

Université de Montréal

What Voting Rules Do Citizens Prefer?

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Résumé

Le système électoral fait de plus en plus objet de débats et de discussions au Canada et ailleurs dans le monde. Bien qu'il existe de nombreuses études sur les avantages et les inconvénients des différents systèmes électoraux, très peu d'entre elles examinent les préférences des citoyens concernant les modes de scrutin et plus particulièrement la façon dont les individus expriment leur choix sur le bulletin de vote. Dans le cadre de ce mémoire, je m'attarde aux questions suivantes : quelle façon de voter les citoyens préfèrent-ils et pourquoi ? Afin de répondre à ces questions, j'ai mené une expérience en laboratoire avec près de 200 participants dans le cadre des élections fédérales canadiennes de 2019. Les participants furent invités à voter dans une série d'élections en utilisant chacune des trois façons de voter suivantes en ordre aléatoire : scrutin à vote unique, vote par approbation et vote par rangement. Après chaque vote, les participants furent informés du résultat électoral dans leur groupe et interrogés sur leur niveau de satisfaction à l'égard de chaque façon de voter. Les résultats démontrent que les citoyens préfèrent avoir la possibilité de classer les partis plutôt que d'utiliser un scrutin à vote unique ou un vote par approbation. Les individus sont également plus susceptibles d'aimer un mode scrutin lorsqu'ils sont satisfaits des résultats de l'élection.

Mots clés : systèmes électoraux, mode de scrutin, vote par rangement, scrutin à vote unique, vote par approbation, expérience en laboratoire

Abstract

Debates over which electoral system would best serve the general public are on the rise in Canada and in other democratic countries. Although there exists a rich literature on the benefits and shortcomings of different electoral systems, very few studies examine citizens' preferences regarding voting rules and the ways in which individuals can cast their vote. In this paper, I address the following questions: What voting rules do citizens prefer and why? To address these questions, I conducted a within-subject laboratory experiment with nearly 200 participants in the run up to the 2019 Canadian federal election. Participants were asked to vote in a set of elections using each of the three following types of ballots in random order: one-mark ballot, approval voting and ranked voting. After each vote, participants were informed of the election results and asked about their level of satisfaction with each voting system. The results show that citizens prefer having the option to rank order the parties rather than using a one-mark ballot or approval voting. Individuals are also more likely to favour voting rules when they are satisfied with the results of the election.

Keywords: electoral systems; ballots; ranked voting; one-mark ballot; approval voting; laboratory experiment

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Introduction

Electoral systems are a crucial component of the political process as they establish the way in which voters express their preferences on the ballot and how these votes are tabulated to elect political representatives. Beyond these mechanical effects, electoral rules can also shape the behaviour of voters and parties (Duverger 1951). They affect citizens' vote choice and satisfaction with democracy (Anderson and Guillory 1997; Blais et al. 2012; Farrell and McAllister 2006; Lijphart 2012) and the party system and political climate, that is the number of political parties (Duverger 1963; Katz 1997; Neto and Cox 1997; Taagepera and Shugart 1989), the strategy of political elites (Carey and Shugart 1995; Cox 1990; Calvo and Hellwig 2011) and the relationship between parties (Shugart 2001). It is, therefore, not surprising that many governments around the world are revisiting their electoral system.

In recent years, there have been numerous debates around electoral reform in Canada. During the 2015 campaign, Justin Trudeau vowed that if he won the election, Canadians would not vote under the current first-past-the-post system in the next federal election (Stone 2017). The leader of the Liberal Party had expressed on numerous occasions his preference for Canadians to use a ranked ballot to elect their members of parliament. However, shortly after he was elected, Prime Minister Trudeau declined the proposition of the Special Committee on Electoral Reform and broke his promise to change the voting system. Over the last two decades, the provinces of British Columbia, Prince Edward Island and Ontario have held referendums on electoral reform and the Québec premier, François Legault, had promised that Québec citizens would do the same in 2022 (Pilon 2004; Roberge 2021).

The discussion around electoral reform is not limited to Canada. In the United States, numerous cities and states have recently adopted or are discussing adopting a preferential voting system, such as ranked-choice voting, in the hope of improving electoral democracy (Fair Vote 2021). For example, New York City held its first mayoral election primaries under ranked-choice voting in June 2021. New Zealanders voted in favour of a mixed-member proportional system both in 1993 and in 2011 (Nagel 2012) and British citizens were asked whether the United Kingdom should switch to the alternative vote system to elect their members of parliament in 2011 (Electoral Commission 2011).

Citizens' views about electoral systems are particularly important at a time when national, sub-national and local governments around the world are re-evaluating their electoral rules and using referendums to determine whether or not they should adopt reforms. A large body of literature examines the consequences of voting systems on electoral results, vote choice, political representation and the party system (Cox 1997; Lijphart 1990; Farrell 2011; Ezrow 2010). However, few studies explain why citizens prefer one voting system over another. In knowing citizens' preferences, governments can implement voting rules that are supported by a great number of individuals, propose viable options in referendums, or determine whether an electoral reform is even needed.

In this study, I focus on citizens' preferences with regard to the ballot type, as this aspect of the electoral system is much less studied. The ballot type refers to the different ways in which citizens can cast their vote on the ballot. Categorical or nominal ballot types force citizens to vote for a single party or candidate, whereas multi-mark ballots or ordinal balloting allow citizens to express their preferences on more than one candidate or party (Rae 1971). Multi-mark ballots reveal a greater amount of information on voters' preferences. As a trade-off, these ballots are

arguably more complicated, because it is more difficult to use, it takes more time to tabulate the votes, and citizens must make an informed decision about a greater number of candidates or parties (Blais and Massicotte 2004).

This master's thesis aims to answer two fundamental questions: What voting rules do citizens prefer and why? I examine which voting rules citizens prefer between 1) the current *one-mark ballot* in Canada, offering voters a categorical vote choice, 2) *ranked voting*, a system where voters list their votes in order of preference, and 3) *approval voting*, a system in which voters must either approve or disapprove each party/candidate on the ballot. Scholarly research on this topic remains limited and does not pay sufficient attention to issues of causal inference. In fact, past studies failed to allow citizens the experience of voting with different ballot types in the context of a real election with real parties or candidates, and they didn't grant voters the opportunity to see the potential electoral consequences of different voting methods.

In an attempt to address these shortcomings, I conducted a within-subject laboratory experiment during the 2019 Canadian federal election campaign. Nearly 200 participants were asked to vote for the actual parties running in the election, using each of the voting rules mentioned above (one-mark ballot, ranked voting, and approval voting) in random order. After casting their vote, participants were informed about the results within their group and were asked to express their satisfaction with the voting rule. My findings show that citizens are significantly more satisfied with ranking their preferences and appreciate one-mark ballots and approval voting equally. This study suggests that citizens prefer ballots that allow them to better express their preferences and they are more satisfied with voting rules when they like the results that they produce. I also show that citizens' preferences in voting rules cannot be explained by individuals' traits and competencies such as their need to evaluate, their need for cognition or their numeracy.

In the first chapter of this thesis, I present an overview of the various electoral systems used in democracies around the world and I introduce the three ballot types studied in this thesis; one-mark ballots, ranked voting and approval voting. I then examine, in the second chapter, the different aspects of the ballot and individual factors that may explain voters' preferences. Chapter 3 serves to contextualize the study, by presenting the history of electoral reform in Canada and the case of the 2019 Canadian federal election. I then describe the experimental design and the methodology in the fourth chapter. Finally, in Chapters 5 and 6, I present the results of the laboratory experiment and discuss the implications of these results.

Chapter 1. Typology of Electoral Systems and Ballot Types

There exist over two-hundred variations of electoral systems and voting rules around the world (Golder 2005). It is therefore crucial to provide a clear classification of electoral systems. Most voting theorists agree that electoral systems can be differentiated by their *electoral formula*, that is the way in which votes are tabulated, their *district magnitude*, meaning the number of seats per district; and their *ballot type*, which refers to the way in which voters express their electoral preferences (Blais 1988; Rae 1971). Although district magnitude has the greatest impact on the proportionality of the electoral results (Rae 1971; Taagepera and Shugart 1989; Lijphart 1994; Farrell 2011), most classifications of electoral systems focus on the electoral formula (Rae 1971; Blais and Massicotte 2004). The first chapter of this thesis provides a brief overview of the theoretical dimensions of electoral systems and ballot types.

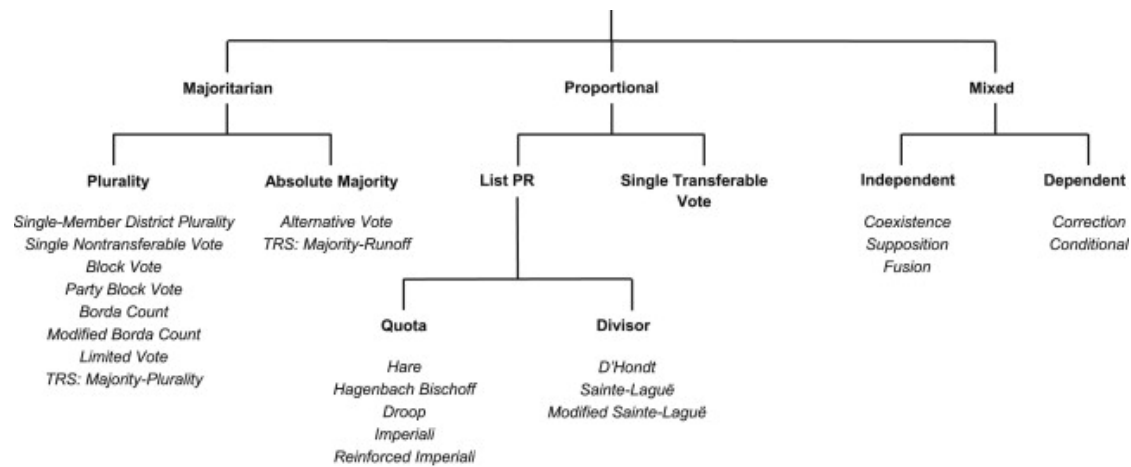
1.1 The Electoral Formula

1.1.1 Majoritarian Systems

Electoral systems fall into three main categories depending on their electoral formula: majoritarian, proportional and mixed systems (Bormann and Golder 2013) (see Figure 1). In majoritarian systems the winner is the candidate or party with the most votes within their constituency or district. These systems are said to favour a strong and stable majority government as well as local representation, as elected officials represent the interests of their constituents (Norris 1997). Majoritarian systems are mainly used in single-member districts.

This type of system is further classified depending on whether or not a candidate or party must obtain an absolute majority of the votes to be declared the winner. In plurality systems, also known as first-past-the-post (FPTP), the winner is the candidate with the most votes, whereas in absolute majority systems the winner must secure more than half of the votes. Members of Parliament in Westminster democracies, such as Canada and the UK, are elected using first-past-the-post. The alternative vote, an absolute majority rule where voters rank their preferences on the ballot, is employed for the election of the House of Representatives in Australia. Other countries such as France, Poland and Austria elect their presidents in a majority runoff or two-round system (TRS), whereby the elected official must win with an absolute majority of the votes through potentially two rounds of elections.

Figure 1. Classification of Electoral Systems



Note: Figure 2 lists those electoral systems used in democratic national-level lower house legislative elections from 1946 through 2011.

Source: Bormann, N. C., Golder, M. 2013. "Democratic electoral systems around the world, 1946–2011." *Electoral Studies* 32(2): 360-369.

