling stations, and likewise, generally report less enthusiasm towards using the Internet to supplement or replace this process (Smith 2016, 70). The City of Peterborough

provides an interesting case study from which to test the hypothesis that older electors are alienated by voting technology. Somewhat counterintuitively, Peterborough has the second largest senior population of any municipality in Canada, *and* is considered to be a leader in Internet voting, having begun offering online balloting in 2006[28] (Goodman, Pammett, and DeBardeleben 2010a, 26). Contrary to what one might assume, older electors have become the largest users of Internet voting, often choosing it over traditional paper balloting (Goodman and Pyman 2016, 29). Write Goodman and Pyman (2016, 29) of this development,

> In some ways it is rather reassuring that older voters are willing to cast their ballots online. There have been concerns expressed about older electors not having sufficient digital literacy or access to electronic devices with an Internet connection, which could be deterrents from using Internet voting. The fact that the largest portion of Internet voting users are over the age of 50 suggests that if these barriers are a factor they may not be marginalizing older electors as much as was originally thought. It could also be that older electors either have more access to the Internet, better digital literacy (or both), or are willing to make use of online voting in spite of these handicaps.

Despite Peterborough's older electors proving to be substantially more technologically-savvy than many researchers foresaw, jurisdictions which offer Internet voting would still be well-advised to provide ample support, both in ensuring equal access to the Internet, and in developing the computer skills of electors which may be less comfortable with technology use writ large (Bélanger and Carter 2010, 210).

A final concern accompanies not just the implementation of Internet voting, but the subsequent elimination of paper ballots, as was the case for 135 of the 178

[28] Between election years 2003 (the last paper-exclusive election cycle) and 2018, the City of Peterborough has experienced a fractional increase in turnout (and not the drastic decrease that some may have predicted).

municipalities offering online balloting in Ontario in 2018[29] (AMO 2018b). Ideally, online ballots would supplement other voting options, allowing for electors to select their preferred method from a suite of choices. However, many jurisdictions cite *cost saving* as an impetus for taking elections online (Barisoff and James 2012, 27; Choi and Kim 2012, 434), which is not possible with adding a supplementary voting method to those methods which are already offered.[30] Additionally, when Internet voting is offered as a supplemental voting method, it is generally the preferred method by a substantial margin, which potentially makes offering a paper channel not only costly, but largely redundant as well (Goodman and Pyman 2016, 18-9). Nonetheless, Goodman et al. (2018, 178) conduct quite possibly the only study on the behavioural effects of eliminating paper ballots,[31] concluding that the risk of dropping some electors from the voting pool may change the composition of the electorate itself, which may fundamentally change the nature of representation, and thus the policies produced by elected officials within a given jurisdiction. Thus, the digital divide remains a very real issue in Internet voting research.

### 2.8.1 Does Internet Voting Increase Access?

Removing the need to physically locate oneself at a public polling location in order to vote clearly eliminates many potential barriers to electoral access. Write Goodman, Pammett, and DeBardeleben (2010a, 15) of moving elections online,

[29] Though, it should be noted, the vast majority of these also offered telephone voting in addition to the Internet channel.
[30] One might suggest eliminating *some* physical polling stations, however, deciding which of these will be eliminated and which will remain is in itself a political project.
[31] During research for this project, no other study was found which examined this phenomenon.

> [t]here is the potential to eliminate long line-ups at polling stations and better address accessibility issues for persons with disabilities, those suffering from illness, those serving in the military or living abroad, those away on personal travel, snowbirds and other groups of citizens such as single parents who may find it difficult to visit a traditional polling station.

In addition to making voting more accessible writ large, the possibility exists to protect vote secrecy for some populations who would otherwise only be able to vote by proxy (Goodman, Pammett, and DeBardeleben 2010a, 15; Mercurio 2004, 425).

Proximity is a factor to be considered with paper voting. For example, research conducted in Estonia found that "the probability of being an Internet voter reaches over 50% as soon as the round trip duration to the polling station increases over 30 min" (Willemson 2017, 302). While proximity in and of itself may represent too great of a cost to some electors, it stands to reason that this barrier would only be compounded by issues of mobility or disability (Vassil et al. 2016, 453; Mugica 2015, 114). In these cases, it may not be realistic for public officials to hope to increase turnout via ways which bring voters to the election, but rather, efforts may be better spent on strategies which *bring the election to the voter*[32] (Chevallier, Warynski, and Sandoz 2006, 56).

Ultimately, it is unlikely many would conclude that individuals who, for any of the reasons discussed above, cannot physically get to a polling station, ought to lose their democratic right to participate in elections. Furthermore, there is no compelling argument which justifies absentee or proxy voters having to sacrifice their right to a secret ballot in order to participate. Both of these can be addressed substantially by offering electors the ability to cast a ballot remotely from their home, using an Internet-connected personal

[32] One might argue that this even has an environmental component, saving electors collectively thousands of kilometres driving to polling locations.

device (Campbell et al. 2014, 973). When offered, Goodman and Pyman (2016, 18-9) demonstrate that such an option is almost universally accepted, with 88 percent of Internet voters surveyed saying that they cast their ballot from home in Ontario in 2014.

Of course, within the larger claim that Internet voting increases turnout, the assumption is also made that the status quo of paper balloting actively creates barriers which *reduce turnout*. To this end, post-election survey research has uncovered a small, but significant percentage of respondents who claim that they would not have voted had online balloting not been available. Generally, survey questions of this nature dig no deeper, for example, by adding another response option that allows the respondent to specify that they *could not* have voted had online balloting not been available. This makes this value an unknown quantity in electoral research, a gap in the literature which would likely be well-filled by future study.[33] For example, Goodman, Pammett, and DeBardeleben (2010a, 35) find in a study of Ontario municipal Internet voters that 11 percent in 2006, and an incredible 29 percent of voters in 2003 reported that they "'probably wouldn't have' or 'for sure wouldn't have' voted if not for the option of an Internet ballot." Given that these were the first instances of Internet voting in binding elections in Canada, it would be both interesting and very useful to know how many of these electors were enfranchised simply by the ability to vote from home.

The digital divide refers to a spectrum of inequalities which occur due to a socially selective process of technological access, in this case, the Internet. Upon the

[33] Though studies of non-voters such as Goodman and Pyman (2016, 25) do offer the response option of *mobility issues* (the addition of the response option *transportation issues* clarifies that *mobility* in this case refers to physical mobility. Similarly, Carter and Campbell (2011, 30) identifying *Illness or disability* as the second-most (16 percent) frequently selected reason for abstention in a survey of American presidential non-voters.

implementation of Internet voting, three turnout outcomes might occur (decrease/no change/increase), and each outcome seems to be equally plausible through the lens of the digital divide. Firstly, it is widely assumed that the vast majority of votes – virtually regardless of the method of casting ballots – will come from a group which faces no barrier to access that ultimately prevents voting (and thus will simply choose the most convenient method regardless). Whether turnout ultimately increases or decreases, therefore, will likely come from those who are enfranchised due to the ability to vote from home – in other words, those who face barriers to access from paper voting – versus those who are disenfranchised due to the digital divide. This is especially true given the common practice (particularly amongst Ontario municipalities) of Internet voting *replacing* rather than supplementing tradition paper ballots (Goodman et al. 2018). More broadly, while a few percentage point difference in turnout may be inconsequential to the vast majority of electors, it is no doubt *very* meaningful to those who are able to participate in the democratic system governing the jurisdiction in which they live, when they otherwise would not have been able to. Electoral interventions which exist to increase accessibility, for this reason alone, ought not exit the purview of election scholars.

## 2.9 Concluding Remarks on Turnout and Participation

One might make the normative claim that a system which has more electors who vote regularly on the basis of a sense of duty or related habit-forming impression of casting a ballot is more desirable than one where large numbers participate haphazardly, spurred by a particularly salient political issue at stake in any given election. The latter

view seems to betray a perspective wherein participation is predicated on *things becoming bad enough*. If this is the criteria catalyzing increasingly proportions of overall political participation, one might be forgiven for taking a rather bearish position on electoral democracy. The question, therefore, ought not be whether or not Internet voting increases turnout, but whether it can effectively engender *consuetude*. A long-term outlook on Internet voting might see the act of casting a ballot become part of an average individual's quotidian repertoire, where banking, communications, consuming news media, finding political information, and likewise, *voting*, can be easily integrated in a daily schedule, facilitated by technology.

Might this undermine the overall "quality" of democratic decision-making? The evidence would suggest not: those who already vote regularly and pay close attention to political information will continue to do so. Some who vote irregularly because of perceived costs associated with taking time to physically go to a polling location and cast a paper ballot are likely to be brought into the ranks of regular voters. Subsequently, some of *that* cohort will inform themselves with political information to a greater degree *because* of the opportunity to be brought into the democratic process. This sequence of events will not happen over night, but rather will take several elections cycles to take full effect, perhaps, over that time, encouraging a greater number of first-time-eligible voters to participate than would have otherwise given the paper voting status quo.

However, the experience of every jurisdiction which implements Internet voting will yield different results, given the presence of certain critical sociocultural and political factors. Therefore, labelling a trial as having 'failed' because the results did not reach an

ideal threshold – especially if only observed over one or two election cycles – will likely only put unrealistic expectations on the new system and set it up to fail from the outset.

One may ask, ultimately, *ought jurisdictions implement Internet voting*? The answer depends very much on the specific goals and wishes of the jurisdiction in question. Regarding municipalities, local officials should be aware of the full breadth of costs and benefits associated, while taking precaution not to overemphasize the benefits, or sensationalize the potential effects which may occur, good or bad. In line with this thesis, however, the conclusion can be made that the full breadth of the Internet voting literature provides *reasonable grounds to be optimistic* about many of the positive claims associated with the introduction of technology into the electoral process. Therefore, local leaders in virtually all municipalities[34] ought, at the very least, to consider the factors which *do and do not* make Internet voting appropriate for their jurisdiction.

Especially important choices currently being made in Ontario on this front include whether to *replace* or *supplement* paper balloting, and what type of registration procedures ought to be required. Each of these should be determined based on the specific needs of the jurisdiction making the choice. And while the "further study" recommendation has become commonplace to the point of banality in the context of Internet voting, it still holds true, both at the municipal level specifically, as well as for those who want to see the technology 'scaled up' to other levels of government. Much of this research, crucially, should maintain a longitudinal outlook.

[34] This, of course, applies only to those municipalities in provinces which have passed legislation favourable towards the bottom-up implementation of alternative voting methods.

# Chapter 3: Original Turnout Studies

## 3.1 Introduction

There are numerous ways to approach the study of Internet voting. Likewise, for researchers, there are several levels of analysis with which to choose from, including national-level Internet elections, which are only held in Estonia, cantonal or provincial level-level elections, such as those held in Switzerland, or, at the local level, where municipalities in two Canadian provinces – Ontario and Nova Scotia – have taken the lead. There are three particular strengths to choosing Ontario municipalities to study Internet voting. First, in Ontario alone, there are "more instances of online voting in binding elections than any other country or jurisdiction" (Goodman 2014, 10), providing, at minimum, a large number of cases to analyze. Second, Ontario municipalities are largely free to administer elections as they see fit (Goodman and Pammett 2014). Accordingly, of those 444 total municipalities which hold regular elections, there are a panoply of balloting methods (paper, internet, touchscreen kiosks, mail-in, telephone, or some combination thereof), voting rules (varying election period lengths and registration rules), and accessibility measures (audio ballots, braille ballots, interpreters, paper ballots with magnified fonts and others), resulting in what Goodman and Pammett (2014) describe as "a patchwork" system of local elections in Ontario, offering ample opportunity for comparative research. Third, the 2018 municipal election represented the fifth election cycle in which Internet voting has been offered, and thus allows for investigations employing longitudinal methodologies. Few studies have incorporated 2018 findings, something this research is uniquely positioned to do so. Accordingly, the following studies supplement turnout data from municipal election years 2000-2014

collected by Goodman and Stokes (2017) with new turnout data generated from the most recent 2018 election cycle, as recorded by the Association of Municipalities Ontario (AMO 2018b).

## 3.2 Study #1: Turnout Effects Over Five Election Cycles

### 3.2.1 Background

Past research has indicated the potential problems with generalizing turnout findings after just one or two election cycles. Says Mendez (2010, 466), "[w]e are at an early stage and it is too difficult to disentangle the 'novelty effect' of e-voting to say much about positive participation effects." Similarly, Vassil et al. (2016, 458-9) conclude from their research of four Estonian electoral cycles that "the potential enabling effects did not surface immediately in the electoral realm after the introduction of the new voting technology, but required a period of at least three elections to appear." The authors surmise that different groups within an electorate will adopt new technology at different rates. This is limited, at least initially, primarily to "people who already have the resources and skills to use new technologies," and that therefore, wide diffusion takes time (Vassil et al. 2016, 459). Thus, it can be concluded that *some* meaningful turnout effects may only manifest after many election cycles where Internet voting is offered.

Given the 'newness' of online balloting technology, there simply are not nearly as many cases from which to gather evidence compared to paper balloting, which has been the chosen method for decades-worth of elections in a hundred or more countries, and in thousands more sub-national elections (Alvarez, Katz, Pomares 2011, 199). In contrast, many observations of Internet voting turnout effects have been extrapolated from limited

opportunities from which to gather data. Accordingly, many conclusions are drawn from single election cycles. Ontario municipalities provide some of the few cases in the world where Internet voting has been offered for *five* complete election cycles.

