Strengthening Electoral Integrity through Election Management

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Abstract

Planning and executing an election is an enormous undertaking that is comprised of a variety of technical and administrative tasks, including registering and educating voters, setting up polling places, counting ballots, and announcing results. Many of these tasks fall under the umbrella of election management, and are executed by election management bodies (EMBs), the government agencies and departments that are tasked with the technical administration of elections. This dissertation asks: how does election management impact electoral integrity? It first considers two stages of the electoral cycle where convenience registration and voting procedures are aimed at improving participation. It then considers the capacity of the election management bodies that implement these procedures.

The first study in this dissertation considers the impact of three registration innovations – election day registration, online registration and pre-registration of youth – on individual registration and turnout in 49 American states across six election years. By tracking the implementation of these registration opportunities over time, and using three modelling strategies, this study emphasizes the need for scholars to be aware of potential issues of endogeneity and the non-random implementation of election laws when evaluating the effectiveness of registration innovations.

The second study considers the socio-demographic and attitudinal correlates of early voting across a number of elections in four jurisdictions: days-long advance voting in Canada, week-long advance voting in Finland, on-demand postal voting in Germany and automatic postal voting in Switzerland. This study finds that early voting is unlikely to mobilize commonly under-represented population groups, with the exception of the elderly, who are often quite likely to take advantage of early voting opportunities.

The final study presents a new approach to comparing election management bodies in cross-national perspective. It measures their capacity to perform their functions through a content analysis of EMB websites in 99 countries, capturing their provision of information, communication with stakeholders, and transparency with the public. This study then assesses the measurement validity of this new measure of capacity, and conducts a small-scale test to determine whether EMBs that score high do actively communicate with their citizens. An application of this new measure of EMB capacity demonstrates its importance in predicting overall electoral integrity, indicating its importance for future scholarly and policy research.

This dissertation demonstrates the importance of three different components of election management for electoral integrity and draws a number of conclusions: first, that our common assumptions about election management and election laws may be mistaken and must therefore be empirically tested; second, that capacity and context often matter more for electoral integrity than formal laws and structures; third, that election management practices may have differential impacts in different countries or for different population groups; and finally that better data sources and partnerships are needed to improve the study of election management and electoral integrity around the globe.

Résumé

Planifier et mettre en place une élection représente une entreprise titanesque qui implique plusieurs tâches techniques et administratives telles que l'inscription des électeurs, la transmission d'informations, la mise en place de bureaux de vote, le décompte des votes et l'annonce des résultats. La plupart de ces tâches sont effectuées par des organismes de gestion électorale (OGE), des agences et départements gouvernementaux qui s'occupent de l'administration technique des élections. Cette dissertation se penche sur la question suivante : comment les organismes de gestion électorale influencent-ils l'intégrité des élections ? Cette dissertation aborde d'abord deux phases du cycle électoral qui visent à augmenter la participation électorale : l'inscription des électeurs et la diffusion d'information sur les élections. Ensuite, cette dissertation analyse l'efficacité des organismes de gestion électorale.

La première étude de cette dissertation se penche sur l'impact de trois innovations en matière d'enregistrement des électeurs- l'inscription le jour de l'élection, l'inscription en ligne et la préinscription des jeunes- sur l'inscription et la participation électorale dans 49 états américains sur une période de six élections. En codifiant la mise en place de ces innovations à travers le temps et en utilisant trois stratégies de modélisation différentes, cette étude souligne l'importance de considérer les problèmes d'endogénéité et de l'implantation non aléatoire de lois électorales lorsque l'on évalue l'efficacité des innovations en matière d'inscription électorale.

La deuxième étude se penche sur les effets du vote anticipé à travers plusieurs élections dans quatre pays : le vote anticipé plusieurs jours à l'avance au Canada, le vote anticipé d'une semaine en Finlande, le vote par la poste sur demande en Allemagne et le vote postal automatique en Suisse. Cette étude démontre que le vote anticipé a peu de chances d'améliorer la

participation électorale des groupes qui ont généralement une participation plus faible. Les personnes âgées sont celles qui risquent le plus de se prévaloir du vote anticipé.

La dernière étude présente une nouvelle approche pour comparer les organismes de gestion électorale à travers le monde. À l'aide d'une analyse de contenu des sites web des OGE de 99 pays qui compare la diffusion d'information, la communication avec les parties prenantes et la transparence envers le public, cette étude mesure la capacité et l'efficacité des OGE. Ensuite, cette étude évalue la validité de la mesure proposée en effectuant des tests à petite échelle pour vérifier si les OGE communiquent efficacement avec leurs citoyens. Puis, l'étude démontre que cette nouvelle mesure de capacité des OGE est en mesure de prédire l'intégrité électorale d'un pays, ce qui révèle son utilité pour des recherches futures.

Cette dissertation démontre l'importance de trois différentes facettes de la gestion électorale pour l'intégrité électorale et propose quelques conclusions. Tout d'abord, nos postulats concernant la gestion des élections et les lois électorales sont parfois faux et doivent donc être testés empiriquement. Deuxièmement, la capacité des OGE et le contexte a plus d'impact sur l'intégrité électorale que les lois et structures formelles. Troisièmement, les pratiques de gestion électorale peuvent avoir des impacts qui diffèrent selon les pays et peuvent avoir plus d'effet sur certains groupes de citoyens que d'autres. Finalement, cette dissertation suggère qu'il importe d'avoir de meilleures données et de d'améliorer nos partenariats avec des parties prenantes en vue d'améliorer l'étude de la gestion et de l'intégrité électorale.

Chapter 1 - Introduction

In October of 2015, Canadians went to the polls after the longest campaign in recent memory. Since the previous election, many election management practices had changed due to the 2014 'Fair Elections Act' (Bill C-23). New identification laws limited the use of vouching in favour of oaths to prove identity, and eliminated the use of 'voter cards' to prove residence. Donation limits had increased for individual citizens, but spending was limited for third-party organizations. Canada's Chief Electoral Officer now faced certain constraints in promoting voter turnout (Government of Canada, 2014). These changes had sparked outrage from academics and commentators: election management had suddenly become a topic of debate among citizens, politicians and academics alike (Williams et al., 2014).

The next month, in November of 2015, Myanmar (Burma) took an important step towards democracy. The country's Union Election Commission was tasked with conducting the first multi-party elections after a period of authoritarian rule. Although there was widespread participation and relative absence of conflict, observers voiced concern about the Union Election Commission's failure to follow vote-counting and reporting procedures (European Union Election Observation Mission, 2015; The Carter Center, 2015). Even greater concerns were voiced about the delays in posting results at polling stations and reporting national-level results. A spokesperson for the major opposition party, the National League for Democracy, even suggested that "The Union Election Commission has been delaying intentionally because maybe they want to play a trick or something" (Phipps & Weaver, 2015). In this case, election management was a focal point for the country's democratic development.

These examples, from two very different contexts, demonstrate the importance of election management to overall electoral integrity. Election management refers to the technical

activities required to run an election: from registering voters to counting ballots. The study of these technical election management procedures, and the bodies that implement them, has expanded in recent years, with scholars focusing on topics ranging from election laws and technology to the structure and conduct of election management bodies (EMBs), the government agencies and departments tasked with many of these election management activities (Catt, Ellis, Maley, Wall, & Wolf, 2014).

Election management has important implications for electoral integrity. The term electoral integrity has become a popular expression to describe the quality of elections, judged according to international norms and standards, throughout the electoral cycle (Norris, 2014). This normative approach to judging the quality of elections suggests a number of parameters to consider. First, it highlights the need to assess the quality of elections throughout the electoral cycle, from the pre-electoral period, when laws are designed and voters are registered, through the campaign and election day, to the aftermath of elections and the impact of the results. Second, it holds that elections can be evaluated based on the same standards in both new and established democracies. Third, it recognizes that elections can fail due to technical incapacity or unintended challenges, as well as due to deliberate manipulation. Finally, it considers a variety of actors, including institutions like election management bodies and civil society organizations, and individuals, including candidates and voters, to be implicated in the integrity of an election. Drawing on this approach, this dissertation examines the impact of election management on a number of standards for electoral integrity, including the implications of election laws for registration and turnout, the provision of information to voters, and communication and transparency between EMBs and stakeholders.

This dissertation asks: how does election management impact electoral integrity? To address this question, this dissertation presents three studies, focusing on three different aspects of election management. The first study evaluates innovations aimed at improving registration rates and turnout in the United States. The second study examines the socio-demographic and attitudinal correlates of early voting in Canada, Finland, Germany and Switzerland. The final study employs a cross-national website content analysis to measure the capacity of election management bodies around the globe.

Together, these studies underline the importance of election management design and practices for our scholarly and practical understanding of electoral integrity, and make a number of important theoretical, empirical, and methodological contributions to the field. These include testing common assumptions about the impact of convenience election procedures and the role of EMBs in promoting electoral integrity, and improving our understanding of how capacity and context impact the effectiveness of election management.

Electoral Integrity

Elections are the primary means through which 'ordinary' citizens participate in politics. Modern democracies incorporate citizens' values and visions into government decisions by selecting representatives to govern on their behalf. Through regular elections, citizens can also hold those representatives to account for their actions (Katz, 2004; Powell, 2000). However, the process of organizing these mass mobilizations of the citizenry is hardly easy. There are countless ways that this process can be disrupted, ranging from the deliberate manipulation of election laws or district boundaries by the incumbent, to influencing voters' choices through

vote-buying and ballot-box stuffing, to the structural or institutional challenges of outdated electoral systems or faulty technology.

Approaches to Evaluating Electoral Integrity

Scholars and practitioners have sought to make sense of the ways that elections can be strengthened by finding methods of measuring the quality of elections. There are a number of approaches to judging the quality of elections around the globe (Birch, 2009, 2011; Butler, Penniman, & Ranney, 1981; Elklit & Reynolds, 2005). Some approaches draw from democratic theory, asking whether elections are fulfilling their purposes as tools for citizen input to the government. Other approaches consider whether elections adhere to the national or regional laws that govern them. This method, however, is less commonly used within the academic study of elections, since laws can vary greatly between and even within countries, and some countries' election laws may be considered unfair.

In current scholarly research, the most common methods of judging the quality of elections are the sociological and normative approaches (Birch, 2009, 2011; Norris, 2014). Sociological approaches take into consideration the cultural context in which an election is conducted. This approach is appealing since it does not objectively judge a jurisdiction's electoral system, laws or practices, but instead considers public perceptions of the conduct of the election (Elklit & Reynolds, 2002). In this type of research, public surveys may be used to collect data on the quality of elections by asking citizens about their experience of an election and whether they perceived it to be fair. In addition to domestic studies, such as national election

studies, a number of cross-national surveys probe the public's perceptions of their elections.[1] While these types of public surveys can be telling in their own right, by tapping into the 'on-the-ground' reality of elections (Atkeson, Alvarez, & Hall, 2015), they remain limited by the public's fickle attention to electoral issues, social desirability, self-censorship, the influence of the media or politicians, or bias associated with supporting the winning or losing candidate (Howell & Justwan, 2013; Singh, Karakoç, & Blais, 2012). They are also limited in their cross-national comparability, since terms such as fairness may mean different things cross-culturally, and the standards by which elections are judged may vary dramatically across contexts (King, Murray, Salomon, & Tandon, 2009).

An alternative method of judging the quality of elections is a normative approach that considers how well an election adheres to international norms and standards, as defined in international agreements or treaties.[2] Some of these documents outline citizen rights and state responsibilities on a number of issues, including the principles that should underlie elections. For example, the United Nations International Covenant for Civil and Political Rights states that all citizens have the right "to vote and to be elected at genuine periodic elections which shall be by universal and equal suffrage and shall be held by secret ballot, guaranteeing the free expression of the will of the electors."[3] Other documents have expanded on these basic rights, such as the United Nations Convention on The Political Rights of Women, which promotes the eligibility of

[1] These include waves of the Comparative Study of Electoral Systems (http://cses.org/), the Global Barometers (www.globalbarometers.org/) and the World Values Survey (http://www.worldvaluessurvey.org/)
[2] For a good overview of these international agreements, see the International IDEA Handbook on *International Electoral Standards: Guidelines for reviewing the legal framework of elections*.
[3] Article 25, Section B of the United Nations International Covenant for Civil and Political Rights (1966), Article 25, Section B, (http://www.ohchr.org/en/professionalinterest/pages/ccpr.aspx) See also an earlier document, the United Nations Universal Declaration of Human Rights (1948), Article 21, Section 3. (http://www.un.org/en/universal-declaration-human-rights/)

women to run for all public offices.[4] Other agreements are more direct about concrete measures that can be taken to ensure electoral integrity. For example, the Copenhagen Declaration of Organization for Security and Cooperation in Europe encourages the presence of international election observers[5] and the right of citizens to establish political parties,[6] as well as other key components of fair elections. Other regional and inter-governmental agreements outline more fine-grained guidelines on the conduct of various state and non-state actors before, during, and after elections.[7]

This normative approach forms the basis of current scholarship on electoral integrity (Boda, 2005; Norris, 2015; Norris, Frank, & Martínez i Coma, 2014). The term electoral integrity, as advanced in academic work by Norris, is defined as the adherence to "international conventions and universal standards about elections reflecting global norms applying to all countries worldwide throughout the electoral cycle, including during the pre-electoral period, the campaign, on polling day, and its aftermath" (2014, p. 12). In the Perceptions of Electoral Integrity Index, Norris and her colleagues list a battery of requirements for the integrity of each step of the electoral cycle, ranging from standards for electoral laws to the performance of election management bodies (Norris, Frank, & Martinez i Coma, 2014).[8] In her work on electoral malpractice, Birch (2011) classifies the quality of elections according to three major areas susceptible to manipulation: electoral institutions (for example, gerrymandering district

[4] United Nations Convention on the Political Rights of Women (1952) http://www.un.org/womenwatch/directory/convention_political_rights_of_women_10741.htm
[5] Organization for Security and Cooperation in Europe Copenhagen Document (1990), Section 8 (http://www.osce.org/odihr/elections/14304).
[6] Organization for Security and Cooperation in Europe Copenhagen Document (1990), Section 7.1 (http://www.osce.org/odihr/elections/14304).
[7] For example, see the Inter-Parliamentary Union Declaration on Criteria For Free and Fair Elections (1994) (http://www.ipu.org/cnl-e/154-free.htm)
[8] See the Electoral Integrity Project's Perceptions of Electoral Integrity Index: https://sites.google.com/site/electoralintegrityproject4/projects/expert-survey-2

boundaries), vote choice (for example, vote-buying), and electoral administration (for example, ballot-box stuffing).

Regardless of how these principles are grouped or classified, all elections in all countries, from the newest to the most established democracies, are measured according to the same principles according to this normative definition of electoral integrity. This is an important distinction, as we often consider electoral integrity a problem of only new or fledgling democracies. In fact, the first and second studies of this dissertation focus on the potential challenges to electoral integrity in a number of post-industrial democracies, which are commonly overlooked in the study of electoral integrity.

Implications of Electoral Integrity

A lack of electoral integrity at any point in the electoral cycle can have serious consequences for the legitimacy of a government, or the political system more generally. This can be reflected in lower satisfaction with democracy or confidence in government, or even, at its extreme, an unwillingness to accept and comply with the laws put in place by an elected government (Lipset, 1959; Norris, 2014).

Perceptions of legitimacy can also influence voter turnout. According to a Downsian model of voting, if an election is marred by fraud or threatened by violence, voters will have less of an incentive to take the time and energy to register and go to the polls, thus lowering voter turnout (Downs, 1957). This idea is reflected in recent empirical research. Birch (2010), for example, found that voters with lower perceptions of the fairness of an election were less likely to vote, even while holding other individual and country-level variables constant. Using expert perceptions to measure electoral integrity, Norris (2014) also finds that turnout is higher when

the electoral process is perceived as fair. Although there remain some limitations to these broad findings that election quality is related to turnout (for example, incentive-based types of malpractice such as vote-buying or mandatory voting may increase turnout (Nichter, 2008)), electoral integrity remains crucial to the legitimacy of elections.

Some research also points to a relationship between electoral integrity and the potential for, or the stability of, democratization. While most academics would caution against making a clear causal link between holding elections and democratization, pointing to the myriad of reasons why non-democratic regimes may hold elections (Donno, 2013), elections can teach citizens how to engage in politics and organize in the civil sphere, as well as create incentives for political actors respond to citizens' wishes (Tucker, 2007). In doing so, high quality elections can expand civil liberties in a country and the entrenchment of the democratic electoral process can serve as a strong antidote to the possibility of authoritarian rule (Lindberg, 2009).

In the most extreme cases, a lack of electoral integrity can lead to conflict, whether that be peaceful protests, violent riots, or even war (Donno, 2013; Kalandadze & Orenstein, 2009; Lindberg, 2006, 2009; Tucker, 2007). Norris (2014) suggests that the problem of electoral violence is more common than we may think, and calculates that about 19% of elections between 1945 and 2010 experienced some form of violence, in new and old democracies alike. Electoral violence is particularly common in hybrid regimes, where democratic avenues to air grievances with the electoral process are not fully developed, yet the incumbent regime may lack the power to suppress protest and violence (Norris, Frank, & Martínez i Coma, 2015). In these cases, even the perception of fraud can lead to violence. Electoral violence can even take place if the challenges to electoral integrity were not deliberate. Voters may resort to violence if they simply perceive fraud to have taken place, even if the irregularities or problems were simply due to a

lack of capacity or unintentional errors. The idea that poor electoral integrity it not always the result of deliberate manipulation forms the basis of the third study in this dissertation that considers EMB capacity.

Election Management

Election management is key to our understanding of electoral integrity, since it concerns the major tasks involved in running elections. Research on election management has had two major foci: some studies consider the laws and procedures that govern elections, while others look at the structure or performance of election management bodies, the institutions that are tasked with implementing the aforementioned electoral procedures.

Election Procedures

Research on election procedures and laws became especially popular among political scientists following the 2000 American Presidential election, when election management procedures such as registration, ballot design and election technology were the focus of much contention. Since then, scholars have focused attention on empirically evaluating the impact of election management procedures, particularly relating to the voter registration and voting process stages of the electoral cycle (Alvarez, Atkeson, & Hall, 2012).

Many of these studies consider the impact of new election procedures aimed at increasing voter turnout. They often take a Downsian approach that expects turnout to increase as the costs associated with registering and voting decrease (Downs, 1957). Consequently, convenience measures like postal voting (Burden, Canon, Mayer, & Moynihan, 2009; Gronke, Galanes-Rosenbaum, & Miller, 2007; Karp & Banducci, 2000), later registration closing dates (Brians &

Grofman, 2001; T. Hall, 2013; Highton, 2004), the use of election technologies (Alvarez, Ansolabehere, & Stewart, 2005; T. Hall & Alvarez, 2008), or more lenient voter identification laws (Alvarez, Bailey, & Katz, 2008; Atkeson, Bryant, Hall, Saunders, & Alvarez, 2010; Erikson & Minnite, 2009; Pastor, Santos, Prevost, & Stoilov, 2010), should decrease the difficulty of voting and increase turnout.

This research has largely focused, albeit not exclusively, on the American context. For example, there is a body of literature studying the impact of automatic postal voting on turnout in Switzerland (Luechinger, Rosinger, & Stutzer, 2007), a case that will be revisited in the second study of this dissertation. Other research has considered the impact of internet voting in Estonia (Alvarez, Hall, & Trechsel, 2009). Additionally, some cross-national comparative work has examined how election laws, particularly convenience measures, impact turnout (Blais, Massicotte, & Dobrzynska, 2003).

These types of studies have produced mixed findings. In some cases, election management procedures work as intended and increase turnout (Berinsky, Burns, & Traugott, 2001; Karp & Banducci, 2000; Luechinger et al., 2007; Richey, 2008), while in other cases there is no effect, or even a negative effect on overall turnout (Burden, Canon, Mayer, & Moynihan, 2014; Funk, 2010). For example, Burden et al. (2014) examine the implementation of a number of election laws in the 2004 and 2008 American presidential elections, and find that when early voting is implemented alone (without election day registration), turnout actually goes down. They hypothesize that this reduces the civic significance of election day and mobilization of voters by parties and campaigns. Studies like this one suggest that changes to election management procedures may not always have the intended effect on turnout. This problem is addressed in the first study of this dissertation on registration innovations in the United States.

Other research suggests that our evaluation of election management procedures must also consider the possibility of differential effects on different population groups. In other words, the same costs (or reduction of costs) of registering or voting may have different impacts on different segments of the population. For example, early research on election day registration was concerned about how it might change the make-up of the electorate (Mitchell & Wlezien, 1995; Rosenstone & Wolfinger, 1978). Recent literature on early voting procedures, including the second study in this dissertation, has considered how early voting is used by different population groups, including the young, the less-educated, and those with lower levels of political interest (Gronke & Toffey, 2008; Karp & Banducci, 2000; Neeley & Richardson, 2001; Stein & Garcia-Monet, 1997). These studies consider the possibility that election management reforms aimed at improving participation may have differential effects, especially on under-represented population groups.

Other research has considered programs and laws aimed at improving the turnout of specific population groups. For example, a growing body of literature has explored the variety of reforms aimed at facilitating the inclusion of voters with disabilities (Prince, 2012; Schur & Adya, 2013). Scholars have considered issues such as accessibility at polling stations, the use of accessible technology, and alternative procedures that may be made available for voters with disabilities (Schur, 2013). Other research has considered accessibility for voters from minority linguistic groups (Jones-Correa, 2005). Some have also studied campaigns that target the registration turnout of under-represented groups, such as minorities and youth (Herron & Smith, 2013), including methods like pre-registration, which will be examined in the first study of this dissertation (Cherry, 2012; Holbein & Hillygus, 2015; McDonald & Thornburg, 2010).

Scholars have also considered a number of unintended consequences of convenience election procedures, in terms of their influence on trust in the election. Research on new election technologies has considered this question in detail (Alvarez, Ines Levin, Julia Pomares, & Marcelo Leiras, 2013; Alvarez, Katz, & Pomares, 2011; Delis et al., 2014; Pomares, Levin, & Alvarez, 2014). Some posit that a lack of personal experience with election workers may lead voters to distrust the face-less technology of online voting, since personal contact with these personnel may engender trust in the election (Alvarez, Hall, & Llewellyn, 2008a). Voters may also be concerned about whether their vote will actually be counted as intended when swallowed into the 'black box' of a voting machine.

Similar questions arise surrounding postal voting, where voters may not actually see their ballot go into the ballot box or have no face-to-face contact with election workers. Voters who cast their ballots before election day may also be concerned that their ballots will be safely stored for counting on election day (Alvarez, Hall, et al., 2008a; Atkeson & Saunders, 2007). For example, Alvarez, Hall, et al. (2008a) find that there is a negative relationship between voting by absentee ballot and trust in the election results. Atkeson and Saunders (2007) find similar results in a smaller-scale survey of voters in one district in Colorado and New Mexico. This question of trust in convenience election procedures remains an important area of study.

Election Management Bodies

Another approach to studying election management is to consider the structure and performance of the bodies that implement election management laws and procedures. Election management bodies are the agencies and departments that manage elections throughout the electoral cycle, from drawing district boundaries, registering voters, monitoring political parties,

media and campaign spending, conducting the polling, and counting the ballots. While the exact duties of EMBs will differ by jurisdiction, the International IDEA *Handbook on Electoral Management Design* defines an EMB as:

> "...an organization or body which has the sole purpose of, and is legally responsible for, managing some or all of the elements that are essential for the conduct of elections and of direct democracy instruments... These essential (or core) elements include:
>
> a. Determining who is eligible to vote;
> b. Receiving and validating the nominations of electoral participation (for elections, political parties and/or candidates);
> c. Conducting polling;
> d. Counting the votes; and
> e. Tabulating the votes." (Wall et al., 2006, p. 5)

These core functions are accompanied by other tasks and duties, ranging from research to public education, which can vary widely between EMBs.

Most academic literature on EMBs begins with the premise that the formal structure of governance matters. From a rational choice institutionalist perspective (P. Hall & Taylor, 1996), formal institutions of electoral management should shape the actions of the 'players' in elections: policymakers who make election laws, candidates who work to get elected, and citizens who decide whether to vote and if so, for whom. Within this framework, the attributes of EMBs as institutions play a role in shaping the overall quality of elections.

Early research on EMBs has focused on the three *de jure* (formal or legal) models of EMB independence (López-Pintor, 2000; Wall et al., 2006). In the independent, or agency,[9] model, the EMB is fully autonomous from the executive branch of government, and is accountable to the legislative or judicial branch of government, or an independent body.

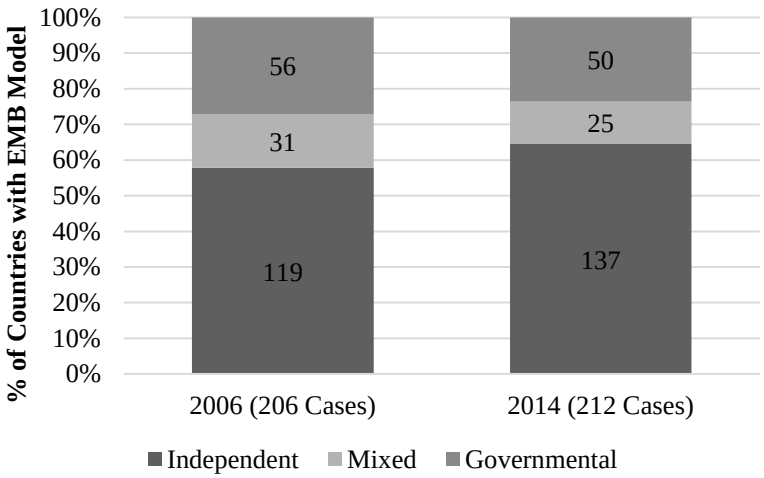
[9] The 'agency' model is a term that has been advanced by Norris to describe independent model EMBs (Norris, 2015).

Elections Canada is an example of one of the oldest independent model EMBs. In the governmental model, the EMB is managed through the executive or the civil service, such as a government ministry or department, such as is the case in Norway, where the Ministry of Local Government, parliament, and a National Election Board comprised of party representatives collaborate to run elections. The mixed model combines elements of both the independent and governmental models. Often a government department will coordinate the day-to-day activities of running elections, but is overseen by an independent commission, board or court. This is the case in France, where the Ministry of the Interior runs elections under the supervision of the Constitutional Council.

This distinction between independent, mixed and governmental EMBs forms the basis of much of the early scholarly literature on EMBs. Both scholars and practitioners have viewed independent EMBs as the 'gold standard' model to be implemented around the world (Hyde & Pallister, 2014; Mozaffar & Schedler, 2002). By operating at arms-length from the government, they are considered more impartial and better able to avoid incumbent manipulation. In fact, the independent model is so popular that many developing or new democracies, and even some established democracies, have adopted the independent model in recent years (Hyde & Pallister, 2014). A 2014 update of the International IDEA Handbook on Electoral Management Design (Catt et al., 2014) reports 137 independent model EMBs, or 64% of all cases studied around the globe, up from 119 independent model EMBs or 57% of all cases in their first edition report published less than ten years earlier (Figure 1) (Wall et al., 2006).

Figure 1: Independent, Mixed and Governmental EMBs in 2006 and 2014[10]

[10] Data from the IDEA handbook on electoral management design (Catt et al., 2014; Wall et al., 2006).