1.1.2 Proportional Systems

Proportional representation (PR) is the most commonly used electoral system around the world (Farrell 2011). The conception of representation in PR systems differs from majoritarian systems in the sense that the elected body aims to be a representative sample of the whole population. In order for elected officials to represent the interests of all citizens, advocates of this system believe that political parties should be represented in near exact proportion to the number of votes that they obtain (Blais and Massicotte 2004). Proportional representation (PR) is thus only used in multimember districts and allows for smaller parties to obtain seats more easily. There are two main types of PR systems: list systems, whereby political parties put forward a list of as many candidates as there are seats in a given district, and single transferable vote (STV), whereby voters rank order candidates from multiple parties on their ballot, granting voters more freedom.

List systems can be further classified based on whether quotas or divisors are used to allocate the seats. Quotas are the number of votes that are needed for a party to obtain a seat in a particular district. In quota-based systems, the quota is calculated by dividing the total number of votes in a district by the number of available seats in that same district. Each party's total number of votes is then divided by the quota. The resulting whole number equals the initial number of seats each party obtains. The remaining seats are given to the parties that have the highest remainder of unused votes. The Hare quota is the most common of quota-based methods and used for legislative elections in Costa Rica, Honduras and Denmark. In divisor-based systems, each party's total number of votes is divided by a series of numbers, D'Hondt being the most common method. The parties with the highest resulting quotients are then allocated seats. For example, if five seats are allocated in a given district, the five highest quotients are awarded a seat. A divisor

based proportional list system is used for legislative elections in Argentina, Spain and Switzerland, amongst other countries.

STV is said to be candidate-centered, meaning that citizens vote for candidates and not parties. Voters in each district rank order the candidates. In the first round of vote counts, each voters' first choice candidate obtains a vote. In order to obtain a seat, candidates must reach a certain quota of votes. If there are not enough candidates that reach this quota, then the candidate with the lowest number of votes is eliminated. First choice votes for that candidate and surplus votes for the candidates who did obtain a seat are then reallocated to the other candidates according to the voters' second choice. This process continues until all seats are allocated in the district. Ireland is currently the only country to use STV for its legislative elections.

1.1.3 Mixed Systems

Finally, a number of democracies elect their officials using a mixed system, which combines the formulas of both majoritarian and proportional electoral systems in a given election (Blais and Massicotte 2004). We can distinguish two main types of mixed systems: independent and dependent systems. Independent voting systems, such as in Japan and Russia, assign a certain number of seats using PR, and another number of seats through plurality or the absolute majority rule. In dependent voting systems, voters cast one vote for a local candidate and another for a national party. Officials are first elected within their district or constituency using a majoritarian electoral rule. Then, the second votes are used to compensate for the disproportional representation of votes in the single-member seats. Therefore, smaller parties are potentially compensated for doing more poorly in the plurality rule vote. Germany is an example of a country that employs a

dependent (compensatory) electoral formula. Mixed systems, though more complicated, are said to combine the advantages of both proportional and majoritarian systems.

1.2. The Ballot Type

An important and understudied feature of electoral systems is the ballot type. The ballot type impacts both the input and the output of elections, that is the way in which citizens cast their vote on the ballot and the way in which voters' interests are represented in government. Past research has shown that the ballot type has an influence on the electoral success of parties (Blumenau et al. 2016), public policy (Däubler and Hix 2018), the descriptive representation of candidates (John et al. 2018), the behaviour of legislators (Chang 2005; Parker and Richter 2018), citizens' vote choice (Aguilar et al. 2015), and their satisfaction with democracy (Bosch and Orriols 2014).

Blais (1988) identifies three aspects of the ballot: the object of the vote, the number of votes and the type of vote. The object of the vote refers to whether citizens vote for party lists, individual candidates or both parties and candidates. There are two main types of party lists. In closed-list systems, citizens vote for political parties. Each party determines the order in which candidates on their list are attributed a seat. In open-list systems, citizens vote for candidates and the candidates with the most votes within and across the different parties are elected. In contrast to closed-list systems, voters not only determine the number of seats each party obtains but also which candidates among those on each party list are given a seat. There is therefore more intra-party competition in open-list systems, as candidates must not only compete against individuals from opposing parties, but also candidates within their political party (Blumenau et al. 2016). In

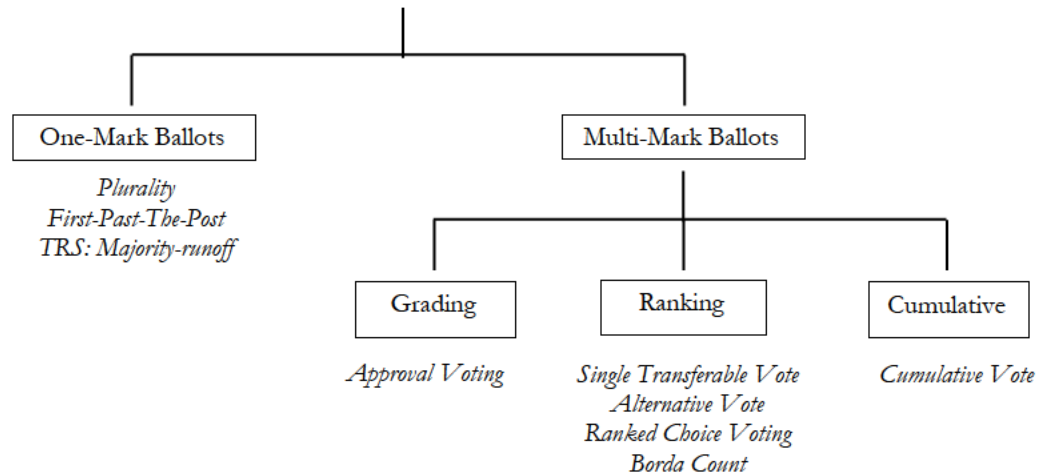
other systems, such as first-past-the-post, parties nominate one candidate in each district, and voters must choose between these different candidates. In various mixed systems, citizens can cast two votes; one to support a specific candidate and another to support a national party.

The ballot may also vary depending on the number of votes individuals cast on election day. In most elections, voters can only express their views on one candidate or party. However, several electoral systems allow voters to cast more than one vote. For example, preferential ballots grant voters the option to rank their preferences on the ballot and as mentioned above, in many mixed systems voters cast one vote using a majoritarian system and another using a proportional system.

In this thesis, I focus on the third aspect of the ballot, that is the type of vote citizens cast. There are two main types of voting rules: exclusive input rules (*one-mark ballots*), and distributive input rules (*multi-mark ballots*) (Maloy 2019). One-mark ballots limit citizens to vote for a single party or candidate, whereas multi-mark ballots allow people to distribute their votes amongst more than one option. Maloy (2019) further classifies three types of multi-mark ballot systems; 1) *grading systems*, in which voters must give a score to each candidate using a pre-determined scale, 2) *ranking systems*, where citizens rank their preferences in a linear order, and 3) *cumulative voting systems*, where voters are attributed a certain number of votes that they can distribute amongst one or many candidates. Figure 2 presents a classification of ballot types and examples of electoral systems for which each ballot structure is used.

This study considers citizens' satisfaction towards three distinct ballot types; 1) a *one-mark ballot* system, 2) *approval voting*, and 3) *ranked voting*.

Figure 2. Classification of Ballot Types Based on the Voting Method



1.2.1 One-Mark Ballots

In many democracies, such as Canada, citizens vote for a single candidate and the candidate with the most votes is elected (Bormann and Golder 2013). One-mark ballots, used for first-past-the-post, plurality and two-round systems, are arguably the least complex type of ballot for voters to employ and for votes to be counted (Burnett and Kogan 2015; Neely and Cook 2008). However, in comparison to multi-mark ballots, they are more restrictive with regard to the way in which voters can express their preferences. Under plurality, some voters tend to cast a strategic vote, meaning that they do not support their favourite candidate, but rather a viable candidate that they do not dislike (Maloy 2019). One-mark ballots such as plurality voting, also tend to lead to fewer political parties (Duverger 1951) and more wasted votes for citizens who do not choose to support a viable candidate (Neely and Cook 2008).

For the population in this study (Quebec citizens), the one-mark ballot represents the status quo. Participants would have experienced voting under the one-mark ballot plurality rule if they ever voted in municipal, provincial or federal elections in the past. Thus, this ballot style is most

likely the best known and understood by the population. Considering that the plurality rule is currently used for elections across Canada, it is only logical to measure citizens' satisfaction towards this voting system in particular. Moreover, plurality voting is used for national elections in many other countries such as the United States, the United Kingdom, and India.

1.2.2 Grading Ballots

Grading systems are a type of multi-mark ballot system in which voters must give a score to each candidate. However, there is a maximum number of votes or level of support that voters can give each candidate. To use the example of Maloy (2019, 88), teachers can give each student in their classroom a minimum grade of 0% and a maximum of 100%, and more than one student can obtain the same exact grade.

In this thesis, I examine citizens' level of satisfaction toward approval voting, because this voting system is the simplest amongst grading systems. Approval voting allows citizens to approve or disapprove each party/candidate. In other words, voters give each candidate a score of 1 or 0, and thus support as many candidates as they like. Each approval translates into one vote for that candidate and the candidate with the greatest number of approvals is elected. Although approval voting is more complicated than the one-mark ballot, this voting rule allows smaller parties to obtain more votes (Alos-Ferrer and Granic 2012) and promotes sincere voting (Brams and Fishburn 2007).

The city of Fargo in the American state of North Dakota, is one of the few areas where approval voting is used for a political race. Approval voting has also been adopted by many

organizations to elect board members, including the Mathematical Association of America and the Electrical and Electronics Engineers, Inc (Brams and Nagel 1991).

1.2.3 Ranking Ballots

Ranking implies that voters have the option to give different levels of support to candidates by ranking them on their ballot. The number of candidates that voters have the possibility to rank can vary. For example, in some cases, voters can rank order up to three candidates, whereas in other cases they may be permitted to place all the candidates in order of preference. However, in comparison to grading systems, ranking does not allow voters to express an equal level of support for more than one candidate.

There are various types of ranking such as the single transferable vote (STV), ranked-choice voting (RCV) — referred to as the alternative vote in Australia — and the Borda Count. Under ranked-choice voting, voters order their preferences on the ballot. A candidate must obtain more than half of the votes to be declared the winner. If no candidate obtains an absolute majority after all the first-choice votes are counted, then the second votes of those who supported the candidate with the least number of votes are counted. This process continues until one candidate wins with a majority of the votes.

In the United States, a growing number of states and cities are using RCV to elect their officials. This voting system is used in Alaska, Hawaii, Kansas and Wyoming for the primaries and it has been used for the first time in a presidential race in the state of Maine in 2020. Ranked choice voting is also currently implemented for local elections in 20 cities in the U.S. (Fair Vote 2021), and there are ongoing campaigns in Michigan, Massachusetts, Alaska and North Dakota to

implement this voting system at the state level. In Canada, three federal political parties, the Conservative Party of Canada, the New Democratic Party and the Green Party of Canada grant their members the possibility to rank order their preferences to elect their party leader (Patel 2020; New Democratic Party of Canada 2016; Green Party of Canada 2020) and the current prime minister of Canada, Justin Trudeau, had expressed his preference toward ranking in 2015 when discussing electoral reform for national elections in the country.