### 3.2.2 Methodology

Study #1 will add turnout data from the 2018 Ontario municipal election to that gathered from four previous cycles (2014, '10, '06, '03) as well as the last election in which Internet voting was *not* offered (2000). A set of the 12 original municipalities which implemented Internet voting in 2003 (henceforth *early adopters*) will be analyzed. With this data, long-term turnout effects might be uncovered from a select group of municipalities which have experienced more binding online election cycles than virtually any other jurisdiction in the world. Though complex statistical analysis is beyond the scope of this research, a simple hypothesis may be here tested by:

$H_2$: *In the long run, the implementation of Internet voting increases voter turnout.*

"Long-run" is here conceptually defined as having the technology available for use in five consecutive election cycles. Given this, three municipalities will be excluded from the set: the Township of North Glengarry (used Internet voting in 2003, abandoned it for 2006 and 2010, then re-adopted it for 2014 and 2018), The Nation (offered Internet voting in 2003 and 2006, but ultimately acclaimed leadership), and the Township of East Hawkesbury (acclaimed leadership in 2018). Thus, the final set of early adopters includes nine municipal cases, each of which has offered Internet voting in some capacity since election year 2003. Finally, while more robust analysis might benefit from controlling for

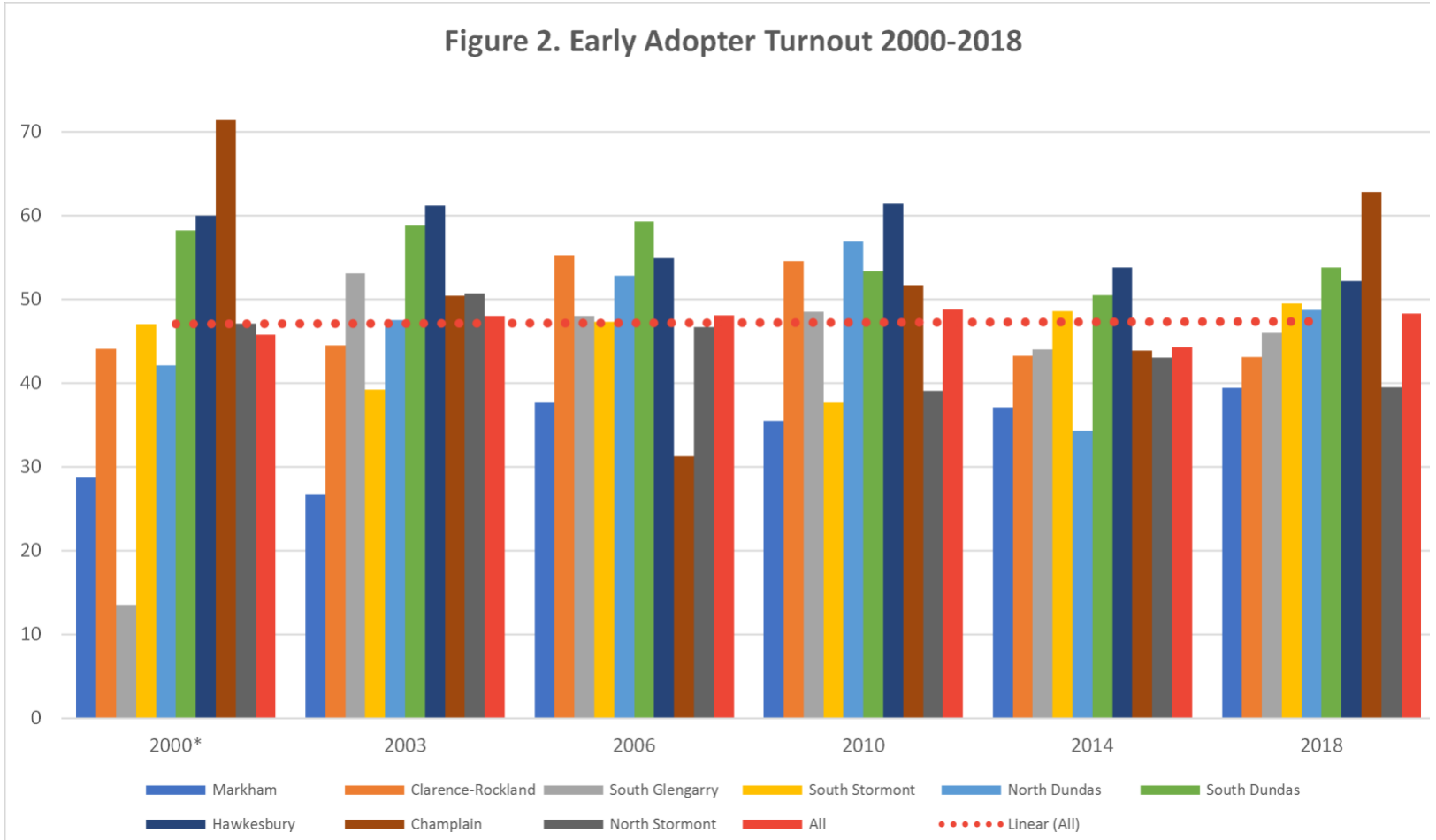
specific contextual factors (for example, Markham only offered online ballots for the pre-voting period in 2003 before fully generalizing it in subsequent cycles), this study will account for turnout and population only (noting only, for example, *if* online ballots were offered, but not *how*). Given the diversity of models which exist, *any* conceptual categorization will necessarily require some sacrifice of context-specific factors. Evidence towards this hypothesis can be derived simply from a comparison of this set of cases versus turnout data from all Ontario municipalities collectively.

### 3.2.3 Results

Table 2. Turnout for Set of Early Adopters 2000-2018

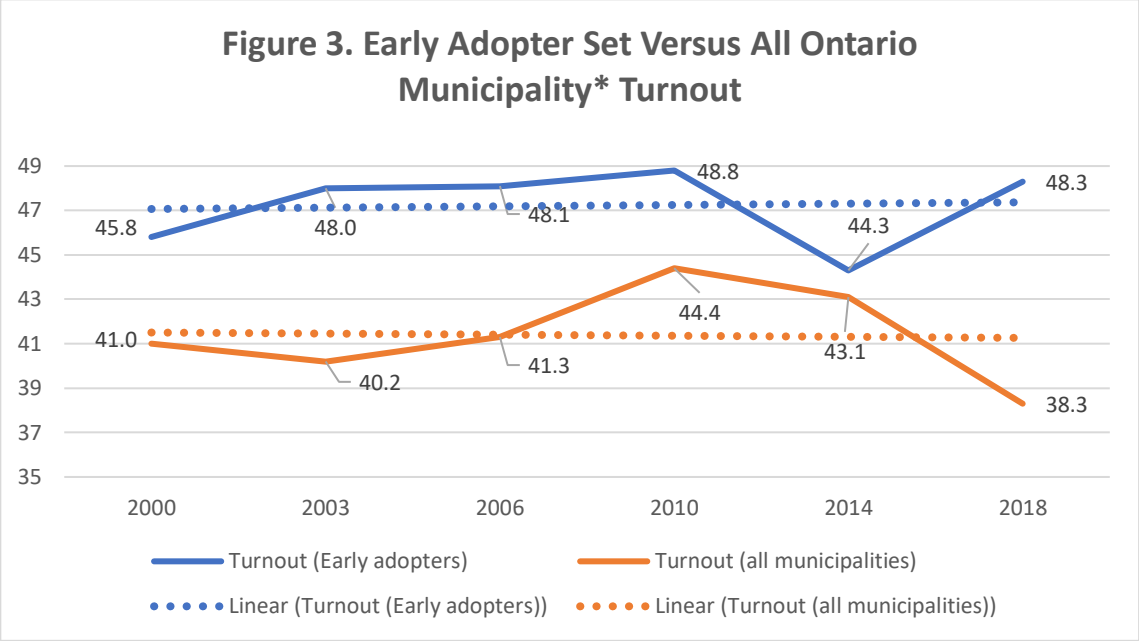
| | | Turnout | | | | | |
|---|---|---|---|---|---|---|---|
| **Municipality** | **Population*** | **2000[P]** | **2003** | **2006** | **2010** | **2014** | **2018** |
| **Markham** | 328,966 | 28.7 | 26.7 | 37.7 | 35.5 | 37.1 | 39.4 |
| **Clarence-Rockland** | 24,512 | 44.1 | 44.5 | 55.3 | 54.6 | 43.2 | 43.1 |
| **South Glengarry** | 13,150 | 13.5 | 53.1 | 48.0 | 48.5 | 44.0 | 46.0 |
| **South Stormont** | 13,110 | 47.1 | 50.7 | 46.7 | 39.1 | 43.0 | 39.5 |
| **North Dundas** | 11,278 | 42.1 | 47.5 | 52.8 | 56.9 | 34.3 | 48.7 |
| **South Dundas** | 10,833 | 58.2 | 58.8 | 59.3 | 53.4 | 50.5 | 53.8 |
| **Hawkesbury** | 10,263 | 60.0 | 61.2 | 54.9 | 61.4 | 53.8 | 52.2 |
| **Champlain** | 8,706 | 71.4 | 50.4 | 31.3 | 51.7 | 43.9 | 62.8 |
| **North Stormont** | 6,873 | 47.1 | 50.7 | 46.7 | 39.1 | 43.0 | 39.5 |
| **All Ontario Municiplities** | N/A | 41.0 | 40.2 | 41.3 | 44.4 | 43.1 | 38.3 |

*As of 2018 (includes non-voting population)
[P] Indicates paper voting for this election cycle
Source: Goodman and Stokes (2017); AMO (2018a)



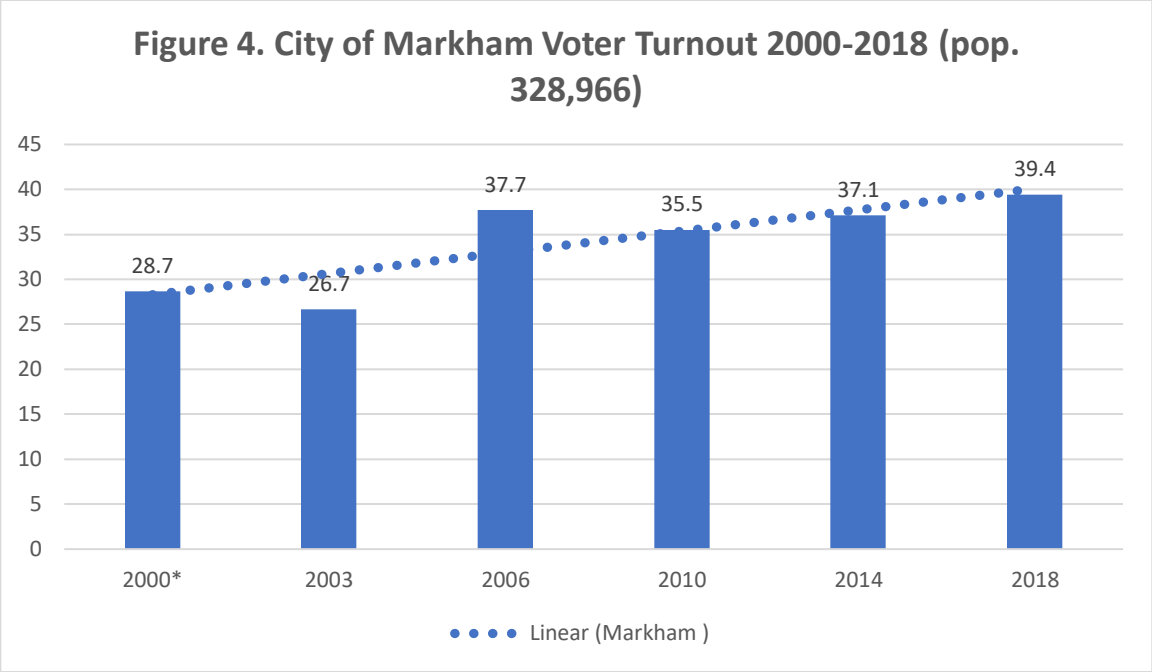

*Indicates paper voting for this election cycle

Figure 2 displays turnout data of this set of early adopters graphically, including an unweighted set average by year (red bars) and a linear trend of the unweighted set average (red dotted line). A slightly positive trend can be observed.




*Includes Internet voting municipalities

Figure 3 compares the unweighted average turnout by election cycle of the nine early adopters, and the unweighted average turnout by election cycle of all Ontario municipalities. The addition of 2018 turnout data demonstrates that although the two data lines nearly converged in 2014, a difference in turnout of 10 percent between the two can be observed in 2018.




### 3.2.4 Discussion

As expected, turnout figures from this set simply do not meet the sensational claims often made about the power of Internet voting to increase participation. That said, there are several interesting observations to be made from this analysis. The first regards the case of Markham, the largest municipality by population by more than an order of magnitude. For the 2003 election, Markham offered Internet voting only during advanced voting, and though overall turnout dipped slightly (Fig 4), the municipality experienced a remarkable 300 percent increasing in advanced polling (Goodman, Pammett, and DeBardeleben 2010a, 25). In 2006, advanced voting increased another 48 percent (Goodman, Pammett, and DeBardeleben 2010a, 25). During a period (2000-2018) where all Ontario municipalities collectively saw turnout diminish by nearly 3 percent (Fig 3), Markham – Ontario's largest online voting municipality – has seen turnout *increase* by over 10 percent.