This movement towards independent model EMBs is grounded in an understanding that independent EMBs can have a positive impact on electoral integrity in new and struggling democracies. A number of studies have explored whether an empirical relationship exists between EMB independence and democratic stability (Hartlyn, McCoy, & Mustillo, 2007; Lehoucq, 2002; Omotola, 2010; Pastor, 1999). Authors have argued that when oppositions and incumbents trust the impartiality of election administrators, they are less likely to resort to non-electoral means, such as political violence, to achieve their goals (Pastor, 1999). EMB impartiality is especially crucial where the technical or resource capacity to run elections is not present and unintended technical mistakes could lead opposition parties to call the election fraudulent and not accept the results. Lehoucq (2002), for example, argues that in South America democratic stability is more likely where independent electoral courts, tribunals or commissions were involved in running elections. Hartlyn et al. (2007) use a quantitative approach to identify a similar phenomenon: elections were of higher quality where more independent EMBs were present. In another example, Omotola (2010) presents the case of Nigeria's weak electoral commission, which lacked autonomy and impartiality and contributed to the instability of the country's fourth republic.

The importance of credibility and public trust has been further explored in studies that look at the relationship between EMB formal design and public confidence. Kereval (2009), for example, looks at EMBs in Latin America, measuring independence in terms of partisanship, appointment procedures, and professionalism. He finds that public confidence in EMBs in Latin America is slightly greater when EMBs are non-partisan, independent, and professional. Birch (2008) considers a similar question in an article that evaluates the impact of a variety of electoral institutions on voter confidence in elections, using survey data from the Comparative Study of Electoral Systems. Unlike Kereval, however, she finds a negative relationship between EMB independence and public confidence in the electoral process. She suggests that this finding may stem from three possible phenomena. Firstly, countries with serious challenges to electoral integrity may adopt an independent model to address these issues. The jurisdictions' previous challenges are then reflected in the public's lower confidence in their independent model EMB. Secondly, most of the governmental EMBs in her study are in established European democracies. Finally, she suggests that this finding may reflect the problem of measuring actual EMB independence by classifying the EMB's formal design.

This problem of *de jure* (formal or legal) vs. *de facto* (actual or in practice) independence is a central concern of current literature on EMBs. Some authors have attempted to expand the ways that we measure EMB independence to include other facets of independence, such as personnel, financial and functional independence, as advanced by van Aaken (2009) in an article on EMBs and international observer missions. Van Aaekn suggests that scholars must also consider where EMBs receive their funding from, the types of activities and breadth of decision-making in which they are involved, and, finally, the basis on which EMB members were appointed.

The question of how EMB members are appointed has received some attention, particularly in regards to the influence of political parties in selecting EMB members. In some countries, EMB members are selected based on professional qualifications, but in others all parties contribute members to an EMB.[11] Intuitively, there is some suspicion surrounding partisanship in an EMB, as some are worried about the same political forces competing in the election being involved in the administration of that election (Hartlyn et al., 2007; Pastor, 1999; van Aaken, 2009). Some research has addressed this question, including an article by Estévez et al. (2008) that considers Mexico's move to a multi-party EMB. The authors find that while EMB members did vote according to their partisan interests, the process of including members from all parties in the decision-making process actually engendered some trust in the EMB and more willingness to work within the EMB's parameters. They explain: "because parties anticipate that their interests will be guarded by their sponsored councillors and can be reasonably sure that agency losses will be minor, they are willing to obey the occasional ruling that hurts their short-term interests" (Estévez et al., 2008, p. 270). They conclude that partisan EMBs are not necessarily incompatible with credible elections.

Another way to classify the formal design of EMBs is based on their degree of centralization, or the "concentration or devolution" of power in running elections (Wall et al., 2006, p. 17). This is an important dimension, as it may affect the level of local responsiveness, the capacity for experimentation and reform, and public confidence in the accuracy of results (López-Pintor, 2000; Mozaffar & Schedler, 2002). In some countries, particularly those with

[11] The International IDEA makes this distinction between party and expert EMB members in their measures of EMB design, though it is possible that EMB members selected by parties could still possesses expertise in the field of election management (Wall et al., 2006)

unitary systems of government, one central EMB conducts all elections within the country, though often with subordinate offices at the local level. Other countries have a central EMB for federal elections, with independent provincial and territorial EMBs that conduct elections within their provinces/territories; local election officials conduct municipal elections. The most decentralized system of election administration is perhaps the United States, where each state has jurisdiction over how elections are conducted at both the national and state level (Alvarez, Hall, & Llewellyn, 2008b; Montjoy, 2008; Pastor, 2006). It has been described by Pastor (2006, p. 273) as "decentralized to the point of being dysfunctional." This variation in state election administration is explored in the first study of this dissertation.

One of the few studies on EMB centralization considers the case of the United Kingdom, where election laws are determined centrally, but implementation is left to local officials. James (2016) considers the case of two referendums in the United Kingdom in 2011, in which the Electoral Commission took centralized control of election management. He finds that citizens did notice more consistent and better quality service in many cases. But he also finds that the change may have reduced cost efficiency, although he cautions that this may have been a result of the process of change, rather than decentralization itself. There is currently no consensus on the impact of centralization on EMB performance.

An important recent advance in the study of election management bodies shifts the focus away from the formal design of an EMB to its actual capacity to run elections. A fully independent EMB would not be conducive to promoting electoral integrity if it is not actually able to fulfill its duties. Little empirical research has focused on EMB capacity. Two of the few studies tackling this question focus on EMB capacity and performance in Africa (Kerr, 2009, 2014). In his 2014 study, Kerr takes into consideration EMB performance before an election (for

example, voter registration, enforcement of election laws) and on election day (for example, wait times, problems with voter list, polling staff) using the Quality of Elections dataset.[12] He finds that EMBs with higher capacity and performance engendered higher levels of trust in elections among the population. Although this work makes an important contribution to our understanding of EMB capacity, Kerr acknowledges that the measures of performance available to him are limited in their precision in measuring the target concept. This dissertation responds to this challenge of measuring EMB capacity in the third study.

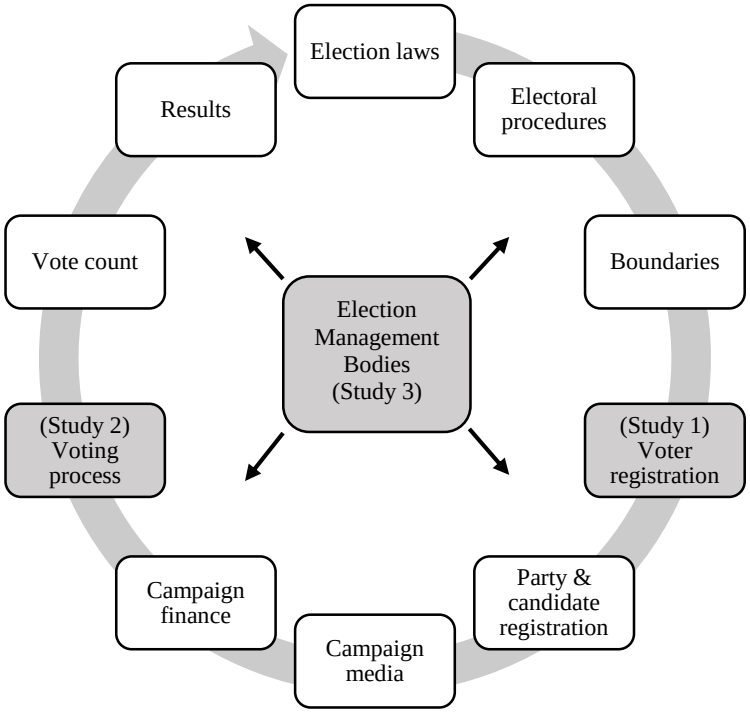
Overview of Studies

This dissertation considers three ways in which election management may influence electoral integrity. As mentioned earlier, electoral integrity is often understood through the lens of an electoral cycle, which considers the quality of elections before, during and after election day.[13] This dissertation first looks at two stages of the electoral cycle (Figure 2): the registration process and the voting process. Finally, it examines the capacity of election management bodies to implement these and other important tasks.

[12] For more on this dataset, see http://sites.duke.edu/kelley/data/

[13] Various organizations and authors have depicted the electoral cycle, including the International IDEA (see http://aceproject.org/electoral-advice/electoral-assistance/electoral-cycle) and the Electoral Integrity Project (Norris, 2014).

Figure 2: Steps of the Electoral Cycle Studied[14]



The first two studies look at specific election management practices aimed at enhancing voters' experiences: innovative voter registration procedures and early voting. These studies consider the cases of a number of post-industrial democracies, where some of the most common threats to electoral integrity are the laws or practices that influence who can vote. In extreme cases, voting laws can disenfranchise certain populations outright,[15] but more commonly election laws will influence the composition of the electorate by implementing certain requirements or procedures that will make the process more difficult for some segments of the population. In

[14] An electoral cycle approach is common to many studies of electoral integrity. The electoral cycle used in this dissertation is adapted from the Electoral Integrity Project (http://www.electoralintegrityproject.com/). See also the electoral cycle approach of the International IDEA (http://aceproject.org/electoral-advice/electoral-assistance/electoral-cycle). Some electoral cycles place election management bodies as one stage of the cycle, however, they are actually involved in planning and implementing the activities of many parts of the electoral cycle.
[15] Even in established democracies, some populations are disenfranchised. These may include non-citizen residents, felons, and expats living abroad.

other words, electoral laws, such as identification requirements and convenience voting measures, can influence the types of citizens who vote. Indeed, one of the most critical contemporary battles for electoral integrity, particularly for established democracies, is the fight to broaden the electorate. This dissertation examines two steps in the electoral cycle that are particularly vulnerable to having differential effects on certain segments of the population.

The first study in this dissertation considers voter registration in the United States, asking: which registration innovations can best facilitate voter registration, produce the most accurate registration lists, and improve voter turnout rates? This study considers how three registration innovations may impact individual registration accuracy and turnout. It first considers election day registration, which has been previously examined, but requires an updated study as more states adopt this innovation. Next, it considers two innovations that have received considerably less study: online registration and the pre-registration of youth. This study uses data from the Current Population Survey from the last six election years (2004-2014) in 49 states to consider the impact of these three registration innovations on both voter registration and voter turnout. It employs three different logistic regression models - difference-in-difference (fixed effects), lagged turnout, and multi-level (mixed effects) models - to estimate the impact of these innovations on an individual's probability of being registered and turning out to vote, while taking into account the potential impact of state-level variables, the dynamics of different elections, and the endogenous application of these innovations. The results challenge our previous understanding of the impacts of these registration laws, and call for more nuanced study of the impact of election laws in the United States.

The second study looks at early voting, a convenience voting measure that allows voters to cast their ballot early, through in-person advance voting or mail-in balloting. It asks: do early

voting opportunities mobilize under-represented population groups? Or do the additional cognitive costs associated with early voting deter under-represented groups from taking advantage of these opportunities? While the focus of most of the research on the impact of early voting has previously been the American case, this study considers the socio-demographic and attitudinal correlates of four types of early voting in four other post-industrial democracies. It considers on-demand postal voting in Germany, automatic postal voting in Switzerland, days-long advance voting in Canada, and week-long advance voting in Finland. It looks at multiple elections across time, at both the national and regional level, using data from a variety of national and comparative election studies. This study finds that early voting rarely mobilizes population groups that are traditionally under-represented at the polls. On the contrary, the population groups that are most likely to use early voting are often those that are likely to vote anyway. Nonetheless, there are some instances, such as for the elderly, where early voting can attract under-represented citizens.

The final study considers the government agencies and departments that conduct election management activities, like voter registration and conducting balloting. Most comparative research on election management bodies to date has considered their formal independence from government. However, this study examines the capacity of EMBs to perform their functions. It argues that EMBs should be assessed based on their provision of information to citizens, communication with stakeholders, and transparency about their operations. Data on information, communication and transparency are collected through a content analysis of EMB websites in 99 countries, followed by a test that measures EMBs' responses to fictional citizen inquiries for information on voting procedures. This study tests the construct validity of this new measure of EMB capacity, by comparing the capacity scores with existing measures of EMBs, and with

structural factors that influence electoral integrity. It also applies the new EMB capacity scores to the study of electoral integrity more generally, demonstrating the importance of this variable in comparative research on election quality. The study concludes that this alternative approach is more objective and cost-effective, opening new avenues for research on EMBs.

In sum, this dissertation provides scholars and practitioners with a better understanding of how election management influences electoral integrity around the globe, by evaluating the effectiveness of two election management procedures, and examining election management body capacity in comparative perspective. It thereby contributes to our scholarly and practical understanding of electoral integrity, election administration, and election laws around the world.

Chapter 2 - Registration Innovation: Comparing Registration Laws in the United States

An electoral cycle approach to electoral integrity suggests that elections are not only what happens on election day, but also the activities that occur beforehand and afterwards. Many pre-election activities that take place before the campaign begins are hidden from public view. Election management bodies may source polling technology, recruit and train poll workers, or register candidates, all before the election campaign officially starts.

For the public, the pre-election period is commonly associated with the process of registering to vote. For many citizens, voter registration is the first, and arguably, most cumbersome step in voting. It often involves filling out forms, proving residence and/or identity, and submitting the paperwork before a closing date. In the United States, this process can look dramatically different depending on which state the voter lives in. Some states have strict closing dates for advance registration, while others allow registration on election day. Voters in some states can register online, while others must register in-person at a registration office or by mail. Some states allow 16- and 17-year olds to pre-register before they are eligible to vote, while others require a voter to be 18 before they can register.

In recent years, a number of national laws have been passed to help streamline registration and other administrative procedures in the United States. The National Voter Registration Act (1993), or 'motor voter' law, enabled voters to register while getting a driver's license and restricted the reasons for which states could remove eligible voters from their registration lists. In 2002, the Help America Vote Act required states to implement state-wide centralized voting lists that are updated with information from other state agency databases.

More recently, the Presidential Commission on Electoral Administration (2014) addressed a variety of election administration challenges, including the registration of voters (Shelley, 2013).

This focus on improving voter registration stems from an understanding that voter registration is crucial for both voters and election administrators. From the perspective of election management bodies, accurate registration is vital to launch public information campaigns and effectively allocate valuable resources on election day. For voters, registration is the first step toward voting. Research has demonstrated that those who are already registered are most likely vote, in part, because they benefit from information and mobilization by election administrators and political parties, and may, over time, develop a habit of keeping their registration information up-to-date and going to vote (Erikson, 1981; Wolfinger, Highton, & Mullin, 2005).

This study considers the potential impact of three registration innovations on individual registration and turnout: election day registration, online registration and the pre-registration of youth. These three innovations represent the major types of changes to registration systems: increasing the length of time during which a voter can register, providing additional opportunities to register, and finally, changing the way that registration lists are accessed and updated.

Using data from the Current Population Survey from the last six election years (2004-2014) in 49 states,[16] this study employs three different logistic regression models - difference-in-difference (fixed effects), lagged turnout, and multi-level (mixed effects) (with and without lagged turnout) - to estimate the overall impact of these laws on an individual's probability of

[16] North Dakota does not have voter registration and is not included in the analysis.

being registered and turning out to vote. These modelling strategies attempt to account for the potential impact of state-level variables, the dynamics of each election, and the endogenous application of registration innovations. In doing so, this study contributes not only to our understanding of the impact of registration innovations, but also our scholarly understanding of the most appropriate methods to use when studying the impact of election laws across jurisdictions.

Voter Registration in the United States

In 2012, a Pew Centre report on registration suggested that about a quarter of eligible Americans were not registered to vote (The Pew Center on the States, 2012) . The accuracy of voter registration records in the United States was also questioned: the same report estimated that about 1 in 8 registrations were invalid, meaning they no longer reflected current information. These invalid registrations could reflect a change in address that was not updated in the file, or a deceased voter. In another article, Ansolabehere and Hersh (2010) suggested that in 2010 the percentage of invalid registrations was close to 9%. While these figures are certainly shocking, one may ask: why does incomplete and inaccurate registration matter for American democracy?

From the perspective of election management, accurate voter registration before the election is important for allocating appropriate resources to polling places, in order to enhance voters' experiences, and potentially decrease wait times. Effective planning can avoid unnecessary frustration for voters and elections staff. Furthermore, registration prior to election day may enhance the security of the vote, discouraging voters from committing fraud by voting at multiple polling places.

For many American voters, registration is the first step that must be taken in order to be eligible to vote on election day. Consequently, how easy it is to register may play a role in whether they decide to vote at all. According to a rational choice, or Downsian, model of voting, voters decide whether or not to vote, in part, based on the projected time or cognitive costs of voting (Downs, 1957). The registration process can be time-consuming, and requires knowledge of the appropriate offices to contact, the documents necessary to prove identification or residence, and the deadlines by which one must register in order to be eligible to vote. As such, voter registration can have an important role to play in the calculus of voting. If registration presents a burden for voters, they may choose to forgo voting altogether.

This potential burden on voters is at least part of the reason why election administrators and legislators may choose to implement innovations to make the process easier on voters and increase the likelihood that they will be accurately registered. These innovations have been largely focused on three major types of changes (see Figure 3). Some innovations focus on the length of the period during which voters can register. This includes two major innovations, the first is a total elimination of closing dates with election day registration, and the second is pushing the registration deadline closer to the election date. Other innovations focus on providing more opportunities for voters to register. These include the 'motor-voter' laws that allow voters to register at state motor vehicle offices, the pre-registration of youth, online registration and registration campaigns targeted at specific groups of voters. Finally, election administrators in the United States have attempted to improve their registration system through list management. To improve the accuracy of their registration lists, some states have implemented more centralized systems of registration throughout the state, or share information with other government agencies and departments. These types of innovations may also include

changing how often they purge their lists of inactive voters. Some purging requirements were included in the 'motor voter' law of 1993. Innovations concerning list management can even include online registration, as it makes it easier for citizens themselves to update their registration information.

Figure 3: Types of Registration Innovations

Length of Time to Register	Closing dates closer to the election day Election Day Registration
Opportunities to Register	'Motor voter' laws (DMV registrations) Online Registration Pre-registration of youth Registration campaigns and public outreach
List Management	List centralization or decentralization List sharing with other government departments and agencies Frequency of purging, 'motor voter' laws (purging) Online Registration

Voter registration also has important effects on turnout rates. In some states, if voters are not registered before election day, they do not even have the option of voting. But even if voters can register on election day, as is the case for an increasing number of states, they forgo some of the benefits of registration. In particular, registrants are usually provided with some information about the voting process and reminders in the mail by election administrators and/or political parties, which decreases some of the information costs of voting. Wolfinger et al. (2005) tested the impact of a number of actions an election administrator may take to help those who are registered know how to vote, including whether being sent sample ballots or information about polling locations affected turnout rates. They found that mailed information boosted turnout rates by between 0.6 and 1.2 percentage points (depending on whether sample ballots or polling place information were sent), especially among less-educated and younger voters.

Hypotheses

This study explores the impact of common registration innovations on registration accuracy and turnout. How effective are legal reforms at producing the intended effects of better registration coverage and higher voter turnout? Previous research on other legal innovations that are aimed at reducing some of the costs of voting have demonstrated that legal changes do not always have large or even positive effects on voter turnout. For example, Burden et al (2014) demonstrate that early voting opportunities can actually have a negative impact on voter turnout. This line of research is vital to ensure that new registration laws are having the intended effect of improving registration and turnout. This study considers three major registration innovations that have been implemented by various states over the past ten years: election day registration, online registration, and the pre-registration of young voters. These three innovations cover some of the major challenges that registration laws are meant to address, namely closing dates, expansion of registration opportunities and list management. Each is directly experienced by voters, making it more likely that the effects of these innovations will be found in individual-level turnout and registration data.

Most of the previous studies on election laws consider turnout as the main dependent variable. However, if we expect that turnout is improved through better registration, it is important to empirically examine the impact of registration laws on this first step of the voting process, that is, voter registration itself. Research that only uses voter turnout as a dependent variable cannot speak to the potential implications of new registration laws for registration accuracy. This knowledge is crucial for the proper allocation of resources by election management bodies. This study therefore considers the impact of registration laws on two related outcomes: registration and voter turnout.

Election Day Registration

Let us first examine the impact of election day registration, an innovation that has already been the focus of a great deal of empirical research. As more and more states adopt election day registration, it is possible that any initial relationship found between election day registration and turnout may have been the product of other factors unique to early adopters of this innovation, such as the political climate in which this registration law was adopted.

Election day registration, as the name suggests, allows voters to register at the polls on election day. This means that they can bypass the sometimes difficult advance registration procedures. Furthermore, citizens who initially had chosen not to register are able to change their minds closer to election day, when parties and the media may mobilize them.

The earliest study of election day registration, by Wolfinger and Rosenstone (1978), used cross-sectional data on registration rates for the 1972 presidential election, alongside data on whether the states had election day registration or required pre-registration, and if so, when their closing dates were, and the opening hours of the registration offices. They found that less stringent registration laws increased turnout by about 9 percentage points. For election day registration specifically, the impact was about 6 percentage points. Later studies by Highton (1997), and Brians and Grofman (2001), found similar results. Many of these studies also found that election day registration was most beneficial to low-education voters, who may not have had the information or foresight to register before election day (Highton, 1997; Mitchell & Wlezien, 1995; Nagler, 1991). However, there remains some debate as to whether this finding holds in all cases, particularly as election day registration becomes more common (Brians & Grofman, 1999, 2001; Highton, 2004; Huang & Sheilds, 2000).

Re-examining the impact of election day registration a decade later, Green and Knee (2011) argued that Wolfinger and Rosenstone's results were largely a product of the methodological assumptions used in their analysis. They note that this analysis did not take into consideration the potential state-specific impacts on voter turnout, and failed to take into account the clustering of state observations. Using time-series data instead, they found that the impact of registration laws on turnout was not as large as Wolfinger and Rosenstone suggest. In their analysis, the impact of changing from 30-day advance registration to election day registration is strongest for presidential election years (the impact ceases to be statistically significant when midterm elections are included), but the impact on turnout is closer to 5 percentage points. In another methodologically rigorous re-examination of the relationship between registration and turnout, Ansolabehere and Konisky (2006) evaluated the impact of mandatory pre-election day registration laws in counties in Ohio and New York where advance registration had previously not been mandatory. They find that these laws did suppress turnout, but at a lower rate than anticipated: their estimates in this 'natural experiment' were closer to 3 to 5 percentage points of long-term turnout decline in the counties studied.

Based on these findings, the availability of election day registration should have a positive impact on an individual's propensity to register and turn out to vote [H1]. Voters who previously would not have registered have the opportunity to register on election day. Their information will be recorded for subsequent elections. Furthermore, they are less likely to experience problems with registration that might prevent them from voting, since they will be able to simply amend their registration information, or even register for the first time, on election day.

Online Registration

The second registration innovation tested in this study is online registration. Arizona was the first state to enact online voter registration in 2002, and since then, many states have followed suit, moving parts or all of their registration process online. In the 2014 midterm election, 21 states offered online registration.[17] Scholars have suggested that online registration could significantly improve the accuracy of the registration process, since registration over the internet will improve access and make registration more convenient for many voters, encouraging them to keep their registration status and information current (Barreto et al., 2010; Shaw, Ansolabehere, & Stewart, 2015). However, this hypothesis has not been subjected to empirical evaluation. Given these suggested positive impacts, the option of online registration should have a positive impact on whether a voter is registered and turns out to vote [H2].

Pre-Registration

Finally, this study considers pre-registration, which allows citizens younger than 18 to register to vote. The exact regulations surrounding these laws vary by state, but in general they allow 16 or 17 year olds to register before they are eligible to vote. This is often done with the assistance of their schools or parents, potentially reducing some of the information costs of voting (Cherry, 2012; Holbein & Hillygus, 2015; McDonald & Thornburg, 2010). Once registered, these young voters will further benefit from reminders and updates from the state and political parties. Furthermore, it is possible that being registered early in life will develop a habit of keeping their registration up-to-date, as other research has demonstrated that voting is a habit,

[17] Data from the National Council of State Legislators http://www.ncsl.org/

that once established, often continues through life (Fowler, 2006; Gerber, Green, & Shachar, 2003; Plutzer, 2002). However, like online registration, pre-registration has been the focus of far less empirical research than other registration innovations. In one of the only national empirical evaluations of pre-registration, Holbein and Hillygus (2015) find that pre-registration increases the turnout of young voters by an average of 13 percentage points. I likewise expect that pre-registration will have a positive relationship with registration and turnout among the youngest group of voters [H3].

Method

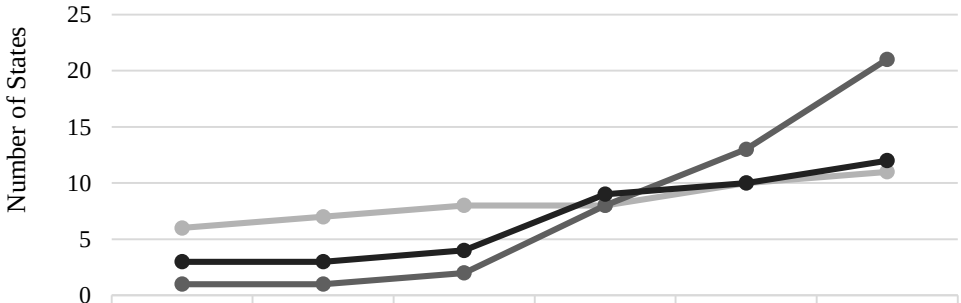
The United States is an ideal country in which to study the impact of election laws, since states enact election laws mostly independently,[18] and have changed their laws frequently over the past several years. This allows for quantitative comparative research across states, while holding constant some country-specific factors, such as the electoral system, the party system and general levels of economic development. Additionally, this study directly addresses the wealth of American research on election administration laws, so it is fitting to continue this research within the American context.

Registration innovations are tracked between 2004-2014 for each state (see Appendix A).[19] During this 10-year time frame, there was a proliferation of registration innovations at the state level (Figure 4). Prior to this time period, innovations like online registration and pre-registration were only used in the same small number of states. The benefit of using multiple election years is the ability to analyze the effects of changes in registration laws over time,

[18] Major exceptions being the National Voter Registration Act (1993) and Help America Vote Act (2002), which still required states to choose whether, how and when to implement their guidelines.
[19] North Dakota is not included because it does not have voter registration.

allowing for a more robust analysis of the impact of the laws. It is important to note, that in most cases these innovations remained in place once introduced, with the notable exception of North Carolina, where pre-registration was eliminated for the 2014 election (Blinder & Fausset, 2016). Data on these changes have been collected through the Election Administration and Voting Survey, which outlines the election laws in each state in its biennial report, and the National Council of State Legislatures database of election laws.[20]

Figure 4: Timeline of Registration Innovations across US States (Number of States with Each Innovation), 2004-2014



	2004	2006	2008	2010	2012	2014
Election Day Registration	6	7	8	8	10	11
Online Registration	1	1	2	8	13	21
Pre-Registration	3	3	4	9	10	12

While many articles on registration laws only consider their impact on turnout, this study considers the impact of these registration innovations on both registration and turnout at the individual level. These variables are measured using survey data from the Current Population Survey (CPS) Voting and Registration Supplement, which was conducted after each midterm and Presidential election (see Appendix B for variables). The survey asks respondents whether they voted, and if they did not vote, whether they were registered.[21] This dataset assumes citizens

[20] In addition, some email communication with the NCSL helped to clarify pre-registration laws.
[21] In this study voters who responded they didn't recall or refused to answer whether they had turned out to vote were coded as missing. In some studies, these voters are marked as having not voted (Burden et al., 2014; Holbein & Hillygus, 2015). The results were not significantly different when this alternative coding of turnout was used.

to be registered if they had voted. The Current Population Survey remains the best available source of information on registration, since studies that have considered the accuracy of official registration lists estimate between 9-12% of registrations on these lists are inaccurate. (Ansolabehere & Hersh, 2010; The Pew Center on the States, 2012). Furthermore, official registration lists do not provide information on all the socio-demographic variables of interest in all 50 states. It is important to note that the self-reporting of registration and voter turnout may be influenced by social desirability or by the higher level of engagement among those willing to spend the time to respond to the survey. It is also possible that the accuracy of the Current Population Survey's turnout rates has diminished over time (Hur & Achen, 2013). However, the Current Population Survey is not explicitly a political survey, and is conducted by the United States Census Bureau, so it is more likely to have respondents who would not be interested in completing a survey about political issues. Voter turnout for the pooled dataset is about 63% (average turnout over the six election years studied is about 50%).[22]

Method 1: Difference-in-difference (Fixed Effects) Model

Many studies that seek to evaluate the impact of election laws use difference-in-difference regression models (Burden & Neiheisel, 2013; Holbein & Hillygus, 2015; Knack, 1995). These models include dummy variables for state and year and an interaction between the two, as fixed effects. This controls for the differences both between elections, such as the candidates, issues or the competitiveness of the race, and within states, such as varying social and political climates. Because elections in the United States are run at the state-level, and

[22] Voter turnout data from the United States Election Project (http://www.electproject.org/).

ballots include not only national-level candidates but also local candidates, state-level election effects, such as the competitiveness of state-level races, are controlled for in this method.