A less common yet relevant ranking system is the Borda Count, in which each order of preference is associated to a certain number of points. The tabulation of the votes using the Borda Count Method is different from ranked-choice voting or the alternative vote system, in the sense that there is only one round of counting. For example, a variation of the Borda Count allocates every voter's first choice candidate five points, their second choice three points and their third choice one point. Although the Borda Count is not currently used for any political race around the world, it is used to distribute points in the Eurovision Song Contest. This system is easier for participants to understand and produces more consensus-based results than other ranking systems (Emerson 2007), while still allowing voters the experience of ordering their preferences. Therefore, I have chosen to measure citizens' preferences toward a variation of the Borda Count, which I refer to as ranked voting throughout this thesis.

1.2.4 Cumulative Ballots

Finally, voters using cumulative ballots attribute a pre-determined number of votes to one or many candidates. For instance, in a district that elects four members of parliament, each citizen can cast four votes that they can allocate among one or more candidates. This type of ballot has

only been adopted for multi-seat contests in a few cities in the United States (Bowler et al. 2003) and in two regions in Germany (Bowler et al. 2018). Given that there are significantly more invalid ballots under cumulative voting and that this system requires a much greater level of cognitive effort, very few theorists and politicians have considered this ballot in policy discussions (Maloy 2019, 109). Thus, I do not measure citizens' satisfaction toward cumulative voting within the framework of this thesis.

Chapter 2. Preferences in Voting Rules

Past research has ascertained the advantages and disadvantages of various electoral systems (Blais 1991; Norris 1997), as well as citizens' and political elites' preferences for electoral rules, focussing mainly on the electoral formula (Banducci and Karp 1999; Bowler and Farrell 2006; Bol 2016). Values, ideology, self-interest and a bias toward the status-quo are proven to influence individuals' preferences (Aldrich et al. 2014; Blais et al. 2015; Bol 2016). Scholars have found that individual and elite values, such as inclusivity of all social groups in the decision-making process and fairness of the electoral rules, have an influence on citizens' preferences of electoral systems (Bol 2016; Bowler et al. 2006; Blais and Massicotte 1997; Banducci and Karp 1999). For instance, legislators located ideologically to the left of the political spectrum are more inclined to support electoral reform and those that are more favourable to the inclusion of social groups in government are more likely to support proportional representation or the alternative vote. Other scholarly work has demonstrated that political elites, as well as voters, prefer rules and systems that will favour the electoral performance of the party with which they identify (Bowler et al. 2006; Katz 2005; Blais et al. 2015).

The literature on citizens' preferences toward the type of ballot is thinner. In this chapter, I present the different aspects of the ballot and the individual characteristics of citizens, which may explain their preferences for voting rules. In particular, I predict that a desire for a better expression of preferences, self-interest, perceived difficulty of using the electoral rule, and individuals' need to evaluate, need for cognition and numeracy influence citizens' views.

2.1 Expression of Preferences

Although citizens can like different candidates equally or have clear ordered preferences, they do not necessarily have the opportunity to express their preferences in this manner on election day. Advocates of multi-mark voting rules argue that the main benefit of this type of ballot is that it allows voters the opportunity to express their electoral preferences more accurately and maximizes voter choice, by giving voters the option to express their views about more than one party/candidate. Voters consequently feel as though they have a greater influence on the electoral results and that these results are more legitimate and representative of the population's preferences, as preferential ballots ensure a maximum and full consideration of each elector's set of votes (Farrell and McAllister 2006). Two cross-country studies comparing citizens' level of satisfaction with democracy under closed- and open-list systems show that individuals are more satisfied with democracy when they are given greater choice (Bosch and Orriols 2014; Farrell and McAllister 2006). This is in line with voters' desire to have more direct control over politicians through a greater personalization of the electoral system (Renwick and Pilet 2016, 19).

Preferential voting systems can also reduce voters' propensity to vote strategically and thus allow voters to express their preferences more accurately (Blais et al. 2012; Green-Armytage et al. 2016). Citizens have stronger incentives to cast a strategic vote in one-mark ballot systems, as they want to avoid wasting their vote by supporting a candidate with a low probability of winning (Duverger 1951). In this type of system some voters must choose between increasing their favourite candidate's chances of victory or increasing their least favourite candidate's chances of losing. In contrast, multi-mark ballots make it more difficult for voters to predict which candidates are more likely to do well and win the election (Bartholdi and Orlin 1991). In ranked-choice voting

systems in particular, citizens have a diminished opportunity of wasting their vote as their second choice will be counted if their favourite candidate is eliminated. Thus, voters can rank their preferred candidate first and rank a more viable option second.

There are ideological and psychological reasons that lead us to believe that voters may be more satisfied when they support their preferred candidate, rather than when they cast a strategic vote. First, voters are more satisfied with democracy and the electoral results when they are ideologically closer to the elected government (Ezrow and Xezonakis 2011; Kim 2009). Given that strategic voters do not support their favourite candidate, these voters should be further placed ideologically relative to the party for which they voted. Second, the literature in psychology demonstrates that humans prefer to be cognitively consistent, meaning that they do not like to participate in actions that contradict their values, preferences and beliefs (Rosenberg 1956). Strategic voters may sense disappointment and remorse as they do not support their favourite candidate on the ballot (Singh 2014).

Although, there are theoretical arguments suggesting that citizens should prefer voting rules that allow them to better express their preferences, some studies have found that this is not actually the case (Blais et al. 2020; Müller and Jankowski 2019). Using data from an experimental survey conducted in Austria, England, Ireland and Sweden, a recent study by Blais et al. (2020) tested whether or not respondents were more satisfied with the voting rule when they could rank-order the parties on their ballot. Subjects were exposed to one of four possible voting scenarios, that differed in the number of parties on the ballot (three or five) and the type of vote they could cast (vote for a single party or rank the parties). The authors found that there was no overall difference in satisfaction between the elections where citizens could rank their preferences on the ballot compared to elections where they could only vote for a single party, regardless of the

respondent's level of education and the number of parties on the ballot. The results also show that Irish citizens, whose government is elected using the single transferable vote, do not significantly prefer ranking. This suggests that having experience using a ranked choice ballot does not lead citizens to prefer this voting system.

Two key aspects of the research design employed by Blais et al. (2020) may explain why the authors found that citizens do not favour voting rules that allow them to rank order the candidates on their ballot. First, voters were asked to choose amongst fictional parties, for which they do not necessarily have strong views and preferences. They simply knew where each party was located on a left-right ideological scale. Therefore, individuals may not have strongly identified with the different parties and consequently may have found it difficult to rank their preferences. Second, the respondents in this study were not aware of the outcome of the election, and thus were not conscious of the effects that the voting rules may have on the results of the election. When seeing the results that various systems produce (although the final outcome rarely varies), citizens can better understand these voting rules and notice which rules favour their preferred party or candidate. It is also possible that in the context of a real election individuals are more sensitive to the electoral results as these have real impacts on policies.

Within the framework of this thesis, ranked voting is the system that offers the best and greatest freedom of expression, as individuals can convey their views about more than one party or candidate, and they can rank their preferences in order. Ranking also lowers voters' incentives to vote strategically. Approval voting offers voters the second greatest flexibility when casting their ballot. In comparison to one-mark ballots and ranked voting, individuals have the opportunity to support more than one party or candidate equally using approval voting. However, their vote remains categorical, as voters are only asked whether they approve or disapprove each candidate.

One-mark ballots are the most restrictive as citizens can only express their views on a single candidate. Thus, informed by this literature, I derive my first hypothesis.

***Hypothesis 1:** Citizens prefer voting rules that allow them to better express their set of preferences. Thus, individuals should be satisfied the most with ranked voting and the least with one-mark ballots.*

2.2 Electoral Results and Self-Interest

As in the case of the electoral formula, the ballot type can also influence election results and thereby also effect policy outcomes. More moderate candidates tend to do better under multi-mark ballot systems, whereas better known candidates are favoured in one-mark ballot systems.

A field experiment during the 2012 French presidential election, allowed Baujard et al. (2014) to identify two factors that explain why electoral results vary between preferential and one-mark ballot systems. The authors compared citizens' vote choice using a single ballot in the first-round of the French presidential election, and approval voting. First, they concluded that a mechanical factor, regarding a greater expression of preferences under preferential voting, was prone to favour inclusive and more moderate candidates. Less politically extreme candidates are capable of attracting greater (secondary) support from both sides of the political spectrum. Second, behavioural factors such as strategic voting explain why more popular candidates succeed in systems that restrict voters to support a single candidate. When preferential ballots are employed, candidates have strong incentives to put forward policies that appeal to the majority of the

population. This incentive encourages candidates to avoid negative campaign strategies, so as to not alienate potential supporters (Horowitz 1991; Donovan et al. 2016).

Considering that voting rules influence electoral outcomes, it is possible that voters prefer electoral systems for the results that they produce. Numerous studies have shown that citizens are more satisfied with democracy when their favourite party wins the election, across all electoral systems and levels of government (Anderson and Guillory 1997; Anderson et al. 2005; Beaudonnet et al. 2014; Blais and Gélinau 2007). First, citizens that voted for the winning party are expected to be located closer ideologically to the elected government and are thus more likely to see their desired policies implemented. They experience greater trust, satisfaction and positive feelings toward government responsiveness and efficacy (Anderson and Tverdova 2001; Holmberg 1999). In addition, individuals who win their election, similarly to winners in a competitive sport, may sense emotional and psychological benefits (Anderson et al. 2005, 25; McCaul et al. 1992). The opposite holds for those who lose their election, as they can experience anger and disillusionment (Wilson and Kerr 1999; Anderson et al. 2005).

If citizens benefit from winning elections, then we can expect them to prefer electoral systems and voting rules that favour their preferred party or candidate. Studies have shown that the attitude of citizens and the political elite toward institutional reform is greatly motivated by partisan self-interest (Biggers 2019; Bowler and Donovan 2013; Blais et al. 2015). Individuals prefer electoral laws that benefit their party.

Using a national sample, Aldrich et al. (2014) studied individuals' preferences for U.S. Electoral College reform. The proposed reform was one similar to the reform that was proposed in Colorado at the time, which would change the winner-take-all rule to a proportional allocation rule. The results showed that support for reform is explained by which candidate one thinks will

likely win the election under the existing system. Citizens who believed that a less preferred candidate would win under the current winner-take-all system were more likely to support electoral reform than citizens who expected their favourite candidate to win. Similarly, using data from an internet-based quasi-experiment during the 2012 French presidential election, Blais et al. (2015) found that after voting with four different electoral systems (two-round, one-round, alternative vote and approval voting) citizens preferred systems that benefitted their favourite candidate the most.

In other words, result-driven citizens may be more concerned with the electoral outcome than the voting process employed. Based on these theoretical considerations and the empirical studies described above, I develop the following hypothesis:

***Hypothesis 2:** The more a citizen likes the winning party the greater their satisfaction with the voting rule that delivers this outcome.*

2.3 Simplicity

It is also important to consider people's cognitive abilities and the resources involved in casting their vote when determining which type of ballot best serves the general public. Existing studies suggest that the main advantage of one-mark ballots versus multi-mark ballots is that the former is easier for voters to understand and may therefore increase turnout and the number of valid ballots (Burnett and Kogan 2015; Neely and Cook 2008). Not only can multi-mark ballots be more confusing for voters, but the higher information costs involved with this type of ballot and the uncertainty towards the results that it produces can lead voters to prefer one-mark ballots.

Although ordinal and cumulative voting ballots allow voters greater opportunities to better express their views, they also make it more difficult for voters to cast their ballot. In the case of ranked voting, voters must use different columns to indicate their first, second and third choice, and with approval voting citizens can support more than one candidate by indicating each candidate that they support. Both of these voting rules are more complicated than one-mark ballots, whereby voters simply cast a single vote.