A slightly positive linear trend can be observed for this set of early adopters over election cycles 2000 to 2018, while a slightly negative linear trend can be observed for all Ontario municipalities collectively (Fig 3). It should be noted, of course, that with each subsequent election cycle, more municipalities offer online voting, and thus the collective turnout of all Ontario municipalities will include a greater percentage of Internet voting municipalities over time (for example, while just under 3 percent of municipalities offered Internet voting in 2003, over *40 percent* of Ontario municipalities which held elections did so for 2018). Nonetheless, this nine-municipality set has outperformed Ontario municipalities as a whole consistently over the timeframe viewed in this study (2000-2018). Furthermore, while the turnout gap between this set and all Ontario municipalities was 4.8 percent in 2000 (when both utilized paper balloting exclusively), this figure has been exceeded in all but two election cycles (2010: 4.4 percent; 2014: 1.2 percent). The average gap between this set and all Ontario municipalities over the five Internet voting election cycles is just over 6 percent, and the total difference in turnout has grown by 5.2 percent.

These data show the necessity of further case study and greater statistical sophistication in studying municipal turnout, especially considering the long-term trends of the earliest adopters of Internet voting. For example, the municipalities of South Glengarry (2000 turnout: 13.5 percent) and Champlain (2000 turnout: 71.4 percent) registered turnout levels in 2000 which appear anomalous within this set of early adopters, with the former being the lowest, and the latter being the highest of all 54 turnouts recorded. It stands to reason, therefore, that the logic employed by officials in each respective jurisdiction for implementing Internet voting was very different.

Likewise, the subsequent turnout results appear near-miraculous in the case of South Glengarry (*increasing* from 13.5 percent in 2000 to a high of 53.1 percent immediately upon implementation) and catastrophic for Champlain (decreasing from 71.4 percent in 2000 to a low of 31.3 percent in just two election cycles upon implementation). Might Internet voting have played a role in one municipality experiencing a 40 percent gain and another a 40 percent reduction in turnout over the timeframe presented in this set? Such a conclusion is beyond the scope of this research, however, it can be reasonably speculated that forces other than ballot casting method drove the bulk of these extraordinary turnout trajectories.

### 3.2.5 Conclusion

The addition of 2018 data to this set of the early adopters of online voting technology only substantiates the narrative of Markham as a Canadian success story (Pammett and Goodman 2013, 25). More broadly, a simple average turnout of this set yields an impression wherein the early adopters of Internet voting have achieved consistently higher voter turnout than the province's municipalities as a whole. This study confirms, however, that it is quixotic to expect that an Internet voting intervention will yield immediate short-term, or even substantial long-term turnout gains. Likewise, any such gains which are achieved do not typically appear linearly, which can be explained, simply, by the fact that the vast majority of voters cast ballots because they are concerned about issues at stake in the election, or, more broadly, see voting as a democratic duty, and not because of the method of voting itself.

This set of early adopters gives researchers a unique opportunity to observe *long-term* phenomena related to the implementation of Internet voting. Unlike Swiss politics, for example, which are very active and thus require frequent participation (Chevallier, Warynski, and Sandoz 2006, 55), municipal elections are structurally very similar to those which occur at the provincial and federal level. Policymakers wishing to 'scale up' Internet voting technology would be well-advised to consider this set of cases closely. Importantly, future research should bear in mind the role of *issues* in driving turnout. The overall competitiveness of a municipal election may vary substantially, and this no doubt affects turnout (Blais and Loewen 2009, 14). Taking this into account, more sophisticated statistical analyses should attempt to quantify metrics of electoral competitiveness, factoring, among other things, incumbency rates, the number of acclamations (particularly with the head of council), winning margins, referendum questions on the ballots, and the salience of certain issues within local and regional media.

## 3.3 Study #2: Comparative Analysis of Turnout by Implementation Cycle

### 3.3.1 Background

The proliferation of Internet voting implementation within the patchwork of Ontario municipalities has been substantial. Since 2003, where 12 early adopters offered electors the opportunity to cast ballots online, the number of municipalities employing the technology has roughly doubled with every subsequent election cycle, with 178 municipalities offering Internet voting in some form for the 2018 election, and thus, giving millions of electors the opportunity to participate via this medium (AMO 2018a; Goodman and Wellsbury 2015). This rollout dynamic presents a wonderful opportunity

for study, with a large number (n=73) of municipalities having experienced ≤3 Internet election cycles, and a somewhat smaller number (n=17) of municipalities having experienced >3 Internet election cycles. Thus, an opportunity is presented for comparative analysis, using the date of Internet voting implementation as the independent variable.

### 3.3.2 Methodology

For this study, turnout data from the 2000, 2003, 2006, 2010, and 2014 municipal election cycles compiled by Goodman and Stokes (2017) will be supplemented by turnout data from the most recent 2018 election (AMO 2018b). The following hypotheses will be considered:

$H_3$: *The earlier Internet voting is adopted, the greater the turnout gains.*

$H_4$: *Internet voting yields higher turnout than traditional paper voting.*

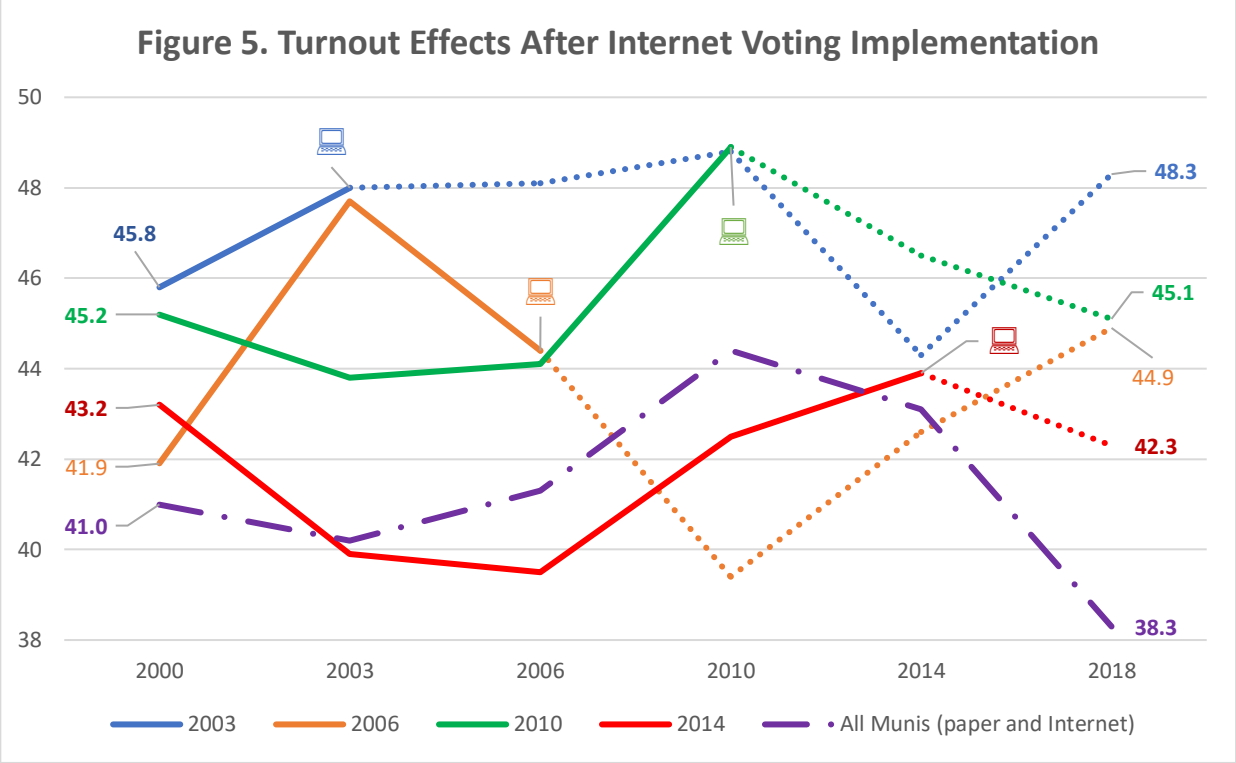
With regards to $H_3$, four distinct cohorts will be analyzed, grouped by the year of implementation. To limit possible influence of the 'novelty effect' (discussed in Study #1), only those municipalities which offered Internet voting in 2018 *and* 2014 will be used, and thus, all municipalities examined will have offered an online ballot for a minimum of two election cycles.

Only those municipalities which have held *six* elections between the years 2000 and 2018 are included in these sets, and thus, those which have acclaimed leadership at

some point during this time are removed.[35] This is likely to remove some (but not all) of the 'competitiveness bias' present in many municipal elections, wherein voters do not feel an impetus to cast ballots given that the results are perceived as a foregone conclusion, as indicated by a recent acclamation. This is especially true when the 'Head of Council' position (Mayor, Warden etc.) – the only position which all electors within a municipality have a say in – is acclaimed, and thus only councilors in specific wards run competitive elections. Also removed from these sets are those municipalities which adopted Internet voting at some point, but then reverted back to paper balloting for subsequent elections.[36] While these are no doubt fascinating case studies and ought to be commented on in future research, they do not fit into the design of this study.

[35] Municipalities which have acclaimed leadership between 2000 and 2018: East Hawksbury (2018); The Nation (2003; 2006); The Archipelago (2000); Huron-Kinloss (2000); and North Frontenac (2018).
[36] These cases include North Glengarry (offered Internet voting in 2003, 2014, and 2018), Huntsville (offered Internet voting in 2010 and 2018), and Guelph (offered Internet in 2014, reverted to paper for 2018).

### 3.3.3 Results




Indicates paper voting
Indicates Internet voting
Internet voting was introduced for this election cycle

Over the course of six Ontario Municipal elections held between the years 2000 and 2018, several trends appear within this set of selected cases. Nine municipalities implemented Internet voting in 2003, resulting in a turnout increase of 0.3 percent between 2003 and 2018, and an overall turnout increase of 2.5 percent since 2000 (Fig 5). Eight municipalities implemented Internet voting in 2006, resulting in a turnout increase of 0.8 percent between 2006 and 2018, and an overall turnout increase of 3 percent since 2000. 22 municipalities implemented Internet voting in 2010, resulting in a decrease of 3.8 percent between 2010 and 2018, and an overall turnout decrease of 0.1 percent since 2000. 51 municipalities implemented Internet voting in 2014, resulting in turnout

decrease of 1.6 percent between 2014 and 2018, and an overall turnout decrease of 0.9 percent since 2000. These values are expressed in the following table:

Table 3. Turnout Effects by Implementation Year

| **Implementation Year (N)** | **Turnout +/- Since Implementation** | **Turnout +/- since 2000** |
|---|---|---|
| 2003 (9) | 0.3 | 2.5 |
| 2006 (8) | 0.8 | 3 |
| 2010 (22) | -3.8 | -0.1 |
| 2014 (51) | -1.6 | -0.9 |
| N = 90 | = -4.3 | = 4.5 |

With reference to $H_4$, within this timeframe explored, and given this set of 90 municipalities, 295 elections have taken place *without* using Internet voting: 90 in 2000; 81 in 2003; 73 in 2006; 51 in 2010, and 0 in 2014 and 2018. By comparison, 245 elections have taken place which offer Internet voting in some capacity: nine in 2003, 17 in 2006, 39 in 2010, and 90 in 2014 and 2018. A simple, unweighted summation of all non-Internet and Internet elections since 2000 yields the following average turnouts:

| | |
|---|---|
| Internet* | 44.9 percent |
| Non-Internet* | 42.3 percent |
| All Ontario municipalities[37] | 41.4 percent |

*Within selected cases

While on the surface this may give the impression that Internet elections slightly outperform non-Internet elections with regards to turnout (increase of 2.6 percent), several methodological considerations mean one should take great caution in using this figure as evidence that Internet voting increases turnout. These are discussed below.

[37] This figure includes all municipalities which held elections between 2000 and 2018, and is thus lower than the average turnout of non-Internet cases within the set of 90 selected for this study.

### 3.3.4 Discussion

It should be clearly understood at this point in the research, given the many factors demonstrated to affect turnout, and additionally, the very marginal (and likely immeasurable) way that certain factors can affect an individual's perceived cost of voting (Blais et al. 2019, 150-1), that the above results do not allow one to conclude, *ceteris paribus*, that Internet voting increases turnout. It bears repeating that in calculating whether or not to cast a ballot, the individual voter is exposed to a plethora of sociological, cultural, political, and economic effects (Smets and Van Ham 2013, 344), all of which are unaccounted for in this methodology. Furthermore, specific to Ontario, there are generally differences in turnout between large and small municipalities (AMO 2018a), and thus, population effects may also be present.[38] These many caveats notwithstanding however, several interesting observations can be made from this study.

First, with reference to $H_4$, this study noted a 2.6 percent larger turnout in Internet-enabled elections since 2000 versus paper elections in this set, and a 3.5 percent larger turnout in Internet voting elections held since 2000 versus the average turnout of all Ontario municipalities since 2000 (which includes all forms of balloting). The latter finding is (coincidentally) identical to the 3.5 percent increase in voter turnout noted by Goodman and Stokes (2016, 1). Although Goodman and Stokes (2016) had the luxury of employing far more sophisticated analyses, this study had the advantage of employing an extra election cycle (2018) from which to gather turnout data and make observations. While a null $H_4$ cannot be *definitively* disproven, there are reasonable grounds to be

[38] Such population effects might include engendering the perception that the more total voters participate, the less each individual vote is worth.

optimistic that, in amalgam, those municipalities which offer online balloting will see slightly greater levels of turnout than those who remain with the paper balloting only status quo.