Method 2: Lagged Turnout Model

However, difference-in-difference models cannot take account of the endogeneity of registration law innovations and their implementation. In other words, the states that have chosen to put these practices in place in this time period are not random. Certain states may have chosen to implement certain innovations because they tend to be progressive in their election administration practices and seek to further innovate. In this case, better registration and turnout rates may be due to other election administration practices or political cultures in that state rather than the law itself. Other states may be seeking solutions to issues of low turnout or registration, and thus implement these laws in an attempt to improve participation in their state. In this case, overall registration and turnout rates may be particularly low for these states, making any observed effect of these laws on the dependent variables only slight.

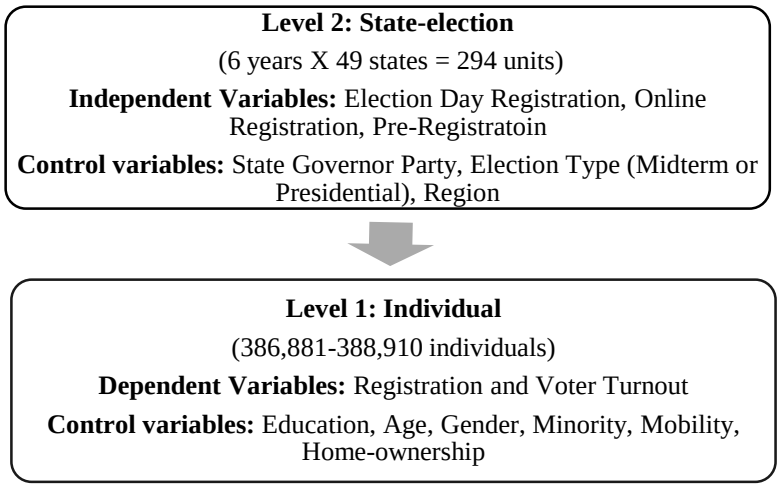
To deal with this issue, Holbein and Hillygus (2015) suggest that studies on election laws use a lagged turnout variable for the state's previous election (of the same type) in the models. Because the CPS dataset is not a panel, official state turnout rates are used in this study. Turnout is used as a control in the registration models since actual registration rates are known to be inaccurate, unlike turnout rates that are more easily reported. Still, turnout provides a good proxy for the state's registration and turnout culture. The results of this method may be interpreted as a lower-bounds estimate of the actual effect when the coefficient is positive (and upper-bounds estimate when negative) (Holbein & Hillygus, 2015). Using this method may therefore provide

an important caveat to the difference-in-difference results, which may be considered a less conservative modelling strategy.

Method 3: Multi-level (Mixed Effects) Model

Finally, this study uses multi-level or mixed effects modelling, since the data feature individuals nested within states and elections (Figure 5). This method can take into consideration both the individual-level and state and election-level variables that may influence registration and turnout. In this study, these controls include whether the state governor was Republican at the time. This captures the partisan climate, which may affect whether more liberal or restrictive registration laws were implemented. It also controls for whether the election was presidential or midterm, which influences voter turnout and interest in the election (turnout and interest are generally higher in Presidential election years). Finally, it controls for the state's region, which is common to comparative state research to account for differences in voting and registration cultures in different regions of the country. In this study, state and year are collapsed into one level, since the changes in laws, rather than the differences between states or between years, are of most interest. I estimate these models with and without the lagged turnout variable mentioned above.

Figure 5: Multi-Level Model



Pre-registration

Because pre-registration applies only to the youngest voters, a slight variation in these methods will be used to study its impact. Unlike other laws that are experienced by the entire population immediately after they come into effect, the impact of pre-registration will only be felt one or two years later when the pre-registered citizens are eligible to vote and are surveyed (the surveys employed in this study only have respondents over the age of 18). Because elections are held every two years, the laws implemented two years previously should have an impact on the population two years later. Thus, a lagged variable considering whether pre-registration was available two years prior to the election studied is used as the main independent variable when studying pre-registration.[23] Consistent with previous research on pre-registration, only responses from respondents between the ages of 18 and 22 will be considered (Holbein & Hillygus, 2015). While this means that it is possible that some of these respondents did not have access to pre-

[23] In the article by Holbein and Hillygus, pre-registration is not lagged. The results are not significantly different when not lagged, as this will affect the results only in the year the innovation is introduced.

registration in the election immediately after the pre-registration law was implemented, it is more important that the age of respondents remains consistent, and the models employ more observations.[24]

Control Variables

For all three methods, individual-level control variables that have been previously demonstrated to impact registration and voter turnout are included. These are: gender, age, education, minority status and mobility.

While many scholars affirm that gender gaps in voting have disappeared in recent years (Childs, 2004; Smets & van Ham, 2013), gender may influence whether or not a voter is registered. The registration process in the United States requires knowledge of specific procedures. Given that women tend to be less interested in politics and less politically informed than men (Carpini & Keeter, 1996; Lizotte & Sidman, 2009), they may be less likely to be registered.

Voting and registration also vary by age. The youngest voters are likely to have the least experience and knowledge of voting and registration, and may therefore lack the skills or interest to ensure accurate registration (Jankowski & Strate, 1995; Smets & van Ham, 2013; Strate, Parrish, Elder, & Ford, 1989).

Socio-economic factors such as education are also related to registration and voter turnout. Many authors have suggested that socio-economic factors influence a voters' civic attitudes, time and money to devote to political activity, feelings of political efficacy, and ability

[24] Models with only 18-20 year olds do not significantly vary from the models with 18-22 year olds.

to overcome the knowledge costs associated with voting (Brady, Verba, & Schlozman, 1982; Kam & Palmer, 2008; Mayer, 2011; McDonald & Thornburg, 2010; Persson, 2013; Tenn, 2007; Verba & Nie, 1972). Education is a useful proxy for a variety of socio-economic factors that may be related to voter turnout and registration. Traditional registration procedures require a great deal of cognitive ability and political knowledge. Voters must know the proper procedures, identification requirements and deadlines to register to vote. The registration innovations studied here are all designed to decrease some of these knowledge costs associated with registration and voting.

The impact of race in the United States is often related to other socio-economic variables, but it has also been related to group identity, turnout traditions, and group mobilization (Leighley & Vedlitz, 1999; Verba, Schlozman, Brady, & Nie, 1993) and is commonly included as an individual-level correlate of voter turnout.

An individual's residential mobility is related to other socio-economic factors, but it also matters in its own right. Voters who are highly mobile, such as those who do not own their own home, will be required to change their registration information or re-register each time they move (Hansen, 2016; Highton, 2000). Research has demonstrated that this factor, more than other socio-demographic factors, can explain lower turnout among high-mobility voters (Squire, Wolfinger, & Glass, 1987).

In sum, three logistic regression methods are used, with a variety of individual and state-level control variables, to provide the most accurate assessment of whether registration laws influence registration and the propensity to vote. Importantly, this assessment allows for the possibility that the impact of registration innovations is reflecting other state characteristics rather than the law itself.

Results

With one notable exception, the control variables have the predicted effects on registration and voting (see Table 1). Contrary to expectations, women were, in fact, more likely, not less likely, to be registered or to have voted, suggesting that knowledge deficits are not an impediment. This may also support some of the recent work that suggests gender gaps in political knowledge may be due to measurement issues (Lizotte & Sidman, 2009; Mondak & Anderson, 2004).

Election Day Registration

Regarding election day registration specifically, the first two models in Table 1 provide the results for difference-in-difference and lagged turnout models on the potential impact of this law on registration. Both estimates are both negative and statistically significant, suggesting that election day registration has a negative impact on registration. This indicates that being able to register at the polls does not necessarily mean that more of the population will be registered to vote overall (even after the election). This may be the case because those who do not end up voting will have little incentive to be registered, whereas those who must register in advance are registered even if they decide not to turn out to vote. In any case, once state- and election-level variables are taken into account (in the multi-level models), the negative relationship disappears. In the initial multi-level model, the coefficient is actually positive, but once lagged turnout is added as a control variable, the effect ceases to be statistically significant. This suggests that election-day registration laws are endogenous and that their apparent positive effect reflects the impact of a state's existing turnout or election administration culture.

For voter turnout, the impact of election day registration initially seems more positive. Both the difference-in-difference and multi-level models suggest that election day registration has a positive impact on the propensity to vote. The difference-in-difference method suggests a 3-percentage point increase in the probability of voting with election day registration,[25] while the multi-level model (without lagged turnout) suggests the increase is closer to 4 percentage points.[26] However, this finding is tempered by the fact that the effect is not statistically significant in the lagged turnout model or when lagged turnout is included in the multi-level model. This supports earlier suggestions by authors such as Ansolabehere and Konisky (2006) and Knee and Green (2011) that the impact of election day registration on turnout may be weaker than initially thought, and may be influenced by factors endogenous to the states that tend to implement this innovation.

Online Registration

When it comes to online registration, on the other hand, there is stronger evidence of a positive effect, at least for registration. This registration innovation has a positive impact on registration in the multi-level model and the effect remains statistically significant when lagged turnout is added to the model. That said, the effect is modest: the marginal effect of online registration indicates an improvement in registration of only about three percentage points even when calculated from the results of the multi-level model without lagged turnout.[27] Moreover, these findings do not extend to the difference-in-difference and lagged turnout models. In fact,

[25] Marginal effects from Model 4 from Table 1. All marginal effects reported in this dissertation were estimated while keeping other variables at their observed values (Hanmer & Ozan Kalkan, 2013).
[26] Marginal effects from Model 6 from Table 1.
[27] Marginal effects from Model 3 from Table 1.

the effect is negative for the difference-in-difference model. Overall, these results suggest that the impact of online registration is likely quite minimal.

The results for turnout are no more encouraging. The multi-level model indicates that there is a 2.5 percentage point increase in the probability of voting where online registration is present.[28] However, this effect shrinks and ceases to be statistically significant when lagged turnout is added to the model, suggesting that any apparent positive impact of online registration may mostly be reflecting a broader election administration culture of innovation and capacity in the state, rather than the practice of online registration itself. This conclusion is reinforced by the lack of a significant effect in the lagged turnout model.

[28] Marginal effects from Model 7 from Table 1.

Table 1: Election Day Registration and Online Registration

	Difference-in-difference (Fixed effects)	Lagged turnout	Multi-level	Multi-level (with lagged turnout)	Difference-in-difference (Fixed effects)	Lagged turnout	Multi-level	Multi-level (with lagged turnout)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	Registered	Registered	Registered	Registered	Voted	Voted	Voted	voted
Election Day Registration	-0.15**	-0.13**	0.14**	-0.03	0.15**	0.03	0.24**	0.10
	(0.00)	(0.04)	(0.05)	(0.05)	(0.00)	(0.04)	(0.05)	(0.05)
Online Registration	-0.14**	-0.02	0.23**	0.17**	-0.06**	0.06	0.13*	0.09
	(0.00)	(0.05)	(0.06)	(0.05)	(0.00)	(0.05)	(0.06)	(0.05)
Female	0.19**	0.19**	0.19**	0.19**	0.11**	0.11**	0.11**	0.11**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Age 18-25	-0.66**	-0.66**	-0.66**	-0.67**	-0.75**	-0.74**	-0.75**	-0.75**
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
White	0.10**	0.10**	0.10**	0.10**	0.06*	0.04	0.06*	0.06
	(0.03)	(0.04)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
College Degree	1.19**	1.18**	1.19**	1.19**	1.07**	1.06**	1.07**	1.06**
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Residence 2 or more years	0.31**	0.31**	0.31**	0.31**	0.34**	0.34**	0.34**	0.34**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Lagged Turnout		2.50**		2.16**		2.62**		1.87**
		(0.24)		(0.23)		(0.22)		(0.22)
Region, Midwest			0.14**	0.11*			0.11*	0.08
			(0.05)	(0.05)			(0.05)	(0.05)
Region, South			0.06	0.16**			-0.01	0.07
			(0.05)	(0.04)			(0.05)	(0.04)
Region, West			-0.17**	-0.11*			0.07	0.12*
			(0.06)	(0.05)			(0.05)	(0.05)
Presidential Election			0.14**	-0.26**			0.71**	0.36**
			(0.04)	(0.06)			(0.03)	(0.06)
Republican Governor			0.02	0.06			-0.00	0.03
			(0.04)	(0.03)			(0.04)	(0.03)
Constant	-0.34**	-1.68**	-0.59**	-1.51**	-1.10**	-2.33**	-1.83**	-2.62**
	(0.03)	(0.13)	(0.06)	(0.11)	(0.03)	(0.11)	(0.05)	(0.10)
State FE	Yes	No	No	No	Yes	No	No	No
Election FE	Yes	Yes	No	No	Yes	Yes	No	No
State*Election FE	Yes	No	No	No	Yes	No	No	No
N. Individual	472,684	472,684	472,684	472,684	475,664	475,664	475,664	475,664
N. State-elections			294	294			294	294
Pseudo R2	0.10	0.09			0.13	0.12		

Clustered (state-election) standard errors in parentheses, ** p<0.01, *p<0.05
North Dakota does not have voter registration and is therefore not studied here.

Pre-Registration

Turning to the impact of pre-registration on a young voter's registration and turnout, this impact may also be less than hypothesized (Table 2). While pre-registration has a positive impact on registration in the difference-in-difference approach, the same result is not found using either the lagged turnout or multi-level models, methods that take into account the non-random application of pre-registration. Although pre-registration appears to have a negative impact on the probability of voting in the difference-in-difference model, there is no statistically significant impact when the alternative modelling strategies are used. This suggests that pre-registration alone may not be a solution to low registration and turnout among youth.

It is interesting to note that this does not match the findings of Holbein and Hillygus (2015), using similar methods but different time points (2000-2012).[29] Three additional states have since adopted pre-registration, and one state, North Carolina, has, controversially, discontinued its pre-registration program (Blinder & Fausset, 2016). This underlines the importance of replicating studies of the impact of election laws at different time points, as states continue to adopt or discontinue these innovations. It is possible that other characteristics of the states that have adopted pre-registration in recent years may account for the lack of association between this registration innovation and turnout.

[29] See Appendix C for an approximate replication of the models estimated by Holbein and Hillygus (2015) for their original time points (2000-2012) and the time points used in this study (2004-2014). The results for 2000-2012 are similar to the findings of Holbein and Hillygus, while the results for 2004-2014 are similar to that of the models presented in Table 2.

Table 2: Pre-Registration

	Difference-in-difference (Fixed effects)	Lagged turnout	Multi-level	Multi-level (with lagged turnout)	Difference-in-difference (Fixed effects)	Lagged turnout	Multi-level	Multi-level (with lagged turnout)
VARIABLES	(1) Registered	(2) Registered	(3) Registered	(4) Registered	(5) Voted	(6) Voted	(7) voted	(8) voted
Pre-Registration	0.55**	-0.07	0.06	0.01	-0.28**	-0.03	0.03	-0.02
	(0.00)	(0.06)	(0.07)	(0.07)	(0.01)	(0.06)	(0.08)	(0.07)
Election Day Registration	-0.22**	-0.10	0.09	-0.01	0.04**	0.11	0.33**	0.21**
	(0.00)	(0.05)	(0.06)	(0.06)	(0.00)	(0.06)	(0.07)	(0.07)
Online Registration	-0.70**	-0.02	0.06	0.03	-0.41**	0.11	0.01	-0.03
	(0.01)	(0.06)	(0.07)	(0.07)	(0.01)	(0.07)	(0.08)	(0.07)
Female	0.18**	0.18**	0.18**	0.18**	0.24**	0.24**	0.24**	0.24**
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Minority	0.06*	0.06	0.07	0.07	-0.05	-0.07	-0.04	-0.05
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
College Degree	0.92**	0.91**	0.91**	0.91**	0.84**	0.83**	0.84**	0.84**
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Residence 2 or more years	0.14**	0.15**	0.14**	0.14**	0.21**	0.21**	0.21**	0.21**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Lagged Turnout		2.38**		1.26**		2.97**		1.56**
		(0.32)		(0.28)		(0.36)		(0.29)
Region, Midwest			0.25**	0.23**			0.17**	0.14*
			(0.05)	(0.05)			(0.06)	(0.06)
Region, South			0.06	0.12*			0.04	0.10
			(0.05)	(0.05)			(0.06)	(0.06)
Region, West			-0.14*	-0.10			0.06	0.10
			(0.06)	(0.06)			(0.07)	(0.06)
Presidential Election			0.47**	0.24**			1.22**	0.93**
			(0.04)	(0.07)			(0.04)	(0.07)
Republican Governor			-0.04	-0.02			-0.01	0.02
			(0.04)	(0.04)			(0.05)	(0.04)
Constant	-0.71**	-1.37**	-0.72**	-1.24**	-1.29**	-2.43**	-2.33**	-2.98**
	(0.05)	(0.17)	(0.07)	(0.13)	(0.05)	(0.19)	(0.08)	(0.14)
State FE	Yes	No	No	No	Yes	No	No	No
Election FE	Yes	Yes	No	No	Yes	Yes	No	No
State*Election FE	Yes	No	No	No	Yes	No	No	No
N. Individual	35,768	35,768	35,768	35,768	36,216	36,216	36,216	36,216
N. State-elections			294	294			294	294
Pseudo R2	0.05	0.03			0.11	0.10		

Clustered (state-election) standard errors in parentheses, ** p<0.01, *p<0.05
Only Youth (ages 18-22) are studied here.
North Dakota does not have voter registration and is therefore not studied here.

Conclusions

Registration innovations are designed to improve registration rates and accuracy, increase turnout and allow election administrators to better allocate resources and reach out to potential voters. But do they actually improve registration and turnout? This study considers this question by tracking three registration innovations – election day registration, online registration and pre-registration - across six elections, in American 49 states. In doing so, this study makes a number of contributions to our practical and scholarly understanding of voter registration in the United States. Firstly, it tests the impact of online registration, a registration innovation that has dramatically increased across states but which has received no empirical testing. It also challenges previous findings on the impact of pre-registration, an innovation that has received only limited study, and adds to the body of evidence on election day registration as more states adopt this procedure. Secondly, this study considers the impact of registration innovations on registration, as well turnout. In many previous studies, only turnout is considered as the major dependent variable in evaluations of election laws. However, registration rates are also an important indicator of the success of these registration laws, since both voters and election administrators benefit from more accurate voter registers. Additionally, many previous studies that consider the impact of registration laws on turnout assume that these innovations improve registration, which in turn improves turnout. However, the results of this study demonstrate that the impact on registration and turnout is not necessarily the same.

The empirical results demonstrate that we cannot be confident that any of the tested registration innovations actually have a positive effect on registration or turnout. Election day registration does not have a positive impact on registration rates overall, and while it may have some positive impact on turnout, this does not hold for all modelling strategies. The results for

online registration also differed depending on the modelling strategies used, leading to the conclusion that it likely has very little substantial or consistent impact on registration or turnout rates. Pre-registration has some positive impact on registration in the difference-in-difference models, but this does not hold up when using alternative strategies and does not increase turnout for the time period studied (2004-2014).

These results are often at odds with previous findings that demonstrate a positive impact of election day registration and pre-registration on turnout. This may reflect the longer time span covered by this study. Earlier studies focused on the early adopters of these registration innovations. These innovations have since expanded to many other states and the impacts found in earlier studies may not necessarily extend to these new states. This points once again to the endogeneity of election laws. The earlier adopters may have had greater support from government, more competent and innovative election administrators that were capable of successfully implementing or lobbying for changes, or may even have been more progressive in building human capital in the state, which would enhance both registration and voting. While the lagged turnout variables employed in this study begin to address this concern, future research is needed to better understand what prompts a state to adopt these registration innovations or not.

Overall, these findings suggest that simply changing a registration law or implementing a new procedure alone is unlikely to make large improvements in an individual's likelihood of registering or turning out to vote. The impact of broader election administration and election law cultures and practices cannot be ignored. This emphasizes the need for testing the impact of election innovations using multiple methods that control for different sources of bias. Additionally, this study suggests that access and the costs of voting may not always be the greatest determinants of registration and turnout. Instead, we must pay attention to work by

scholars looking at issues such as motivation and sense of duty (Blais, 2000). In sum, this study challenges our understanding of the impact of registration innovations on overall registration and turnout, and calls for more nuanced study of the impact of election laws in the United States.

This study also makes a number of methodological contributions. Firstly, it emphasizes the importance of endogeneity in our study of impact of election laws. Election laws are not implemented randomly, and as such, scholars must consider how to capture the pure effect of laws in their models. This study does so by using three different methods to estimate the potential impact of these election laws on individual registration and turnout, which provides more confidence in the results since each method is able to take into account different potential sources of bias.

It also demonstrates that different modelling strategies can have dramatically different results, an important consideration when using the results of empirical studies to inform public policy on election laws. In particular, the findings reveal two patterns associated with the modeling strategies. Firstly, the multi-level models, particularly in Table 1, appear to demonstrate the most consistently positive impact on both registration and turnout. It is possible that the multi-level models over-estimate the impact of election laws because it is impossible to control for all the potential state and election-level variables that may impact registration and turnout. This should cause scholars some pause in the use of multi-level models to study the impact of election laws. Secondly, when the lagged turnout variable is added to these multi-level models, the coefficient shrinks and typically ceases to be statistically significant. In fact, the lagged turnout models mostly fail to show statistically significant effects. These results support the idea that a state's previous experience with turnout may influence its choice of election laws. It could also indicate that turnout is serving as a proxy for other, less-easily measurable

variables, such as the state's political culture. This suggests that rather than the law itself, the implementation of the law is capturing other political variables, again reinforcing the conclusion that endogeneity must be carefully considered in any statistical studies of the impact of election laws.

The second study in this dissertation likewise calls for more rigorous examination of an election law aimed at improving the voter experience. It considers the impact of early voting procedures, including in-person and mail-in advance voting. However, rather than examining their overall effect, this study considers whether the impact of these procedures is different for under-represented population groups. It considers this question outside of the American context, adding a number of much-needed cases to the study of election management practices in a comparative perspective.

Chapter 3 - Early Voting: Comparing Canada, Finland, Germany and Switzerland

For many voters, casting their ballot is closely associated with the excitement of election day. Now registered (or intending to register at the polls), voters go to polling stations spread throughout the jurisdiction to cast their ballot. However, for some voters, voting on election day may not be possible. They may be out of town or homebound, and therefore require a way to cast their ballot without going to a polling station on election day.

Election management bodies in many countries therefore organize early voting opportunities, which allow voters to cast their ballot before election day by mail or in person. While the initial early voting programs focused on providing opportunities for those who would not otherwise be able to vote on election day, recent expansions of early voting have extended these opportunities to the general population, no longer requiring that citizens provide an excuse to be eligible to vote early.

But who is benefiting from these convenience measures? Is early voting mobilizing under-represented population groups? Or do the additional cognitive costs associated with early voting deter under-represented groups from taking advantage of these opportunities? In other words, does the additional time and energy required to get the necessary information about early voting opportunities, dates, locations and procedures discourage under-represented groups from voting early? These concerns have been the focus of some empirical research, particularly within the American context. Scholars have suggested that rather than facilitating the turnout of under-represented populations, early voting may appeal only to those who are already likely to vote (Barreto, Streb, Marks, & Guerra, 2006; Giammo & Brox, 2010; Karp & Banducci, 2001; Neeley & Richardson, 2001). This is a crucial problem for democratic representation. If certain population groups are better represented at the polls, their opinions and needs may also be better

represented in government (Verba, Schlozman, & Brady, 1995). Politicians, motivated by their desire for re-election, will have less incentive to respond to the needs of the population groups who are less likely to vote. The make-up of the voting population may even influence the types of policies enacted by governments (Gallego, 2014; Leighley & Nagler, 2014; Lijphart, 1997).

This study asks: what are the socio-demographic and attitudinal correlates of early voting? Is early voting attracting a population that is different than those who are already likely to vote on election day? It examines a number of potential correlates of early voting including age, gender and education, as well as attitudes about politics, including interest, knowledge, and partisan intensity. It considers four different types of early voting in four post-industrial democracies: on-demand postal voting in Germany, automatic postal voting in Switzerland, days-long advance voting in Canada and weeks-long advance voting in Finland. Additionally, this study looks at multiple elections, at both the national and regional level, using survey data from a variety of national and comparative election studies. The examination of early voting in a variety of elections and countries that use different types of early voting is important for our scholarly understanding of the impact of this convenience measure. There is currently no consensus in the research literature as to the individual predictors of early voting, likely because the results of existing studies differ in the regions and elections covered, the types of early voting studied, and the variables considered. This paper therefore contributes new evidence about the most important socio-demographic variables related to early voting. It demonstrates that early voting will not be used in the same way by all population groups, or in all countries.

Early Voting

To better understand the socio-demographic and attitudinal correlates of early voting, it is necessary to first consider the factors that influence whether a voter will choose to go to the polls or not. Authors such as Downs (1957), and later Riker and Ordeshook (1968), suggest that electoral institutions play a role in the rational 'calculus of voting.' In these models, the time and cognitive costs of voting are among the critical factors that are taken into consideration when a voter decides whether it is worth casting a ballot in an election. According to this theory, convenience voting measures, such as early voting, should influence this decision by reducing some of the costs of voting. In the case of postal voting, a voter may not even have to leave home to cast a ballot, if a caregiver, friend, or family member is willing to mail it for them, or if they receive mail pick-up at their door or apartment building. This decreases or even eliminates the travel time associated with voting. For both postal and in-person advance voting, voters can choose from a greater range of times to cast their ballot, making it easier to find time to vote amidst their other obligations.

However, there is an alternative hypothesis that early voting may not reduce voting costs for segments of the population that are not already politically mobilized, and who do not already have the skills and knowledge to navigate these early voting opportunities. In the case of on-demand postal voting, those who wish to receive a postal ballot must apply for one by a deadline, fill it out according to the written procedures, and mail it back by another deadline. For some, this procedure may actually be more difficult than simply voting at the polling station. Similarly, in the case of in-person advance polling, voters may need to do additional research to find their advance voting locations and times. As a result, early voting may not actually reduce the costs of voting, especially for those with less time or political knowledge.

Scholars continue to debate whether the provision of early voting has a significant effect on turnout, and whether this effect is positive or negative. Some scholars have contributed to this debate by considering the impact of early voting on aggregate turnout, while others have examined the characteristics of those who vote early.

In one of the few cross-national studies of the impact of early voting on turnout, Blais et al. (2003) compare 151 elections in 61 countries between 1990 and 2001. They find that turnout is about ten percentage points higher among registered voters when the 'ease of voting' (measured by whether it is possible to vote by mail, in advance, or by proxy) is greater. Most other studies consider the impact of one type of early voting in one jurisdiction. In Switzerland, the rolling introduction of postal voting allowed some researchers to examine the effect this change had on turnout rates in the country. Luechinger et al. (2007) find that the introduction of postal voting did have a postive effect, averaging 4.1 percentage points, on turnout in Switzerland. In the American context, studies of Oregon's move to exclusive postal voting in 2000 have also found the change to have a positive impact on turnout (Berinsky et al., 2001; Karp & Banducci, 2000; Richey, 2008). However, in a study of in-person advance voting in Canadian elections, Blais et al. (2007) find only a small positive effect (0.7 percentage points) on turnout. Stein and Garcia-Monet (1997) also find a modest effect of in-person early voting in Texas when comparing the advance polling rates and overall turnout rates between two elections. They find that for each percentage point increase in votes cast early, total turnout increases by about 0.07 points.