Donovan et al. (2019) found that citizens perceive the voting rules to be more difficult in cities that use ranked-choice voting than in cities that use the plurality rule in the United States. In cities that use a plurality rule, 73 percent of people said it was “very easy” to understand the voting rules, whereas only 61 percent said the same in cities that use ranked-choice voting. Sinclair and Alvarez (2004) also note that voters who are confused about the rules, are more likely to overvote or rank more than one candidate in a given position which leads to spoiled ballots.

Müller and Jankowski (2019) used pre-electoral survey data from four elections in 2011 and 2015 in two German states. The states were subject to an electoral reform in 2011, which changed their closed-list proportional system to an open-list proportional system. The new open-list system consists of a preferential ballot, in which voters have five votes that they can cumulate or distribute amongst candidates. Prior to each election, respondents were asked whether they approve, disapprove or are indifferent to the new electoral law. The authors concluded that the majority of citizens disapproved the open-list system because of its complexity. However, those situated on the left of the political spectrum were more likely to support the new law, whereas voters with a lower political interest were more indifferent toward the preferential ballot. Although this study provides information regarding citizens’ views towards preferential voting systems, voters did not have the opportunity to evaluate other voting rules.

It also takes more effort to grade or express one's views about all the candidates than to simply cast a single vote. Preferential voting increases citizens' information costs as they have the possibility to express their views on more than one candidate (McDaniel 2016; Lau and Redlawsk 2006). Although information costs are perceived to be quite small across various electoral systems, those who find voting to be difficult are slightly less prone to turnout on election day (Blais et al. 2019). McDaniel (2016) studied turnout in the municipal elections in San Francisco under ranked-choice voting and found that turnout decreased due to this electoral system amongst both White and Black voters. Voter fatigue and lack of information about the candidates can also lead some voters to partially rank or grade their options, which defies the purpose of allowing citizens the opportunity to distribute their votes (Burnett and Kogan 2015). Using a post-election survey of the 2004 municipal election in San-Francisco, Neely et al. (2006) found that citizens who fully ranked their candidate preferences declared to have gathered more information about the candidates than those who did not rank their top three candidates.

Multi-mark ballots also make it harder for voters to predict the results of the election, as citizens must express their views on more than one candidate (Bartholdi and Orlin 1991). Voters that have a better understanding of how their vote affects the electoral results may be more inclined to participate in the electoral process and prefer the electoral system in question, as they find it easier to make their vote choice. Also, the tabulation of votes being more laborious under ranked-choice voting leads some voters to question the fairness of the political process. Nielson (2017) found that some citizens believe that their vote is not counted accurately under ranked-choice voting. Following the 2021 Democratic primary election for the mayor of New York City (the first election under ranked-choice voting in this city), 135 000 dummy ballots that were used to test a computer system were mistakenly counted (Glueck 2021). This led the Board of Elections to

revoke the preliminary election results and recount the votes. Although this mistake is not directly caused by ranked-choice voting, it serves to show that tabulating the votes is harder and more complicated under this voting system.

All in all, studies in economics have shown that individuals tend to prefer simple rules over more complex ones (Moffatt et al. 2015; Sonsino et al. 2002). For example, Moffatt et al. (2015) conducted a choice experiment, where individuals had to participate in numerous lotteries that varied in terms of the complexity of their rules. The authors found that 50 percent of the population are complexity-averse, whereas 33 percent are complexity-neutral and 17 percent are complexity-loving. In political science, the seminal work of Sniderman et al. (1993) shows that citizens simplify the political process by using heuristics when making political decisions and do not favour complex decision rules. In fact, using post-referendum survey data from Switzerland, Hessami and Resnjanskij (2019) found that citizens are less likely to support complex referendum proposals.

With regard to the three ballot types studied in this thesis, ranked voting is the most difficult to use as voters are asked to rank order three parties. Furthermore, each order of preference is associated to a different number of points (5 points, 3 points or 1 point), which might be more confusing for participants. Approval voting is the second most difficult voting rule to use, as voters must indicate whether they approve or disapprove each party. Finally, the one-mark ballot should be the simplest voting rule for citizens, as it requires voters to cast a single vote, and it is the current ballot used across Canada for local, provincial and federal elections. Thus, building on the existing theoretical framework, my next hypothesis is:

***Hypothesis 3:** The more a voting rule is easy to use and understand the more a citizen favours this voting rule. Thus, citizens are satisfied the most with one-mark ballots and the least with ranked voting.*

2.4 Individual Traits and Abilities

Political psychologists have measured how various personality traits and intellectual skills and competencies can affect vote choice, political participation, knowledge and interest (Ahlering 1987; Kam 2005; Holbrook 2006; Mondak 2010). These traits, skills and competencies are relevant to the study of electoral systems and the ballot structure. Considering that different ballots offer distinct ways to express preferences and are easier or harder to use, I focus on individuals' need to evaluate, need for cognition and their numeracy.

2.4.1 Need to Evaluate

As mentioned previously, ranked voting and approval voting have the advantage of allowing voters to convey their political views more accurately. Consequently, voters are invited to form an opinion on a greater number of candidates. Not all citizens may react similarly to the opportunity and cost of better expressing their preferences. In particular, individuals' preferences for the type of ballot may depend on their need to evaluate.

The need to evaluate was popularized by Jarvis and Petty (1996), who developed a scale with high internal consistency to measure this personality trait. This trait "represents the extent to which people spontaneously evaluate objects or experiences as either good or bad" (Bizer et al.

2002, 1). In other words, people high in need to evaluate rate many aspects of their life and environment. According to Tormala and Petty (2001), when asked what they think of an object, people who score highly on this trait are more likely to have previously already formed an opinion on this object, whereas those who score lower on this trait must retrieve relevant information to make a judgement on the spot.

Bizer et al. (2004) examined the relationship between individuals' need to evaluate and their political behaviour using data from the 1998 National Election Survey Pilot and the 2000 National Election Study. The authors conclude that individuals with a higher need to evaluate have more opinions about the candidates, are more likely to use their own stances on political issues and partisan identification when forming opinions on candidates, and they have stronger emotional reactions to political actors. They are more prone to engage in political activism, to turnout and to actively seek out information in the news.

Given that individuals with a high need to evaluate tend to have deeply rooted political opinions and are more likely to have prior beliefs on candidates, we can expect these people to express their opinions on the ballot with more ease than those with a lower need to evaluate. In this study, ranked-choice voting involves the most decision making and is the ballot type that grants voters the most freedom of expression, followed by approval voting and the one-mark ballot. Therefore, I derive the following hypothesis.

***Hypothesis 4:** The greater one's need to evaluate the more they are likely to like voting rules that allow them to better express their preferences. More specifically, citizens with a higher need to evaluate are most satisfied with ranked voting and least satisfied with the one-mark ballot.*

2.4.2 Need for Cognition

In psychology, a commonly studied trait is individuals' need for cognition. "The need for cognition is a stable personality trait that describes individuals' tendency to engage in and enjoy effortful cognitive activity" (Cacioppo and Petty 1984, 306). People who score highly on this trait think deeply about information, whereas those who score poorly tend to make decisions without much thinking and rely more on their emotions (Cacioppo and Petty 1984; Marcus et al. 1995).

Studies in marketing have shown that individuals with a higher need for cognition better respond to complex advertisements than those with a lower need for cognition (Putrevu et al. 2004). In the political science literature, scholars have found that need for cognition is correlated with political knowledge, electoral activism and political interest, as people who score higher on this trait engage more with campaigns and are more likely to seek out news sources (Condra 1992; Tsfati and Cappella 2005; Bizer et al. 2002; Marcus et al. 1995).

Two reasons lead me to believe that individuals with a higher need for cognition are more satisfied with multi-mark ballots than citizens who score lower on this personality trait. First, as mentioned previously, multi-mark ballots are more complex than one-mark ballots. If citizens perceive this to be the case, then logically citizens with a higher need for cognition should be more satisfied and stimulated by complex voting rules, such as approval voting and ranked voting, than those with a lower need for cognition. Second, need for cognition is proven to be correlated with knowledge and political information (Tidwell et al. 2000; Liu and Eveland, Jr 2005; Condra 1992). Ahlering (1987) studied the relationship between citizens' need for cognition and political behaviour in the context of the 1984 U.S. Presidential election. Individuals with a higher need for

cognition were more likely to watch the debate and had more opinions about the candidates. Thus, I introduce my fifth hypothesis.

***Hypothesis 5:** The greater one's need for cognition the more they are likely to like complex voting rules that allow them to better express their preferences. Citizens with a higher need for cognition are most satisfied with ranked voting and least satisfied with the one-mark ballot.*

2.4.3 Numeracy

When adopting voting rules, political elites should pay special attention to how these rules facilitate the voting process for citizens. For example, many scholars have highlighted the negative effect of registration and identification laws on voter turnout in the United States (Rosenstone and Wolfinger 1978; Randon Hershey 2009; Hajnal et al. 2017). With regard to electoral systems, more complex ballots are shown to have negative impacts on voter turnout and on the number of valid ballots (McDaniel 2016; Burnett and Vladimir 2015). These more complex electoral rules also increase socioeconomic differences in voter turnout and the way citizens understand the voting rules (Berinsky 2005; Sinclair and Alvarez 2004; Donovan et al. 2019). Some studies have shown that a higher level of education, in particular, leads citizens to better understand electoral rules and participate on election day. Jankowski et al. (forthcoming) report that respondents with lower education are more likely to misunderstand the complex mixed-member proportional electoral rules in Germany than those with more education. Similarly, Donovan et al. (2019) find that understanding of ranked-choice voting correlates with education across the United States. Finally,

using data from five mayoral elections in San Francisco between 1995 and 2011, McDaniel (2016) concludes that the complexity of instant-runoff voting increases voter turnout disparities related to education.

One much less studied variable that may moderate individuals' understanding and satisfaction toward more complex ballots is numeracy. Numeracy refers to "the ability to process basic probability and numerical concepts" (Peters et al. 2006, 407). Individuals who score lower on numeracy find it more difficult to understand and conduct basic mathematic tasks on a daily basis. This ability has been shown to influence risk perceptions in medical, financial and other domains (Galesic and Garcia-Retamero 2011; Gurmankin et al. 2004).

Peters et al. (2006) measured how numeracy effects judgement and decision making by asking individuals to perform four tasks that require number processing. Participants were faced with fictional probability scenarios related to education, crime, finance and gambling. The authors found that high numerates were able to make better decisions using appropriate numerical principles and were less influenced by framing effects, whereas low-numeracy decision makers lacked the ability to fully understand the tasks. In a similar line of research, Mérola and Hitt (2016) studied how numeracy moderates the effectiveness of numeric appeals on public opinion. Their findings show that high-numeracy individuals were more persuaded by numeric policy information, whereas those with low numeracy relied on partisan cues to form an opinion. Therefore, if people with better mathematic ability are more likely to understand and use numeric information, it stands to reason that they feel more comfortable with quantitative tasks and information than low numerates.

As mentioned previously in the chapter, multi-mark ballots make it harder for voters to predict the electoral outcome. In fact, it is more difficult to predict how many candidates citizens

will choose to support or the order in which they will rank these candidates in the case of ranked voting. Mathematically, it is also more complicated for individuals to understand the tabulation of votes when every voter can cast more than one vote. The effect of each citizen's vote is easier to understand mathematically under one-mark ballots than with ranked voting and approval voting. The ranked ballot used in this study particularly requires more mathematical thinking as each ranking position is granted a certain number of points. My final hypothesis is the following.