With regards to $H_3$, those municipalities which offered online voting for the 2003 and/or 2006 election cycles (n=17) have experienced a collective 5 percent increase since 2000, while those which implemented Internet voting *after* 2006 (n=73) have seen a collective turnout decrease of 1 percent.[39] This provides some evidence towards the notion that because turnout phenomena related to Internet voting implementation might take multiple cycles to appear (or likewise, biases may take multiple cycles to disappear), the sooner jurisdictions offer online balloting, the sooner citizens – and especially irregular voters – will become comfortable with the technology. The Technology Acceptance Model theoretical framework[40] states, broadly, that new technology will only become widely established if users perceive it to be useful and simple to use (Choi and Kim 2012, 436). Simply, more election cycles offering online balloting gives electors greater opportunities to experience the technology for themselves, and most electors appear to come to this conclusion. Given the overwhelming satisfaction noted amongst Ontario's electronic municipal voters (Goodman and Pyman 2016, 18), it is intuitive that with more opportunities for electors to see for themselves that online balloting is beneficial in some way (time-saving or otherwise), the greater the chance that the technology will proliferate.

[39] This finding is rather surprising, given that Goodman and Stokes (2016, 8) hypothesize that turnout effects should be *greater* the later online balloting is offered, given the general proliferation of Internet use over the past two decades.
[40] For a full explanation of the TAM theoretical framework, refer to chapter 4.

One must, however, exercise caution with this finding as well. The number of cases of early Internet voting adopters (2003, 2006; n=17) is much smaller than those which have adopted the technology more recently (2010, 2014; n=73), and thus other factors are likely to contribute to this 6 percent difference in turnout outcomes. For example, Pammett and Goodman (2013, 32) note that there is often a palpable pride which accompanies those on the cutting edge of novel service delivery, especially in the context of Internet elections. This may apply more so to the 2003 and 2006 cohort than the latter two.

More broadly, it should be noted that *all* cases in this set have, at some point, not only adopted online voting, but retained it for at least two election cycles.[41] This can be taken as an indication that all of these municipalities virtually without exception see 'increasing turnout' as a policy priority. In many cases, Internet voting is just one of a suite of efforts to increase participation, and therefore, turnout effects between a given set of Internet voting municipalities and paper voting municipalities may be attributable to a broader difference in attitude or philosophy towards voter turnout, and the subsequent policy measures which occur as a result[42] (Atkeson and Saunders 2007, 659). Future studies might attempt to further uncover policy variation between municipalities which actively attempt to increase turnout and those which do not make such an attempt, placing Internet voting within this constellation of policy choices.

[41] It remains, of course, a possibility that some adopters will abandon the technology for various reasons, as the City of Guelph chose to do for the 2018 election after offering online balloting in 2014.

[42] Though it is likely that most municipalities – even those which do not adopt Internet voting – are at least somewhat interested in increasing voter turnout.

### 3.3.5 Conclusion

Study #2 hypothesized firstly, that earlier implementation of Internet voting would yield greater long-term turnout results, and secondly, that over a given period, municipalities which offered online balloting would experience greater turnout writ large than those which do not. Some evidence exists supporting these propositions. Though there are substantial limitations to the relatively rudimentary method employed here, future research should further investigate the role of implementation date. Such research, particularly, should consider long-term trends, exercising ample caution in generalizing turnout effect conclusions derived from one or two election cycles.

# Chapter 4: Trust

## 4.1 Introduction: Trust as the Foundation of Democracy

As has been well-established here already, there is near-universally understood link between the act of voting and the health of democracy writ large. As Richter (2010, 80) writes,

> An election in a parliamentary democracy is the fundamental tool by means of which the citizens unite into a public body which is able to act. By active participation the citizens gain the possibility to take part in the installation of the organization called state and thus to perceive it as something of their own making, not as something ordered from above.

Properly run elections are fundamental to the legitimacy of the governing, and sacred to the governed (Barisoff and James 2012, 12). In fact, says Bean (2011, 26), the notion of citizen participation is "inextricably linked with understandings of democracy." However, simply holding regular elections is just one piece of the puzzle. There is another ingredient which, without it, threatens undermines the entire democratic project: *trust*.

Within the context of elections, trust manifests in a variety of ways: trust that ballots will be counted as cast (Gerck, 2001; Atkeson and Saunders 2007); trust that attempts at manipulation will be detected and dealt with appropriately by election officials (Sebé et al. 2010, 667; Chandros et al. 2019, 268); trust that other voters are not being coerced into voting in a particular way (Neumann et al. 2016, 339) and likewise, that one's own vote is known only to them (Birch, Cockshott, and Renaud 2014, 190); and, trust that overall, elections are being conducted in a fair and transparent way (Chen, Jan, and Chen 2004, 330-1). The introduction of Internet voting – systems with which voters are *generally* far less familiar than traditional paper balloting (Smith 2016, 79) –

forces a wholesale reconsideration of the role of trust in democratic elections, and therefore in other crucial factors such as security, privacy, fairness, and transparency.

In the context of modernizing elections, it can often be challenging for non-experts to discuss complex Internet communications technology. Say Pammett and Goodman (2013, 16), "the argument becomes a kind of 'take it or leave it' opinion, in which lay audiences are forced to make a yes-no decision with no possibility of compromise." The purposes of this section, therefore, will be to synthesize several claims relevant to the study of Internet voting which have emerged from the Internet security, voting behaviour, and technology acceptance theories literature, as well as highlight numerous results from social scientific studies on voter trust, especially those which occur in Internet voting jurisdictions. Ultimately, no voting system is perfect, whether it is conducted via electronic channels or on paper (Realpe-Muñoz et al. 2018, 193). Rather than strive for a standard or perfection, therefore, election officials ought to implement whatever system engenders *maximum trust* amongst the largest number of its users.

## 4.2 Paper Voting: Trustworthy or Familiar?

The genesis of Internet voting in Canadian politics occurred during a 2003 NDP leadership contest, and not long after, it was trialed for the first time by a dozen municipalities in Ontario (Goodman 2014, 9). Given this extremely short life and the relatively small scope of the technology, it is very likely that an overwhelming majority of those who have *ever* participated in a Canadian election at *any* level have cast a paper ballot, and this no doubt is a clear advantage for the status quo. Put another way, says Willemson (2017, 303), "where paper voting is really superior to its electronic sibling is

its centuries-long head start." Familiarity with the process no doubt engenders feelings of trust, as does the relatively graspable processes by which a paper ballot becomes a vote (Beroggi 2014, 50; Olsen and Nordhaug 2012, 37).

Of course, paper ballots which are both filled out and counted by human hands are susceptible to error and abnormalities as well. Research on paper balloting demonstrates that, depending on the specific characteristics of the ballots used, human error rate is generally 1 to 2 percent, well within the margins which decide the outcome of many democratic contests (Willemson 2017, 297). However, says Beroggi (2014, 50), "[a]t present, voters seem more afraid of large-scale electronic vote falsification than of manually falsified paper votes at post offices or polls." While Willemson (2017, 303) contests that the "only reliable way to see which problems occur in practice and how severe they are is to try the whole system out live,"[43] the fact remains that any new system of casting a ballot should, at minimum be *as* trusted as the one being supplemented or capitulated, and ideally, be *more* so. The remainder of this chapter will look at perhaps the most commonly-cited contention against the implementation of Internet voting: *security*, and its concomitant, *trust* (Goodman, Pammett, and DeBardeleben 2010a, 16; King and Hancock 2012). In doing so it will emphasize the importance of *perceptions* of security, employing the Technology Acceptance Model theoretical framework. It will then consider how the issue of ballot secrecy – a constitutionally-protected right in many electoral democracies – might be affected by the

[43] Willemson (2017, 303) ultimately concludes that the benefits are worth the potential risks, remarking, "if we do not give electronic voting a chance, we will also miss all the opportunities of increased accessibility, lowered cost of participation and fully repeatable counting which, contrary to the paper voting, really is doable by everyone."

adoption of Internet voting. Finally, it will touch on the important issue of using private sector providers of Internet voting technology, as is done by all Ontario municipalities which offer online balloting, noting the unique risks this may introduce.

## 4.3 The Issue of Security

As has been established throughout this project, all voting systems have costs and benefits, and it is incumbent upon researchers and public decision-makers to consider all of these in full. The most frequently-cited risk is that of *security*, and more specifically, various threats that might compromise some part of the election, or the electoral proceedings in their entirety (Goodman, Pammett, and DeBardeleben 2010a, 16). Say Goodman, Pammett, and DeBardeleben (2010a, 16), "[t]hreats of computer viruses or hacker-orchestrated 'denial of service' attacks are most commonly mentioned as problems that could compromise an election and public confidence in electronic voting." Critiques of Internet voting range from the Orwellian to the highly technical, but all point to the dangers posed to the "security, integrity and secrecy of Internet ballots" (Oostveen and Van den Besselaar 2004, 65).

The most unique aspect to remote Internet voting, by definition, is that it can be done anywhere where an online-enabled device can be connected to the Internet. Thus, voting is said to be transplanted from a *controlled* to an *uncontrolled* environment, introducing a suite of challenges which do not exist when electors cast ballots at a supervised polling location (Jaquim, Ribeiro, and Ferreira 2010, 311; Saglie and Segaard 2016, 155). The computer science literature offers a number of "basic security properties" which any Internet voting system must, in theory, guarantee. Sebé et al. (2010, 667)

identify seven such properties: (1) *Authentication*: only eligible voters are able to cast ballots; (2) *Unicity*: voters cannot cast multiple ballots; (3) *Integrity*: attempts at manipulation at any point of the election can be detected; (4) *Privacy*: no cast ballot can be linked to the voter which cast it; (5) *Verifiability*: "[f]airness of the whole voting procedure can be checked. A voting scheme is universally verifiable if anyone can independently verify that all ballots have been counted correctly. If voters can only verify that their own ballot has been counted, the scheme is individually verifiable"; (6) *Uncoercity*: once ballots are cast, a voter cannot verify that they voted for any particular option; and (7) *Fairness*: "[a]ll ballots remain secret until the election is complete." Chen, Jan, and Chen (2004, 331) add a criteria of 'practicability', which demands that neither additional skills beyond that of rudimentary computer use, nor any special equipment are required to participate. As will be demonstrated, however, this principle can often be difficult to achieve in practice.

Many observers (Alvarez, Katz, and Pomares 2011, 202; Willemson 2017, 303-4; Neumann et al. 2016, 337) highlight the fact that some overarching requirements of Internet voting security are contradictory in nature, for example, *vote secrecy* and *auditability* (Willemson 2017, 303-4). This has proven to complicate many theoretical and practical attempts at building Internet voting models, which necessarily, therefore, must make trade-offs at some juncture of the decision-making process[44] (del Blanco et al. 2007). Adding to the complexity is the difficulty in quantifying or comparing Internet

[44] Willemson (2017, 303-4) phrases this quandary slightly differently, writing, "there will always be some parts of the setup that the voter will have to trust as given, and hence critically-minded researchers will have an eternal chance to write papers about breaking them."

voting schemes, which, say Neumann et al. (2016, 337-8), forces decision-makers to select Internet voting models[45] without being able to make a fully-informed decision regarding which model to select.

### 4.3.1 Models for Secure Internet Voting

The computer science and electronic democracy literatures abound with models for Internet voting systems which seek to maximize the above security properties. While this project is concerned primarily with the socio-political aspects of Internet security[46], an exploration of more technical considerations is needed to fully frame the state of the debate (Alvarez, Katz, and Pomares 2011, 214-5).

One technology which has received substantial attention since it emerged is Internet voting systems which offer 'end-to-end' verifiability (E2E-V) (Chandros et al. 2019, 268; Gibson et al. 2016, 281; Gerck 2010, 1). E2E-V systems, uniquely, offer two key advantages, including giving voters the ability to verify "that their vote is cast as they intended and correctly recorded (individual verifiability)" as well as ensuring that "anyone can verify that all recorded votes were properly included in the tally (universal verifiability)" (Gibson et al. 2016, 281). Addressing the auditability versus privacy tradeoff, Gibson et al. (2016, 281) continue,

> End-to-end verifiable systems also typically use sophisticated cryptographic techniques for providing privacy (though this is not part of the definition of end-to-end verifiability). Such protocols should guarantee that voters do not need to

[45] and by extension, private providers of certain Internet voting models. More on private purveyors of voting technology in section (4.8) of this chapter.
[46] Along this line, say Stoica and Ghilic-Micu (2016, 55), "[e]lectronic voting is rather a social and political project rather than a technical one, a component of the political dimensions of the new media technologies, leading to improvements of social nature through increasing the number of citizens involved in the political decision process."

> blindly trust any component of the system; all components can be scrutinised so that their computation can be verified if their trustworthiness is in doubt.

The benefit of E2E-V systems is that it gives electors assurance that the election result has not been manipulated, either by attackers or by election authorities themselves[47] (Chandros et al. 2019, 268). Some models such as the 'Witness-Voting System' (Gerck 2010, 1), are end-to-end audited, and ensure voter secrecy by making voter and vote 'unlinkable', although, the author says, each is identifiable. Although these systems clearly will not allay *all* security fears, they provide a mechanism for virtually anyone to understand that *ballot tallies* have not been compromised by would-be attackers.