Other research challenges these findings that early voting increases turnout (Fitzgerald, 2005; Giammo & Brox, 2010). For example, Burden et al. (2014) suggest that early voting actually decreases overall turnout. They conduct individual-level and county-level analyses of

the usage of various forms of early voting in the 2004 and 2008 U.S. presidential elections and find that early voting laws are not associated with higher turnout. In fact, early voting may decrease turnout because it diminishes the civic significance of election day for individuals and changes the incentives for political actors to pursue mobilization efforts. Funk (2010) suggests that a similar phenomenon occurs in Switzerland, where postal voting may decrease the social incentives of voting, particularly in rural areas.

Other literature, predominantly in the American context, has considered whether early voting has differential impacts on different population groups. For example, Herron and Smith (2012, 2014) examine the impact of early voting on the turnout rates of traditionally underrepresented groups. In one article, they compare voting patterns in the 2008 and 2012 elections in Florida and find that the reduced number of advance polling days in 2012 had the greatest negative effect on racial/ethnic minorities, registered Democrats, and those without a party affiliation (Herron & Smith, 2014). In another study, they find that African American, Hispanic, younger, and first-time voters are significantly more likely to vote early than other voters, and are therefore disadvantaged by a reduction in the number of early voting days available (Herron & Smith, 2012). Similarly, Stein and Garcia-Monet (1997) suggest that the early voting drives of the Clinton-Gore campaign, targeted toward Hispanic voters and new registrants, did appear to have some success in encouraging early voting among their supporters. But on the whole, they caution against the conclusion that early voting helps to reduce unequal participation among traditionally underrepresented populations, as they also find that early voting is positively correlated with higher median home values, suggesting that wealthier voters were most likely to use early voting.

Stein and Garcia-Monet's article is only one of many to consider the socio-demographic and attitudinal characteristics of early voters in the United States. Most researchers find that early voters tend to be older (Barreto et al., 2006; Gronke & Toffey, 2008), but evidence about the impact of other socio-demographic characteristics is mixed. Some suggest that early voters tend to be better educated (Gronke & Toffey, 2008; Karp & Banducci, 2000, 2001), while others find education not to be a significant determinant of early voting (Neeley & Richardson, 2001; Stein, 1998). There is also debate over whether early voters are, in fact, wealthier than election-day voters (Karp & Banducci, 2000; Neeley & Richardson, 2001; Stein & Garcia-Monet, 1997).

Regarding attitudinal variables, there is some consensus that early voters are more informed, engaged, and interested in the election and in politics more generally (Gronke & Toffey, 2008; Karp & Banducci, 2001; Stein, 1998). However, there remain areas of debate, particularly regarding the partisan intensity of early voters, compared with election day voters. For example, while Stein (1998) suggests that early voters may be stronger partisans, Gronke and Toffey (2008) caution that this finding does not necessarily hold for all elections.

However, these predominantly American findings on the socio-demographic and attitudinal correlates of early voting may not be generalizable to other countries and contexts, given America's unique Electoral College system and turnout cultures. Furthermore, each state and in some cases, each county, implements its own form of early voting. This decentralized administration and implementation of early voting makes it difficult to generalise from the American case. This study therefore expands the study of early voting to four other countries, each with a different model of early voting.

Hypotheses

Despite some research from the United States showing that some traditionally less participatory populations do take greater advantage of early voting than initially thought (Herron & Smith, 2012; Stein & Garcia-Monet, 1997), the bulk of evidence concludes that many of the common socio-demographic predictors of turnout have even stronger effects on early voting. This may reflect the fact that early voting can entail significant cognitive and time costs, and therefore will not mobilize under-represented groups.

Three of the most important socio-demographic variables considered in the literature on voter turnout are age, income and education.[30] Studies of voter turnout have demonstrated that, in general, the young are the least likely to vote and middle-aged voters the most likely. Lower turnout on the part of younger adults is likely due to a combination of factors that may include lower levels of political interest, civic duty, social pressure, and the perceived importance of voting (Jankowski & Strate, 1995; Smets & van Ham, 2013; Strate et al., 1989). Since early voting procedures can require more effort and knowledge to complete, voters in the youngest age group should be less likely to vote early than their middle-aged counterparts [H1].

Other literature on age and turnout has demonstrated a slight decline in turnout among seniors, possibly due to health concerns or difficulties in getting to the polls (Cutler & Bengtson, 1974; Norris, 2002; Smets & van Ham, 2013). In these cases, early voting may assist seniors in turning out to vote, since they can vote in their home (in the case of postal voting), or at a time when they are feeling well or a caregiver is available to assist them (Kembhavi, 2013). In fact,

[30] Other socio-demographic variables may influence early voting, such as disability or location. However, these types of questions are not consistently asked across countries and thus the effects of these variables cannot be easily compared.

some advance polling locations are even located in seniors' residences. For these reasons, senior voters should be more likely to vote early [H2].

According to the socioeconomic model of voter turnout, as theorised by Verba and Nie (1972), and later expanded upon by Brady et al. (1982), an individual's social status, including type of job, level of education, and income, is an important predictor of whether the individual will vote or not. Among these variables, higher levels of education, in particular, are commonly related to higher voter turnout. It is theorized that education influences civic skills, political attitudes and feelings of efficacy, and the social networks that instill in citizens a duty to vote (Burden, 2009; Emler & Frazer, 1999). While the scholarly community is increasingly skeptical of the argument that higher education actually causes higher voter turnout, they do note that these two variables tend to correlate (Burden, 2009; Kam & Palmer, 2008; Persson, 2013). As such, education level is likely a proxy for other factors relating to social status, family background and other early life influences. So regardless of whether education actually causes turnout or whether self-selection makes those with higher education more likely to turn out to vote, education remains a good indicator of those who are more likely to vote in the first place. This has been demonstrated both in the American context and cross-nationally, though it is important to note that some scholars have found that the predictive power of education is lower, or even non-significant, in some Western European countries (Gallego, 2010; Norris, 2002). However, a study by Nevitte et al. (2009) found that three of the countries studied in this article, namely Switzerland, Germany and Canada, did exhibit a significant relationship between education and turnout (Finland is not included in Nevitte et al.'s study).

One of the primary reasons why education is thought to influence voter turnout is the provision of civic skills necessary to navigate registration and voting systems. Consequently,

levels of education may be particularly important in determining who is taking advantage of early voting, since the cognitive and knowledge costs of voting are likely to be more pronounced for more complicated early voting procedures. As such, those with higher levels of education should be more likely to vote early than those with lower levels of education [H3].

Early voting may also be related to an individual's gender. Some research has suggested that there exist gaps between men and women regarding political knowledge and interest (Carpini & Keeter, 1996; Lizotte & Sidman, 2009; Mondak & Anderson, 2004; Verba, Burns, & Schlozman, 1997). This could be due to a number of reasons, including differential educational attainment, or the availability of time to devote to amassing political knowledge. It may also be due to gendered patterns of employment that result in lower salaries, less time in the workforce, or different types of jobs.[31] Regardless of the reasons why women may appear to know less about politics than men do, this gender gap in knowledge may have important consequences for the likelihood of women taking advantage of early voting opportunities. Women may be less likely to know about these opportunities, and consequently, be less likely to take advantage of them than men [H4].

This study also tests the potential impact of three attitudinal variables: political interest, political knowledge and partisan intensity. According to psychological models of voting, political interest is key to explaining whether a voter will turn out or not (Blais, 2000). Put simply, politically interested citizens will pay more attention to politics and the campaign, and

[31] It must also be noted that some scholars have suggested that this knowledge gap could be the result of women being less likely to guess the answers to political knowledge questions in surveys. Nonetheless, some studies show that even accounting for this, a sizable political knowledge gap between men and women remains (Mondak and Anderson, 2004).

thus be more aware of opportunities for early voting. Voters with high political interest may therefore be more likely to vote early than those with low levels of political interest [H5].

Relatedly, these politically interested citizens may be more likely to have higher levels of political knowledge, another potential correlate of early voting. Having greater political knowledge is thought to reduce some of the information costs of voting, that include researching candidates and forming preferences (Carpini & Keeter, 1996; Popkin & Dimock, 1998; Zaller, 1990). These voters may not require the length of the campaign to make their voting decisions and may therefore be confident enough of their choice to vote early, before the campaign has come to a close. Additionally, those with greater levels of general political knowledge may also be more likely to know where, when and how to cast an early ballot. Accordingly, the more political knowledge a voter has, the more likely they should be to vote early [H6].

Identification with a political party should also help to predict early voting. Strong partisans will be more likely to vote early as they do not need the campaign to decide whom they will vote for. Additionally, it is likely that parties will mobilize their partisans to vote early to ensure they vote. For example, Oliver (1996) demonstrates that the increase in opportunities for absentee balloting in the United States increased turnout only when parties mobilized their supporters to take advantage of these measures. Blais et al. (2007) find a similar effect in Canada, as those who identify with a party and/or were contacted by a party were more likely to use advance polls. Accordingly, those who feel close to a political party should be more likely to vote early [H7].

Comparing Across Countries, Time and Regions

This study is unique in that it tests these hypotheses in four countries with different early voting procedures in both regional and national elections. By studying early voting in a variety of regions and elections in each country, the findings will be more generalizable to the country as a whole.

There are two major families of early voting: postal voting and in-person advance voting. Each of these types of early voting can vary according to their ease of use. Postal voting can be available only to voters who request a postal ballot in advance, as is the case in Germany and the United Kingdom, or it can be the default option, as is the case in Switzerland and some American states, most notably Oregon since 1998, where all voters receive a postal ballot that they can return by mail, and in some cases, hand-deliver to a local office. On-demand postal voting may be the most costly type of early voting, in terms of time and knowledge, since the citizen must navigate a multi-step process to receive and submit a postal ballot. The automatic postal voting option, by contrast, is possibly one of the easiest methods of early voting, because voters do not need to perform any additional task to receive a postal ballot.

In-person advance voting can vary in the number of days and types of locations where early voting is available. In some countries, like Finland and Sweden, or more recently, New Zealand, voters have a period of one or two weeks leading up to the election during which they can vote at a variety of advance polling locations, some of which are centrally located in places like post offices. This process may be easier for voters, since there is a longer window during which they can vote early, and the locations are prominent and commonly frequented. In Canada, by contrast, the official early voting period lasts a short number of days, often over a weekend

the week before the campaign closes. This process can be considered more difficult, because there is a narrower window of opportunity to vote early, and the locations of early voting are more restricted, usually in a select number of traditional polling locations.

To facilitate a comparative study of early voting, this study selects one country that uses each of these types of early voting: Switzerland for automatic postal voting, Germany for on-demand postal voting, Canada for shorter in-person advance voting, and Finland for longer in-person advance voting (Figure 6). Each of these cases are post-industrial democracies, and were selected based on the availability of early voting questions in national and sub-national surveys. The types of early voting presented in this study represent the primary (or only) type of early voting in the country. For example, while Canada does also have postal voting, as well as special polling places and times for some elections, in-person advance voting is most common.

Figure 6: Models of No-Excuse Early Voting

Postal Voting	Easier	Automatic	Ex. **Switzerland**
	More Difficult	On-Demand	Ex. **Germany**, United Kingdom
In-Person Advance Voting	Easier	Long period (week(s))	Ex. **Finland**, Sweden, New Zealand
	More Difficult	Short period (days)	Ex. **Canada**

Switzerland

As mentioned earlier, postal voting is the easiest in Switzerland, where all voters receive ballot papers in the mail and can mail them in or drop them off at the polling station. This procedure was first introduced in a selection of cantons in 1978, and had been expanded to all cantons by 2005. Early voting is the norm in Switzerland: approximately 85% of the population

used postal ballots in the 2011 general election.[32] This study uses national data on early voting since 1999 (by which time postal voting was available in most regions[33]), which is available through the Swiss Election Studies.[34] Regional data are available through the Making Electoral Democracy Work project for Zurich and Lucerne in 2011.[35]

Germany

While postal voting has also existed in Germany for a number of years, the 2009 federal election was the first time it was available nation-wide without an excuse. To take advantage of postal voting in Germany, voters must apply for a mail-in ballot, and then mail the ballot or hand-deliver it to a municipal office. While this process is perhaps the most difficult of the four types of early voting presented in this study, it does not seem to deter voters, since in the last federal election 23.4% of voters voted early. Survey data on early voting are available from 2013 from the German Longitudinal Election Studies.[36] Regional survey data for Bavaria and Lower Saxony are available for the 2013 state elections from the Making Electoral Democracy Work project.[37]

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[32] A report by the Office for Democratic Institutions and Human Rights (2011) provides an approximate percentage of Swiss voters who use postal voting.
[33] Because of the rolling introduction of early voting, this study only considers those cantons for which early postal voting was available at the given time point.
[34] For more details about the Swiss Election Studies, see http://forscenter.ch/en/our-surveys/selects/
[35] The Making Electoral Democracy Work (MEDW) dataset includes pre- and post-election survey data for selected regions in five countries: Canada, Germany, Switzerland, France and Spain. Three of these countries are included in this study. Early voting is not available in France and while mail-in balloting is available on-demand in Spain, it is used by a very small portion of the survey respondents. For more details about the Making Electoral Democracy Work datasets, see http://electoraldemocracy.com/voter-behaviour.
[36] For more details about the German Longitudinal Election Studies, see http://gles.eu/wordpress/english/
[37] A panel was used for Bavaria's state and national elections. Since the same respondents were re-surveyed and the two elections were close together, only data from the state election (the first election to be studied) are used.

Canada

While postal balloting is available in Canada in special circumstances (such as for overseas voters), most Canadians who vote early take advantage of in-person advance polls set up at a number of polling stations, usually the weekend before the election.[38] Voters are encouraged to visit the advance polling station listed on their voter information card.[39] No-excuse advance voting was first introduced in the 2000 federal election, when only 3.5% of voters cast their ballot in advance. However, the rate of early voting has since increased to a record 20.7% of voters in the 2015 federal election, when the number of advance voting days increased from three to four. Questions about early voting have not been consistently asked in Canadian Election Studies.[40] Consequently, survey data are only available for the 2000 and 2008 federal elections.[41] The Making Electoral Democracy Work dataset has survey data for the 2015 federal election for the provinces of Ontario, Quebec and British Columbia.[42] Data on early voting in regional elections are available for the 2011 Ontario election and the 2012 Quebec election.

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[38] In recent elections, Canadians were also able to take advantage of voting by special ballot at returning offices and special offices (including on campuses and Friendship Centres and YMCAs) throughout the campaign. In the 2015 election, about 619,000 Canadians, or about 3% of all voters, voted in this way. See Mayrand (2015).
[39] Note that that this specific information is sent only to registered voters. Canada has a permanent register of electors that is updated through a variety of mechanisms, ranging from targeted enumeration, to list sharing with provinces, to online registration. Canadians are also able to register at the polls on election day.
[40] For more details on the Canadian Election Study, see http://www.queensu.ca/cora/ces.html
[41] While a question about advance polling was asked during the 2006 pre-election survey, these data are incomplete as voters could still cast their ballot in an advance poll before the election. Advance voting was not asked in the post-election survey.
[42] The 2015 Canadian Election Study does not ask about early voting. However, the Making Electoral Democracy Work dataset for the 2015 Canadian federal election does include a question on early voting. Since this dataset only includes respondents from three provinces (British Columbia, Ontario and Quebec), the responses from these three regions were pooled and weighted equally by region.

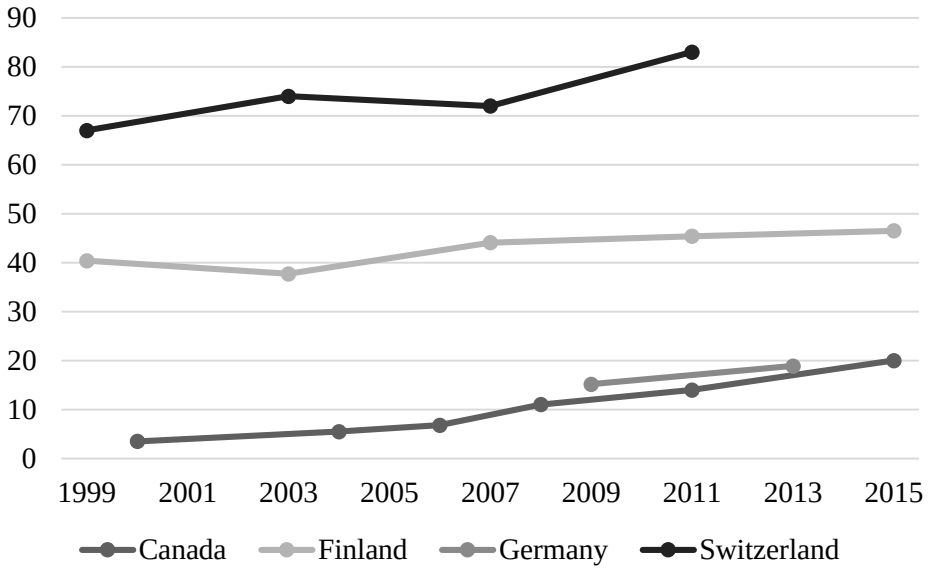
Finland

In-person advance voting is even more common in Finland, where the period of advance voting is much longer, usually about a week, and often takes place at post offices throughout the country. This method of advance voting, codified as a right of all voters in the Finnish Election Act in 1998, is quite popular, with at least 40% of the population using advance voting in any given national election.[43] The Finnish National Election Study[44] contains data on early voting for the three most recent elections. Unlike the other three countries studied, Finland does not generally have regional elections, and thus the regions are not studied.

In all cases, it is important to note that the use of early voting has increased over the time period studied, possibly due to greater familiarity with these opportunities, and increased mobilization by parties and election management bodies (Figure 7).

[43] For more details on early voting statistics in Finland, see http://www.stat.fi/til/pvaa/kas_en.html
[44] For more details on the Finnish Election Study, see http://valforskning.pol.gu.se/english

Figure 7: Percentage of Voters who Voted Early in National Elections, 1999-2015



Data for Canada, German and Finland come from each country's official election returns. Postal voting turnout data were not available for Switzerland, so data from the national election study were used instead. Data for the 2015 Swiss election is not yet available.

This selection of four cases with different forms of early voting allows us to address another important question: do the socio-demographic and attitudinal correlates of early voting vary by type of early voting used? Given the relationship between the costs of voting and the propensity to vote, I expect that while the aforementioned hypotheses should hold for all types of early voting, the magnitude of the differences in the effects of socio-demographic and attitudinal variables between early and election-day voters will be greater where early voting is more difficult, namely Germany for postal voting and Canada for in-person advance voting [H8].

Method

For each dataset, respondents are grouped into two categories: early voters and election day voters. Socio-demographic characteristics and attitudes are recoded to be as similar as possible across election studies. Age is split into three categories (ages 18-35, ages 36-65 and ages 66 and over) in order to best account for the lower turnout among the youngest and oldest

voters, while also being sensitive to the low number of respondents in some datasets. Education is dichotomized into two categories: some or completed postsecondary education, and high school education or less. I do so in part to ensure that the education variable is comparable across countries. Additionally, most recent research regarding education levels and turnout in Western democracies uses postsecondary education as the main division between levels of educational attainment (Kam & Palmer, 2008). Because the attitudinal variables of political interest, political knowledge and partisan intensity were measured on different scales in each dataset, they are recoded to run from 0 to 1 (See Appendix D for more details about the variables used and their coding).

Data are pooled by country, and weighted according to the actual proportion of early voters.[45] Each election is weighted equally. To uncover whether election day and early voters differ, I use logistic regression, with the dependent variable as method of voting with election day voting coded zero and early voting coded one. Non-voters are not considered in this analysis, since this study is interested in the different ways in which voters go to the polls (early or on election day), rather than why a citizen may choose to turn out to vote in general (the subject of a plethora of previous articles (Smets & van Ham, 2013)). I first estimate a logistic regression model with election fixed effects, with the aforementioned socio-demographic variables as the independent variables. I then add attitudinal variables to the models.[46]

[45] Data are weighted according to actual type of turnout since the percentages of respondents to national election studies that voted early is larger than the actual percentage of the population that voted early. Weighting according to turnout is a common practice in studies of voting behaviour (Highton & Wolfinger, 2001; Rubenson, Blais, Fournier, Gidengil, & Nevitte, 2007). Accurate data on early voting rates were not available for Switzerland and for regional elections in Bavaria and Lower-Saxony.

[46] Variance inflation factors were checked to ensure that the attitudinal variables studied were not collinear.

Results

Socio-demographic and Attitudinal Correlates of Early Voting

The most consistent finding is that across all four countries, being in the oldest age group is positively associated with early voting (Table 3).[47] It is possible that early voting is popular among the elderly who have trouble getting to the polls on election day. Postal voting may allow them to vote without even leaving their home, while in-person advance voting may allow them more flexibility in seeking assistance to get to the polls. Political parties may even facilitate the transportation of elderly voters who may need assistance getting to the polls in advance of election day to alleviate pressure on election day. Election management bodies may also place targeted in-person early voting locations in hospitals and seniors' residences to make it easier for these populations to vote. Regardless of the reason why the elderly are more likely to vote early, the positive result is a promising finding for those who see early voting as essential to improving voting access among the elderly, the sick and the disabled (Prince, 2012).

[47] This result remains statistically significant and positive if the oldest age group is re-categorized as only those 75 years and older. The predicted probability of early voting remains similar, with the slight exception of Switzerland, where the marginal effect of being in the oldest age group decreases by about 2 percentage points.

Table 3: Socio-Demographic and Attitudinal Correlates of Early Voting by Country

	Canada		Finland		Germany		Switzerland	
VARIABLES	(1) Early Voting	(2) Early Voting	(3) Early Voting	(4) Early Voting	(5) Early Voting	(6) Early Voting	(7) Early Voting	(8) Early Voting
Female	-0.28***	-0.19**	0.05	0.09	0.17**	0.17**	0.13**	0.16**
	(0.08)	(0.08)	(0.07)	(0.07)	(0.07)	(0.08)	(0.06)	(0.06)
Ages 18-35	0.03	0.11	-0.29***	-0.28***	0.11	0.12	0.07	0.09
	(0.10)	(0.10)	(0.09)	(0.09)	(0.09)	(0.09)	(0.08)	(0.08)
Ages 66+	0.49***	0.43***	0.91***	0.89***	0.41***	0.43***	0.47***	0.46***
	(0.10)	(0.10)	(0.09)	(0.09)	(0.11)	(0.11)	(0.08)	(0.08)
Post-Secondary Education	0.02	-0.07	0.03	-0.03	0.37***	0.36***	0.18**	0.15**
	(0.10)	(0.10)	(0.08)	(0.08)	(0.08)	(0.08)	(0.07)	(0.07)
Interest in Politics		0.75***		0.38**		0.17		0.49***
		(0.18)		(0.16)		(0.18)		(0.15)
Political Knowledge		0.29		0.12		0.04		0.07
		(0.18)		(0.17)		(0.13)		(0.12)
Partisan Intensity		0.22**		0.34***		-0.29**		-0.11
		(0.11)		(0.13)		(0.12)		(0.10)
Regional Election	4.28***	4.34***			0.60***	0.46***	1.24***	1.20***
	(0.11)	(0.12)			(0.12)	(0.15)	(0.13)	(0.13)
Constant	-6.27***	-7.08***	-1.13***	-1.60***	-1.83***	-1.75***	0.56***	0.21
	(0.11)	(0.20)	(0.09)	(0.17)	(0.11)	(0.16)	(0.08)	(0.14)
F Value	449.97***	326.51***	37.16***	26.49***	68.55***	46.39***	40.32***	31.42***
Observations	9,928	9,928	3,201	3,201	6,525	6,525	9,462	9,462

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1
Logistic regression models with election fixed effects.
Dependent variable is whether the voter cast their ballot early or on election day (election day voting is reference category).
Data are weighted so each election is weighted equally, and also by early vs. election day turnout. Data on official early voting rates are not available for Switzerland and for regional elections in Bavaria and Lower-Saxony, so these data are not weighted by turnout type.
No regional elections were studied for Finland.

It is interesting to note that the magnitude of this relationship between age and early voting varies across countries (Table 4). On the lower end, there is only about a 2-percentage point difference in the estimated probability of early voting (compared with election day voting) between the middle and oldest age groups in Canada.[48] In Finland, by contrast, the effect is quite pronounced, with the probability of early voting estimated to be about 22 percentage points

[48] All marginal effects in this dissertation are estimated using the observed values method. For an overview of this method, see (Hanmer & Ozan Kalkan, 2013)

higher for the oldest age group, than for those in the 36-65 age group. While further research is needed to know the exact reasons behind this large difference in magnitude, it is possible that the elderly find it particularly convenient to vote in commonly frequented locations like post offices in the Finnish case.

Table 4: Estimated Probability of Voting Early (in Percentages) by Socio-Demographic Characteristics

	Canada	Finland	Germany	Switzerland
Ages 18-35	4.2	28.7	33.5	81.5
	(3.6 - 4.8)	(25.8 - 31.7)	(34 - 36.6)	(79.4 - 83.5)
Ages 36-65	4.1	35.0	31.2	84.0
	(3.7 - 4.5)	(32.8 - 37.1)	(29.4 - 33.0)	(79.3 - 81.5)
Ages 66+	6.4	56.6	39.8	86.4
	(5.4 - 7.4)	(52.9 - 63)	(35.7 - 43.9)	(84.9 - 87.8)
No Post-Secondary Education	4.4	37.7	31.0	81.4
	(3.7 - 5.0)	(35.5 - 4)	(29.3 - 32.6)	(84 - 82.3)
Post-Secondary Education	4.5	38.3	38.6	83.8
	(4.1 - 4.8)	(36.1 - 46)	(35.7 - 41.5)	(82.2 - 85.4)
Male	5.0	37.5	31.4	81.1
	(4.5 - 5.5)	(35.3 - 39.7)	(29.4 - 33.4)	(79.9 - 82.3)
Female	3.9	38.6	34.9	82.9
	(3.5 - 4.3)	(36.3 - 48)	(32.8 - 37.0)	(81.7 - 84.0)

Predicted probability of voting early from Table 3, Models 1, 3, 5, and 7. 95% confidence interval in brackets.

The youngest age group was only significantly different in their likelihood of voting early in Finland, where they were about six percentage points less likely to vote early than their middle age counterparts (Table 4). In Canada, Germany and Switzerland, by contrast, being in the youngest age group was unrelated to early voting. Future research is needed to better understand why there are such pronounced age differences in early voting in the Finnish context, and whether this is related to the expanded number of early voting days and types of early voting locations in Finland, or other contextual factors.

There is also a positive relationship between post-secondary education and early voting in the two countries in which postal voting is used. In Germany and Switzerland, post-secondary education has a significant effect on early voting. There is a two-percentage point difference in the predicted probability of voting early between those with and without post-secondary education in Switzerland, and an eight-percentage point difference between these groups in Germany (Table 4). The education effect may be stronger in Germany because the early voting process in this country requires the most skills, given that voters must apply in advance for a mail-in ballot.

The influence of gender on early voting is mixed. In Canada, the impact of being female on early voting is negative, as predicted, but in all other countries, women are actually more likely than men to vote early. However, the difference between women and men is quite small (about two percentage points) for all cases (Table 4). It is also important to note that the negative effect of being female on early voting in Canada shrinks to less than one percentage point when attitudinal variables are added to the models, which suggests that, as hypothesized, the gender gap in early voting may be at least in part attributed to differences in political interest between men and women.