***Hypothesis 6:** The higher one's numeracy, the more they are likely to like complex voting rules. More specifically, citizens with higher numeracy are most satisfied with ranked voting and least satisfied with the one-mark ballot.*

In sum, I expect individuals to prefer electoral systems that allow them to express their preferences more accurately, that produce electoral outcomes that they like, and that are easier to employ. I also predict that individuals with a higher need to evaluate, need for cognition and numeracy are most likely to be satisfied with ranked voting, followed by approval voting and then the one-mark ballot, contrarily to individuals that score lower on these psychological traits. However, these are not the only factors that may influence citizens' preferences for voting rules. Studies suggest that citizens have a bias for the status quo, because of the uncertainty that is involved with change (Samuelson and Zeckhauser 1988). Hessami and Resnjanskij (2019) found that the more complex the electoral reform proposal the more individuals prefer the status quo. Citizens may also have opinions on the indirect consequences of the ballot type. For example,

voting theorists have argued that ranked voting leads to more campaign civility as candidates benefit from obtaining individuals' second or third rank votes (Horowitz 1991; Donovan et al. 2016). Others have found that some electoral systems may favour the election of female and ethnic minorities (John et al. 2018). Although potentially important in the evaluation of electoral rules, these factors are outside the scope of this research.

Chapter 3. The Canadian Context

Canada is a constitutional monarchy and is based on the Westminster system first developed in England. It consists of ten provinces and three territories, which share legislative powers with the federal government. In Canada, all elections for both levels of government use a first-past-the-post system with single-member districts. Voters cast a vote for a candidate in their constituency, and the candidate with the most votes within each constituency is granted a seat in the lower house. Consequently, there tends to be a significant disproportion between parties' seat share in parliament and their vote share. The current system also favours the formation of majority governments, meaning that the winning party often holds more than 50% of the seats in parliament.

At the federal level, there are six major political parties: the Liberal Party of Canada, the Conservative Party of Canada, the New Democratic Party of Canada (NDP), the Bloc Québécois, the Green Party of Canada and the People's Party of Canada. However, historically, only two political parties have dominated the political scene and formed government at the federal level, the Liberal Party of Canada and the Conservative Party of Canada (including the predecessors of the latter). There are currently 338 seats in the House of Commons.

Across Canada, discussions around electoral reform for federal and provincial elections have been going on for some time. The important difference between parties' vote share and their seat share is cited as the main grievance of the current system. In fact, in 2019, the Liberal Party of Canada won the election and formed a minority government with only 33.12% of the popular vote and 46.45% of the seats in the House of Commons. The Conservative Party of Canada secured a greater percent of the vote share (34.34%) than the Liberal Party but did not form government

due to a lower number of seats won. The present chapter serves as a summary of the recent history of electoral reform in Canada, and the electoral context at the time this study was conducted.

3.1 Recent History of Electoral Reform in Canada

Massicotte (2008) argued that Canada has a long history of electoral reform that can be categorized into three distinct waves. The first started after the First World War in the 1920s. At the time, a combination of the alternative vote and the single transferable vote were the two most popular alternatives to the plurality system in place. In the first half of the 20th century, 18 municipalities in the Western provinces adopted the single transferable vote for municipal elections. The alternative vote was implemented for provincial elections in British Columbia in 1951, but abolished in 1953, and Manitoba and Alberta adopted a combination of the single transferable vote and the alternative vote (Massicotte 2008, 113). The Second Wave, in the 1970s and 1980s, was marked by discussions around using a type of mixed system for federal elections similar to the one used in Germany to reduce regional cleavages (Massicotte 2008, 114). In Quebec, the newly formed Parti Québécois was also prone to adopting a similar system for provincial elections, as the current system led to its underrepresentation in parliament (Massicotte 2008, 115).

However, most important to this study is what Massicotte (2008) described as the Third Wave, starting in the late 1980s. This wave is marked by important discussions on the issue with regard to federal elections, and provincial elections in British Columbia, Prince Edward Island, Ontario and Québec. During this time, there was a new emphasis placed on the use of commissions, citizens' assemblies and referendums in the reform process, and the mixed-member proportional

system was clearly the most commonly discussed alternative to the first-past-the-post system employed across Canada. In this chapter, I summarize the main discussions and reform attempts between the early 2000s and today for federal and provincial elections, in order to contextualize my study.

3.1.1 Federal Elections

The most recent discussions around electoral reform in Canada started during the 2015 federal campaign. At the time, the Liberal, NDP and Green Party all expressed interest in reforming the current first-past-the-post system, and each included a plan in their party's platform (Liberal Party of Canada 2015; New Democratic Party of Canada 2015; Green Party of Canada 2015). The NDP expressed its preference for a mixed-member proportional system, whereas the Green Party stated that a public consultation should be organized to determine what type of proportional representation is best suited for Canadians.

However, the leader of the Liberal Party, Justin Trudeau, was most vocal and received the most attention for his promise that the 2015 election would be “the last federal election conducted under the first-past-the-post voting system” (Liberal Party of Canada 2015, 27). The Liberal Party pledged to convene an all-party Parliamentary committee to study potential reforms and make a recommendation to Parliament. Justin Trudeau also voiced on numerous occasions his personal preference for a ranked ballot, whereby voters would not have to cast a strategic vote, and MPs would obtain support from at least 50 per cent of their riding (Wherry 2017).

After his election, in June 2016, Prime Minister Trudeau formed the all-party Special Committee on Electoral Reform. The committee's mandate was to study alternatives to the current

system, while engaging in discussions with Canadian citizens via cross-country consultations. In December 2016, the committee's report was tabled and suggested that Canadians adopt a system of proportional representation through the means of a referendum (Stone 2017). However, no specific system was described. On February 1st, 2017, Justin Trudeau and the Liberals announced that they would drop their promise of electoral reform, which received criticism from the opposition and the public. In a town hall meeting in Iqaluit, the prime minister cited that a proportional system would give too much power to extremist parties and a referendum would be too divisive for the country (Kirkup 2017). Thus, the Canadian electoral system remains unchanged.

3.1.2 Provincial Elections

The provinces of British Columbia, Prince Edward Island, Ontario and Quebec have all considered changing their electoral system through the means of a referendum in the last two decades. However, none of these referendums succeeded and a referendum in the province of Quebec has yet to occur. All Canadian provinces currently use the first-past-the-post system to elect their members of parliament.

In British Columbia three separate referendums were held on electoral reform in the province, and all three failed. On May 17th, 2005, in conjunction with the provincial election, the population was called to the polls to vote on whether or not British Columbians should use the single transferable vote system to elect their members of the Legislative Assembly rather than the current first-past-the-post system. The remarkably large disproportion between the vote share and seat share of the winning party in 1996 and 2001 sparked this debate. In 1996, the NDP won the election with 3 fewer percentage point votes than the Liberals, and in 2001 the Liberal Party

secured 77 of the 79 seats with 57% of the popular vote (Pilon 2010, 75). The winner of the 2001 election, Premier Gordon Campbell, decided to establish a citizens' assembly on electoral reform, which would decide which system would be presented to the population in a referendum. The citizens' assembly proposed the single transferable vote. On election day in 2005, 57% of voters supported the electoral reform. However, the referendum required a super-threshold, meaning that 60% of votes had to be in favour of the reform and 60% of the ridings needed to obtain support from the majority (Pilon 2007; 103-104).

Following the surprisingly favourable referendum results, Premier Campbell announced a second referendum on the STV proposal, which would include a map of the ridings in advance and funding for both pro and anti-reform groups. On May 12th, 2009, 60.9 per cent of voters voted against the use of the single transferable system, which ended the debate around electoral reform for a certain period of time (Pilon 2010). A third mail-in-ballot referendum on electoral reform occurred between October 22nd and December 7th, 2018. The then minority government formed by the NDP and the Green Party agreed to invite the population to express their views on electoral reform in a referendum (McElroy 2018). Voters were first asked which system should be used for provincial elections in British Columbia between the current first-past-the-post system and proportional representation. They were then asked which proportional system should be used if voters voted against the current system. The options were dual-member proportional representation, mixed-member proportional representation and rural-urban proportional representation. Again, the referendum failed, as 61.3 per cent of voting citizens supported the current first-past-the post voting system (McElroy 2018).

Similarly, Prince Edward Island held three referendums regarding the reform of their electoral system. Following the recommendation of the Electoral Reform Commission, voters were

first asked whether the province should switch to a mixed-member proportional system in 2005. This referendum resulted in 63.58% of the votes in favour of maintaining the first-past-the-post system (Elections Prince Edward Island 2005). In 2016, Premier Wade MacLauchlan held a second plebiscite without a required threshold to determine citizens' preferences between five different voting systems, including the current system, preferential voting, and mixed-member proportional representation. With turnout only reaching 36%, mixed-member proportional was declared the favourite system (Elections Prince Edward Island 2016). Due to the extraordinarily low turnout, Premier MacLauchlan announced that the province would hold a new referendum to ascertain citizens' preferences in the following provincial elections. In 2019, 48.3% of the votes were in favour of a switch to a mixed-member proportional voting system, whereas 51.7% of the votes were against reform (Elections Prince Edward Island 2019).

In Ontario, only one referendum was held on electoral reform. In 2004, then Premier and leader of the Liberal Party, Dalton McGuinty, established a citizens' assembly to study various electoral systems and to potentially propose a new electoral system for the province of Ontario. Following, the suggestion of the citizens' assembly, the population voted on switching to a mixed-member proportional system in 2007. Again, a large majority (63.18%) of the electorate voted in favour of maintaining the existing electoral system (Elections Ontario 2007).

More recently, the Quebec government has discussed the possibility of changing their electoral system. In September 2018 during the provincial campaign, the leader of the Coalition Avenir Québec and current Premier of Québec, François Legault, vowed to implement an electoral reform during his mandate and even signed a pledge with Québec Solidaire and the Parti Québécois to change the system for the 2022 election. However, once elected, François Legault first announced the delay of the reform to after the next provincial election, and then added that a

referendum would have to pass by the population first, contrary to his initial promise. One year after the election, la CAQ and Minister LeBel tabled Bill 39, to change the current first-past-the-post system to a mixed proportional system with regional compensations. To change the system, the government announced that there would be a referendum during the 2022 provincial election, in which 50% + 1 of voters would have to support the reform proposal. However, in April 2021, Legault's government declared that there would not be a referendum in 2022 as there would not be enough time for the government to study and adopt Bill 39 before the election (Bélair-Cirino 2021).

In summary, although electoral reform has often been subject of debate across Canada, it has never been accomplished through the means of a referendum at the provincial or federal level in the country. On some occasions, the threshold for reform was not met and accompanied with relatively low turnout rates. In other cases, such as in Canada in 2017 and more recently in Québec, the governing party has gone back on its word and abandoned plans of holding a referendum. Most discussions around reform in the country have focussed on proportional representation. However, talk of a potential ranked ballot was considered by the Trudeau government in 2015 and the single transferable vote was proposed in a referendum in British Columbia in 2005.