E2E-V is one of a suite of so-called 'auditing mechanisms' which are added to elections proceedings with the aim of improving trustworthiness (Gerck 2010, 7). Such mechanisms, writes Gerck (2010, 7), are implemented "with the intent to preempt or at least resolve a dispute regarding the proper casting and counting of votes. For example, to provide an acceptably high confidence level that all ballots were counted as cast." Within the Canadian context, Halifax Regional Municipality implemented a system with four 'layers' of security, including an auditing feature:

> The first, a "penetration test", involved a contracted IT firm trying to break through the Intelivote system to evaluate whether existing security mechanisms were capable of adequately preventing another person or group from tampering with the system. The second check involved analyzing the encryption system used in the communication between computer servers. The third was an external audit of the entire voting process undertaken by an auditing firm. Finally, the fourth check analyzed the network's overall security to ensure prevention of attacks and problems" (Goodman, Pammett, and DeBardeleben 2010a, 29).

[47] For a more technical and thorough explanation of end-to-end verification voting systems, see Gibson et al. (2016, 281). For examples of voting system designs using end-to-end verification, see Gerck (2010), Jaquim, Ribeiro, and Ferreira (2010), and Sebé et al. (2010, 674).

Once again, it is important to recall that no ballot-casting model – online or offline – can be fully guaranteed to be free of irregularities or impenetrable to attack, and thus, sophisticated audit mechanisms are as much to engender a sense of trust among the electorate as they are to strive for a technically sound system (Warkentin et al. 2018, 202-3; Alvarez, Katz, and Pomares 2011, 200).

In fact, the most vulnerable point in any Internet voting system is not in the system itself, but the user's personal device, be it a home computer or mobile device (Realpe-Muñoz et al. 2018, 183). Simple issues which might be easily be overlooked such as unintuitive user interfaces or operational complexity above a minimum threshold can lead users to unwittingly invite would-be attackers onto their personal devices (for example, by visiting a webpage mimicking the jurisdiction's official webpage) (King and Hancock 2012, 51). Jaquim, Ribeiro, and Ferreira (2010, 310) detail a method called "CodeVoting" to overcome the issue of unsecure client platforms using secure hardware attached to the individual voter's personal device (similar to the electronic ID readers used in Estonia), though this runs the risk of disenfranchising those would-be voters who do not possess the appropriate hardware. Other researchers, notably Chandros et al. (2019, 269) claim to have created two

> state-of-the-art, end-to-end verifiable, distributed voting systems with no single point of failure besides setup… Both systems allow voters to verify their vote was tallied-as-intended without the assistance of special software or trusted devices, and allow external auditors to verify the correctness of the election process. Additionally, both systems allow voters to delegate auditing to a third party auditor, without sacrificing their privacy.

However, even with these promising models of Internet voting security, the authors ultimately conclude that there are performance tradeoffs with each individual system.

Finally, registration is crucial to security (both technical and perceived). In both Ontario and Nova Scotia, a variety of registration processes are offered. In 2014, only twelve of 97 municipalities required registration in order to cast a ballot via the Internet, with the rest allowing electors to log into the system and vote without prior registration (Goodman and Stokes 2016, 4). Such systems of course always require some form of authentication. For example, in a post-election survey of 38 municipal representatives from the 2014 election conducted by Goodman and Smith (2017, 169), 92% required a scratch off PIN card received in the mail, 42% required a date of birth, and 16% required creating a security question and answering it correctly. Pre-registration is typically more common in larger cities, allowing for the requirement of multiple credentials to access the system (Goodman and Smith 2017, 169). Each requirement will have ramifications with regards to both actual protection of voting integrity, as well as public perceptions of security.

Ultimately, security concerns are likely to exist part and parcel to virtually any Internet voting systems. Firstly, the technical considerations are the domain of computer science experts, and likewise, conversations with non-experts tend to devolve into 'for' or 'against' positions which do not accurately reflect the risks and benefits of these systems (Olsen and Nordhaug 2012, 37). Secondly, it is extremely difficult to quantify and/or compare Internet voting systems for the simple reason that there is no 'perfect standard' of Internet voting security, and therefore trade-offs will always be made based on the needs of the jurisdiction implementing the system (Realpe-Muñoz et al. 2018, 193). Thirdly, regardless of the system in place, it is the voter's personal device that represent the most vulnerable point to attack (King and Hancock 2012, 51). Fourth, regardless of

the technical proficiency of the security system in place, including meeting a sufficient number of basic security properties (Sebé et al. 2010, 667), a system will *only be as good as the voting public believes it to be* (Alvarez, Katz, and Pomares 2011, 200; Gjøsteen and Lund 2016, 299). To many commentators, the security issue carries risk, but the risk can be minimized to a sufficient degree to reap the benefits of Internet voting (Goodman, Pammett, and DeBardeleben 2010a, 47; Willemson 2017, 303; Beroggi 2014, 50). For others, notably public officials in the UK (Mendez 2010, 461) and Norway (Olsen and Nordhaug 2012, 37), the security issue represents an impasse. One might conclude that for those with a certain degree of pre-existing distrust towards the Internet and technology writ large, *no* form of security will suffice. This remains to be seen, however, as more electors in more jurisdiction have the chance to cast a ballot online. The next section will shift the focus away from the researchers and onto the voters themselves, examining surveys conducted both before and after Internet voting system adoption.

## 4.4 Trust, Usability, and the Technology Acceptance Model

Davis (1989, 319), working at the dawn of the computer age, sought to fill a gap in the information technology literature, writing, "[v]alid measurement scales for predicting user acceptance of computers are in short supply." The two variables in question: *perceived usefulness* and *perceived ease of use* would lay the foundations for a still widely-used theoretical framework known as the *Technology Acceptance Model* (henceforth TAM) (Choi and Kim 2012, 436). *Perceived usefulness* is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis 1989, 320). *Perceived ease of use*, meanwhile, is defined by

Davis (1989, 320), as "the degree to which a person believes that using a particular system would be free of effort." In the three decades since Davis's pioneering work, many scholars (Warkentin et al. 2018, 195; Choi and Kim 2012, 435; Nemeslaki, Aranyossy, and Sasvári 2016) have applied these two variables, including in survey research testing respondents' willingness to cast ballots online. Thus, another trade-off might be identified which not only affects perceptions of security, but which may contribute to participation or non-participation as well: that of *complexity* (and thus technical security) versus simplicity (and thus, high usability) (Rana, Dwivedi, and Williams 2015, 559; Budurushi et al. 2016, 309).

Warkentin et al. (2018) employ the TAM theoretical framework in their study of citizens' intentions to use Internet voting, asking, additionally, if social identity may play a role in this decision-making process.[48] The researchers define *trust* as "the willingness to rely on another party in whom one has confidence," and further, that it is "the belief that the other party on whom one depends will behave as expected in a socially responsible manner and in doing so will fulfill the trusting party's expectations of it" (Warkentin et al. 2018, 198). In accordance with the TAM framework, say Warkentin et al. (2018, 198-9),

> …higher levels of trust are positively related to the perceived usefulness of the internet-based voting system. Such a relationship between trust and perceived usefulness is especially pertinent in the case of iVoting. The main reason people vote is to have a voice, but if they cannot trust that their voice will be counted properly in the process (i.e. their trust in the agency administering the iVoting process, to be honest, capable, and reasonably benevolent in carrying out its responsibility), their voting might seem to them to be useless.

[48] Carter and Lemuria (2012, 2) employ a similar research design, exploring "the factors that influence citizens' perceptions of and intentions to use I-voting."

The researchers introduce an element of political behaviour to the TAM framework as well, concluding that if voters trust the *actual individuals* employed at the electoral agency (measured as the degree to which voters see election figures as 'people like me'), a concomitant increase in perceived usefulness of Internet voting – and thus a greater intention to vote online – is demonstrated (Warkentin et al. 2018, 202-3).

Emphasized frequently in this research is the idea that participation and security do not exist in vacuums, but rather, are inextricably connected. Likewise, ample research seeks to measure the strength of TAM variables which lead to an "intent to use" Internet voting amongst citizens. The TAM framework demonstrates that *perceived usefulness* is causally related to *intent to use*, and thus it is crucial for researchers to examine variables which are shown to affect perceived usefulness (Warkentin et al. 2018, 202). For example, Smith (2016, 79) demonstrates that voters "who have greater day-to-day familiarity with information management" have greater confidence in *both* Internet and paper-based voting systems. Conversely, less-educated voters, those who report low rates of Internet use, and rural voters tend to express less confidence in *both* systems as well[49] (Smith 2016, 79). This indicates that broader forms of trust, such as trust in government or trust in the political system writ large, often predominate versus trust in the specific method for casting ballots. This notion is substantiated by Zada, Falzon, and Kwan (2016, 120), who find, like Warkentin et al. (2018, 202-3), that trust in the electoral agency is *at least* as important as trust in the vote-enabling technology itself. Delwit, Kulahci, and Pilet (2005, 160) also find a relationship between educational attainment

[49] As opposed to these groups *demonstrably* trusting, for example, paper voting versus Internet voting.

and ease of use, concluding that among those with fewer such qualifications, the researchers often see greater degrees of "mistrust and social defiance in electronic voting." Though again, education is a variable that appears to lose its predictive power towards Internet voting use with each additional electoral cycle (Vassil et al. 2016).

Brauer and Trechsel (2006, 17), investigating 'intent to use' Internet voting before its implementation in Estonian municipal elections in 2005, find that a suite of issues related to trust in the online voting mechanism substantially influences whether or not one participates via this channel, writing,

> [m]uch of the use of e-voting in fact boils down to the simple question: does one trust or not this mechanism to take one's vote correctly into account, producing trustworthy results? If this question can be answered by an unconditional, or almost unconditional "yes", then the probability for one's use of e-voting at the polls goes significantly up. Any successful information policy pointing in the direction of giving voters trust in the mechanism itself will therefore make this means of participation more popular.

Considering that a large number of Ontario municipalities have chosen to eliminate paper balloting upon implementing Internet voting, accurately gauging this form of trust may prove crucial in achieving participatory success or failure. Substantiating this idea, Vassil et al. (2016, 456) find that those who report trusting Internet voting generally are 49 percent more likely to vote via the internet versus those who consider it untrustworthy.

Given that the TAM theoretical framework emphasizes *perceived usefulness* and *perceived ease of use*, it follows that the design of the voting system – especially the user interface with which voters *actually* interact – is crucial for engendering feelings of trust once an Internet voting system has been implemented (Realpe-Muñoz et al. 2018, 193). Any confusion, say Realpe-Muñoz et al. (2018, 183) is "problematic in elections because it is the voters themselves who must consider their voting experience to be a success. To

have confidence in the outcome of an election, voters must believe that their votes were cast as intended and recorded. They must believe that they successfully used the voting system." This points to the crucial work of post-election surveys which seek input from stakeholders in order to continuously offer more user-friendly systems. To needlessly introduce complexity into an Internet voting system is likely to engender feelings of distrust, regardless of the technical efficacy of the system in question. Accurately calculating these factors is crucial to meaningful public policy, given that implementing an Internet voting system at any level is likely to carry substantial costs, both financial and, potentially, political (Zada, Falzon, and Kwan 2016, 120).

## 4.5 Might Internet Voting *Increase* Trust in the Electoral System?

Though much of the consideration thus far has focused on the rather negative effects Internet voting might have on trust, a considerable amount of scholarship exists suggesting that enabling electors to vote online may, in fact, *increase* overall trust in the process. This is often done by comparing Internet voting to existing paper-based systems. Zissis and Lekkas (2011, 249) for example, writing nearly a decade ago, proclaim, "[i]t is becoming clear that electronic voting systems can enhance trust, as today's voting processes lack transparency and audit ability," and that therefore, the question is not *whether or not* to deploy online elections, but rather, *how*. In other words, the focus should be on establishing research-based standards and best practices.

Within the Canadian context, a post-election survey of Ontario municipal Internet voters conducted by Goodman and Pyman (2016) seems to indicate that trust was, in fact, quickly established upon implementation. A remarkable 98, 95, and 94 percent of Internet

voting respondents said that they would be likely to vote online in future municipal, provincial, and federal elections respectively (Goodman and Pyman 2016, 18). Further, "over 95 percent say they would recommend Internet voting, with less than 5 percent saying they would 'definitely' or 'probably' not do so… this seems to be an indication of enthusiastic support, as there would be no tendency to try to get others to follow suit if Internet voting were not perceived as a desirable method of voting" (Goodman and Pyman 2016, 18). A large majority of respondents described the process as "'easy', 'simple', 'straightforward', 'convenient' and 'private'" (Goodman and Pyman 2016, 16). Of course, these responses are only from those who chose to vote online *and*, subsequently, participate in a post-election survey regarding online voting, and thus may skew more positive. However, such overwhelming support would seem to provide strong evidence towards the TAM theoretical framework, where a useful system which makes voting simpler garners widespread acceptance, as indicated by the near-ubiquitous willingness to recommend Internet voting to others.

Finally, substantial satisfaction with Internet voting is indicated by Ontario municipal electors' choice of balloting option. During the 2014 election, 23 municipalities offered three distinct balloting options, giving electors the choice between paper, Internet, and telephone voting. Of all ballots cast, 55.6% of votes were cast by internet, 31.6% by paper and 12.8% by telephone (Goodman and Smith 2017, 170). This followed a trend established in the previous election cycle, where of the "12 municipalities that used all three voting options, internet ballots were more popular than telephone and paper combined in eight municipalities, more popular than either of the

other two channels in three municipalities, and less popular than both the other channels in just one municipality" (Goodman and Smith 2017, 170).