There are also mixed findings regarding the attitudinal correlates of early voting (Table 5). Political interest is a positive predictor of early voting in all cases, although this relationship is not statistically significant in Germany. The magnitude of the difference in the predicted probability of early voting between the most and the least interested in politics ranges from about three percentage points in Canada, to eight percentage points in Finland. It is possible that the most interested, who are likely already keen to vote, will use early voting for convenience.

Additionally, party volunteers and poll workers, who are more engaged in politics, may use early voting opportunities if they anticipate being busy on election day.

Table 5: Estimated Probability of Voting Early (in Percentages) by Attitudinal Characteristics (controlling for social background characteristics)

	Canada	Finland	Germany	Switzerland
Ages 18-35	4.5	29.1	33.5	81.7
	(3.8 - 5.2)	(26.1 - 32.1)	(30.4 - 36.6)	(79.7 - 83.7)
Ages 36-65	4.1	35.0	31.2	84
	(3.7 - 4.4)	(32.8 - 37.1)	(29.4 - 33.0)	(79.3 - 81.5)
Ages 66+	6.0	56.1	40.0	86.3
	(5.0 - 6.9)	(52.4 - 59.8)	(35.9 - 44.1)	(84.8 - 87.7)
No Post-Secondary Education	4.6	38.4	31.0	81.5
	(3.9 - 5.3)	(36.1 - 47)	(29.3 - 32.7)	(80.6 - 82.4)
Post-Secondary Education	4.4	37.7	38.4	83.5
	(4.0 - 4.7)	(35.4 - 39.9)	(35.5 - 41.4)	(81.9 - 85.1)
Male	4.8	37.1	31.4	89
	(4.3 - 5.3)	(34.9 - 39.3)	(29.4 - 33.5)	(79.7 - 82.1)
Female	4.1	39.0	34.9	83.1
	(3.7 - 4.5)	(36.7 - 41.2)	(32.7 - 37.0)	(82.0 - 84.2)
Low Interest	2.8	32.9	39.0	76.7
	(2.1 - 3.5)	(28.7 - 37.2)	(26.0 - 35.8)	(73.2 - 80.2)
High Interest	5.5	41.2	34.2	83.7
	(4.8 - 6.2)	(38.2 - 44.3)	(31.3 - 37.1)	(82.5 - 85.0)
Low Knowledge	3.6	36.2	32.7	81.4
	(2.6 - 4.6)	(38 - 41.6)	(29.8 - 35.6)	(79.3 - 83.4)
High Knowledge	4.6	38.8	33.5	82.4
	(4.2 - 5.1)	(36.1 - 41.4)	(35 - 36.6)	(89 - 83.9)
Low Partisan Intensity	4.2	34.2	35.2	82.6
	(3.8 - 4.6)	(31.1 - 37.3)	(32.8 - 37.7)	(81.2 - 84.1)
High Partisan Intensity	5.1	41.7	29.4	81.1
	(4.3 - 5.8)	(38.5 - 44.8)	(26.1 - 32.7)	(79.3 - 82.9)

Predicted probability of voting early from Table 3, Models 2, 4, 6 and 8. 95% confidence interval in brackets.

Political knowledge is not a statistically significant predictor of early voting. However, partisan intensity is positively related to early voting in both Canada and Finland. In Canada, the effect is admittedly quite small, with only one percentage point difference between the most and least partisan (Table 5). However, in Finland, the strongest partisans were about seven

percentage points more likely to vote early. This is possibly due to either mobilization or assistance from the political parties themselves to facilitate advance voting. Partisans may also be keen to vote early if they intend to be involved in party or election activities on election day. Additionally, strong partisans mostly do not need additional time to make up their mind, and so may be more willing to vote before the campaign has finished. In the case of Germany, partisan intensity actually has a negative relationship with early voting (about six percentage points). This relationship remains negative in a simple bivariate regression between partisan strength and early voting and thus cannot be attributed to the presence of other attitudinal variables. This finding, alongside the lack of a statistically significant relationship between early voting and political interest in Germany, is certainly counterintuitive, and suggests a unique relationship between attitudinal variables and early voting in this context.

Comparing Across Countries

The second major question this study addresses is whether the pattern of effects varies across countries and types of early voting. While a larger sample of jurisdictions would be needed to confidently assess the impact of different types of early voting, it is telling that these four very different contexts present similarly mixed results. There are no overarching trends between the two major families of early voting, or between the easier and more difficult models of early voting. Nonetheless, this study can offer some broad conclusions about early voting in each of the cases studied.

In Canada, the magnitude of all statistically significant findings is quite small. The marginal effect of each of the socio-demographic and attitudinal variables studied is less than 3 percentage points. This may be related to Canada's model of early voting, which is very similar

to election day voting: voters visit a prescribed polling location to vote on a specific set of days. As a result, Canada's model of early voting may not significantly change the costs associated with early voting, thus making it less likely to produce large socio-demographic and attitudinal differences between election day and early voters.

In Finland, the most striking result is the large differences between early and election day voters with respect to age, political interest and partisan intensity. The strong impact of age in the Finnish case is an area that requires further study. One may suspect, however, that it may be related to the availably of early voting in a variety of locations, including post offices, municipal offices and some other centres such as hospitals, places that the elderly are more likely to frequent.

The model of in-person advance voting in Finland and Canada does not require voters to apply for postal ballots and therefore entails less advance planning. It is interesting that political interest and partisan intensity have the greatest impact on early voting in these two cases. It is possible that political parties may be mobilizing to encourage their voters to vote early, or simply that those who are more engaged in the process will be keen to vote early if there are few costs associated with doing so.

In Germany, where early voting entails the most difficult and time-consuming procedures with voters having to apply for a postal ballot, we see an enhanced impact of education and reduced impact of attitudinal variables. The impact of education suggests that this type of early voting does require additional cognitive skills, which is unsurprising considering the more complicated process of early voting in Germany. On the other hand, the lack of an impact of interest and the negative impact of partisan intensity suggests that it is not simply the most engaged who are using early voting.

Finally, it is interesting to note that, although the relationships are quite weak, there are significant socio-demographic and attitudinal differences between those who choose to go to the polls early and those who only go to the polls on election day even in Switzerland where early voting is the default option. Future research should consider other variables that may be related to a voter's eagerness to vote early, besides the convenience of early voting. These include a voter's decisiveness and the timing of their decision for whom they would vote. These variables may help to explain why, even in a case such as Switzerland where early voting is the default option, there remain differences between early and election day voters that do not appear to be related to the costs of voting. However, the necessary data are currently not available across countries and elections.

Conclusions

To summarize the key findings, I return to the major questions this study seeks to address: do early voters differ significantly from election day voters in terms of socio-demographic and attitudinal variables? What are the broader implications of these differences for voter turnout and the composition of the electorate? And finally, are there specific patterns found for different types of early voting?

This study first examined three major socio-demographic variables. Across all four countries, being in the oldest age category is positively related to early voting. It is possible that some elderly voters rely on early voting as a way to get to the polls or to vote within the comfort of their home. For these voters, early voting may provide the additional convenience necessary to facilitate their turnout. There appears to be a minimal influence of gender on early voting; where this variable is statistically significant, its impact is quite small. Where the impact is largest, in

Germany, being female is actually positively related to early voting, contrary to the hypothesis that the gender gap in political knowledge would result in fewer women than men voting early. This finding suggests that early voting will likely not reflect any gaps between the level of political knowledge among men and women. Education has a statistically significant positive impact on early voting in the two countries studied that employ postal voting. The impact of education on early voting is most pronounced in Germany, where early voting likely takes the most cognitive resources, since voters must apply for a postal ballot in advance. This emphasizes the cognitive costs associated with the postal voting procedure in Germany.

Turning to attitudinal variables, these results show that interest in politics and partisan intensity, but not political knowledge, are positively related to early voting in three of the four countries studied. It is interesting that the impact of political interest is statistically significant in the three countries with relatively little advanced planning required to vote early. This suggests that in Canada, Finland and Switzerland, early voting is most often used by those who are already interested and engaged in politics as a measure of convenience.

These findings on the socio-demographic and attitudinal correlates of early voting can help to answer the question of whether early voting will mobilize those who would not vote otherwise or are traditionally under-represented at the polls. For most of the cases and variables analyzed in this study, the answer is no. This study finds that early voting may take additional educational or cognitive resources, particularly in the case of Germany's on-demand postal voting, and will be taken advantage of by those already more interested in politics in Canada, Finland and Switzerland. This makes the likelihood of early voting increasing turnout for most underrepresented population groups unlikely. Early voting may provide greater convenience, but it likely does not decrease the costs of voting enough to increase participation among population

groups that are less likely to vote in general. In some cases, such as in Germany where early voting takes more advance planning, it may even increase the costs of voting for these groups.

Nevertheless, there are some promising findings for proponents of early voting. For elderly voters, early voting opportunities may facilitate turnout. This is an encouraging finding for election administrators committed to finding ways to reduce voting obstacles for elderly voters. Likewise, this study finds that any knowledge gaps that may exist between men and women will not dissuade women from using early voting opportunities.

Finally, this study makes an important contribution to the study of early voting by considering four different countries, where most previous research has focused largely on the American case, and by looking at four different models of early voting. It examines on-demand postal voting in Germany, automatic postal voting in Switzerland, days-long advance voting in Canada and weeks-long advance voting in Finland. In Canada and Switzerland, where early voting is quite similar to election day voting, the socio-demographic and attitudinal differences between early and election day voters are quite small. In Germany, on-demand postal voting does appear to take additional cognitive resources, since it is a more complicated process. One notable finding is the greater use of early voting by the elderly in Finland, where early voting takes places in a greater variety of locations and for a longer period of time, which may be more convenient for the elderly.

The inconsistent results between jurisdictions demonstrate that different types of early voting may have different consequences for turnout. While further comparative research would be needed to confidently assess the effect of each model of early voting, this study does allow us to conclude that the type of early voting and the country in which it is implemented do impact the types of population groups that are likely to take advantage of early voting opportunities.

Nonetheless, given country-specific factors, we cannot assume that the impact of an early election law in one country will be the same in another jurisdiction.

For practitioners and policymakers, the results caution against the presumption that the use of convenience election laws is a panacea for unequal turnout. For scholars, this study emphasizes the importance of research on convenience election laws in a variety of jurisdictions and at a variety of time points. This type of research will allow scholars to begin to piece together the impact of other factors such as the cultures associated with early voting and how early voting is promoted by EMBs and political parties.

The next study also recognises the diversity of election management practices, by evaluating election management body capacity in 99 countries. This study moves beyond the laws and procedures governing elections, and considers the bodies that implement them. It demonstrates the importance of the capacity of election management bodies to deliver high quality elections to our overall understanding of electoral integrity.

Chapter 4 - Election Management Body Capacity: Information, Communication and Transparency

After the votes have been counted, and the winners announced, the electoral cycle begins anew, as the major players take stock of the election and consider how the integrity of the contest may be improved. The study of electoral integrity 'between elections' demands the study of election management bodies, the government agencies and departments that implement election procedures throughout the electoral cycle, from pre-election tasks such as boundary delineation and voter registration, through election-day administration of voting procedures and the counting of ballots, to post-election reporting and auditing (Wall et al., 2006).

However, these tasks can be run with varying degrees of effectiveness, and the design and conduct of EMBs around the world vary greatly. For example, some EMBs are permanent fixtures of government bureaucracy, while others are temporary commissions that are formed for each election. Some are highly independent, while others operate from government departments. Some actively experiment with new practices to facilitate voter turnout, while others run on shoestring budgets and can only focus on the essential activities in their mandate (Blais, Massicotte, & Yoshinaka, 2003; López-Pintor, 2000; Wall et al., 2006). With such differences between EMBs, how can scholars or practitioners accurately measure and compare their actual capacity to perform their tasks?

In the comparative study of election management bodies, much research has focused on their formal independence from government, or employs survey data on public or expert perceptions of fairness as the key metrics for judging the quality of election management (Birch, 2008; Kerevel, 2009; Norris, 2015). However, these measures may not be the best way of

comparing whether EMBs are able to perform the tasks essential to their mandates. Perceptions of fairness and institutional design are distinct from capacity. From a scholarly perspective, then, devising a way to ascertain differences in EMB capacity across countries or jurisdictions is necessary for further comparative study on election administration and election quality more generally. Practitioners likewise require a way to measure and classify EMBs in order to evaluate programs and funding aimed at benchmarking and improving their performance. Because the tasks that EMBs perform are so fundamental to elections, any attempt by either scholars or practitioners to improve the quality of elections requires a method of accurately assessing the capacity of EMBs on a cross-national basis.

This study develops a new method of assessing EMBs based on their provision of information, communication with stakeholders, and transparency. This method of evaluating EMBs captures their day-to-day performance and capacity to provide services to the public. Data on information, communication and transparency were collected through a content analysis of EMB websites in 99 countries that held national elections between mid-2012 and 2014, and transformed into a scale of EMB capacity using Mokken scaling analysis. Rather than focusing on subjective judgements about EMBs, this method measures actual EMB activities. Furthermore, it is replicable over time, and can be checked or repeated by any researcher. It is also more cost-effective than expert surveys, requiring only a number of foreign-language reading research assistants, rather than the cooperation of hundreds of experts.

This study assesses the construct validity of this new method of evaluating EMB capacity in three ways. Firstly, it tests for discriminant validity by comparing the resulting measures with measures of other aspects of the quality of election management that are conceptually distinct, including formal independence and public perceptions of electoral integrity. It tests convergent

validity by comparing the scores with expert perceptions of electoral integrity. It also tests for nomological validity by examining the relationship between the EMB capacity scores and structural factors that are known to influence electoral integrity, including economic development, level of democracy, and government effectiveness.

Finally, this study uses this new measure of EMB capacity to explain variation in electoral integrity more generally, demonstrating its usefulness in comparative research. This study therefore contributes to our comparative understanding of EMBs themselves and presents a new avenue for research into the capacity of EMBs to perform the tasks that are crucial to electoral integrity.

The Challenge of Evaluating EMBs

Much of the early scholarly work on EMBs focused on how scholars could classify and evaluate EMBs, while acknowledging the imperfections of the various measures currently in use (Hartlyn et al., 2007; López-Pintor, 2000; van Aaken, 2009). This section outlines and evaluates the two major methods of classifying EMBs that have been used in existing research: independence and perceptions of EMB quality.

Independence

The earliest cross-national research on EMBs focused on their structural independence. The IDEA *Handbook on Electoral Management Design* distinguishes three basic models based on an EMB's level of independence from government (Wall et al., 2006). In the independent model, the EMB is fully autonomous from the executive branch of government, and is often accountable to the legislative or judicial branch of government or an independent body. One of

the most longstanding examples of an independent EMB is Elections Canada, the centralized body under the supervision of an independent Chief Electoral Officer that runs federal elections in Canada. In the governmental model, the EMB is managed through the executive or the civil service, such as a government ministry (often the ministry of the interior) or department. In the case of Norway, for example, the Ministry of Local Government, a National Election Board (which includes party representatives), and parliament all have roles in the management of elections at the central level. The mixed model combines elements of both the independent and governmental model. In this model, a department or ministry, whose activities are overseen by an independent commission, board or court, often manages the day-to-day running of elections. In France, for example, the Ministry of the Interior handles most of the administration of elections, while the Constitutional Council is required to supervise elections to ensure they are being conducted fairly.

This distinction between the independent, mixed and governmental models is key to many studies of EMBs because the level of autonomy should, in principle, influence an EMB's ability to be impartial. Early research assumed that independence is vital to ensuring that political interests do not tamper with elections and that the current government does not influence the administration of the very elections in which its political survival is at stake (Birch, 2008; Kerevel, 2009). Other authors have expanded this framework to include personnel (which can refer to the appointment, partisanship and tenure of EMB members), financial (the sources and control of EMB budgets) and functional (the types of tasks in which they are involved) independence as well (Elklit & Reynolds, 2005; Hartlyn et al., 2007; Kerevel, 2009; Pastor, 1999; van Aaken, 2009).

Empirical research, however, suggests that independence may not be the best way of comparing EMBs. For example, in her consideration of electoral management in *Why Elections Fail*, Norris notes that there are instances of both independent (what she calls the 'agency' model of EMBs) and governmental EMBs that have high levels of electoral integrity, as measured by expert perceptions of electoral integrity (Norris, 2015). This makes sense when we look at examples of governmental and independent EMBs. There are highly trusted governmental EMBs that conduct elections impartially and formally independent EMBs that are known to conduct poor quality elections. As mentioned earlier, Norwegian elections are managed by governmental bodies, but elections are functionally independent and widely trusted (Wall et al., 2006). The same could not be said, however, of the formally independent, but demonstrably corrupt and government-influenced Central Election Commission in Russia (Fish, 2014). Furthermore, while the inclusion of party representatives in EMBs could be construed as a watering down of their independence, according to Estevez et al. the presence of party representatives is precisely what made Mexico's Federal Electoral Institute able to remain impartial and conduct what were largely regarded as clean elections (Estévez et al., 2008). These examples point to the necessity of capturing de facto independence, as opposed to the de jure independence. Furthermore, comparative studies contend with the historical reality that many cases of governmental EMBs are in the older democracies, where elections continue to be administered within government departments as they have for decades. New democracies, on the other hand, have adopted the 'gold standard' of independent EMB, sometimes on the advice of the international community. Countries with the most serious challenges to electoral integrity may also adopt independent-model EMBs to address these problems. As newer bodies, these EMBs may not be able to perform at the level of older governmental EMBs, thus influencing the results of comparative

research focusing on formal independence. Clearly, measuring or classifying EMBs solely through the lens of formal independence is limited in its usefulness in cross-national comparative studies.

Public Perceptions

An alternative to comparing EMBs based on independence is to consider expert and public perceptions of EMBs. Few cross-national surveys have captured public perceptions of election administration, and those that have are limited to select countries and imprecise questions. For example, the Comparative Study of Electoral Systems (Module 1, 1996-2001) asked respondents whether they believed the last election was conducted fairly. This question, however, could pick up a host of election issues, including the conduct of political parties or candidates, unrelated to election management bodies. The Global Barometer (2001-2008) asked respondents a more specific question about trust in each country's electoral commission, but was not fielded in many advanced industrial democracies. The most recent wave of the World Values Survey (6^{th} Wave, 2010-2014) asked how often "votes are counted fairly" and "election officials are fair." This begins to point more directly toward the conduct of election management bodies.

However, using public perceptions to measure EMBs is problematic because the public is likely not paying close attention to the design and functions of EMBs, and can therefore not be expected to know a great deal about their EMB or how it performs. Responses may also reflect confidence in government and politics more generally, or the outcome of the elections studied. Furthermore, the public can be easily distracted by media, partisan or government reflections on the conduct of the election, or by personal experiences that may not reflect the EMB's conduct as

a whole. Furthermore, data for public perceptions of election management are only available for a limited number of countries, where large surveys were conducted.

Expert Perceptions

An alternative to public perceptions of EMBs is to use expert perceptions. The most comprehensive cross-national measure of the capacity and performance of EMBs currently available is contained in the Perceptions of Electoral Integrity dataset. This expert survey has been conducted following legislative and presidential elections since mid-2012. Experts were asked to rate the quality of the election at all stages of the election cycle, from voter registration to campaign finance. This survey also included a sub-index on the conduct of EMBs. Experts were asked to evaluate EMB impartiality, distribution of information, and whether they allowed public scrutiny. Furthermore they were asked to provide a score for the overall performance of election authorities. These scores were combined into a sub-index. These data on EMBs benefit from using a variety of indicators of EMB performance, not simply perceptions of fairness, as used in the public perceptions data. Furthermore, this approach is more precise since it looks at their conduct during a specific election period, and asks for the perceptions of experts who were likely following the actions of election management bodies more closely than the public.

However, like public perceptions, it is possible that even experts do not pay as much attention to EMBs as they may pay to other issues like voter fraud or political violence. Additionally, Martinez i Coma and van Ham suggest that expert perceptions of electoral integrity will be less accurate when they involve judgements, as opposed to factual information (Martinez i Coma & van Ham, 2015). Unfortunately, the Perceptions of Electoral Integrity Index sub-index on EMBs focuses on evaluative judgements, increasing the risk of variance among the scores of

different experts and between countries. Furthermore, expert survey hinge on finding respondents for each country who are willing to provide their judgements, leading to a more time consuming and costly process.

An Alternative Approach: Information, Communication and Transparency

Rather than focusing on ill-fitting measures of independence, or perceptions of EMB quality, this study presents an approach that measures the capacity of EMBs. The term 'capacity' or 'capacity-building' is sometimes used in research concerning the ability of EMBs to perform their functions, and programmes designed to strengthen election management quality in developing democracies (Kerr, 2014; Norris, 2015). However, this term only rarely receives a detailed definition (Kerr, 2009). In this study, EMB capacity is defined in the same way we would define the political capacity of any government, agency or organization. In his research on political capacity and autonomy in Africa, Bratton distinguishes political autonomy and political capacity. He explains "Whereas autonomy answers the question "who initiates?," capacity tells us "how implementation is achieved"" (Bratton, 1994, p. 236). According to this definition, EMB capacity should be measured according to how we expect an EMB to act, rather than who is making decisions, which is the conventional question of EMB independence.

This begs the question: how do we expect an EMB to act? One of the most important qualities we expect from an EMB is accountability, as we would expect from any government body. In the case of EMBs, this accountability is directed to their major stakeholder: the voting public. Accountability can be defined by three key principles: the communication of and justification for decisions made, the ability for stakeholders to have input, and a clear recognition of where the body's authority does and does not lie (O'Loughlin, 1990). This relates closely to

the principle of transparency, or the free flow of information, in this case from the EMB to voters (Hollyer, Rosendorff, & Vreeland, 2014). Finally, EMBs, like any government body, are expected to deliver goods or services to the public of a high quality. In the case of EMBs, these services are the technical administration of elections. We could hardly call an EMB a success if it was transparent, but unable to actually run elections.

Transferring these ideas to the context of election management, three key themes emerge: information, communication and transparency. Information refers to the range of information available to assist voters. This can include information about alternative voting measures, assistance for disabled voters, information on the voter's electoral district, details about the necessary voter identification, and information about how to register to vote. This information should be accurate, timely and clear. Some of the indicators of the quality of information used in this study are direct measures of service provision, such as providing registration information. Other indicators do not directly measure service provision, but can provide a useful estimate or proxy. For example, information for overseas voters may not be available online, but these opportunities may still exist. However, the absence of these services on the EMB website does demonstrate to the researcher that these services are less accessible (since, by definition, overseas voters are unable to visit a local EMB office).

Relating to the concept of accountability, or the ability of stakeholders to provide input, communication refers to the ways that voters can connect and engage with their EMB. Communication in this context focuses on how citizens can get in touch with their EMB for specific inquiries or to lodge complaints. The ease and availability of different means of communication is also an indirect, but useful, indicator of whether the EMB is engaged in assisting voters and other stakeholders with the election process.

Transparency can be measured by considering how much information is publicly available about an EMB's decisions and activities. One of the most important pieces of information that an EMB produces is the vote count for an election. The most transparent results are provided in units smaller than the total (meaning by district or polling division). This allows the public to examine the election results in detail. Transparency can also include the information that citizens can access about the identity of their EMB members or commissioners (or senior government officials) and their qualifications. Another indicator of transparency is whether citizens have access to information about the accountability structure or hierarchy of the EMB. It is also important to consider whether the EMB regularly reports on its activities, as these reports serve both as a good delivered by the EMB to the public, as well as an indicator of accountability and transparency.

Data Collection

EMB provision of information, communication with voters, and transparency are measured through a content analysis of EMB websites. The evaluation of government websites has become commonplace in the e-government literature (Downey, Ekstrom, & Jones, 2011). A government department or agency's online presence can prove to be a useful indicator of its activities and linkage with stakeholders. For example, in a chapter on the *Digital Divide*, Norris coded parliamentary websites to determine whether they act as effective channels of information and communication (Norris, 2001). We can expect that an EMB website will likewise provide us not only with information about its practices, but also a general sense of its activities and openness with citizens. As mentioned earlier, it will also serve as an indicator of the capacity of the EMB (including budgets and personnel) to keep current, comprehensive and user-friendly materials on its website. EMB websites are a useful source of information, since they point

toward the actual activities of EMBs, as opposed to legal documents and constitutions, which often detail how an EMB *should* function rather than how it actually functions in practice. Unlike perceptions or expert judgements, the content analysis of an EMB website serves as an objective measure, since it does not rely on subjective assessments or survey responses.

It is worth noting that EMB capacity, as measured by a website content analysis, may be biased by levels of internet penetration in a country, since EMBs will be more likely to devote time and resources to their website if more citizens have Internet access. Although there remains a 'digital divide,' it is estimated that 40% of the world's population was on the internet in 2014 (International Telecommunication Union, 2014). With the proliferation of access to the internet, particularly through smartphones[49] and other personal computing devices, the internet remains one of the most accessible means of communication between EMBs and the public.

This study measures EMBs' provision of information, communication and transparency in 99 countries. These countries were taken from the possible 107 countries that are included in the Perceptions of Electoral Integrity Index (PEI_3, 2012-2014), all of which have had an election since mid-2012. I selected the primary EMB in each country as identified in the IDEA handbook (Wall et al., 2006). When two EMBs were present in a country (for example in a mixed system), I selected the EMB performing the major functions defined by the same IDEA handbook. Of these 107 countries, 8 did not have an EMB website at the time of coding. These 8 countries were not included in the analysis for two reasons: firstly, to ensure that these outliers did not influence the results, and secondly, to account for the possibility that these websites were

[49] It is estimated that 32% of the world's population has mobile broadband internet in 2014. ((International Telecommunication Union, 2014))

simply inaccessible outside of the country or offline for maintenance during the coding period.[50] The list of countries studied is included in Appendix E.

Coders who are proficient in the 45 languages used on the EMB websites studied were hired to code the websites between June and October, 2015.[51] The starting point for coding was the EMB homepage. The coder answered a number of questions about whether certain elements could be found on the website (see Appendix F for the full list of questions). These 20 questions were formulated based on the key components of information, communication and transparency discussed in the previous section. Each question asks for a simple 'yes' (1) or 'no' (0) answer. This dichotomous classification is advised as a useful basic scheme in building measures (Collier, Seawright, & LaPorte, 2012). More practically, this avoids subjective coder judgements about the quality of the information contained on the website. To be scored 'yes,' the information must be accessible from the website, without searching through legal or constitutional documents. It was acceptable to be sent to other websites, such as a subnational EMB or, in the case of mixed EMBs, another government body. To ensure the reliability of these data, the coders first coded an English or French-language website so the researcher could review their work and check that they properly understood the coding scheme and so they could ask the researcher for clarification about certain elements. Additionally, two coders were assigned to each website. Any differences between the two coding results were re-checked by the researcher (sometimes using website translation functions like google translate). When it was not

[50] The 8 countries without EMB websites were: Benin, Cuba, Equatorial Guinea, Haiti, Mali, Mozambique, North Korea, Sao Tome and Principe, Syria and Turkmenistan.

[51] Most coders were students with no special skills beyond the language they were hired to code. This reflects the ordinary citizens' interaction with an EMB website. The exception for the coding timeframe is Albania, for which the second coding was not completed until January, 2016. There were national elections in Argentina, Belarus, Egypt, and Guinea during the coding period.

possible to see why the differences arose, both coders were consulted and the question was discussed until a response was agreed upon.