3.2 Canadian Federal Election (2019)

On September 11th, 2019, Prime Minister Trudeau officially announced the beginning of a 40-day federal campaign, leading to the 43rd Canadian general election on October 21st, 2019. The Liberal and Conservative parties were involved in a close race throughout the campaign. Although the campaign was not heavily issue driven, climate change and the cost of living took a central

place in the public debate. The Liberals proposed an increase of taxes on the upper class and international businesses, and a reduction of taxes on middle class citizens (Liberal Party of Canada 2019). However, this economic plan would still lead to a four-year deficit. With regard to the environment, the Liberal Party announced that Canada would reach net-zero carbon emissions by 2050 and promised to plant two-billion trees and ban single-use plastics (Liberal Party of Canada 2019). The Conservative Party, led by Andrew Scheer, focussed on affordability issues, tax cuts for the middle class, and vowed to repeal the federal carbon tax (Conservative Party of Canada 2019). The NDP's platform promised to implement mental health, dental and hearing coverage for all Canadians, and committed to investing in carbon-free electricity and improving transit routes (New Democratic Party of Canada 2019). The Bloc Québécois developed a "Green Equalization" plan to punish provinces that emit more greenhouse gasses and promised to push towards an increase of taxes for web companies (Bloc Québécois 2019). The party campaigned in favour of Quebec's secularism law and vowed to prevent the federal government from intervening with the legislation.

However, possibly the most memorable events of the 2019 campaign were centered around scandals and attacks. Throughout the campaign, Trudeau was greatly criticized for the SNC Lavalin controversy. The Ethics Commissioner concluded that Justin Trudeau intervened in a criminal case against a Quebec-based construction company, SNC-Lavalin, by attempting to influence the Minister of Justice and Attorney General, Jody Wilson-Raybould. Trudeau was also greatly criticized as pictures of him wearing brownface and blackface on three occasions in his past came out to the public during the campaign. These two events hurt Trudeau's popularity, yet did not cost him the election. The Conservative leader, Andrew Scheer, was also targeted for his

views on abortion and was often linked by the Liberal Party to the polarizing, Ontario Premier, Doug Ford.

On election day, the Liberal Party lost its majority, yet still won the election with 157 of the 338 seats in the House of Commons. The winning party obtained 33.1% of the vote share, which represents the lowest percentage of the popular vote of a governing party in Canadian history (Brean 2019). The Conservative Party obtained the greatest proportion of the votes (34.4%), but only 131 of its candidates were elected. The Bloc Québécois, led by Yves-François Blanchet, won 32 seats, at the expense of the NDP under Jagmeet Singh, which only received 24 seats throughout the country. Led by Elizabeth May, the Green Party elected three Members of Parliament, making it the party's most successful election yet.

After the election, Justin Trudeau ruled out the possibility of forming a coalition, and his party would therefore have to rely on support from the NDP and possibly the Bloc Québécois to push through legislation. The election results show a great regional divide and a weakening of political consensus in Canada (Nanos 2020), as the Conservatives thrived in western Canada, especially Alberta and Saskatchewan, and the Bloc Québécois performed particularly well in Québec, securing 32 seats in the province. The NDP saw a significant decrease of popularity in Québec, as Alexandre Boulerice was the only MP to obtain a seat in the province. The Liberals heavily relied on Ontario to win the election, yet they were able to receive the support of eastern Canada and parts of British Columbia and won 35 seats in Québec.

Although reform of the electoral system was not subject to debate throughout the campaign in 2019, the results of the general election led to discussions around the Canadian voting system and prompted a secession movement from western Canada, referred to as "Wexit". The large disparity between the overall distribution of the vote and the composition of the (Liberal)

government ignited strong criticism of the current first-past-the-post system. The leader of the NDP, Jagmeet Singh, called the system “broken” after his party received less seats than the Bloc Québécois, despite winning a greater proportion of the popular vote (Wright 2019). Elizabeth May wrote a letter to the prime minister following the election, urging him to consider implementing a single transferable voting system with ranked voting in Canada (Green Party of Canada 2019). Furthermore, political analyst Philippe J. Fournier published in *Macleans* a simulation of the 2019 election results using a ranked-ballot system, similar to that favoured by Justin Trudeau in 2015 (Fournier 2019). Although he only used voters’ first and second choice due to data limitations, his results are relatively similar under first-past-the-post and ranked voting. However, the Conservative Party would lose the most, as his estimations show that they would go from 121 seats under first-past-the-post to 107 seats under ranked voting. Although the Conservative Party won the popular vote, they received very few second-choice votes, which suggests that the party is more polarizing and that some voters may have cast an Anti-Conservative vote.

Chapter 4. Research Design and Methodology

4.1 Research Design

To empirically investigate preferences towards voting rules, I conducted a within-subject laboratory experiment with 192 participants, from October 7th to October 18th, 2019, in the run up to the 2019 Canadian federal election held on October 21st. Participants were asked to vote for real parties in consecutive elections, with the voting rule being the only manipulation, in order to compare citizens' level of satisfaction with each voting rule. The 192 participants were divided into 11 groups of 15 to 20 people and participated in a 30-minute session in a computer laboratory at the Université de Montréal. They answered a short survey to measure their sociodemographic and individual traits and how much they like or dislike the main political parties running in the election (See Appendix A for the exact question wording). They were then asked to vote in six consecutive mock elections, using each of the three following ballots: one-mark ballot, ranked voting and approval voting.¹

The six main federal political parties were listed on the ballot. These are the Liberal Party of Canada, the Conservative Party of Canada, the New Democratic Party of Canada, the Bloc Québécois, the Green Party of Canada and the People's Party of Canada. I chose to list the parties on the ballot and not the candidates as participants resided in different constituencies and were not necessarily familiar with the candidates in another constituency. Previous studies also suggest that local candidates are less important than parties and their leaders in parliamentary democracies

¹ The study was programmed using the software package z-Tree (Fischbacher 2007).

(Bittner 2018). Some citizens do vote for a local candidate or a preferred leader from another party, but this is not the case for the vast majority of the electorate (Daoust and Blais 2017; Blais et al. 2003; Daoust et al. 2021).

After receiving a brief verbal and written explanation of the voting rule in question, respondents participated in two consecutive elections with the same rule, to ensure that they truly understood the voting system. The results within their group were shown on their computer screen after each election.² Following the two elections, participants indicated their level of satisfaction with the voting rule, using a 0 to 10 scale, where 0 indicated that the participant was not at all satisfied and 10 very satisfied with the voting rule. Participants then proceeded to do the same thing with the two other voting systems. The order in which the group used each rule was randomized within the 11 groups.

With the one-mark ballot, participants were required to vote for a single party, resembling the current electoral system in Canada. Ranked voting allowed the participants to rank up to three parties in order of preference. For the ranked ballot, a variation of the Borda Count was used whereby the respondent's first choice obtained five points, their second choice three points and their third choice one point.³ This system is easier for participants to understand than other ranking systems whereby voters' second (or third, fourth, etc.) choice is only counted if their first (and/or second, third, fourth, etc.) choice does not pass a threshold of votes. Yet, it still allows voters the experience of ordering their preferences. I was therefore more confident that participants understood the rules. Approval voting allowed the participants to support the number of parties that they desired, meaning that voters could vote for up to six parties. After each election, the

² The computers in the laboratory were linked, in order for participants to see the electoral results within their group after each election. Examples of the ballots and the presentation of the results are shown in Appendix B.

³ See Chapter 1 for a deeper explanation of the Borda Count.

winning party and the number of votes, points or approvals for each party was revealed. The party with the most votes, points or number of approvals was declared elected for that election. In the case of a tie, the winner was randomly determined between the leading parties.

Participants were recruited using Facebook advertisements posted on various Université de Montréal departmental pages and groups. Flyers and posters were also distributed around campus, and recruitment emails were sent to students and faculty by departmental administrators. Only Canadian citizens eligible to vote were allowed to participate in the study. Each participant received a \$10 monetary compensation at the end of the laboratory session. This study was approved by the institutional review board of the Université de Montréal.⁴

4.2 Methodology

4.2.1 Data

As mentioned previously, the sample in this study consisted of 192 eligible voters, meaning that each participant was a Canadian citizen and 18 or older. The unit of observation is the participant with a given voting rule. Given that each participant voted using three different voting rules, each individual appears three times in the dataset. Thus, there are 576 units of observations in this study (192 participants X 3 voting rules). All variables except for the age of the participant and their satisfaction with the voting rule are coded on a scale from 0 to 1.⁵ The descriptive statistics are shown in Table 1.

⁴ See Appendix C for the certificate from the institutional review board.

⁵ See Appendix A for the exact coding and question wording of all the variables.

Given that the recruitment and the experiment took place at the Université de Montréal, most of the sample consisted of students. The average age of the participants was 22 years old, and most respondents were undergraduate students from the Faculty of Arts. The sample included slightly more women than men. In fact, there were precisely 80 men and 112 women.

Table 1. Descriptive Statistics

| | Minimum | Maximum | Mean | Standard Deviation | <i>N</i> |
|-----------------------------------|---------|---------|--------|-----------------------|----------|
| Gender (Women = 1) | 0 | 1 | 0.583 | 0.493 | 576 |
| Education | 0 | 1 | 0.504 | 0.153 | 576 |
| Age | 18 | 84 | 22.839 | 6.166 | 576 |
| Ideology | 0 | 1 | 0.385 | 0.144 | 576 |
| Political Interest | .1 | 1 | 0.723 | 0.209 | 576 |
| Satisfaction with the Voting Rule | 0 | 10 | 6.443 | 2.423 | 576 |
| Like Winner | 0 | 1 | 0.685 | 0.202 | 576 |
| Like Winner (First Election) | 0 | 1 | 0.691 | 0.197 | 576 |
| Simple | 0 | 1 | 0.785 | 0.245 | 576 |
| Need to Evaluate | 0 | 1 | 0.690 | 0.223 | 576 |
| Need for Cognition | 0 | 1 | 0.625 | 0.485 | 576 |
| Numeracy | 0 | 1 | 0.684 | 0.234 | 576 |
| Small Group | 0 | 1 | 0.401 | 0.491 | 576 |

The sample of respondents differs from the population of Quebec with regards to gender, age, education, political interest and ideology. However, as argued by Druckman and Kam (2011), this should not pose any problems for external validity unless the studied effect depends on a characteristic for which the sample does not have variance. Given that ideology and political interest may affect citizens' preferences toward voting rules (Müller and Jankowski 2019), it is relevant to study more closely the distribution of these two variables.

The student sample leans to the left of the political spectrum. In fact, the mean ideology score of the sample is .38 on the left-right scale and the standard deviation is .14, where 0 is the extreme left and 1 is the extreme right. However, there is variation in ideology as 30% of the

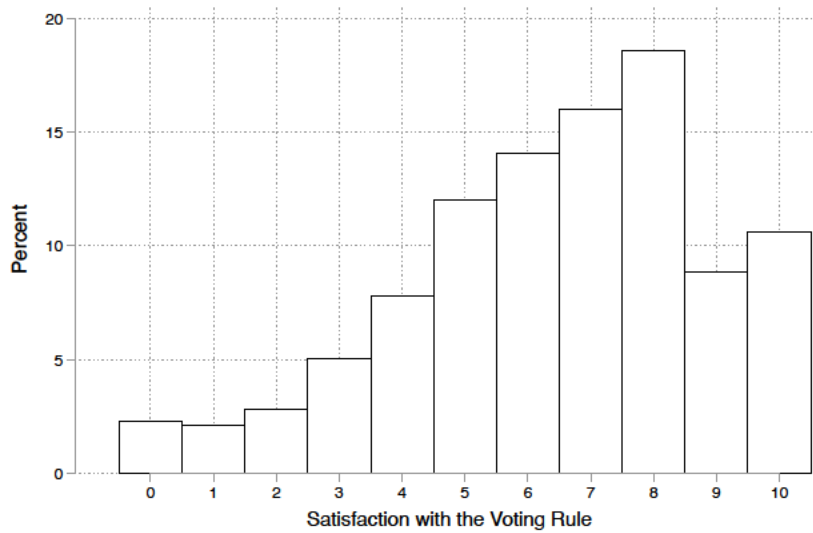
sample is in the center or right of the political spectrum. In general, students in our sample were also very interested in politics. The subject's mean political interest is 0.7 with a standard deviation of 0.2 on a graduated scale from 0 to 1, where 0 is not at all interested in politics and 1 is very interested in politics. Again, variation of political interest is large enough to perform additional analyses to ensure the external validity of the study. The distribution for both of these variables is shown in Appendix D.