A wide variety of factors are demonstrated to influence voters' trust in Internet voting, including perceptions of security, perceptions of usefulness and ease of use, trust in the technology itself or with the electoral administration, Internet experience and education. Undoubtedly, future research will uncover more as the technology becomes more widespread (Choi and Kim 2012, 435). Understanding the dynamics of trust in Internet voting is crucial for two reasons. First, the Technology Acceptance Model theoretical framework indicates that if citizens see Internet voting as useful and easy, they are likely to participate, and, as demonstrated in Ontario, might even recommend that others do the same (Alvarez, Katz, and Pomares 2011, 200; Goodman and Pyman 2016, 18). Second, jurisdictions looking to Internet voting must be aware that every security choice (or non-choice) might have subsequent effects on citizens' trust and acceptance of said system, and therefore, dictate the success or failure of Internet voting writ large. Says Schürmann (2011, 28), "[a] modernized voting system does not need to be perfect, but it should implement a process that is at least as trustworthy as the one we know today."

## 4.6 The Security Paradox Hypothesis

The somewhat paradoxical nature of Internet voting security is that the more complex security measures become, the less understandable they are to the lay public (Pammett and Goodman 2013, 16). As security measures increase, therefore, *understandability* – the keystone of the perception of security – is reduced, possibly

negating the actual gains made by increasing the sophistication of the security.[50] Moreover, creating more sophisticated security measures, thereby reducing understandability, risks alienating large numbers of voters who might experience a decrease in *perceived ease of use*, and choose nonparticipation as a result. Paradoxically, this is caused by a *perception* of a lack of security stemming from a reduction in understandability of a system that is, in practice, more secure. In other words, complexity and understandability are inversely related, and perceptions of security and understandability are positively related. Therefore, increasing security complexity risks creating a system which is thought to be less secure as a result by the public. From a policy orientation, this quandary may be expressed as a system only being able to possess two of the three characteristics that make up an ideal system. Therefore, the following hypothesis might be proposed:

> $H_5$: *It is impossible to have an Internet voting system which average voters fully understand, and perceives as secure, which is also maximizes technical security.*

This is a hypothesis for which testing is beyond the scope of this research. However, future scholars would be well-advised to produce answers which attempt to overcome this important problem.

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[50] To this end, say (Pammett and Goodman 2013, 16), "The way in which security concerns have been presented has had an impact on the willingness of jurisdictions considering Internet voting trials to involve the public in a deliberative process leading up to the decision. Processes of widespread public consultation will inevitably bring about submissions maintaining that security concerns trump all other factors and that the efforts should be stopped immediately. In this context, some jurisdictions are reluctant to use open public consultation processes."

## 4.7 The Issue of the Secret Ballot

An additional (and rather substantial) fear which tends to accompany debates about Internet voting is that it might increase opportunities for fraud, coercion, and vote buying (Goodman, Pammett, and DeBardeleben 2010a, 16). The mechanism which might, if left unaddressed, open elections up to these risks is the difficulty in ensuring a *secret ballot*. Of course, paper balloting occurs in a *controlled environment*, where private voting booths are supervised by election officials, and, crucially, *votes cannot be traced back to the voter*. This removes the incentives for both would-be coercers and would-be bribers (Saglie and Segaard 2016). Both are unable to confirm that the voter they are attempting to influence has voted in a certain way, and thus coercion is not worth the potential criminal repercussions, and bribery is not worth the investment.[51] For its effectiveness in reducing electoral manipulation in a variety of ways, "[b]allot secrecy is now a common and unquestioned component of virtually all legitimate democratic contests" (Gerber et al. 2013, 77).

Clearly, moving the elections from the environment described above to one which is *uncontrolled* presents an extra layer of complexity to the secret ballot principle. Put another way, say Saglie and Segaard (2016, 157), "[t]he dilemma, in short, is that a system that is supposed to increase political equality, by increasing accessibility, may also damage the same equality, by giving one individual influence over more than one vote." Though the Internet voting literature might, at times, paint an image of paper balloting as rather anachronistic, one ought not underestimate the effect that the humble

[51] For an excellent examination of coercion, bribery, and other forms of election manipulation, see Cheeseman and Klaas's *How to Rig an Election* (2018).

voting booth has had in protecting the integrity of a voter's right to vote as they – and they alone – wish.

To this point, while outright manipulation in the form of coercion and bribery may grab the attention of election scholars (Saglie and Segaard 2016, 157; Cheeseman and Klaas 2018), it is subtler forms of influence that pose not only a technical challenge for those designing Internet voting systems, but a democratic theory and broader philosophical question with regards to what constitutes fair and unfair persuasion. Birch, Cockshott, and Renaud (2014, 190) explain this dynamic exceedingly well, writing,

> [i]n private spaces such as the home or the office, there are numerous value systems that compete with those of democracy; should civic duty be judged by a voter to be less important in a given instance than their duty as a spouse, child, friend or employee, then ballot secrecy could well be compromised. Many voters will, in private contexts, be subjected to subtle and not-so-subtle pressures to vote in front of others and to vote in ways of which others approve. Many might succumb to such pressures and thereby forfeit their sincere contribution to the democratic process for the sake of friendship, conjugal harmony or job prospects.

Though the dynamic of competing public Interest generally is most prominent in discussions of Internet voting, it applies equally to postal voting – offered as the exclusive balloting method for 2018 in 60 Ontario municipalities, and in conjunction with other methods in several more. In fact, one may speculate that Internet voting might be *more* confidential than postal voting, given a widespread expectation of privacy associated with personal electronic devices.

Some scholars (Engelen and Nys 2013) even take an opposing view on ballot secrecy, arguing that a potential for voters' choices to be revealed – even a very small one – might *add* a desired degree of accountability into the electoral process. Others, such as Saglie and Segaard (2016, 158) pose a further question: ought the secrecy ballot be a right or a duty? To test this question empirically, these researchers conducted post-

election surveys after Internet voting trials in 2011 in Norway. Among respondents, 94% believed that voting online should be a possibility, and over 80% reported trusting the vote method. When explicitly asking subjects about their feelings about secret balloting, "more than 80% did not agree that Internet voting should yield to this principle" (Saglie and Segaard 2016, 162). The authors examine, therefore, the possible implications of accepting "a less strict understanding of ballot secrecy and… adjust legal regulations to align with people's understanding" (Saglie and Segaard 2016, 166-7). Simply put, the responsibility of ensuring ballot secrecy may shift from public officials to the private voter.

Some systems, including that used in the Norwegian trials (which were ultimately deemed unsuccessful), as well as the one used in Estonia – the only national-level Internet vote available to all citizens – employ certain measures to, in theory, address the secret ballot issue in Internet voting. Electors have the option of casting multiple ballots online, and one paper ballot at a physical voting location (Saglie and Segaard 2016, 166). If voters are unable to maintain a secret or private 'virtual polling booth' due to external pressure of some kind (Unt and Solvak 2017, 1), they can cast *new* ballots at a later time, or, as a last resort, cast a paper ballot at a supervised voting location (Reiners 2017, 45). The last Internet vote cast, or the paper vote cast, becomes the one included in the final tally. This option is, of course, complicated by jurisdictions which implement Internet voting as a *replacement* for paper balloting (which is the case for a majority of municipalities in Ontario). Even for those which maintain a reduced number of physical polling places, where these are located, ultimately, will make them more accessible for some than to others.

Several more authors (Birch, Cockshott, Renaud 2014, 193; Gerber et al. 2013) identify potentially problematic behavioural aspects to the secret ballot issue, for example, arguing that vote choice is likely to be affected by even a *small risk* of such a decision becoming subject to social scrutiny. The mere *possibility* that individual A may desire to please family, friends, or peers, fear jeopardizing employment, or possess an indifference to electoral outcomes which incentivizes the selling of one's vote, might undermine the integrity of these important democratic proceedings in the mind of individual B, thus undermining the desire to participate (because *other voters* are subject to these forces) (Jaquim, Ribeiro, and Ferreira 2010, 311; Birch, Cockshott, and Renaud 2014, 193; Gerber et al. 2013, 78). Jurisdiction have to consider which of these possible transgressions ought to be considered permissible, and in some cases, introduce new rules accordingly. The city of Markham, Ontario, for example, chose to introduce Internet voting with intensified penalties for breaches of voter secrecy, including maximum fines of $10,000 or potentially up to two years in jail, though, say Pammett and Goodman (2013, 16), "to date no charges have been laid."

The secret ballot issue is a practical and normative quandary for both election officials and researchers, and very much remains an open question in the literature. Likewise, though a multitude of real-world solutions have been adopted, each of which are judged on a variety of criteria, there is no single agreed upon solution nor universally accepted processes to follow, and thus, jurisdictions must decide which values *they* want to prioritize. If absolute vote secrecy is deemed an inalienable right for electors, remote voting of any kind (both Internet and mail-in ballots) are simply not options. There is, therefore, an impetus on social scientists to continue gathering evidence of voter

behaviour, and to determine if effected secret ballot dynamics in Internet voting systems do, in fact, undermine citizens' ability to freely exercise their democratic right.

## 4.8 The Role of Private Internet Voting Systems Providers

A final consideration which is likely to affect voter trust is the issue of *who actually provides* the Internet voting systems. The privatization of elections refers not only to moving the casting of ballots from the public sphere into the private, but also to the shift in responsibility for conducting elections from public bodies to private sector companies. This move has the potential to impact how voters view the election itself, especially for those voters who carry some degree of skepticism with regards to the role of the private sector (Goodman, Pammett, and DeBardeleben 2010a, 17).

Every election held online in Canada since 2003 has been contracted out to one of six companies: CanVote, Intelivote, and Simply Voting, Canadian organizations, Dominion Voting Systems and Everyone Counts, American, and Scytl, headquartered in Spain (Goodman and Pammett 2014, 17). When Internet voting was first introduced in Ontario in 2003, just two providers CanVote and an American company, Elections Systems & Software, offered online balloting services in Canada (Goodman and Pammett 2014, 17). In the time since, write Goodman and Pammett (2014, 17), "there has been an influx of companies providing a wide range of election services, including online poll training for workers, modules for candidates to track whether electors have voted (but not who they voted for) and target their get out the vote efforts."

With around 200 municipalities offering Internet voting in some form over the past election cycle in Ontario and Nova Scotia, "there has been more deployment of

internet voting municipally in Canada than anywhere else in the world" (Goodman and Wellsbury 2015). As mentioned frequently throughout this research, the ability for municipalities to set the terms for their own elections, including selecting the election provider, setting an election period length, choosing the type of balloting, selecting processes for registration and authentication, and other crucial details has led to a substantial diversity in municipal elections.[52] So too does this mean that each municipality is tasked with the important decision of *which* private sector company will provide online voting services, companies which face little to no regulation with regards to how such services are offered (Goodman and Wellsbury 2015). This has led some commentators to call for the creation of overarching policies or standards (Goodman and Wellsbury 2015), however, it remains to be seen if or how this call will be heeded.

### 4.8.1 Issues With the 2018 Ontario Municipal Election

Several authors indicate that the status of Internet voting is rather tenuous, where one bad experience may prove catastrophic with regards to the trust of electors. King and Hancock (2012, 52) write, for example, that a major concern is that "while we may run a thousand good Internet voting pilot projects, it only takes one compromised Internet election to set back that particular technology for decades." Indeed, in both the UK and Norway, as well as the United States in almost all cases, fear of security issues

[52] Though in a province in which 417 municipalities held elections in 2018, an array of balloting methods is clearly needed. Consider that there are 62 municipalities with a permanent population of <1000, while the ten largest municipalities have an average population well over 500,000. Moreover, the needs of every municipality will differ based on a number of factors, and population accounts for just one of these.

manifesting in a variety of ways has predominated, ultimately proving insurmountable, and largely causing the failure of getting Internet voting off the ground (Hall 2015, 103).

During the 2018 Ontario Municipal elections, a major issue with one Internet voting service provider – Denver, Colorado-based Dominion Voting Services – affected elections proceedings for approximately 90 minutes in 51 municipalities (Britneff 2018). "Voters experienced slow response times and system timeouts" (Laucius 2018), prompting many municipalities to extend their voting periods by one to two hours, and in some cases, "others declared emergencies under the Municipal Elections Act and extended their voting period for a full day" (Britneff 2018). Dominion blamed, though did not name, a "Toronto-based internet colocation provider for placing an unauthorized limit on incoming voting traffic that was roughly 1/10$^{th}$ of the system's designated bandwidth" (Britneff 2018). Further, the company was not aware of any issue until alerted by the municipalities themselves (Laucius 2018).

Dominion assured voters that at no time was the system's integrity nor its security compromised, and promised that the issue would not happen again (Britneff 2018). However, time will tell if any long-term damage to voter trust was done as a result. In one case, a Pickering city council candidate expressed concern that the irregularity had cost her the election (Britneff 2018), and Western University software engineering assistant professor Alexander Essex described the event as the "tip of the iceberg," insinuating that the event was a precursor to a "nation-state deploying cyber operations against a democratic election" (Laucius 2018). In another article, Essex is quoted as saying of Internet voting, "[i]t's not a strong foundation for a democratic institution to be built off a

multinational, completely global infrastructure that is basically being run by business concerns and is completely non-transparent" (Perkel 2018).

It remains to be seen whether issues with the 2018 Ontario Municipal election and subsequent negative media framing of the incident may be the nail in the coffin for jurisdictions who were already hesitant about Internet voting, or even prompt those who already use it to capitulate and return to paper balloting. Intuitively, one might imagine that 90 minutes of slowed bandwidth might turn some voters away and prevent them, ultimately, from participating. However, in a large number of cases, voting was available for multiple days, and thus 90 minutes of service interruption may prove inconsequential. Researchers ought to study this event closely in the future, as it provides an excellent real-world opportunity to test theories of trust and participation.