To build the capacity score, I used Mokken scaling analysis (Hardouin, Bonnaud-Antignac, & Sebille, 2011; van Schuur, 2003). This non-parametric technique considers how well the 20 binary variables collected by the coders form an additive scale. This method suggests that certain elements will be easier for EMBs to implement than others. For example, presenting the total final election results is easier for an EMB than presenting the results in smaller units, such as by region or candidate. Likewise, presenting the names of the EMB staff is easier than providing EMB members' qualifications for the position. Mokken scaling is particularly appropriate for building a web-based EMB capacity score since it does not require a priori assumptions about the relative importance of the elements we expect to find on EMB websites.

The initial analysis using Mokken scaling, demonstrated that the 20 items cannot simply be added together to form a scale of EMB capacity, since Loevinger's H coefficients range from only 0.13 to 0.36. Only seven of the 20 items score above 0.30, indicating a weak, but acceptable, level of scalability (van Schuur, 2003). Instead, Mokken scaling suggests four subscales, clustered around four key themes, or dimensions of, capacity (see Appendix G for more details). All four subscales qualify as having high scalability (van Schuur, 2003). The dimensions are found in Table 6.

Table 6: Dimensions of EMB Capacity

Dimension	Loevinger H-coefficient	Components
Transparency of Results	0.91	- Election results - Election results in smaller units
Transparency of Personnel	0.60	- Specific names to contact - Hierarchy - Name of EMB member(s) - Qualification of EMB members
Information	0.60	- Disabled voters - Foreign voters - Voter identification - Voter eligibility - Voter registration
Communication	0.56	- Contact in person - Contact by post - Contact by telephone

Three of these subscales can be combined to form a 0 to 3 scale with an acceptable Loevinger's H-coefficient of 0.36. Each of these subscales presents a dimension of EMB capacity. The information scale represents the types of information or services that are provided to the public by the EMB. The two transparency scores measure transparency in terms of the announcement of election results, and public information on the EMB's personnel and hierarchy. Finally, a communication score measures the ways in which the public can contact their EMB. Combining information, communication and transparency of results, the resulting scale of EMB capacity can be used to derive an overall score of EMB capacity.

EMB capacity scores

The EMB capacity scores for each country are reported in Figure 8 (more detailed scores are presented in Appendix H and I). Countries that traditionally receive excellent scores in terms of election quality, like Australia, Norway, the Netherlands and Sweden, do have high EMB capacity scores. However, they are joined by some countries less known for election quality, such as Bulgaria and Thailand (Norris, Coma, Nai, & Gromping, 2015).

In fact, some of the higher scores came from unlikely places. For example, the Fijian Elections Office has a sleek and easily navigable website, which may point to assistance from the international community.[52] Similarly, Afghanistan's Independent Election Commission has a high EMB website score, perhaps reflecting the international community's focus on the quality of elections in Afghanistan. These observations are a promising area for future research.

At the bottom of the capacity scale are countries that are traditionally known for weaker electoral integrity, including Guinea and Djibouti. However, there are other countries close to the bottom that may be more surprising, including the United States. In fact, though, the United States often receives lower scores in terms of perceptions of electoral integrity than similarly established democracies. The decentralized system of election administration may contribute to lower EMB capacity in the United States.

While there is a correlation between Internet penetration and the final EMB capacity scores (Correlation coefficient: 0.44, $p<0.01$), there are examples of countries with low EMB capacity scores with high rates of internet penetration (for example, Kuwait with about 61 internet users per 100 people), and examples of countries with the highest possible EMB capacity score that have low internet penetration (for example, Mongolia only has an internet penetration rate of about 10 internet users per 100 people).

[52] Australia, for example, has assisted through their International Services programme: http://www.aec.gov.au/About_Aec/AEC_Services/International_Services/index.htm

Figure 8: EMB Capacity Scores

Capacity Score (0-3)	Country
3.00	Australia, Bhutan, Bulgaria, Colombia, Costa Rica, Fiji, Hungary, Japan, South Korea, Malta, Mexico, Mongolia, Netherlands, Norway, Paraguay, Slovakia, South Africa, Sweden, Thailand, Tunisia
2.50-2.99	Afghanistan, Albania, Austria, Bahrain, Botswana, Chile, Cyprus, Czech Republic, Germany, Iceland, India, Indonesia, Jordan, Kenya, Latvia, Mauritius, Moldova, Namibia, New Zealand, Pakistan, Philippines, Romania, Slovenia, Uruguay
2.00-2.49	Argentina, Belarus, Belgium, Bolivia, Bosnia and Herzegovina, Brazil, Burkina Faso, Cambodia, Ecuador, Egypt, El Salvador, Georgia, Iraq, Italy, Lithuania, Macedonia, Malawi, Malaysia, Mauritania, Nepal, Panama, Serbia, Solomon Islands, Togo, Turkey, Ukraine, Venezuela, Zimbabwe
1.50-1.99	Algeria, Armenia, Azerbaijan, Bangladesh, Guinea-Bissau, Israel, Micronesia, Sierra Leone, Swaziland, Tonga, United States
1.00-1.49	Angola, Cameroon, Granada, Honduras, Iran, Kuwait, Maldives, Rwanda, Tajikistan
0.50-0.99	Barbados, Congo, Ghana, Guinea, Madagascar, Montenegro
0.00-0.49	Djibouti

See Appendix I for a full listing of EMB capacity scores.

To address the concern that these EMB websites are merely static facades, or that an EMB's website information may not be backed up by staff who are willing to interact with citizens, I conducted a test of whether EMBs responded to citizen inquiries via the email address or web form on the EMB's website. This sort of test of the responsiveness of public officials is not unprecedented. For example, Loewen and MacKenzie conducted a study that involved sending emails to Members of Parliament in Canada from fictitious constituents to test whether constituency population size influenced the helpfulness of the responses, as measured by two blind coders (Thomas, Loewen, & Mackenzie, 2013).

In this study, the coders composed two emails, using an English-language guide, asking the EMB for information. The first email asked how to register to vote after moving to a new city. The second email was about residency requirements to vote.[53] These emails were sent approximately three weeks apart from two fictitious gmail.com accounts, and were signed by a

[53] English versions of the email are in Appendix J.

common male name for each language chosen by the coder.[54] Emails could not be sent to the ten EMBs that did not have an email address or web forms on their website, and the two EMBs that required the sender to input an identification number (i.e. passport number) in order to send a question. The responses were coded by the native language speakers according to five categories: no response, an automatic reply, a referral to another body or website, a request for additional information in order to assist the voter, or an answer to the question asked. A score was created for each of the 87 countries between 0 and 2, where 0 was no response (or only an automatic response) for both emails, 1 was a substantive response for only one of the emails (including a referral, request for additional information to respond to the query or an answer to the question) and 2 was a substantive response for both emails. The response rate was surprisingly low: about 30% of the emails received a substantive response (meaning either a referral to another agency, a request for further information, or an answer to the question asked). The remaining emails were sent automatic replies containing no information, failed in their delivery, or received no response.

The resulting email test scores should correlate with the communication dimension of capacity, as well as the overall capacity scores. Looking at just the communication dimension, the communication capacity score mean was 0.92 for the countries with two substantive responses; for the countries with only one response, it was 0.83; and for no responses, it was 0.77. Using a one-way analysis of variance (ANOVA), it is encouraging that the variance of website scores is significantly related to email response scores (Two responses vs. no response:

[54] Coders were instructed not to choose a name that is country or region-specific since these emails were sent to various countries speaking the language translated. They were also instructed to adapt the greeting and closing line to the language's custom.

0.14 std. err. 0.07, $p<0.1$). There is also a relationship between the results of this email test and overall capacity. For the countries with two substantive responses, the capacity score mean was 3.43; for the countries with only one response, it was 3.15; and for no responses, it was 2.55. The variance of website scores is significantly related to email response scores (Two responses vs. no response: 0.61 std. err. 0.21, $p<0.05$), using a one-way ANOVA. These findings enhance confidence in the validity of assessing EMB websites as a proxy for actual EMB capacity.

Assessing Measurement Validity

In addition to examining the relationship between the EMB capacity scores and their responsiveness via email, it is important to consider the measurement validity of these scores: are they measuring the intended concept? I test measurement validity in three ways: discriminant validity, convergent validity, and nomological validity (Adcock & Collier, 2001; Carmines & Zeller, 1979; King, Keohane, & Verba, 1994). Testing measurement validity in this way has proven a useful tool for many comparative social scientists seeking to better measure key concepts relating to elections and democracy (Bollen, 1980; Elkins, 2000; Hill, Hanna, & Shafqat, 1997). For each model, I used simple correlations to test measurement validity. Country-level control variables are not included in these models because this is an exercise in measurement validation, rather than explanation. In other words, these models do not seek to explain a causal relationship between the two measures, but rather to simply show their association, regardless of the other structural variables that may influence both.

Discriminant Validity

I first test the discriminant validity of EMB capacity scores by comparing them with a measure of EMB independence and with public perceptions of electoral integrity. Discriminant

validity implies that two measures should not be related if they are measuring different properties (Adcock & Collier, 2001). As noted above, classifications of EMBs' formal structure do not necessarily reflect their day-to-day functioning or ability to provide services, while public perceptions are likely to be capturing confidence in government and politics more generally, or satisfaction with the outcome of the elections, and not just the capacity or performance of the EMB. For discriminant validity to be achieved, then, this measure should not be significantly related to these measures.

I consider first the relationship between the EMB capacity scores and the measure of EMB independence, as classified in the International IDEA's Global Database on Elections and Democracy (see Appendix K). This categorization of independent, governmental and mixed EMBs is commonly used in studies on EMB structure (Birch, 2008; Carter and Farrell, 2010; Norris, 2015). Because there are so few cases of mixed EMBs, independence is divided into two categories: fully independent and mixed or governmental. This is an appropriate division since the day-to-day running of elections is often performed by governmental bodies in the mixed model. This division has also been used in previous comparative research (Birch, 2008). Because we expect that EMB formal independence has little to do with an EMB's actual capacity or performance, there should not be a significant difference in mean EMB capacity scores, based on formal design. As expected, the relationship is not statistically significant when tested using analysis of variance (ANOVA[55]) (Independent vs. governmental or mixed -0.27, std. err. 0.18, p=0.12). Clearly, the EMB capacity scores and independence are measuring different properties.

[55] For ANOVAs reported in this study, Tukey's honestly significant difference is used.

As an additional test of discriminant validity, the EMB capacity scores were compared with the sixth wave of the World Values Survey. This public survey includes the most recent battery of questions relating to perceptions of election management. It asks: "In your view, how often do the following things occur in this country's elections?" The two areas concerning EMBs are: "Election officials are fair," and "Votes Counted Fairly" (see Appendix L). As mentioned earlier, the public is likely unaware of the conduct of EMBs, and their survey responses may reflect other variables such as political interest and support for the winning party or candidate, or evaluations of fairness that were reported in the media or by candidates. Furthermore, these questions are addressing the concept of fairness, which is different than the concept of capacity that is measured in this study; an EMB may be fair, but how does it perform its main duties? For these reasons, there should not be a relationship between the EMB capacity scores and public perceptions of electoral integrity because they are measuring different concepts. Because of the limited number of countries involved in the World Values Survey that overlap with the selection of countries that have had elections between mid-2012 and 2014, only 28 countries could be studied here. As expected, mean levels of public perceptions of fairness in elections are not related to the EMB capacity scores (Correlations: 'Officials fair' coefficient: -0.22, p=0.25; 'Votes counted fairly' coefficient: -0.21, p=0.26).

Convergent Validity

As mentioned earlier, the best comparative measure of the actual functioning of EMBs to date is the Perceptions of Electoral Integrity dataset, an expert survey about the quality of elections throughout the election cycle (see Appendix M). This dataset includes responses to a variety of questions relating to EMBs, including a more concrete performance indicator.

Furthermore, it surveys experts who may have a clearer sense of the capacity of an EMB to perform its duties. While this measure has its flaws (see above), it is the best measure we have to test convergent validity by assessing whether the capacity scores correlate with another (somewhat) valid measure of the target concept. I expect there to be a statistically significant association between both expert perceptions of EMBs conduct and the overall quality of election management[56] and the EMB capacity scores. Because this dataset also contains questions specific to different stages of the electoral cycle, it is possible to test whether relationships exist between the sub-indices (information, communication and transparency) and expert assessments of the election in those areas. The EMB website sub-index for information should be positively related to expert assessments of the availability of information about voting procedures and whether election authorities distributed appropriate information. The two sub-indices for transparency should be positively related to expert perceptions of whether the election authorities were impartial and allowed for public scrutiny. However, this relationship may be weaker, given that expert perceptions are known to be less accurate when judging this aspect of EMB performance (Martinez i Coma & van Ham, 2015).

As expected, there was a significant positive relationship between the EMB capacity scores and the PEI EMB sub-index (an aggregation of scores for all questions in the index related to EMBs (Correlation coefficient: 0.48, $p<0.001$) and the performance evaluation question ("Thinking about the electoral authorities administering elections, in your view... Do you agree or disagree with the following statements: The election authorities performed well.") (Correlation coefficient: 0.42, $p<0.001$).

[56] The overall EMB sub-index from the Perceptions of Electoral Integrity Index includes four areas: performance, information, impartiality and public scrutiny. See Appendix K for more details about this index.

There was also a positive relationship between the EMB information dimension score and expert assessments of whether the election authorities distributed voting information (Correlations: 'Voting information available' coefficient: 0.46 ,$p<0.001$; 'Distribution of information' coefficient: 0.48 ,$p<0.001$). Similarly, there was also a statistically significant correlation between the transparency score and expert perceptions of transparency (Correlations with results: EMB allowed public scrutiny' coefficient: 0.26, $p<0.01$; 'EMB impartial' coefficient: 0.28, $p<0.01$). However, there was no statistically significant relationship between the personnel transparency score and these expert perceptions of transparency and impartiality (Correlations with results transparency scores: EMB allowed public scrutiny' coefficient: 0.07, $p=0.47$; 'EMB impartial' coefficient: 0.05, $p=0.64$). This suggests that the results transparency score may be a more reliable measure of overall transparency than the personnel measure. This supports its inclusion as the indicator of transparency in the overall capacity scores.

Nomological Validity

Finally, I test for nomological validity (also called construct validity by some authors). I seek to demonstrate that there is a relationship between the EMB capacity scores and the structural factors that are expected to be related to EMB capacity and electoral integrity. First, I consider economic development, which according to the 'Lipset hypothesis,' will play an important role in a country's level of democracy more generally (Lipset, 1959, 1960). As expected, there is a correlation between economic development (measured by GDP[57]) and EMB capacity scores (Correlation coefficient: 0.37, $p<0.001$). However, previous research has indicated that electoral integrity is not linearly related to economic development (Norris, Frank,

[57] GDP is truncated to 60000 (per capita on purchasing power parity) to take into account one outlier (Kuwait).

& Martinez i Coma, 2014). Instead, electoral integrity may improve up to a certain level of economic development, but then reach a plateau. I therefore consider OECD membership as a simple measure of economic development that is likely to influence the capacity of EMBs, since greater financial and personnel resources should improve their capacity to deliver services to the public. Being a member of the OECD indicates a market economy that has reached a high level of development. Using one-way analysis of variance (ANOVA), I find that EMB capacity scores vary significantly by OECD membership (OECD vs. non-OECD 0.61, std. err. 0.17, $p<0.05$).

I also consider the extent of civil and political rights within a country, as the EMB may not concern itself with providing information to the public if the contest is not truly open and fair. In previous research, perceptions of electoral integrity have had a positive relationship with civic and political rights (Norris, 2015; Norris, Frank, & Martinez i Coma, 2014). I consider the relationship between the EMB capacity scores and the Freedom House classification of whether the country is an electoral democracy, a useful way of dividing those countries where we can expect to have a meaningful electoral contest. As expected, the EMB capacity scores varied significantly (ANOVA of electoral democracy vs. non-electoral democracy 0.61, std. err. 0.18, $p<0.001$).

Finally, I compare the EMB capacity scores with a measure of government effectiveness, drawn from the Quality of Governance dataset. Norris has demonstrated a relationship between public administration effectiveness and perceptions of EMBs (Norris, 2015). It is likely that this measure of the government effectiveness will influence the quality of election management, since election management falls within the realm of public administration. Indeed, there is a statistically significant relationship between the World Bank government effectiveness measure and the EMB capacity scores (Correlation coefficient: 0.45, $p<0.001$).

Each of these relationships demonstrates nomological validity, since the common structural variables that should affect EMB capacity have significant relationships as expected (Adcock & Collier, 2001).

Application: The Role of EMB Capacity in Strengthening Electoral Integrity

This new measure of EMB capacity provides scholars with the opportunity to examine the role of EMBs in promoting electoral integrity more generally: Does EMB capacity influence overall electoral integrity? As mentioned earlier, EMBs play an important and active role in all parts of the electoral cycle: they register and educate voters, manage candidate and party registration and financing, conduct polling on election day, and count the results. Indeed, they are one of the most crucial players in every step of the cycle. Consequently, the capacity of an EMB to implement election laws competently, without error, should improve the integrity of the election.

To test this hypothesis, we first need a measure of electoral integrity. Despite the aforementioned challenges of expert surveys, our best measure of the quality of recent elections is the aforementioned Perceptions of Electoral Integrity (PEI) Index. This expert survey compiles the responses of experts to questions about all stages of the electoral cycle into a 100-point scale (Mean 66.47, Standard Deviation 14.13). See Appendix M for the questions in the dataset. While EMBs are considered as one component of this index, the questions about EMBs do not specifically refer to capacity, but instead to related concepts like performance and impartiality, so there is little threat that any results will be impacted by the inclusion of items relating to EMBs in this PEI Index.

Because this test, unlike the earlier tests of measurement validity, is concerned with causality, it is important to control for any other variables that may influence both the overall conduct of the election and the capacity of an EMB. This includes the two major structural variables used in the test for nomological validity: economic and democratic development. Studies have suggested that the quality of democracy and elections is related to these two key variables (Lipset, 1959). Additionally, Norris et al. (2014) have shown both variables to be important predictors of PEI scores. They also note that the length of time a country has been democratic should affect perceived electoral integrity, since the experience of many elections over time should improve a country's capacity to conduct clean elections. Consequently, regime durability is also included as a control variable (See Appendix K for details on each of these control variables).

Because the expert judgements in the PEI Index are at the individual level, it is also important to control for individual-level variables that are known to influence expert judgements. Martinez i Coma and van Ham (2015) identified left-right ideology, age, sex and whether they lived in the country they were evaluating as the key variables that influence expert judgements on electoral integrity (See Appendix M for details).

Because the PEI data is multi-level (individuals (level 1) nested in countries (level2)), I estimate multi-level regression models, with individual-level perceptions of electoral integrity (level 1 variable) as the dependent variable, and EMB capacity (level 2 variable) as the main independent variable, controlling for the country-level and individual-level characteristics mentioned earlier.

The results demonstrate that even when filtering out the effect of economic development, level of democracy, and regime durability, EMB capacity has a significant positive impact on

electoral integrity (Table 7). Similar results, albeit with a slightly larger regression coefficient, are found when the log of EMB capacity is used, suggesting that steeper increases in electoral integrity are found as EMBs with lower levels of capacity improve. This relationship holds when variables measuring internet penetration and government effectiveness are included in the regression, though both are excluded from the final model due to high multicollinearity with other structural variables such as economic and democratic development. This relationship also holds in a simple cross-sectional regression model.

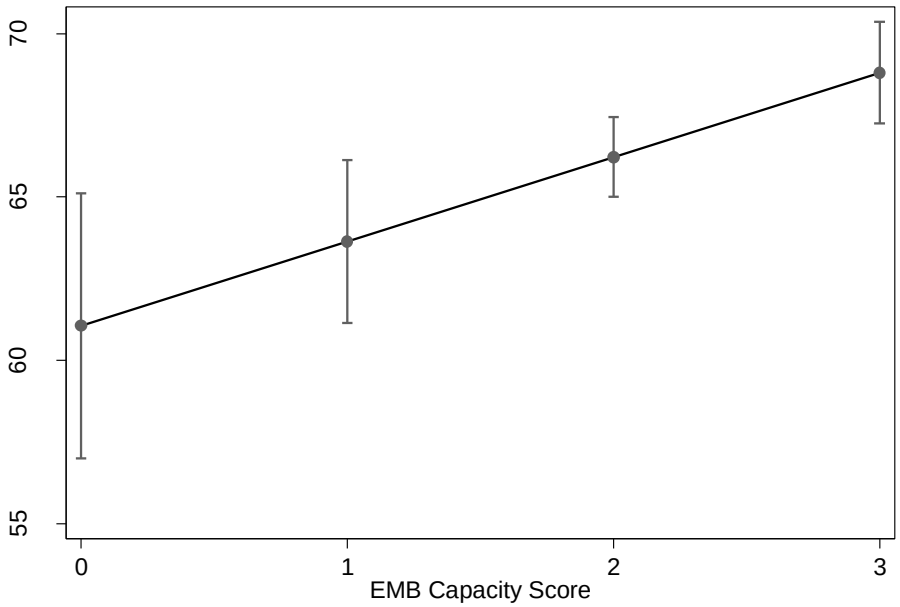
Table 7: The Impact of EMB Capacity Scores on Expert Perceptions of Electoral Integrity

VARIABLES	(1) PEI Index of Electoral Integrity	(2) PEI Index of Electoral Integrity
EMB Capacity	**2.58****	
	(1.02)	
(Log of) EMB Capacity		**4.55*****
		(1.66)
Ideology	0.67***	0.67***
	(0.17)	(0.17)
Age (Decades)	0.23	0.23
	(0.22)	(0.22)
Female	-1.15*	-1.16*
	(0.59)	(0.59)
Expert Domestic	-0.01	-0.01
	(0.59)	(0.59)
GDP (Truncated)	0.00***	0.00***
	(0.00)	(0.00)
Regime Durability	0.02	0.02
	(0.03)	(0.03)
Freedom House, Partially Free	5.92***	5.85***
	(1.94)	(1.93)
Freedom House, Free	16.40***	16.45***
	(2.14)	(2.11)
Constant	43.01***	45.48***
	(2.61)	(2.06)
Observations	1,217	1,217
Number of Countries	99	99
Rho	0.28	0.28

Multilevel regression models (Level 1 Individuals, Level 2 Country)
Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Figure 9 presents the predicted PEI scores based on the EMB capacity score developed in this study. The marginal effect of a one-point increase in capacity is about 2.6 points on the country's PEI score.[58] While this may seem small, the same marginal effect requires about 50 additional years as a democracy, or about $25 000 additional GDP per capita.

Figure 9: The Impact of EMB Capacity on Electoral Integrity



Predicted Probabilities from Table 7, Model 1. 90% confidence intervals shown.

In sum, EBM capacity is an important and previously unmeasured component of overall electoral integrity. This demonstrates the importance of having a clear measure of this key variable for scholarly research on election quality and emphasizes the importance of future work to understand the determinants of EMB capacity around the world.

[58] Marginal effects from Model 1 from Table 7.

Conclusions

As the government agencies and departments tasked with the technical administration of elections, EMBs are crucial to strengthening electoral integrity. Most research, however, has focused on their independence from government, or perceptions of how they function. This study advances the idea that an EMB's capacity to provide information to the public, remain transparent in its activities, and communicate with stakeholders also matters for electoral integrity.

However, scholars of election administration and electoral integrity have lacked a clear measure of EMB capacity. The measure of EMB capacity presented in this study fills this gap. It demonstrates that a content analysis of EMB websites can be an appropriate and useful way of measuring actual EMB performance and capacity. The coding of EMB websites helps us to evaluate the quality of the relationship between EMBs and voters: the provision of clear and timely information to the public, accessibility for citizen questions and complaints, and being transparent about their design, personnel, rules and activities. This method of data collection has a number of benefits. Firstly, it does not rely on judgements that can be influenced by the availability of experts to respond and the accuracy of the experts' information. This new measure of EMB capacity further benefits from its relative cost-effectiveness and ease, compared to cross-national public or expert surveys. The procedure of conducting content analyses of EMB websites could also easily be repeated, allowing scholars and practitioners to track EMB capacity over time.

This study creates a scale of EMB capacity using Mokken scaling analysis. It also addresses the concern that EMB websites may not be backed by appropriate staff and resources

for voters through a test of the responsiveness of EMBs to fictional citizen inquiries. This test demonstrated that the level of information, communication and transparency on an EMB website are related to EMBs' response rates to emails asking for help.

This study also assesses the measurement validity of these EMB capacity scores. As expected, EMB capacity scores are not related to formal EMB independence or public perceptions of electoral integrity, a good check on discriminant validity. Further, the study tests for convergent validity by examining the relationship between the capacity scores and expert perceptions, which, despite their limitations, represent the best of the conventional methods for assessing EMB performance and capacity. Here, there is a significant relationship. Finally, this study assesses nomological validity, by showing statistically significant relationships with structural factors that are known to affect the capacity of EMBs, including levels of democracy, development, and government effectiveness.

Using this new method of measuring EMB capacity, this study also sheds new light on the impact of EMB capacity for electoral integrity more generally. Capacity has been a missing variable in our models of the determinants of electoral integrity. This study demonstrates that EMB capacity is an important predictor of electoral integrity, even when accounting for other factors such as economic and democratic development.

Future work on election management should use this new way of measuring EMB capacity to better understand the causes of varying levels of EMB capacity, including the impact of budgets, staff and foreign aid devoted to building administrative capacity. Once made public, these data measuring EMB information, communication and transparency also presents scholars and practitioners with new opportunities to evaluate EMB capacity in comparative perspective. Over-time comparisons could help scholars and international donors better understand whether

financial aid and technical assistance improve the capacity of EMBs. Scholars and lawmakers may also be able to consider whether changes in the formal design or laws pertaining to an EMB (such as moving to an independent model) can have a positive impact on their service provision and transparency. EMB capacity may also serve as an important explanatory variable when looking at problems such as rates of voter fraud and irregularities, incidences of problems with citizen registration or voting, or even post-election violence due to perceived electoral manipulation. Thus, these EMB capacity scores open many new avenues for research and evaluation of the role of EMBs in electoral integrity around the world.

Chapter 5 - Conclusion

Election management, or the technical administration of elections, has the potential to influence the integrity of an election at any stage of the electoral cycle. Scholars therefore need to carefully consider the impact of various aspects of election management, from registering voters and conducting polling, to the capacity of the bodies that manage elections, on electoral integrity.

Summary of Contributions

The aim of this dissertation was to explore this relationship between election management and electoral integrity. It did so by conducting three studies on different components of election management: voter registration, early voting, and the capacity of election management bodies.

Registration Innovations

The first study considered the voter registration stage of the electoral cycle. Specifically, this study evaluated the impact of election day registration, online registration and the pre-registration of young voters. Online registration and pre-registration, in particular, have been subject to little previous empirical evaluation, while the impact of election day registration benefits from an updated examination as more states adopt this measure. This study also considered the impact of these registration innovations on individual-level registration and voter turnout. While most previous studies focus on the impact of registration laws on turnout, this study demonstrates that it is also important to consider the impact of these laws on registration

itself, which is often assumed to be the first step in the causal chain from legal innovation to changes in turnout.

This study took advantage of the variety of registration innovations implemented at different times in different American states and used three different modelling strategies to evaluate their impact. Each strategy took into consideration different potential sources of bias that may influence whether a state implemented the aforementioned registration innovations such as existing registration and turnout cultures in each state. Despite previous research pointing to the promise of these innovations, this study demonstrated that these registration practices may not have as sizable an impact on registration or voting as initially thought. The impact of each innovation failed to remain statistically significant across all modelling strategies. In two models, election day registration, in fact, had a negative relationship with an individual's likelihood of being registered, and while the ability to register on election day had a positive association with an individual's decision to vote, it did not hold up in the models with lagged turnout included. The availability of online registration does not appear to significantly impact an individual's registration or turnout, nor is a state's provisions for pre-registration of youth related to the registration or turnout of the youngest voters in the state. These findings suggest that registration procedures may have much less of an impact on turnout than many scholars and commentators suggest.