4.2.2 Analyses

In order to test the hypotheses, a series of ordinary least square regression models are estimated. All standard errors are clustered by participant. The dependent variable is the participant's satisfaction with the voting rule in all of the models. More specifically, the respondents were asked 'On a scale of 0-10, where 0 means "not at all satisfied" and 10 means "very satisfied", how satisfied are you with the voting rule you have just used'. In general, participants were quite satisfied with the voting rules. The mean level of satisfaction on a 0 to 10 scale is 6.4, and the standard deviation is 2.4. The distribution of the variable is presented in Figure 3. Very few respondents are dissatisfied with the voting rule. In fact, a little less than 20 per cent of respondents give the voting rule a satisfaction score of 4 or less.

First, the mean level of satisfaction for each voting rule is shown. Then, I measure the effect of the voting rule on satisfaction while controlling for the order in which participants used each rule, ideology, political interest and socio-demographic variables. This tests whether or not voters prefer a ballot that allows them to better express their preferences (*Hypothesis 1*).

Figure 3. Distribution of Satisfaction with the Voting Rule



A second regression model captures whether citizens' level of satisfaction towards electoral rules depends on how much they like the winner of the election (*Hypothesis 2*). To do so, a variable measuring how much the respondent likes or dislikes the winning party on a graduated scale from 0 to 1 is included in the model. The question was worded as follows: 'What do you think of the following political parties? Use a scale from 0 to 10, where 0 means that you strongly dislike the party, and 10 means that you strongly like the party.' The winner of the second election for each voting rule is used, as this was the most recent electoral result for the participant.⁶

To test whether citizens prefer voting systems for their simplicity (*Hypothesis 3*), a third regression model includes a variable measuring the respondent's perception of how difficult it is to vote using each system. Participants answered the following question: 'On a scale from 0-10, do you think that it is difficult or easy to vote using the following voting rule, where 0 means "very

⁶ The winner of the first and second election with each voting rule varied only 6 times out of 33 (see Appendix E). The New Democratic Party of Canada won 43 out of the 66 elections.

difficult” and 10 means “very easy”.’ On average citizens thought the voting rules were very easy to use. The mean being 0.78 on the rescaled variable ranging from 0 to 1.

Three separate regression models are calculated to measure whether individuals’ traits moderate their preferences with regard to the voting rule. First, I test the interaction effect of the voting rule and individual’s need to evaluate on satisfaction with the voting rule (*Hypothesis 4*). Then, two more similar interaction models are performed for individuals’ need for cognition (*Hypothesis 5*) and their numeracy (*Hypothesis 6*). To measure the need to evaluate, participants were asked whether they ‘strongly agree’, ‘somewhat agree’, ‘somewhat disagree’ or ‘strongly disagree’ with the following statement: “I have opinions on almost everything”. To measure the need for cognition participants were asked whether they prefer to solve simple or complex problems, and finally to measure numeracy, individuals were asked how they evaluate their capacity to work with fractions and calculate a 15% tip. The question wording for all three of these questions has been validated in their respective domains (Jarvis and Petty 1996; Cacioppo and Petty 1982; 1984; Fagerlin et al. 2007; Zikmund-Fisher et al. 2007). See Appendix A for exact question wording and the coding of the variables.

Finally, I attempt to better understand the results by performing a series of additional analyses and robustness checks.

Chapter 5. Results

5.1 Expression of Preferences, Self-Interest or Simplicity

Figure 5 shows the mean level of satisfaction with each voting rule without any controls. These results show that there is little difference in satisfaction between the elections where voters used approval voting and those where they used a one-mark ballot. The mean level of satisfaction is 6.2 on the 0 to 10 scale for both of these voting rules. However, citizens are significantly more satisfied with the voting rule when they have the possibility of ranking their preferences (95% CI). On average individuals like ranking 0.6 points more than they like voting with a one-mark ballot or approval voting (a difference of 10%). These results suggest that citizens like the opportunity to express their views about all the parties, but only when they can place these parties in the order of their choice on the ballot.

Table 2 reports the average effect of the voting rule on the level of satisfaction. The first model controls for sociodemographic characteristics, ideology, political interest and the order of the elections. Women seem to be more satisfied with the voting rules in general, though the other variables including ideology, political interest and the order of the elections do not have an impact on individual's evaluations. The effect of ranking on one's level of satisfaction remains quite similar when accounting for other covariates. On average citizens are 0.62 points more satisfied with using a ranked ballot than casting a single vote. These results offer support for *Hypothesis 1*, insofar as citizens do prefer ranking, which allows them to better express their set of preferences. Yet, citizens do not express greater satisfaction toward using approval voting compared to the current one-mark ballot.

Figure 4. Mean Level of Satisfaction with the Voting Rule

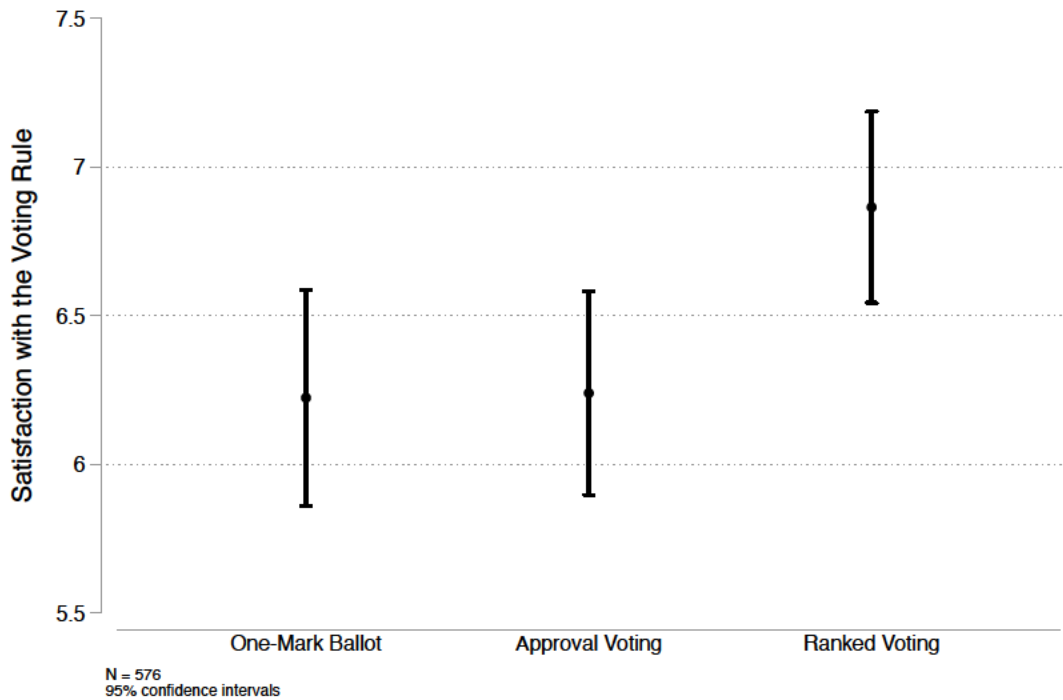


Table 2 – Model 2 measures whether those who like the winner are more satisfied with the voting rule. The coefficient for the “like winner” variable is quite large, positive and significant ($p < 0.001$). Those who give the winning party (of the second election) the highest rating (10 on the 0 to 10 scale) are, on average, 3.37 points more satisfied with the voting rule than those who give the lowest score (0 on the 0 to 10 scale). Given that in some groups the winning party is sometimes different in the first and second election, Table A2 (Appendix F) shows the results using the winning party like/dislike scores for the first election. The results remain the same when using this variable. This confirms the second hypothesis; the more a citizen likes the electoral outcome using a specific voting rule, the more they are likely to appreciate this voting rule. The effect of ranking remains positive and significant ($p < 0.001$), which shows that regardless of how much citizens like the electoral outcome, individuals still prefer ranking their vote.

Table 2. OLS Regressions of Satisfaction with the Voting Rule

| | DV = Satisfaction with the Voting Rule | | |
|-----------------------|--|-------------------|-------------------|
| | Model 1 | Model 2 | Model 3 |
| Gender (women = 1) | 0.71** (0.26) | 0.50* (0.25) | 0.69** (0.26) |
| Education | -1.01 (0.96) | -0.89 (0.82) | -1.08 (0.90) |
| Age | 0.01 (0.02) | 0.01 (0.02) | 0.01 (0.02) |
| Ideology | -0.68 (0.93) | 0.89 (0.99) | -0.40 (0.86) |
| Political Interest | -0.09 (0.60) | 0.00 (0.57) | -0.23 (0.58) |
| Like winner | | 3.37*** (0.74) | |
| Simple | | | 2.19*** (0.59) |
| <i>Voting Rule</i> | | | |
| One-Mark Ballot (ref) | - | - | - |
| Approval Voting | -0.02 (0.22) | -0.05 (0.22) | -0.04 (0.22) |
| Ranked Voting | 0.62** (0.22) | 0.58** (0.22) | 0.57** (0.22) |
| <i>Order</i> | | | |
| 1 (ref) | - | - | - |
| 2 | 0.20 (0.22) | 0.24 (0.21) | 0.24 (0.21) |
| 3 | 0.11 (0.20) | 0.11 (0.20) | 0.15 (0.19) |
| Constant | 6.43*** (0.92) | 3.47*** (1.02) | 4.57*** (0.92) |
| <i>N</i> | 576 | 576 | 576 |
| <i>R</i> ² | 0.043 | 0.111 | 0.091 |

Standard errors are robust and clustered by individual (shown in parentheses)

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

In Table 2 - Model 3, I add a variable measuring citizens' perception of how easy or difficult it is to vote in each system. On average the more citizens feel that the voting rule is easy to use, the more they are likely to be satisfied with this rule. However, the average simplicity score for all three voting rules is around 0.78 on a scale from 0 to 1, where 1 is "very simple to use". Contrary to *Hypothesis 3*, voters do not find one-mark ballots to be the easiest to use and ranked voting the hardest. The fact that our sample is highly educated may explain why the subjects find all voting rules to be simple. Simplicity may also be a proxy for satisfaction with the voting rule. It is possible that participants evaluate the difficulty of voting with a certain ballot based on how much they are generally satisfied with the voting rule. Therefore, *Hypothesis 3* cannot be confirmed with the data from this study.

5.4 Individual Traits and Abilities

Table 3 measures whether people's need to evaluate moderates the effect of the voting rule on their level of satisfaction (*Hypothesis 4*). The results show that, contrary to my expectations, those with the highest need to evaluate like approval voting less than the one-mark ballot, whereas the opposite holds for those with the lowest need to evaluate. With regard to ranked voting, surprisingly those with a higher need to evaluate prefer this voting system over the one-mark ballot to a lesser extent than those with a lower need to evaluate. However, all of these coefficients are not statistically significant. Thus, *Hypothesis 4* cannot be confirmed, as individuals' need to evaluate does not significantly influence their level of satisfaction with the voting rules.