## 4.9 Concluding Remarks on Trust

This chapter has explored the phenomena of trust, considering the role of trust in democratic elections, and whether paper systems are inherently more trustworthy, or simply more familiar to most voters. It then examined the Technology Acceptance Model theoretical framework, which postulates that if new technologies are perceived as useful and easy to use, they are likely to be accepted by the public. This has important implications for Internet elections, which, despite being subject to intense technical scrutiny are generally deemed "only as good as the public believes it to be" (Alvarez, Katz, and Pomares 2011, 200). Finally, the issue of secret balloting was examined, considering possible implications for how this principle may be affected by the implementation of Internet voting.

Recent service interruption issues with Internet voting in the 2018 Ontario municipal elections may undermine both the perceived usefulness – in that many may wonder *why* the technology is superior to paper ballots – and the ease of use – as voters potentially become frustrated with the system, and perhaps choose non-participation as a result – of Internet voting technology. The tone struck by the media surrounding Internet voting after the 2018 election was largely negative (Britneff 2018; Perkel 2018; Laucius 2018). This may affect the trajectory of an Internet voting proliferation which has witnessed the number of Ontario municipalities offering an online ballot nearly *doubling* every year since its inception in 2003. The issue of security and the phenomenon of trust writ large in the context of Internet voting include many unanswered questions, though based on user-reported satisfaction with systems currently in place, there is reason for optimism. It is important that both researchers and policymakers alike continue to study these important factors closely.

# Chapter 5: Recommendations and Conclusion

## 5.1 Review of Prior Recommendations

This concluding chapter will serve two ends. First, it will note the many policy recommendations which are located within the Internet voting literature, highlighting in particular those recommendations which have been offered within the Canadian context. Second, it will offer its own suite of recommendations, both from a policy perspective, as well as those made with the intention of informing future research agendas.

One overarching theme, especially in the Canadian context, is that electoral systems have the highest chance of success when they are created for the jurisdiction implementing it. To this end, say Goodman, Pammett, and DeBardeleben (2010a, 7),

> The models that enjoy success are effective because they have been tailored to meet the specific needs of a particular jurisdiction. The lesson behind these success stories for Canada is that no specific model should be directly copied for use here, although specific features of them may be.

At the local level, this is naturally facilitated by a legal framework which allows municipalities autonomy with regards to the voting system employed, and commentators frequently speak towards the benefit of employing a 'bottom-up' approach to Internet voting implementation (Trechsel and Gasser 2013, 55). In the future, it is conceivable that online balloting may transcend the municipal level, and be offered for use by the provinces, or even in federal elections. Both Elections Canada as well as several provincial election bodies have created legal statutes which permit research into alternative forms of voting, including voting by Internet[53] (Goodman 2014, 10). It is

[53] In fact, Elections Canada had committed to trialing Internet voting as part of its *Strategic Plan 2008-2013*, but no such trial has yet proceeded.

crucially important that those studying Canada's online voting municipalities understand the contextual factors which allow Internet voting to succeed, as opposed to devising systems under a 'one-size-fits-all' philosophy. In this way, understanding one's own jurisdiction is *as* important for policymakers as understanding the technical features, risks, and benefits of online voting.

Other authors echo the opinion that tailoring voting systems to the needs of specific jurisdictions gives such policies the greatest chance at succeeding. Alvarez, Hall, and Treschsel (2009, 497) propose, first at foremost, that the key to making Internet voting work is for target jurisdictions to have "a legal structure, a technology infrastructure, and a political culture that is supportive of this voting mode." To this end, relatively simple social scientific undertakings can give policymakers a sense of their citizens' wishes and concerns, and fully take these into account. Doing so is, among other things, crucial for engendering trust and 'buy-in' amongst the citizenry.[54] Supplementing this, Trechsel and Gasser (2013, 57) offer the recommendation that, similar to Switzerland, policymakers make it known insofar as possible that Internet voting is a 'work-in-progress' rather than a pursuit of perfection. Say the researchers, "[w]e strongly believe that this pragmatic perspective, opposed to a perfectionist's approach, is a condition sine qua non for the success of Internet voting" (Trechsel and Gasser 2013, 57). It is clear, therefore, that Internet voting alone is unlikely to achieve any of the stated goals without a robust accompanying voter education campaign, offering resources to

[54] This is true regardless of the voting system in question. It is possible, for example, that through thorough consultation of the Internet voting literature, in concert with analysis of real-world cases, some jurisdictions may opt to retain the status quo (Goodman and Smith 2017, 175). Regardless of the choice made, such decisions should be made, ultimately, with concern for citizen trust and equality of participation at the forefront.

voters and framing potentially divisive issues (such as security concerns) in ways that emphasize a cost/benefit calculus rather than the technical flaws of any given system of voting (Atkeson and Saunders 2007, 659).

Though three-quarters of Ontario municipalities in 2018 chose to *replace* rather than *supplement* paper voting with Internet voting, Goodman et al. (2018, 179-80) caution that policymakers should be "extremely hesitant" to do so. Conclude the authors,

> It is ironic that changes to voting rules in the name of improved voter accessibility may be having the opposite effect. Much of election modernization is carried out to enhance voter equality—a key principle of elections. To promote universality policymakers need to consider the access, knowledge, and skills of all electors to ensure that socioeconomic divisions among the voter population are not further exacerbated by the policy change.

Though 'cost savings' might be a strong incentive for jurisdictions to capitulate traditional polling place voting[55], taking the above recommendation into account, it may be more advisable to supplement paper voting for at least one election cycle, even if there exists the desire to eliminate paper altogether. After all, investing in and earning the trust of electors *should* take priority over offering elections as inexpensively as possible.

## 5.2 Recommendations Resulting from This Research

As a result of this research undertaking, the following list of 10 recommendations have been compiled, six of which are meant to inform future research agendas concerned with the study of Internet voting-related phenomena, and four of which are meant to

[55] For example, in an exploratory paper examining the feasibility of implementing Internet voting at the provincial level in British Columbia, Barisoff and James (2012, 27) found that "[i]f, at some point in the future, Internet voting were to replace in-person voting, there could be substantial labour cost savings. In 2009, approximately $11.5 million was paid in fees to the 37,000 election officials hired to deliver the provincial general elections."

inform future policy agendas for jurisdictions either considering, or which already offer an online ballot option in elections.

*Recommendations for Future Research*:

**(1)** There remains, broadly, a need for researchers to examine phenomena which are generated as a result of implementing Internet elections within democratic systems. In other words, justification exists for "Internet elections" becoming its own subfield of elections research. This recommendation specifically addresses the issue of Internet voting implementation outpacing Internet voting study. Though there are proxies in the traditional voting literature which can substantially inform Internet voting research (I.e. perceived costs), the ways in which individuals interact and behave online are markedly different than in the 'public square', and thus, it stands to reason that online *voting* behaviour too cannot be properly elucidated without research designed specifically for that purpose. The impetus for *this* research project was that the pace of Internet voting implementation appears to be outpacing the production of Internet voting research, and this sentiment remains.

Furthermore, in parallel with the rapidly-changing nature of Internet technology, the ways individuals react and behave vis-à-vis online election technology is likely to exist in near-constant flux. Thus, the study of Internet-derived sociopolitical phenomena risks aging rapidly (Ex. the changing nature of the digital divide as general connectivity reaches

unprecedented heights). This provides additional impetus for researchers to grow the study of this important topic.

**(2)** Future research, especially that which employs a local level of analysis, should consider what an 'ideal' level of municipal turnout is. If 100 percent turnout is the ideal, then the institutional barriers which prevent turnout from reaching even half of this figure in most cases warrant significantly further examination. In part, extremely low local turnout may be due to the method by which ballots are cast, but institutional factors are likely to play a much larger role. For example, municipal politicians lack many of the benefits of provincial and federal politicians, not least of which are brand recognition and a bevy of funding sources, and this might create different expectations for what types of turnout can be achieved at the local level versus at the provincial or federal level. More broadly, one might claim that because municipal issues, such as those surrounding property ownership, do not effect citizens as ubiquitously as issues at the provincial and federal level, turnout expectations may also be different. In fact, a good starting point for research might be the simple question: *why does low voter turnout at the municipal level matter?* This project takes the position that increasing local turnout, even in small degrees, is a worthy undertaking, however, given the differing institutional arrangements of Ontario's (and more broadly, Canada's) municipalities, it is difficult to argue that elections at this level are failing because, in amalgam, they do not achieve the same levels of turnout as those at the provincial and federal levels.

The issue of municipal turnout is further complicated by the fact that some municipalities achieve substantially higher than average rates of participation, challenging the idea that institutional factors are the *sole* reason for lower turnout at this unique level of governance. Therefore, while the national level of analysis tends to dominate electoral research with regards to turnout, the field of political science writ large would benefit from shifting more attention to the local level.

**(3)** One of the strongest predictors of first-time voting among young people found in this research was the voting habits of parents, as well as other social pressures more broadly (Plutzer 2002; Gerber, Green, and Larimer 2008). Future research should inquire whether Internet voting offers young people in low-turnout sociological environments a vehicle for *bypassing* these pressures and participating despite them, versus paper balloting. Intuitively this would seem to be the case, however, demonstrating this empirically would be of high value to the Internet voting literature.

**(4)** Blais et al. (2019) note a dearth of literature examining the *perceived costs of voting*, and this no doubt extends to Internet voting. Further, it might be speculated that even as traditional costs of voting (travelling to the polling station, potential embarrassment with being unsure of the proceedings etc.) are reduced virtually to zero by Internet voting, new forms of perceived costs which are exclusive to Internet voting might appear. For example, some voters may see the 'civic virtue' of physically voting at a polling station as undermined by the transactional and impersonal nature of online voting (Birch, Cockshott, and Renaud 2014, 190; Gibson 2002, 570; Goodman, Pammett, and

DeBardeleben 2010, 17). In the never-ending pursuit of increasing participation, these new forms of perceived cost would become important to understand.

**(5)** Post-election surveys of Internet voters should ensure that response options distinguish between voters who *would* not have participated (I.e. because of convenience-related issues) and those would *could* not have participated (I.e. because of access-related issues) without the option of casting an online ballot. Such a distinction would no doubt buttress voter equality-based arguments towards Internet voting.

**(6)** Future research concerned with voter turnout at the municipal level would be well-advised to account for *competitiveness variables*. Broadly, an amalgamated turnout (for example, for all 417 municipal elections in 2018) includes the entire spectrum of contests, from those where the head of council is acclaimed and only a few councilors are actually selected, to those with heated, close races with salient issues amplified in the media. Research which examines turnout effects *while controlling* for variables such as number of acclamations, incumbency rates, winning margins, the presence or absence of referendum questions, and the salience and intensity of electoral issues in the media would provide much stronger evidence towards the ability of Internet voting to increase turnout writ large, especially in municipal contests which are, more often than not, far less competitive than their provincial and federal counterparts (Goodman and Stokes 2016, 3).

*Recommendations for Policymakers:*

**(1)** Turnout in many jurisdictions and at all levels of government is, broadly, lower than ideal. In some cases, it has diminished consistently, and in others has always been low (Powell et al. 2012, 361). Compounding this fact, youth turnout rates are at or near their lowest point ever. That is the reality. Therefore, if Internet voting is *not* adopted as an option to grow participation, the status quo must be thoroughly justified (as opposed to being treated as the default). Moreover, if Internet voting *is* adopted as means of growing participation, it must be accompanied by a broad and intensive campaign to familiarize and normalize the idea of electoral proceedings occurring in the digital realm.

**(2)** As research from a wide variety of political contexts consistently shows, though electors may have several reservations about exercising their democratic right online, once they do, they are overwhelmingly satisfied with the experience (Brauer and Trechsel 2006, 17; Goodman and Smith 2017, 170; Toots, Kalvet, and Krimmer 2016, 2; Goodman and Pyman 2016, 16-7). The most robust social scientific research in Canada shows clearly that once voters use Internet voting, they are exceedingly likely to report the experience as positive, that they would vote online again, and that they would do so at higher levels of government. These results cannot be ignored, and there is a reasonable argument to be made that user satisfaction should supersede the claims of technical experts who are able to identify minute theoretical flaws with *any* online voting system. Without doubt, responsibly balancing these perspectives is crucial. However, it remains a fact that the user experience in Canada has, thus far, been remarkably positive.

It remains to be seen whether or not this very positive public opinion has been undermined by issues with the 2018 Ontario Municipal Election. This will be an issue for policymakers and researchers alike to watch closely.

**(3)** "A need for further study" is not synonymous with ceasing the rollout of Internet voting. In fact, further study is itself predicated on more municipalities, and, in due course, one or more provinces taking the lead in modernizing elections. This research is in line with the conclusion of Trechsel and Gasser (2013, 57), who note that the general understanding of Internet voting in Switzerland is that of a 'work-in-progress'. Electors should be aware, insofar as is possible, that Internet voting is not an inevitability, but rather an ongoing experiment, the success of failure of which depends greatly on their participation.

**(4)** If Internet voting rollout at the provincial or federal level employs a similar model to that which has predominated at the municipal level, Internet voting services will be provided by the private sector. This puts a number of crucial decisions, namely, *which* provider to employ, onto the shoulders of policymakers. Some commentators (Goodman and Wellsbury 2015) have called for overarching regulations of an industry which has, at this point, virtually no restrictions on how it operates. It would behoove policymakers, therefore, to monitor the role of private providers within the larger debate surrounding Internet voting.