The varying results for each of the three different modelling strategies raise crucial questions about the challenges of isolating the effects of election laws in state-by-state comparative research. In particular, the results point to potential endogeneity in the implementation of registration innovations in states. In other words, the states that choose to implement these laws, and the time at which they decide to do so, are not random. Any positive

impacts of these registration laws may instead reflect other state-level factors, such as the political climate that led to their adoption, the progressiveness and willingness of the state EMB to innovate, or previous experiences with high or low registration accuracy or turnout. This study highlighted the need for future research considering the impact of election laws on registration or turnout to take these factors into consideration.

Early Voting

The second study in this dissertation considered the voting process stage of the electoral cycle by exploring the socio-demographic and attitudinal correlates of early voting. Unlike many previous studies that focus on the American context, this study examined early voting in four other countries: days-long advance polling in Canada, week-long advance polling in Finland, on-demand postal voting in Germany and automatic postal voting in Switzerland. By considering a variety of countries and types of early voting, the findings can speak to the potential impact of early voting in other jurisdictions and demonstrate whether the American findings are generalizable to countries with other turnout cultures and electoral systems.

This study employed individual-level survey data on socio-demographic and attitudinal variables for a number of national and regional elections in each country. It found that early voting does not generally mobilize under-represented population groups, with the exception of elderly voters who do take advantage of early voting opportunities. In fact, in many cases, early voting was used by the population groups that were already most likely to participate. For example, in the two countries where postal voting is used, post-secondary education was a significant predictor of early voting. Additionally, in Canada, Finland and Switzerland, those who were more interested in politics were more likely to vote early. These findings suggest that

those who already tend to be mobilized to vote are also most likely to take advantage of early voting opportunities. This suggests that in most cases early voting is unlikely to raise turnout among under-represented population groups.

But beyond the relationship between being in the oldest age group and voting early, none of the socio-demographic and attitudinal variables could predict early voting across all four countries and types of early voting studied. This suggests that some combination of the different models of early voting and the country in which they are implemented influence which population groups are most likely to take advantage of this convenience voting measure. This should be kept in mind when scholars and practitioners attempt to generalise the findings from single jurisdictions to early voting in general. Further comparative research across a greater number of countries is needed to determine whether there are any clear patterns across different types of early voting opportunities.

Election Management Body Capacity

The final study considered the capacity of EMBs, the government agencies and departments tasked with the technical administration of elections. Unlike evaluations of EMBs based on their independence or perceptions of their performance, capacity captures how well an EMB is equipped to perform its essential functions. This study therefore introduced a new measure of EMB capacity, based on a content analysis of EMB websites and Mokken scaling. The resulting scores measure the capacity of EMBs to provide information to citizens, communicate with stakeholders, and remain transparent in their activities. This study tested the measurement validity of these scores, and conducted a test to uncover whether EMB websites are supported by personnel willing to communicate with the public. It argued that coding websites

offers a more cost-effective and replicable method of measuring EMB capacity than alternative methods, such as formal design, or public or expert surveys.

Furthermore, this study demonstrated that EMB capacity is important to our understanding of the factors that impact overall electoral integrity. EMB capacity is, in fact, a significant positive predictor of electoral integrity (as measured through expert perceptions of the entire electoral process), even when taking other structural variables into account. This EMB capacity variable is therefore a missing variable in our understanding of the determinants of overall electoral integrity. This study concluded that future research must go beyond simply considering the independence or impartiality of EMBs, and evaluate their capacity: the ability to provide information to the public, communicate with stakeholders and be transparent in their operations.

Key Challenges and Directions for Future Research

In addition to the aforementioned empirical findings, this dissertation makes a number of contributions to our scholarly and practical understanding of electoral integrity, and comparative politics more generally.

Testing Common Assumptions

Election management laws, institutions and procedures are often designed with good intentions: to increase turnout, to eliminate fraud, or to improve impartiality. But the results of each of the studies in this dissertation demonstrate that common assumptions about election management and the policy interventions used to combat perceived weaknesses in electoral integrity must be rigorously tested.

A good example of this is the convenience election procedures that have been implemented in the past decades to make registering and voting easier. We may assume that these convenience measures will expand the electorate by reducing voting costs, but this does not necessarily play out in the empirical analysis in this dissertation. The first study in this dissertation suggests that changing laws and procedures does not always have a positive impact on registration and turnout. By comparing the results of three different statistical approaches, this study demonstrates potential issues with endogeneity related to the implementation of election laws in the United States. As such, this study calls for researchers to take into account potential sources of bias in their statistical analysis of the effects of elections laws on voter participation. Practitioners and policymakers faced with resource constraints should also consider whether potential convenience election innovations will truly have the intended outcomes, be that increased registration or higher turnout, when making the difficult decisions as to which innovations to advocate for and implement.

Similarly, the second study in this dissertation demonstrates the importance of studying the impact of laws in a variety of contexts. Many studies on early voting look at one country or one election, often in the American context, but this study looks at four different countries with four different types of early voting. The mixed results should caution policymakers and practitioners from assuming that certain electoral management practices will have the same impact in their jurisdiction as it does in another jurisdiction. Additionally, the mixed results demonstrate that not all types of early voting will attract the same population groups. In these cases, then, rather than increasing turnout among under-represented population groups, early voting may simply make it easier for those who would vote anyway to cast their ballot.

These first two studies also challenge the common assumption that lowering voting costs, be that via registration innovations or early voting opportunities, is likely to improve participation. Many voting studies begin with the premise that the time and knowledge costs associated with registering and voting play a role in the turnout calculus. However, both of these studies demonstrate that when these costs are lower, they do not uniformly increase turnout. While there were some instances of convenience measures increasing participation, for example, early voting among the elderly, the overall results suggest that convenience measures may do less to improve turnout than initially thought.

Finally, this dissertation addresses the common assumption that EMB independence is the key variable in understanding the impact of EMBs on overall electoral integrity. The analysis presented here and in other recent research indicates that this is not necessarily the case (Birch, 2008; Norris, 2015). The final study in this dissertation argues that alternative methods of evaluating EMBs, particularly regarding their capacity to perform their activities, are needed. This study also challenges our conceptions of which countries have the 'best' EMBs. While many of the countries we may expect to have high or low EMB capacity did score accordingly, there were also a number of surprising findings. Countries not known for high electoral integrity scored near the top, including Afghanistan and Fiji. Conversely, the United States, a longstanding democracy scored poorly. The capacity scores were not simply a reflection of differing levels of economic or democratic development, and were unrelated to the traditional classification of election management bodies according to their formal independence. Research probing the determinants of election management capacity is one of the most important next steps in this field of study.

These studies suggest that common assumptions about which election laws will improve participation or what characteristics of EMBs translate into better electoral integrity are not necessarily accurate. This underscores the importance of testing and re-testing the effects of election management designs and practices on electoral integrity.

Context and Capacity

In empirically evaluating assumptions about election management, scholars have often focused on variables that are easy to measure: namely formal structures and laws. Indeed, there is a great deal of research still to be done on the impact of formal institutions on electoral integrity. However, these studies should not discount other factors that influence how these institutions and laws may impact electoral integrity. The results of each of the studies in this dissertation suggest that variables such as capacity and context matter for electoral integrity as well.

The first two studies demonstrate that simply changing election laws will not necessarily improve voter participation. Both studies demonstrated largely null effects of changes in election laws and practices on improving participation overall and among under-represented groups. Additionally, as the first study in this dissertation demonstrates, the implementation of innovative election laws is likely not random, but instead may reflect a government or EMB's willingness to innovate. Researchers and policymakers must therefore contend with this reality when determining the effectiveness of election laws and procedures and designing new election management procedures. Future research may also consider the capacity of EMBs to implement new election procedures as a key variable when attempting to understand their effectiveness.

The final study in this dissertation argues that capacity is a distinct concept from impartiality or independence, which are often the focus of research on EMBs (Birch, 2008; van Aaken, 2009). Indeed, the EMB capacity scores developed in this study do not even correlate with formal independence or public perceptions of fairness. Nonetheless, the statistical analysis showed that capacity scores help explain overall electoral integrity in a way that alternative measures like independence cannot. Capacity is therefore an important variable that must be taken into consideration when analysing the determinants of electoral integrity. This finding encourages the international organizations and government agencies that work in the field of electoral assistance to consider an emphasis on capacity-building projects in addition to current work strengthening independent electoral authorities. Scholars likewise must avoid the temptation to study only what is easily measurable, and also consider that electoral institutions and laws exist within a more complex political landscape.

Differential Impacts

Additionally, scholars must continue to evaluate the differential impacts of election management processes. In other words, the same laws and institutions may have different consequences for electoral integrity for various population groups, or in different countries.

This potential for differential impacts is highlighted in the second study in this dissertation, which argues that all population groups may not necessarily take advantage of convenience voting measures at the same rates. This study found that early voting often mobilizes already-represented segments of the population, and is unlikely to be used by groups that are under-represented at the polls. Scholars studying the impact of election management on voter participation must therefore acknowledge that certain laws may increase participation

among only certain segments of the electorate. Future research is needed to further understand which convenience laws can actually have a positive impact on the participation of under-represented groups in particular. Election practitioners likewise must consider which population groups new election procedures will help, and where these innovations may actually contribute to growing inequalities in participation.

Likewise, the differential impacts of election management practices may also extend to different countries. While scholars often look for a 'gold standard' in EMB design or election management procedures, is it possible that certain practices, such as registration systems, alternative voting procedures, or means of communication with citizens, work better in some types of contexts than others? In the second study, for example, the socio-demographic and attitudinal correlates of early voting varied by country, and thereby by type of early voting.

The final study of this dissertation likewise points to a number of future research directions that would consider the differential impacts of variables that classify EMB design or capacity. For example, future research on EMBs should consider the impact of formal design or independence in different contexts. One could hypothesize that this variable will not be as crucial for longstanding democracies, which have a wealth of experience in running elections and may be situated within a professional and impartial public service. However, independence may be very important in new democracies, especially if independent EMBs benefit from dedicated personnel and resources, and the freedom to experiment with new solutions to electoral challenges. This is an area that requires further research.

In sum, scholars must consider not only the overall effect of the laws and policies they study, but how they may have different effects in different contexts, countries and population groups.

Data Sources and Partnerships

In order to conduct the high quality research needed to test common assumptions about election management, tackle less-easily measurable variables like capacity and context, and consider potential differential impacts of election management on different groups and contexts, scholars require better data sources to address the impact of election management on electoral integrity.

The challenge of finding appropriate data sources was apparent in the first and second studies of this dissertation, which used survey data to understand the impact of election management practices on registration and turnout. Scholars acknowledge that survey data is limited in the types of populations it can cover and the accuracy of responses, especially on questions of turnout. While the official turnout records available in some jurisdictions can help to address this challenge, these data sources are also limited in the types of socio-demographic and attitudinal information they can provide.

The final study specifically addressed this challenge of finding appropriate sources of data to study election management and electoral integrity. While scholars have access to some data on the laws that govern EMBs and how EMBs are perceived, capturing their ability to perform their essential activities is much more difficult. In the third study of this dissertation, this challenge was addressed by finding a novel proxy for the concept of EMB capacity through a website content analysis and test of EMB responsiveness.

Other large data collection projects, conducted in concert with EMBs, which focus on their design, practices and strategies, may also help to address these issues. Qualitative approaches may also be leveraged to better understand election management comparatively. For

example, future research may consider case studies of the most and least successful capacity-building strategies, through interviews with current and past election practitioners, to uncover the determinants of EMB capacity in developing democracies. Additionally, taking advantage of natural or field experiments will allow scholars to be more confident in their findings about the impact of specific election management interventions that may improve electoral integrity. For example, field experiments may consider the potential of new registration innovations, such as door-to-door enumeration, for improving the accuracy of registration lists, especially in less affluent or high-mobility areas.

Each of these suggested avenues for further research requires greater scholarly partnership with EMBs themselves. Successful partnerships will provide researchers access to quality data and the potential for field experiments, while EMBs will benefit from empirical evaluation of their programs and strategies. These linkages can be achieved by listening to the challenges and research needs of EMBs on one hand, and an increased focus on knowledge dissemination on the other.

Conclusion

This dissertation demonstrated the importance of election management for electoral integrity, through three studies, each tackling a different component of election management, and a different way of evaluating electoral integrity. The first study examined the potential of registration innovations to improve voter registration and turnout, both of which are key to ensuring adequate representation of the public through elections. It found that common registration innovations do not necessarily improve an individual's likelihood of being registered or turning out to vote, and thereby cautioned against the assumption that legal changes will

necessarily have a great impact on electoral integrity, as measured by equal and full participation. The second study also considered turnout as the main indicator of electoral integrity. More specifically, it was concerned with the participation of under-represented population groups in early voting procedures. It demonstrated that this election management practice may simply mobilize population groups already likely to vote. The final study took the broadest approach to considering the relationship between election management and electoral integrity. The application of EMB capacity scores demonstrated the importance of this capacity variable for overall electoral integrity, as measured by expert perceptions of the entire electoral cycle. In this case, election management appeared to have a significant impact on overall electoral integrity, when tested using cross-national regression analysis.

In conclusion, I return to the major question this dissertation sought to address: can election management strengthen electoral integrity? In response, I would argue that some innovations in election management, like the strengthening of election management body capacity, can have a positive impact on electoral integrity. However, other election management innovations, like the registration innovations studied in this dissertation and early voting, are unlikely to make much of a difference on overall electoral integrity. Nonetheless, if they make the electoral process easier for even a limited number of citizens, they may be worth the associated time and financial costs to election management bodies. But for some election management procedures the potential added convenience must be carefully weighed against the possibility that they will only advantage certain segments of the population that are already likely to be represented. Consequently, election management has the potential to strengthen electoral integrity, but scholars and practitioners must carefully study all the potential impacts of election

management practices in order to decide on the policy interventions that may best strengthen electoral integrity around the globe.

Appendix

Appendix A: Registration Innovations by State and Year

State	2004			2006			2008			2010			2012			2014		
	ED*	OR	PR	ED	OR	PR	ED	OR	PR	ED	OR	PR	ED	OR	PR	ED	OR	PR
Alabama	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Alaska	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Arizona	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes	No
Arkansas	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
California	No	No	No	No	No	No	No	No	No	No	No	Yes	No	Yes	Yes	No	Yes	Yes
Colorado	No	No	No	No	No	No	No	No	No	No	Yes	No	No	Yes	No	Yes	Yes	Yes
Connecticut	No	No	No	No	No	No	No	No	No	No	No	No	Yes	No	No	Yes	Yes	No
Delaware	No	No	No	No	No	No	No	No	No	No	No	No	No	No	Yes	No	Yes	Yes
Florida	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes
Georgia	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	Yes	No
Hawaii	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes
Idaho	Yes	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes	Yes	No
Illinois	No	No	No	No	No	No	No	No	No	No	No	No	Yes	No	No	Yes	Yes	No
Indiana	No	No	No	No	No	No	No	No	No	No	Yes	No	No	Yes	No	No	Yes	No
Iowa	No	No	No	No	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes	No	No
Kansas	No	No	No	No	No	No	No	No	No	No	Yes	No	No	Yes	No	No	Yes	No
Kentucky	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Louisiana	No	No	No	No	No	No	No	No	No	No	Yes	No	No	Yes	No	No	Yes	No
Maine	Yes	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes	No	Yes	Yes	No	Yes
Maryland	No	No	No	No	No	No	No	No	No	No	No	Yes	No	Yes	Yes	No	Yes	Yes
Massachusetts	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Michigan	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Minnesota	Yes	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes	Yes	No
Mississippi	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Missouri	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	Yes	No
Montana	No	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes	No	No
Nebraska	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	Yes
Nevada	No	No	No	No	No	No	No	No	No	No	No	No	No	Yes	No	No	Yes	No
New Hampshire	Yes	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes	No	No
New Jersey	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
New Mexico	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
New York	No	No	No	No	No	No	No	No	No	No	No	No	No	Yes	No	No	Yes	No
North Carolina	No	No	No	No	No	No	No	No	No	No	No	Yes	No	No	Yes	No	No	No
North Dakota	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Ohio	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No

State	2004			2006			2008			2010			2012			2014		
Oklahoma	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Oregon	No	No	No	No	No	No	No	No	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Pennsylvania	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Rhode Island	No	No	No	No	No	No	No	No	No	No	No	Yes	No	No	Yes	No	No	Yes
South Carolina	No	No	No	No	No	No	No	No	No	No	No	No	No	Yes	No	No	Yes	No
South Dakota	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Tennessee	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Texas	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Utah	No	No	No	No	No	No	No	No	No	No	Yes	No	No	Yes	No	No	Yes	No
Vermont	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Virginia	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	Yes	No
Washington	No	No	No	No	No	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes	No
West Virginia	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Wisconsin	Yes	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes	No	No
Wyoming	Yes	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes	No	No

*ED – Election Day Registration, OR – Online Registration, PR – Pre-registration

Data Sources: National Council of State Legislatures: http://www.ncsl.org/research/elections-and-campaigns.aspx and Election Administration and Voting Survey: http://www.eac.gov/research/election_administration_and_voting_survey.aspx

Appendix B: Data Sources

Registration Innovations (From NCSL and EAVS)	
Election Day Registration	0 – Closing Dates 1 – Election Day Registration
Online Registration	0 –Not facilitated by online platform 1 – Facilitated by online platform
Pre-registration	0 – No 1 – Yes
Socio-Demographic Variables (From CPS)	
Youth	1 = Ages 18-25 0 = 26+
Female	0 = Male 1 = Female
White	0 = Minority (all other responses) 1 = White
College Degree	0 = No College Degree 1 = College Degree
Residence Length	1 = Two years or less at current address 0 = More than two years at current address
Socio-Demographic Variables (For replication of Holbein and Hillygus) (From CPS)	
Married	0 = Not married 1=Married
Family Income	0 = Less than $50,000 per year 1 = $50,000 or more per year
Hispanic	0 = Not Hispanic 1 = Hispanic
Metropolitan Area	0 = Not a metropolitan area 1 = Metropolitan area
Business or Farm	0 = Does not own a business or farm 1 = Owns a business or a farm
In-Person Interview	0 = Was not interviewed in person 1 = Was interviewed in person
DMV Registration	0 = Did not register at a DMV 1 = Registered at a DMV
Voting and Registration (post-election) (From CPS)	
Self-reported Voter Turnout	0 = Did not vote 1 = Voted
Self-reported Registration Status	0 = Not Registered 1 = Registered (assumed if respondent had voted)
State and Election Variables (Variety of Sources)	
Turnout	% of voting age population , lagged (previous election of the same type)
Governor's Party	0 = Democrat or Independent (not republican) 1 = Republican
Election Year	2006-2014
Region	0 = Northeast 1 = Midwest 2 = South 3 = West (recoded to dummy variables)

Data Sources:

Electoral Assistance Commission: http://archives.eac.gov/ and http://www.electproject.org/home/voter-turnout/voter-turnout-data

National Council of State Legislatures: http://www.ncsl.org/research/elections-and-campaigns.aspx

Election Administration and Voting Survey: http://www.eac.gov/research/election_administration_and_voting_survey.aspx

National Governor's Association: https://www.nga.org/cms/home.html

United States Census Bureau, Current Population Survey, Voting and Registration Supplements: http://www.census.gov/topics/public-sector/voting.html

Appendix C: Replication of Models by Holbein and Hillygus for Different Time Points

	2000-2012		2004-2014	
	Difference-in-difference (Fixed effects)	Lagged turnout	Difference-in-difference (Fixed effects)	Lagged turnout
	(1)	(2)	(3)	(4)
VARIABLES	Voted	Voted	Voted	Voted
Pre-Registration	0.16**	0.02	-0.05**	0.02
State	(0.00)	(0.02)	(0.00)	(0.01)
Age	0.02**	0.02**	0.02**	0.02**
	(0.00)	(0.00)	(0.00)	(0.00)
Married	-0.03*	-0.04**	-0.03*	-0.03**
	(0.01)	(0.01)	(0.01)	(0.01)
Female	0.05**	0.05**	0.05**	0.05**
	(0.00)	(0.00)	(0.00)	(0.00)
Family Income	0.07**	0.06**	0.07**	0.06**
	(0.01)	(0.01)	(0.01)	(0.01)
College Degree	0.13**	0.13**	0.12**	0.12**
	(0.01)	(0.01)	(0.01)	(0.01)
White	-0.01	-0.00	-0.01	-0.02
	(0.01)	(0.01)	(0.01)	(0.01)
Hispanic	-0.07**	-0.08**	-0.07**	-0.06**
	(0.01)	(0.01)	(0.01)	(0.01)
Metropolitan area	0.03**	0.02**	0.03**	0.04**
	(0.01)	(0.01)	(0.01)	(0.01)
Residence (2 or more years)	0.03**	0.03**	0.03**	0.03**
	(0.00)	(0.00)	(0.00)	(0.00)
Business or farm	0.05**	0.05**	0.04**	0.04**
	(0.01)	(0.01)	(0.01)	(0.01)
In-person	-0.04**	-0.05**	-0.04**	-0.04**
	(0.01)	(0.01)	(0.01)	(0.01)
Constant	-0.27**	-0.27**	-0.20**	-0.37**
	(0.04)	(0.04)	(0.04)	(0.06)
Observations	37,270	37,270	32,231	32,231
R-squared	0.14	0.11	0.15	0.13

Clustered (state-election) standard errors in parentheses, ** p<0.01, *p<0.05
Only youth (ages 18-22) are studied here.
In these models, to be consistent with the methods of Holbein and Hillygus (2015), North Dakota and Washington DC are included and pre-registration is not lagged. Some variables are specified slightly differently than in the original models of Holbein and Hillygus (2015). For example, residence and family income are classified as binary variables. Registration status is not included as a control variable, since all those who voted are assumed to have registered.

Appendix D: Variables

Variable	Coding
Early Voting*	0 = Voted on election day [reference category] 1= Voted early
Gender	0 = Male [reference category] 1 = Female
Age groups	1 = Age 18-35 0 = Age 36-65 [reference category] 1 = Age 66+
Education	0 = high school or less [reference category] 1 = some or completed post-secondary
Interest in Politics	Scales were different for each country. To standardize, it was recoded to a 0-1 scale.
Political Knowledge	The type and number of political knowledge questions were different for each country (ranging from identifying political leaders' pictures to questions about political processes). To standardize, it was recoded to a 0-1 scale, where 0 indicated least political knowledge and 1 indicated most political knowledge.
Partisan Intensity	Scales were different for each country. To standardize, they were all collapsed to a 0-1 scale, where 0 indicated least partisan and 1 indicated most partisan.
Regional Election	0 = National election [reference category] 1 = Regional election

***Notes on the construction of the early voting variable:** For the Making Electoral Democracy Work datasets, voters were surveyed once leading up to election day and again after the election. In the post-election survey, the respondents were asked specifically whether they had used a method of early voting, where appropriate specifically listing the options available (for example, advance polling, absentee balloting). In addition, the pre-election questionnaire, conducted shortly before the election, asked respondents if they had already voted (which presumes that those who had already voted did so using early voting measures). These data, however, are necessarily incomplete as voters still had time to cast an early ballot between the survey and election day. To include the greatest possible number of respondents who voted early, I include in the early voting category all voters who responded they had voted early in either the post-election or pre-election survey. For national election studies, however, only post-election questions on whether the voter early or on election day were available. However, the overall results do not substantially differ if only the post-election question is used for the Making Electoral Democracy Work datasets.

Data Sources:

Making Electoral Democracy Work Datasets: http://electoraldemocracy.com/

Canadian Election Study: http://ces-eec.arts.ubc.ca/

Finish Election Study: http://www.vaalitutkimus.fi/en/

German Longitudinal Election Study: http://gles.eu/wordpress/english/

Swiss Electoral Studies: http://forscenter.ch/en/our-surveys/selects/

Appendix E: Countries Studied

Country	Most Recent Election	EMB Name	EMB Website	Email Test
Afghanistan	14-Jun-14	Independent Election Commission	http://www.iec.org.af/fa/	Yes
Albania	23-Jun-13	Central Election Commission	www.cec.org.al	Yes
Algeria	17-Apr-14	Ministère de l'Intérieur et des Collectivités Locales	http://www.interieur.gov.dz/Dynamics/frmItem.aspx?html=50&s=23&lng=ar	Yes
Angola	31-Aug-12	National Election Commission	www.cne.ao/	Yes
Argentina	27-Oct-13	Camara Electoral	http://www.electoral.gov.ar/	No
Armenia	18-Feb-13	Central Election Commission	www.elections.am/	Yes
Australia	07-Sep-13	Australian Electoral Commission	www.aec.gov.au	Yes
Austria	29-Sep-13	Ministry of Internal Affairs	www.bmi.gv.at/wahlen	Yes
Azerbaijan	09-Oct-13	Central Election Commission	www.msk.gov.az/az/	Yes
Bahrain	29-Nov-14	Directorate of Election and Referendums	www.vote.bh/Ar/index	Yes
Bangladesh	05-Jan-14	Election Commission	www.ecs.gov.bd	Yes
Barbados	21-Feb-13	Barbados Electoral and Boundary Commission	www.electoral.barbados.gov.bb/	Yes
Belarus	23-Sep-12	Central Commission of the Republic of Belarus on Elections	www.rec.gov.by/	Yes
Belgium	25-May-14	Ministry of Interior	http://www.elections.fgov.be/index.php?id=1622&L=2	Yes
Bhutan	13-Jul-13	Electoral Commission of Bhutan	www.election-bhutan.org.bt/	Yes
Bolivia	12-Oct-14	National Electoral Court	http://www.oep.org.bo/	Yes
Bosnia-Herzegovina	12-Oct-14	Election Commission	http://www.izbori.ba/Default.aspx?Lang=3	Yes
Botswana	24-Oct-14	Independent Election Commission	www.iec.gov.bw	No
Brazil	26-Oct-14	High Electoral Tribunal	www.tse.jus.br/	No
Bulgaria	05-Oct-14	Central Election Commission	www.cik.bg/	Yes
Burkina Faso	02-Dec-12	Independent National Election Commission	www.ceni.bf/	Yes
Cambodia	28-Jul-13	National Election Commission	www.necelect.org.kh/nec_khmer/	Yes
Cameroon	30-Sep-13	Elections Cameroon	www.elecam.cm/	Yes
Chile	15-Dec-13	Electoral Service	http://www.servel.cl/ss/site/home.html	Yes
Colombia	01-Jun-14	National Electoral Council	www.registraduria.gov.co	Yes

Country	Most Recent Election	EMB Name	EMB Website	Email Test
Congo, Democratic Republic of	05-Aug-12	National Election Commission	www.ceni.gouv.cd/	Yes
Costa Rica	06-Apr-14	Supreme Electoral Tribunal	www.tse.go.cr	Yes
Cyprus	24-Feb-13	Central Electoral Service	www.moi.gov.cy/moi/moi.nsf/page16_gr/page16_gr?OpenDocument	Yes
Czech Rep	25-Oct-13	Ministry of the Interior	www.mvcr.cz/volby.aspx	Yes
Djibouti	22-Feb-13	National Independent Electoral Commission	www.ceni.dj/	Yes
Ecuador	17-Feb-13	Supreme Electoral Tribunal	cne.gob.ec/es/	Yes
Egypt	26-May-14	High Elections Committee	https://www.elections.eg/	Yes
El Salvador	09-Mar-14	Supreme Election Tribunal	www.tse.gob.sv/	No
Fiji	17-Sep-14	Elections Fiji	www.electionsfiji.gov.fj/	Yes
Georgia	27-Oct-13	Central Election Commission	www.cec.gov.ge	Yes
Germany	22-Sep-13	Ministry of Interior	www.bundeswahlleiter.de	Yes
Ghana	07-Dec-12	Election Commission of Ghana	www.ec.gov.gh/	Yes
Grenada	19-Feb-13	Parliamentary Election Office	www.gov.gd/departments/parliamentary_election_office.html	Yes
Guinea	28-Sep-13	National Election Commission	www.ceniguinee.org/	Yes
Guinea-Bissau	18-May-14	National Election Commission	www.cne-guinebissau.org/	Yes
Honduras	24-Nov-13	Supreme Electoral Tribunal	www.tse.hn	Yes
Hungary	06-Apr-14	Ministry of Interior and National Election Office	http://valasztas.hu/hu/ovi/index.html	Yes
Iceland	27-Apr-13	Election Commission	www.landskjor.is/	Yes
India	12-May-14	Election Commission	eci.nic.in/eci/eci.html	Yes
Indonesia	09-Jul-14	General Election Commission	www.kpu.go.id	Yes
Iran	14-Jun-13	Ministry of Interior	http://www.shora-gc.ir/Portal/Home/	Yes
Iraq	30-Apr-14	High Election Commission	http://www.ihec.iq/ar/	Yes
Israel	17-Mar-15	Central Elections Committee	www.knesset.gov.il/elections17/heb/cec/CecIndex.asp	Yes
Italy	24-Feb-13	Ministry of Interior	www.interno.gov.it/it	Yes
Japan	14-Dec-14	Ministry of Internal Affairs	www.soumu.go.jp/	Yes
Jordan	23-Jan-13	Independent Election Commission	www.entikhabat.jo/public/DefaultAr.aspx	Yes
Kenya	04-Mar-13	Independent Boundaries and Election Commission	www.iebc.or.ke/	Yes
Korea, Republic	19-Dec-12	Republic of Korea National Election Commission	www.nec.go.kr/portal/main.do	Yes

Country	Most Recent Election	EMB Name	EMB Website	Email Test
Kuwait	27-Jul-13	Kuwait Election Commission	eservices1.moi.gov.kw/elections/mainmenu.nsf	No
Latvia	04-Oct-14	Central Election Commission	www.cvk.lv/pub/public/index.html	Yes
Lithuania	25-May-14	Central Elections Committee	www.vrk.lt	Yes
Macedonia	27-Apr-14	State Election Commission	www.sec.mk/index.php?lang=mk	Yes
Madagascar	20-Dec-13	National Election Commission	www.ceni-madagascar.mg/	Yes
Malawi	20-May-14	Malawi Electoral Commission	www.mec.org.mw/	Yes
Malaysia	05-May-13	Election Commission	www.spr.gov.my/	Yes
Maldives	22-Mar-14	Elections Commission	http://www.elections.gov.mv/index-2.html	Yes
Malta	09-Mar-13	Malta Electoral Commission	http://www.electoral.gov.mt	Yes
Mauritania	21-Jun-14	National Independent Election Commission	www.ceni.mr/	Yes
Mauritius	10-Dec-14	Office of the Election Commissioner	electoral.govmu.org/English/Pages/default.aspx	Yes
Mexico	01-Jul-12	Federal Election Institute	www.ine.mx/portal/	Yes
Micronesia	05-Mar-13	Office of President	http://www.fsmpio.fm/	No
Moldova	30-Nov-14	Central Election Commission	http://www.cec.md/index.php?l=ro	Yes
Mongolia	26-Jun-13	General Election Commission	www.gec.gov.mn/	Yes
Montenegro	07-Apr-13	Republic Electoral Commission	http://www.dik.co.me/	Yes
Namibia	28-Nov-14	Election Commission of Namibia	www.ecn.na/	Yes
Nepal	19-Nov-13	Nepal Election Commission	www.election.gov.np/election/np	Yes
Netherlands	12-Sep-12	Netherlands Electoral Council	www.kiesraad.nl	No
New Zealand	20-Sep-14	Elections New Zealand	www.elections.org.nz/	Yes
Norway	09-Sep-13	Ministry of Local Government and Regional Development	https://www.regjeringen.no/nb/tema/valg-og-demokrati/valgportalen-valg-no/id456491/	Yes
Pakistan	11-May-13	Pakistan Election Commission	www.ecp.gov.pk	No
Panama	04-May-14	Panama Electoral Tribunal	www.tribunal-electoral.gob.pa	Yes
Paraguay	21-Apr-13	Paraguay High Tribunal of Electoral Justice	www.tsje.gov.py	Yes
Philippines	13-May-13	Commission on Elections	www.comelec.gov.ph	Yes
Romania	16-Nov-14	Permanent Electoral Authority and Central Election Bureau	www.roaep.ro	Yes
Rwanda	16-Sep-13	National Election Commission	www.comelena.gov.rw/home/	Yes

Country	Most Recent Election	EMB Name	EMB Website	Email Test
Serbia	16-Mar-14	Republic Election Commission	http://www.rik.parlament.gov.rs/index_l.htm	Yes
Sierra Leone	17-Nov-12	National Election Commission	www.nec-sierraleone.org/	Yes
Slovakia	29-Mar-14	Ministry of Interior	www.civil.gov.sk	Yes
Slovenia	13-Jul-14	Republic Election Commission	http://www.dvk-rs.si/index.php/si	Yes
Solomon Islands	19-Nov-14	Election Commission	www.siec.gov.sb/	Yes
South Africa	07-May-14	Independent Electoral Commission	www.elections.org.za	Yes
Swaziland	20-Sep-13	Elections and Boundaries Commission	www.gov.sz/index.php?option=com_content&id=366&Itemid=343	Yes
Sweden	14-Sep-14	Electoral Authority	www.val.se/	Yes
Tajikistan	06-Nov-13	Central Commission for Elections and Referenda	http://www.kmir.tj/tj/konunguzori.html	Yes
Thailand	02-Feb-14	Electoral Commission	www.ect.go.th/	Yes
Togo	22-Apr-15	National Election Commission	www.ceni-tg.org/	Yes
Tonga	27-Nov-14	Electoral Commission	www.tongaelections.com/	Yes
Tunisia	07-Dec-14	Independent Election Commission	www.isie.tn/	Yes
Turkey	10-Aug-14	Supreme Electoral Council	http://www.ysk.gov.tr	Yes
Ukraine	26-Oct-14	Central Election Commission	www.cvk.gov.ua	Yes
United States	04-Nov-14	Local Authorities	www.fec.gov	Yes
Uruguay	30-Nov-14	Electoral Court	www.corteelectoral.gub.uy/	No
Venezuela	14-Apr-13	National Electoral Court	www.cne.gov.ve/web/index.php	Yes
Zimbabwe	31-Jul-13	Election Commission	www.zec.gov.zw/	Yes

Appendix F: EMB Website Content Analysis Coding Scheme

Coders were instructed to:

- Access the website in the country's official language (if applicable), and not to use internet translating functions.
- Mark no if there was a space for the material, but the area was under construction or not loading
- Mark no if the material was only found in a legal text, such as an election law or constitution (except for the question that specifically refers to legal texts)

Variable	Question
Eligibility to Vote	Does the website provide information about the qualifications to vote? (ex. age, residency qualifications)
Alternative Voting Measures	Are there alterative options for voting, besides casting a ballot at a polling station on election day? (If so, list types and any restrictions)
Foreign Voters	If a voter out of the country, is there information about voting options?
Disabled Voters	Is information available that mentions options for additional assistance for disabled voters to cast their ballot?
Electoral district	Can citizens check their electoral district or polling division online? (this does not include specific polling station locations)
Voter Identification	Does the website contain information about what documents (ex. voting card, identification) are required to vote?
Voter Registration Information	Are registration procedures posted online?
Contact Email	Does the website provide information about contacting the EMB: Via email/email form?
Contact In Person	Does the website provide information about contacting the EMB: In person? (This may include regional or local offices, hours of operation, building information, maps etc.)
Contact Post	Does the website provide information about contacting the EMB: Via post? (Must include all information to send mail to the EMB, such as postal codes etc.)
Contact Telephone	Does the website provide information about contacting the EMB: Via telephone?
Contact Specific Names/Departments	Does the website list names and/or contact information of specific divisions (whether individually or through a contact form) rather than a 'catch all' email address or form?
Electoral Laws and Fraud	Are citizens provided information about election laws or what constitutes electoral fraud?
Complaints	Are citizens directed as to how to lodge complaint about the election procedure? (Specify how if possible)
Election Results	Can you access vote count for the last Legislative or Presidential election final vote count? (If not, record most recent election for which there are results)
Election Results Smaller Units	Can you access in smaller units than the national total? (ex. by constituency, region, polling station etc.)
EMB member(s) name	Are the names of the EMB members, electoral commissioners, or civil servant who is in charge of elections printed on the website?
EMB member(s) qualifications	Are their qualifications, experience or biography printed on the website?
Hierarchy	Is there information about the election administration hierarchy or accountability structure?
Reporting	Are reports on the activities of the EMB made available online? (please note date and type of most recent report)

Appendix G: Mokken Scaling of EMB Capacity Score

Mokken Scaling (all 20 Items)

Scale 1

Item	Obs.	Mean Score	Observed Guttman errors	Expected Guttman errors	Loevinger H coeff	z-stat.	p-value	Number of NS Hjk
Election Results	99	0.8384	1	12.12	0.9175	7.04	0.00	0
Election Results Smaller Units	99	0.7576	1	12.12	0.9175	7.04	0.00	0
Scale	99		1	12.12	0.9175	7.04	0.00	

Scale 2

Item	Obs.	Mean Score	Observed Guttman errors	Expected Guttman errors	Loevinger H coeff	z-stat.	p-value	Number of NS Hjk
Contact Specific Names/Departments	99	0.60	19	43.73	0.56	6.83	0.00	0
Hierarchy	99	0.70	17	39.59	0.57	6.51	0.00	0
EMB member(s) name	99	0.89	4	18.28	0.78	5.68	0.00	0
EMB member(s) qualifications	99	0.51	16	40.18	0.60	6.60	0.00	0
Scale	99		28	70.89	0.60	9.06	0.00	0

Scale 3

Item	Obs.	Mean Score	Observed Guttman errors	Expected Guttman errors	Loevinger H coeff	z-stat.	p-value	Number of NS Hjk
Disabled Voters	99	0.58	40	78.61	0.49	8.26	0.00	0
Foreign Voters	99	0.61	39	78.73	0.50	8.58	0.00	0
Voter Identification	99	0.69	26	71.94	0.63	10.36	0.00	0
Eligibility to Vote	99	0.71	19	68.44	0.72	11.33	0.00	0
Voter Registration Information	99	0.54	40	74.73	0.46	7.37	0.00	0
Scale	99		82	186.22	0.55	14.45	0.00	0

Scale 4

Item	Obs.	Mean Score	Observed Guttman errors	Expected Guttman errors	Loevinger H coeff	z-stat.	p-value	Number of NS Hjk
Contact In Person	99	0.65	7	14.44	0.51	3.59	0.00	0
Contact Post	99	0.82	7	15.3	0.54	4.21	0.00	0
Contact Telephone	99	0.94	2	7.42	0.73	4.08	0.00	0
Scale	99		8	18.59	0.56	4.74	0.00	0

Scale 5

Item	Obs.	Mean Score	Observed Guttman errors	Expected Guttman errors	Loevinger H coeff	z-stat.	p-value	Number of NS Hjk
Voter Identification	99	0.69	10	35.88	0.72	8.38	0.00	0
Eligibility to Vote	99	0.71	7	34.79	0.79	9.10	0.00	0
Voter Registration Information	99	0.54	7	31.64	0.77	7.68	0.00	0
Scale	99		12	51.15	0.76	10.26	0.00	0

Mean scores were created for:

- Transparency (results): Election Results, Election Results Smaller Units
- Information: Disabled Voters, Foreign Voters, Voter Identification Information, Voter Registration Information
- Transparency (personnel): Contact Specific Names/Departments, Hierarchy, EMB member(s) name, EMB member(s) qualifications
- Communication: In-person, Post, Telephone

The overll capacity scale was determined using Mokken Scaling:

Item	Obs.	Mean Score	Observed Guttman errors	Expected Guttman errors	Loevinger H coeff	z-stat.	p-value	Number of NS Hjk
Information	99	0.53	12	19.70	0.39	2.82	0.00	0
Transparency	99	0.79	15	22.47	0.33	3.64	0.00	0
Communication	99	0.81	17	27.02	0.37	3.47	0.00	0
Scale	99		29	54.9	0.36	4.03	0.00	0

Appendix H: Dimensions of Capacity

Country	Information (0-1)	Communication (0-1)	Transparency – Results (0-1)	Transparency – Personnel (0-1)
Afghanistan	0.80	1.00	1.00	1.00
Albania	0.60	1.00	1.00	1.00
Algeria	0.80	0.67	0.50	0.00
Angola	0.00	1.00	0.00	0.75
Argentina	0.40	1.00	1.00	0.25
Armenia	0.00	0.67	1.00	1.00
Australia	1.00	1.00	1.00	0.75
Austria	1.00	0.67	1.00	0.75
Azerbaijan	0.40	0.67	0.50	1.00
Bahrain	0.80	1.00	1.00	0.00
Bangladesh	0.40	1.00	0.50	1.00
Barbados	0.60	0.33	0.00	0.25
Belarus	0.00	1.00	1.00	0.75
Belgium	1.00	0.33	1.00	0.25
Bhutan	1.00	1.00	1.00	0.75
Bolivia	0.00	1.00	1.00	0.00
Bosnia	0.60	0.67	1.00	0.75
Botswana	1.00	0.67	1.00	0.25
Brazil	0.40	1.00	1.00	1.00
Bulgaria	1.00	1.00	1.00	0.75
Burkina Faso	0.60	0.67	1.00	0.75
Cambodia	0.60	0.67	1.00	1.00
Cameroon	0.60	0.33	0.50	1.00
Chile	0.80	1.00	1.00	1.00
Colombia	1.00	1.00	1.00	1.00
Congo	0.80	0.00	0.00	0.25
Costa	1.00	1.00	1.00	1.00
Cyprus	1.00	1.00	0.50	0.00
Czech Republic	0.80	1.00	1.00	0.75
Djibouti	0.00	0.33	0.00	0.50
Ecuador	0.40	1.00	1.00	1.00
Egypt	0.80	0.33	1.00	0.25
El Salvador	0.00	1.00	1.00	0.50
Fiji	1.00	1.00	1.00	0.50
Georgia	0.80	0.67	1.00	1.00
Germany	0.80	1.00	1.00	0.50
Ghana	0.20	0.67	0.00	1.00
Granada	0.00	1.00	0.00	0.25

Country	Information (0-1)	Communication (0-1)	Transparency – Results (0-1)	Transparency – Personnel (0-1)
Guinea	0.60	0.00	0.00	0.75
Guinea-Bissau	0.00	0.67	1.00	0.25
Honduras	0.00	0.33	1.00	1.00
Hungary	1.00	1.00	1.00	1.00
Iceland	0.80	1.00	1.00	0.75
India	0.80	1.00	1.00	0.75
Indonesia	0.60	1.00	1.00	1.00
Iran	0.40	0.67	0.00	0.50
Iraq	0.80	0.67	1.00	1.00
Israel	0.80	0.33	0.50	0.25
Italy	0.80	0.67	1.00	0.75
Japan	1.00	1.00	1.00	0.50
Jordan	0.80	1.00	1.00	0.75
Kenya	0.80	1.00	1.00	1.00
Korea	1.00	1.00	1.00	1.00
Kuwait	0.00	0.00	1.00	0.00
Latvia	0.80	1.00	1.00	1.00
Lithuania	0.40	0.67	1.00	0.75
Macedonia	0.20	1.00	1.00	0.75
Madagascar	0.00	0.33	0.50	0.50
Malawi	0.00	1.00	1.00	1.00
Malaysia	1.00	1.00	0.00	1.00
Maldives	0.00	0.67	0.50	0.25
Malta	1.00	1.00	1.00	0.75
Mauritania	0.20	1.00	1.00	0.50
Mauritius	0.80	1.00	1.00	0.75
Mexico	1.00	1.00	1.00	1.00
Micronesia	0.00	0.67	1.00	0.25
Moldova	0.80	1.00	1.00	1.00
Mongolia	1.00	1.00	1.00	1.00
Montenegro	0.00	0.67	0.00	0.50
Namibia	0.60	1.00	1.00	1.00
Nepal	0.60	0.67	1.00	1.00
Netherlands	1.00	1.00	1.00	0.75
New Zealand	1.00	0.67	1.00	1.00
Norway	1.00	1.00	1.00	1.00
Pakistan	0.60	1.00	1.00	0.75
Panama	0.60	0.67	1.00	1.00
Paraguay	1.00	1.00	1.00	1.00
Philippines	0.80	1.00	1.00	1.00

Country	Information (0-1)	Communication (0-1)	Transparency – Results (0-1)	Transparency – Personnel (0-1)
Romania	1.00	0.67	1.00	1.00
Rwanda	1.00	0.33	0.00	0.75
Serbia	0.00	1.00	1.00	0.75
Sierra Leone	0.60	0.33	1.00	0.50
Slovakia	1.00	1.00	1.00	0.50
Slovenia	1.00	1.00	0.50	0.75
Solomon Islands	0.80	1.00	0.50	0.00
South Africa	1.00	1.00	1.00	1.00
Swaziland	0.60	1.00	0.00	0.25
Sweden	1.00	1.00	1.00	0.00
Tajikistan	0.00	1.00	0.00	0.50
Thailand	1.00	1.00	1.00	0.25
Togo	0.60	0.67	1.00	0.50
Tonga	0.60	1.00	0.00	0.50
Tunisia	1.00	1.00	1.00	0.50
Turkey	0.60	0.67	1.00	0.50
Ukraine	0.80	0.67	1.00	1.00
United States	1.00	0.67	0.00	1.00
Uruguay	0.60	1.00	1.00	0.50
Venezuela	0.00	1.00	1.00	0.50
Zimbabwe	0.80	0.67	1.00	1.00

Appendix I: Capacity Scores (full)

Capacity Score (0-3)	Country
3	Australia, Bhutan, Bulgaria, Colombia, Costa Rica, Fiji, Hungary, Japan, Korea, Malta, Mexico, Mongolia, Netherlands, Norway, Paraguay, Slovakia, South Africa, Sweden, Thailand, Tunisia
2.8	Afghanistan, Bahrain, Chile, Czech Republic, Germany, Iceland, India, Jordan, Kenya, Latvia, Mauritius, Moldova, Philippines
2.67	Austria, Botswana, New Zealand, Romania
2.6	Albania, Indonesia, Namibia, Pakistan, Uruguay
2.5	Cyprus, Slovenia,
2.47	Georgia, Iraq, Italy, Ukraine, Zimbabwe
2.4	Argentina, Brazil, Ecuador
2.33	Belgium
2.3	Solomon Islands
2.27	Bosnia, Burkina Faso, Cambodia, Nepal, Panama, Togo, Turkey
2.2	Macedonia, Mauritania
2.13	Egypt
2.07	Lithuania
2	Belarus, Bolivia, El Salvador, Malawi, Malaysia, Serbia, Venezuela
1.97	Algeria
1.93	Sierra Leone
1.9	Bangladesh
1.67	Armenia, Guinea-Bissau, Micronesia, United States
1.63	Israel
1.6	Swaziland, Tonga
1.57	Azerbaijan
1.43	Cameroon
1.33	Honduras, Rwanda
1.17	Maldives
1.07	Iran
1	Angola, Granada, Kuwait, Tajikistan
0.93	Barbados
0.87	Ghana
0.83	Madagascar
0.8	Congo
0.67	Montenegro
0.6	Guinea
0.33	Djibouti

Appendix J: Email Test

Email #1 (English)
Subject line: Voter Registration

Hello,

I have just moved to a different city, and I was wondering how to make sure I am registered to vote here.

Thank you,

NAME

Email #2 (English)

Subject line: Residency?

Greetings,

I have been living outside of the country for the past year. I was wondering if I am still eligible to vote?

Thanks,

NAME

Experiment Coding
0 – No responses (or automatic reply)
1 – One substantive response (including referral, request for additional information in order to assist, or answer to the question)
2 – Two substantive responses

Appendix K: Country-Level Variables

Variable	Coding	Source
Election Management Body Design	Governmental, Mixed or Independent Note: In this study, Governmental and Mixed were collapsed into one category, since too few countries in the dataset had mixed EMBs. (Independent 1, Mixed or Governmental 0)	International IDEA Global Database on Elections and Democracy (http://www.idea.int/elections/emd/electoral-management-design-database.cfm)
GDP	Gross Domestic Product, per capita, PPP, constant 2000 international $, 2013 has 2012 values.	World Bank (www.worldbank.org) Acquired from: from PEI_3.0.
OECD Membership	Is the country holding the election a member of the Organization for Economic Cooperation and Development (OECD)? This is a dichotomous variable (no: 0, yes: 1)	OECD (http://www.oecd.org/) Acquired from: from PEI_3.0.
Freedom House Electoral Democracy	From Freedom House assigns the designation 'electoral democracy' to countries that meet minimum standards for political rights (see methodology: https://freedomhouse.org/report/freedom-world-2015/methodology) This is a dichotomous variable (Non-Electoral Democracy: 0, Electoral Democracy: 1)	Freedom House (www.freedomhouse.org) This study uses the 2015 data release.
World Bank Government Effectiveness	Quality of public service provision, the quality of the bureaucracy, the competence of civil servants, the independence of the civil service from partisan pressures, and the credibility of the government's commitment to policies. (-2.5 to 2.5)	Quality of Governance Dataset (http://qog.pol.gu.se/data) January 2015
Internet use	Internet users per 100 persons (0-100) No data was available on this dataset for Macedonia, so 2014 data from the World Bank was added. http://data.worldbank.org/indicator/IT.NET.USER.P2	Quality of Governance Dataset (http://qog.pol.gu.se/data) January 2015
Regime Durability/Length of Democracy	The number of years since the last regime transition that led to a three point change or greater from previous year. Note: Polity studies only countries with populations of 500000 or more. For these countries, the length of democracy was estimated using the following sources: Barbados (1966) http://thecommonwealth.org/our-member-countries/barbados/constitution-politics Grenada (1983) http://news.bbc.co.uk/2/hi/americas/1209649.stm Montenegro (2003) https://freedomhouse.org/report/freedom-world/2007/montenegro#.Vb_SivlViko Maldives (2008) https://freedomhouse.org/report/freedom-world/2010/maldives#.Vb_S0vlViko Tonga (2010) https://freedomhouse.org/report/freedom-press/2013/tonga#.Vb_TrvlVikp Micronesia (1979) https://freedomhouse.org/report/freedom-world/2003/micronesia#.Vb_TVvlViko	Polity (http://www.systemicpeace.org/polity/polity4.htm) Acquired from: from PEI_3.0.

	Serbia (2004) http://www.systemicpeace.org/polity/ser2.htm Iceland (1944) (https://freedomhouse.org/report/freedom-world/2015/iceland) Malta (1964) (http://www.parlament.mt/historicalbackground?l)	

Datasets:

International IDEA, Global Database on Elections and Democracy, *http://www.idea.int/db/*

Norris, Pippa; Martinez i Coma, Ferran; Gromping, Max, 2015, "Perceptions of Electoral Integrity, Version 3",*http://dx.doi.org/10.7910/DVN/29114*, Harvard Dataverse, V3

Teorell, Jan, Stefan Dahlberg, Sören Holmberg, Bo Rothstein, Felix Hartmann & Richard Svensson. 2015. The Quality of Government Standard Dataset, version Jan15. University of Gothenburg: The Quality of Government Institute, *http://www.qog.pol.gu.se*

Freedom House, Freedom in the World 2015, *https://freedomhouse.org/report/freedom-world-2015*

Appendix L: Public Perceptions of Electoral Integrity

World Values Survey

Variable	Description
Election Officials are Fair	In your view, how often do the following things occur in this country's elections? Election officials are fair 0. Not at all often or Not often 1. Fairly or very often
Votes Counted Fairly	In your view, how often do the following things occur in this country's elections? Votes are counted fairly 0. Not at all often or Not often 1. Fairly or very often

Dataset: WORLD VALUES SURVEY Wave 6 2010-2014 OFFICIAL AGGREGATE v.20150418. World Values Survey Association (www.worldvaluessurvey.org)

Appendix M: Expert Perceptions of Electoral Integrity

Perceptions of Electoral Integrity Index 3.0

Period	Sections	Questions	Direction*
Pre-election	1. Electoral laws	1-1 Electoral laws were unfair to smaller parties	N
		1-2. Electoral laws favored the governing party or parties (N)	N
		1-3 Election laws restricted citizens' rights	N
	2. Electoral procedures	2-1. Elections were well managed	P
		2-2. Information about voting procedures was widely available	P
		2-3. Election officials were fair	P
		2-4. Elections were conducted in accordance with the law	P
	3. Boundaries	3-1. Boundaries discriminated against some parties	N
		3-2. Boundaries favored incumbents	N
		3-3. Boundaries were impartial	P
	4. Voter registration	4-1. Some citizens were not listed in the register	N
		4-2. The electoral register was inaccurate	N
		4-3. Some ineligible electors were registered	N
	5. Party registration	5-1. Some opposition candidates were prevented from running	N
		5-2 Women had equal opportunities to run for office	P
		5-3. Ethnic and national minorities had equal opportunities to run for office	P
		5-4. Only top party leaders selected candidates	N
		5-5. Some parties/candidates were restricted from holding campaign rallies	N
Campaign	6. Campaign media	6-1. Newspapers provided balanced election news	P
		6-2. TV news favored the governing party	N
		6-3. Parties/candidates had fair access to political broadcasts and advertising	P
		6-4. Journalists provided fair coverage of the elections	P
		6-5 Social media were used to expose electoral fraud	P
	7. Campaign finance	7-1 Parties/candidates had equitable access to public subsidies	P
		7-2. Parties/candidates had equitable access to political donations	P
		7-3 Parties/candidates publish transparent financial accounts	P
		7.4 Rich people buy elections	N
		7-5. Some states resources were improperly used for campaigning	N
Election day	8. Voting process	8-1. Some voters were threatened with violence at the polls	N
		8-2 Some fraudulent votes were cast	N
		8-3 The process of voting was easy	P
		8-4 Voters were offered a genuine choice at the ballot box	P
		8-5 Postal ballots were available	P
		8-6 Special voting facilities were available for the disabled	P
		8-7 National citizens living abroad could vote	P
		8-8 Some form of internet voting was available	P
Post-election	9. Vote count	9-1. Ballot boxes were secure	P
		9-2 The results were announced without undue delay	P
		9-3 Votes were counted fairly	P
		9-4 International election monitors were restricted	N
		9-5 Domestic election monitors were restricted	N

	10.Post-election	10-1 Parties/candidates challenged the results 10-2 The election led to peaceful protests 10-3 The election triggered violent protests 10-4 Any disputes were resolved through legal channels	N N N P
	11. Electoral authorities	11-1. The election authorities were impartial 11-2. The authorities distributed information to citizens 11-3 The authorities allowed public scrutiny of their performance 11-4 The election authorities performed well	P P P P
Background of Experts (Selected)			
Domestic Expert		Domestic experts are living in the country of the election while the international expert is someone with expertise in the country but living in a different country. (0/1).	
Age Group		Expert of the age recoded by the decade the expert was born (by decade)	
Gender		Female (1) or Male (0)	
Ideology		Respondents used the left/right scale to place their personal ideological stance, one being very left and 10 very right.	

***** Direction of the original items P=positive, N=negative**.**

Dataset: Norris, Pippa; Martinez i Coma, Ferran; Gromping, Max, 2015, "Perceptions of Electoral Integrity, Version 3",http://dx.doi.org/10.7910/DVN/29114, Harvard Dataverse, V3

For more details on the Perceptions of Electoral Integrity Index, including all the component variables, see https://sites.google.com/site/electoralintegrityproject4/projects/expert-survey-2

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