## 5.3 Conclusion

This research sought to accomplish two goals: first, to synthesize a broad and diffuse Internet voting literature which has amassed over two decades of study, and second, to incorporate data from the 2018 Ontario Municipal election, testing several hypotheses, and capitalizing on large sets of jurisdictions which have offered online ballots for between two and five election cycles. The first chapter provided a sense of both the scale and scope of the study of Internet voting, highlighting how and where such study occurs. Chapter 2 expanded on the claim that Internet voting increases turnout – a notion which exists at the foundation of arguments for online voting. Though this claim remains, ultimately, unproven, original studies conducted in Chapter 3, in concert with a multitude of empirical findings presented throughout this research, provide solid grounds for optimism in the dual claim that, in some cases, Internet voting may increase turnout, and in other cases, halt its further decline (Solvak and Vassil 2018, 4). Chapter 4 examined the issue of trust, a characteristic at the bedrock of any well-functioning democratic system, and considered ways in which the implementation of Internet voting might affect trust, particularly as it relates to perceptions of security. Finally, several recommendations were offered for both researchers and policymakers to consider further. These recommendations emerged through an intensive process of reviewing a large number of findings within the broader Internet voting literature.

One might make several conclusions after emerging from this process. Perhaps most importantly, it must be widely acknowledged that there is no one perfect electoral model. Every system has flaws and will be subject to abnormality, anomaly, and attack. Likewise, the choice to use one model for conducting elections versus another will,

necessarily, be a process of evaluating costs and benefits, with key trade-offs made within this calculus. Though the needs of each jurisdiction are highly unique, earning the trust of, and providing access for, each and every voter should be paramount. Accordingly, the high rates of reported satisfaction observed in a wide variety of political contexts provide strong indication that the citizen demand for more convenient, accessible, and trustworthy government services will remain strong.

It is conceivable that as Internet voting proliferates, citizens in paper voting jurisdictions will wonder why *their* public representatives have chosen to remain with the status quo. This continued spread is by no means guaranteed, however. Though the window for jurisdictions to take a leading position in making elections more convenient and accessible than ever remains wide open, recurring fears of new threats may never allow these benefits to be fully realized. However, given the substantial body of evidence towards the efficacy of Internet voting which has accumulated through two decades of electoral study, one may conclude that a point has been reached where virtually all jurisdictions should consider offering an online ballot as an electoral modernization measure.

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## Appendix A: Voter Turnout Data Table, 2000-2018

### Internet Voting Implemented 2003

| Municipality | 2000[P] | 2003 | 2006 | 2010 | 2014 | 2018 |
|---|---|---|---|---|---|---|
| **Champlain** | 71.4 | 50.4 | 31.3 | 51.7 | 43.9 | 62.8 |
| **Clarence-Rockland** | 44.1 | 44.5 | 55.3 | 54.6 | 43.2 | 43.1 |
| **Hawkesbury** | 60.0 | 61.2 | 54.9 | 61.4 | 53.8 | 52.2 |
| **Markham** | 28.7 | 26.7 | 37.7 | 35.5 | 37.1 | 39.4 |
| **North Dundas** | 42.1 | 47.5 | 52.8 | 56.9 | 34.3 | 48.7 |
| **North Stormont** | 47.1 | 50.7 | 46.7 | 39.1 | 43.0 | 39.5 |
| **South Dundas** | 58.2 | 58.8 | 59.3 | 53.4 | 50.5 | 53.8 |
| **South Glengarry** | 13.5 | 53.1 | 48.0 | 48.5 | 44.0 | 46.0 |
| **South Stormont** | 47.0 | 39.2 | 47.3 | 37.7 | 48.6 | 49.5 |

[P] Indicates paper voting used this election year

**Internet Voting Implemented 2006**

| Municipality | 2000[P] | 2003[P] | 2006 | 2010 | 2014 | 2018 |
|---|---|---|---|---|---|---|
| **Addington Highland** | 47.1 | 38.3 | 32.0 | 33.6 | 28.7 | 31.4 |
| **Augusta** | 37.0 | 54.6 | 48.2 | 40.3 | 42.1 | 43.0 |
| **Cobourg** | 52.9 | 36.5 | 44.9 | 47.3 | 52.4 | 44.1 |
| **Edwardsburgh/ Cardinal** | 31.8 | 41.2 | 46.3 | 47.4 | 55.1 | 52.9 |
| **Town of Perth** | 26.8 | 66.0 | 52.2 | 41.3 | 38.8 | 51.3 |
| **City of Peterborough** | 48.9 | 47.9 | 48.0 | 44.1 | 47.0 | 48.3 |
| **South Frontenac** | 50.2 | 50.2 | 43.2 | 44.1 | 37.0 | 38.3 |
| **Tay Valley** | 40.6 | 47.1 | 40.0 | 16.7 | 39.6 | 50.0 |

[P] Indicates paper voting used this election year

## Internet Voting Implemented 2010

| Municipality | 2000[P] | 2003[P] | 2006[P] | 2010 | 2014 | 2018 |
|---|---|---|---|---|---|---|
| **Arnprior** | 54.2 | 64.0 | 58.0 | 64.5 | 41.5 | 47.7 |
| **Belleville** | 48.2 | 41.0 | 50.9 | 41.7 | 44.7 | 42.3 |
| **Brockton** | 44.6 | 49.3 | 41.5 | 58.9 | 52.3 | 49.0 |
| **Brockville** | 46.1 | 40.4 | 41.5 | 52.5 | 47.2 | 50.2 |
| **Burlington** | 22.6 | 16.5 | 34.8 | 36.3 | 34.1 | 39.8 |
| **Carling** | 46.7 | 43.7 | 36.3 | 45.2 | 42.2 | 34.6 |
| **Elizabethtown-Kitley** | 51.1 | 43.0 | 25.4 | 36.6 | 36.1 | 39.3 |
| **Greenstone** | 52.9 | 63.6 | 62.8 | 66.0 | 57.3 | 53.2 |
| **Laurentian Valley** | 45.6 | 39.2 | 54.7 | 48.5 | 43.8 | 44.7 |
| **Leeds and the Thousand Islands** | 55.5 | 46.1 | 46.4 | 40.0 | 40.6 | 46.1 |
| **McNab/Braeside** | 44.3 | 36.7 | 41.6 | 48.0 | 52.4 | 42.3 |
| **Mississippi Mills** | 44.9 | 61.0 | 55.6 | 54.3 | 53.0 | 59.7 |
| **Montague** | 36.2 | 31.3 | 41.0 | 53.6 | 52.3 | 47.8 |
| **North Grenville** | 39.6 | 39.1 | 39.3 | 47.1 | 41.8 | 47.1 |
| **Pembroke** | 55.4 | 49.2 | 47.2 | 42.9 | 45.9 | 45.5 |
| **Port Hope** | 32.4 | 41.4 | 45.3 | 48.3 | 57.6 | 45.0 |
| **Prince Edward** | 40.2 | 39.7 | 39.4 | 49.6 | 43.8 | 45.7 |
| **Renfrew** | 52.7 | 46.3 | 44.2 | 52.2 | 53.8 | 47.5 |
| **South Bruce** | 48.1 | 63.3 | 67.5 | 51.2 | 48.0 | 46.6 |
| **Stratford** | 52.2 | 49.8 | 45.5 | 47.8 | 47.4 | 49.7 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **West Elgin** | 33.4 | 22.6 | 28.7 | 43.1 | 37.8 | 20.9 |
| **Whitewater Region** | 46.9 | 37.0 | 21.6 | 47.2 | 49.9 | 48.4 |

[P] Indicates paper voting used this election year

## Internet Voting Implemented 2014

| Municipality | 2000[P] | 2003[P] | 2006[P] | 2010[P] | 2014 | 2018 |
|---|---|---|---|---|---|---|
| **Adelaide Metcalfe** | 26.9 | 23.7 | 26.0 | 31.0 | 46.0 | 47.0 |
| **Ajax** | 32.5 | 26.7 | 23.2 | 26.0 | 30.4 | 32.9 |
| **Brantford** | 46.9 | 35.0 | 44.5 | 43.4 | 37.6 | 36.7 |
| **Cambridge** | 31.4 | 22.1 | 26.0 | 28.7 | 29.9 | 32.3 |
| **Casselman** | 62.1 | 61.4 | 61.0 | 63.8 | 67.8 | 59.0 |
| **Cavan Monaghan** | 40.9 | 32.4 | 38.7 | 43.0 | 47.2 | 46.6 |
| **Central Frontenac** | 50.7 | 51.9 | 51.6 | 46.0 | 44.0 | 24.9 |
| **Central Huron** | 37.2 | 17.4 | 18.2 | 37.9 | 28.4 | 31.8 |
| **Chatham-Kent** | 51.7 | 44.2 | 45.6 | 39.9 | 42.1 | 45.4 |
| **Clearview** | 35.0 | 38.0 | 40.8 | 44.8 | 41.8 | 38.0 |
| **Deep River** | 54.1 | 52.5 | 36.0 | 57.0 | 64.2 | 63.5 |
| **Frontenac Islands** | 65.8 | 49.4 | 46.7 | 63.0 | 66.7 | 27.7 |
| **Gananoque** | 51.3 | 56.1 | 51.3 | 46.4 | 53.1 | 60.3 |
| **Greater Napanee** | 44.7 | 37.7 | 31.6 | 39.8 | 48.7 | 50.4 |
| **Greater Sudbury** | 44.4 | 40.0 | 40.8 | 49.8 | 50.7 | 45 |
| **Grimsby** | 46.1 | 47.3 | 45.0 | 36.6 | 41.9 | 43.8 |
| **Hamilton Township** | 38.0 | 33.1 | 32.5 | 28.5 | 42.6 | 27.7 |
| **Huron East** | 42.7 | 33.6 | 31.8 | 36.7 | 36.5 | 37.6 |
| **Innisfil** | 34.7 | 13.6 | 44.5 | 46.1 | 40.1 | 32.5 |
| **Kenora** | 61.0 | 55.0 | 57.0 | 58.6 | 50.8 | 49.8 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Kingston** | 42.7 | 41.7 | 39.9 | 36.7 | 39.5 | 41.6 |
| **Kingsville** | 45.1 | 49.5 | 51.8 | 55.0 | 47.7 | 46.8 |
| **Leamington** | 51.9 | 49.6 | 49.2 | 50.0 | 42.3 | 44.6 |
| **Loyalist** | 29.3 | 21.4 | 46.0 | 33.5 | 33.0 | 36.7 |
| **Lucan Biddulph** | 37.0 | 38.6 | 7.8 | 32.8 | 48.7 | 41.8 |
| **McDougall** | 41.6 | 38.7 | 49.1 | 37.0 | 37.8 | 31.5 |
| **McKellar** | 14.4 | 36.0 | 39.7 | 48.5 | 50.9 | 47.7 |
| **Meaford** | 53.0 | 51.1 | 54.6 | 49.0 | 50.1 | 43.8 |
| **Merrickville-Wolford** | 44.0 | 47.6 | 17.0 | 43.9 | 45.6 | 54.8 |
| **Middlesex Centre** | 43.5 | 9.8 | 26.8 | 40.7 | 14.0 | 43.0 |
| **Minden Hills** | 45.7 | 38.8 | 31.4 | 45.2 | 42.1 | 33.8 |
| **Mulmur** | 44.5 | 49.1 | 46.4 | 50.6 | 35.8 | 43.4 |
| **North Middlesex** | 51.0 | 41.9 | 23.2 | 44.0 | 49.3 | 46.4 |
| **Northern Bruce Peninsula** | 40.4 | 38.6 | 43.6 | 38.0 | 39.1 | 41.1 |
| **Parry Sound** | 50.6 | 47.9 | 51.6 | 38.0 | 39.1 | 52.8 |
| **Penetanguishene** | 48.2 | 34.2 | 37.7 | 49.5 | 46.5 | 42.0 |
| **Prescott** | 52.3 | 47.4 | 41.7 | 48.3 | 57.6 | 40.1 |
| **Quinte West** | 41.9 | 33.5 | 42.8 | 29.3 | 33.0 | 34.1 |
| **Russell** | 47.7 | 46.8 | 49.1 | 50.6 | 36.4 | 47.9 |
| **Seguin** | 41.6 | 57.1 | 51.8 | 53.8 | 41.8 | 47.4 |
| **Shuniah** | 29.0 | 42.7 | 42.5 | 39.7 | 51.1 | 38.2 |
| **Southwest Middlesex** | 47.1 | 42.1 | 44.3 | 32.8 | 49.1 | 52.7 |
| **Springwater** | 31.4 | 4.9 | 30.6 | 38.8 | 42.6 | 37.5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Stone Mills** | 30.5 | 29.0 | 30.7 | 29.7 | 46.0 | 44.2 |
| **Strathroy-Caradoc** | 57.2 | 43.3 | 47.7 | 46.8 | 36.1 | 37.8 |
| **Tecumseh** | 45.0 | 54.1 | 47.7 | 45.7 | 52.7 | 37.4 |
| **Thames Centre** | 34.0 | 56.8 | 52.0 | 46.9 | 50.9 | 47.1 |
| **Timmins** | 60.5 | 55.0 | 29.1 | 38.9 | 46.5 | 53.5 |
| **Wasaga Beach** | 25.3 | 37.3 | 31.2 | 27.0 | 46.3 | 46.5 |
| **West Perth** | 34.6 | 36.2 | 25.1 | 37.4 | 38.5 | 34.4 |
| **Whitestone** | 44.4 | 42.4 | 38.7 | 42.7 | 40.8 | 33.0 |

[P] Indicates paper voting used this election year