Table 3. Moderation Effect of the Need to Evaluate on Satisfaction with the Voting Rule

| | DV = Satisfaction with the Voting Rule |
|--|---|
| Gender (women = 1) | 0.64* (0.25) |
| Education | -0.83 (0.90) |
| Age | 0.01 (0.02) |
| Ideology | -0.72 (0.91) |
| Political Interest | -0.48 (0.65) |
| Need to Evaluate | 2.08* (0.86) |
| <i>Voting Rule</i> | |
| One-Mark Ballot (ref) | - |
| Approval Voting | 0.98 (0.75) |
| Ranked Voting | 1.54* (0.67) |
| One-Mark Ballot x Need to Evaluate (ref) | - |
| Approval Voting x Need to Evaluate | -1.45 (1.02) |
| Ranked Voting x Need to Evaluate | -1.33 (0.93) |
| <i>Order</i> | |
| 1 (ref) | - |
| 2 | 0.21 (0.22) |
| 3 | 0.11 (0.20) |
| Constant | 5.16*** (1.02) |
| <i>N</i> | 576 |
| <i>R</i> ² | 0.056 |

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The regression model in Table 4 determines whether or not individuals' need for cognition impacts their preferences in voting systems. More specifically, this table measures whether or not people with a higher need for cognition are more likely to favour complex voting rules that allow them to better express their preferences (*Hypothesis 5*). The positive coefficient representing the interaction between approval voting and need for cognition demonstrates that people with the highest need for cognition are slightly more likely to favour approval voting over the one-mark ballot, whereas the opposite holds for those with the lowest need for cognition. The positive coefficient for the interaction effect between ranked voting and the need for cognition attests that those with the highest need for cognition prefer ranked voting over the one-mark ballot to a greater extent than those with the lowest need for cognition. These results are in line with the hypothesis that individuals with a higher need for cognition prefer more complex voting rules such as ranked voting and to a lesser extent approval voting compared to those with a lower need for cognition. However, all of these coefficients are not significant. As a robustness test, I examine the interaction effect of simplicity and need for cognition in Appendix G. This effect is also not statistically significant. Consequently, it is impossible to confirm *Hypothesis 5*. One's need for cognition does not clearly influence their preferences in voting rules.

Table 5 measures the moderation effect of numeracy on satisfaction with the voting rule. Surprisingly, the negative interaction effect of numeracy and approval voting suggests that individuals with the highest level of numeracy tend to be more satisfied with one-mark ballots than approval voting. On the contrary, individuals with the lowest level of numeracy tend to be more satisfied with approval voting. The interaction effect between ranked voting and numeracy is however in line with my expectations. People with higher numeracy prefer ranked voting over the one-mark ballot to a slightly greater extent than those with lower numeracy. However, the effects

Table 4. Moderation Effect of the Need for Cognition on Satisfaction with the Voting Rule

| | DV = Satisfaction with the Voting Rule |
|--|---|
| Gender (women = 1) | 0.62* (0.26) |
| Education | -0.92 (0.95) |
| Age | 0.00 (0.02) |
| Ideology | -0.73 (0.92) |
| Political Interest | 0.06 (0.62) |
| Need for Cognition | -0.54 (0.39) |
| <i>Voting Rule</i> | |
| One-Mark Ballot (ref) | - (.) |
| Approval Voting | -0.24 (0.31) |
| Ranked Voting | 0.52 (0.33) |
| One-Mark Ballot x Need for Cognition (ref) | - |
| Approval Voting x Need for Cognition | 0.36 (0.43) |
| Ranked Voting x Need for Cognition | 0.17 (0.43) |
| <i>Order</i> | |
| 1 (ref) | - |
| 2 | 0.20 (0.22) |
| 3 | 0.11 (0.20) |
| Constant | 6.76*** (0.96) |
| <i>N</i> | 576 |
| <i>R</i> ² | 0.049 |

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5. Moderation Effect of Numeracy on Satisfaction with the Voting Rule

| | DV = Satisfaction with the Voting Rule |
|----------------------------------|---|
| Gender (women = 1) | 0.78** (0.28) |
| Education | -0.98 (0.94) |
| Age | 0.00 (0.02) |
| Ideology | -0.77 (0.96) |
| Political Interest | -0.09 (0.59) |
| Numeracy | 0.76 (0.84) |
| <i>Voting Rule</i> | |
| One-Mark Ballot (ref) | - |
| Approval Voting | 0.48 (0.62) |
| Ranked Voting | 0.56 (0.59) |
| One-Mark Ballot x Numeracy (ref) | - |
| Approval Voting x Numeracy | -0.72 (0.90) |
| Ranked Voting x Numeracy | 0.09 (0.85) |
| <i>Order</i> | |
| 1 (ref) | - |
| 2 | 0.20 (0.22) |
| 3 | 0.10 (0.20) |
| Constant | 5.91*** (0.90) |
| <i>N</i> | 576 |
| <i>R</i> ² | 0.047 |

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

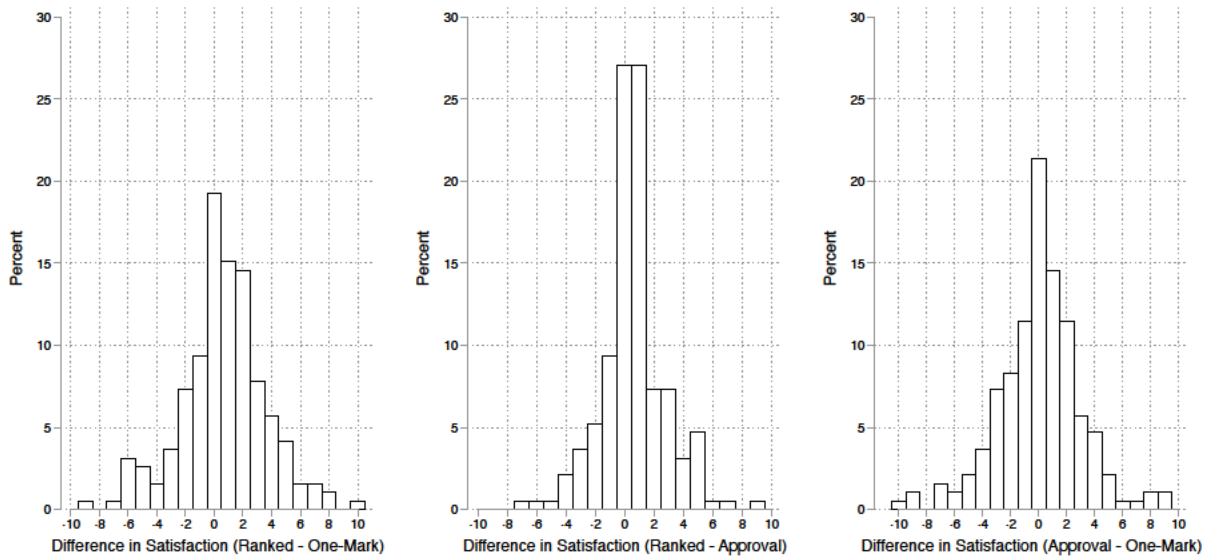
are not statistically significant. I also test the interaction between simplicity and numeracy in Appendix G. This interaction is not statistically significant at a 95% confidence interval. Given these results, *Hypothesis 6* cannot be confirmed. Individuals with lower numeracy are not more likely to prefer one-mark ballots over multi-mark ballots.

5.3 Alternate Explanations and Robustness Checks

The main results of this experiment show that, overall, ranked voting is preferred to single-mark ballots and approval voting. In order to better understand these results, it is useful to study the distribution of individual differences in satisfaction. The graph on the left of Figure 6 shows citizens' difference in satisfaction in elections with ranking and the one-mark ballot. Positive scores indicate that citizens prefer ranking, whereas negative scores represent citizens who prefer voting with a one-mark ballot. Only 28% of the sample favour using the current one-mark ballot and less than 20% of individuals feel indifferent. All in all, many citizens prefer ranking but not by a lot (1 or 2 points). These findings demonstrate that the relationship between the opportunity to rank the parties on the ballot and satisfaction is not skewed by individuals who strongly prefer ranking or strongly dislike casting a single vote.

When comparing the level of satisfaction between ranked voting and approval voting, we notice that a great proportion of citizens like the voting rules equally. In fact, 27% of citizens express no difference in the level of satisfaction and another 27% only slightly prefer ranking over approval voting (+1 point). The mean of 0.68 and median of 1 serve to show that again most citizens do prefer ranking over approval voting, but this preference is weak.

Figure 5. Distribution of Individual Differences in Satisfaction

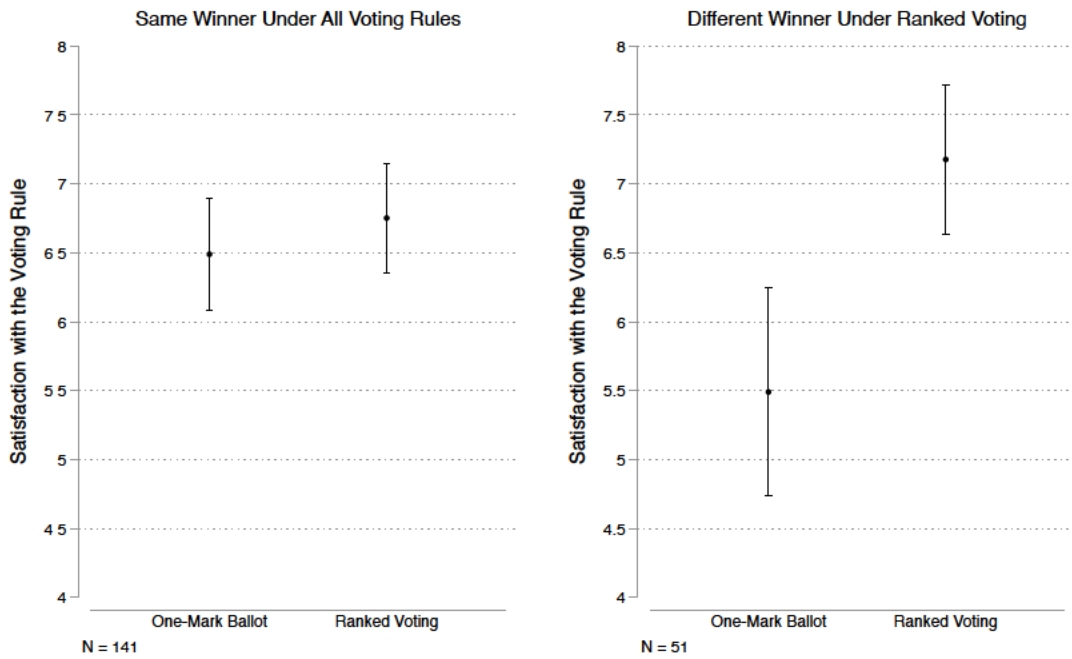


The right most graph of Figure 5 presents the distribution of individual differences in satisfaction in elections using approval voting and the one-mark ballot. In this graph, positive numbers indicate a greater preference for approval voting and negative numbers a greater satisfaction with the one-mark ballot. The mean, median and mode of this distribution is 0, which implies that a large number of citizens feel equally satisfied with both approval voting and the one-mark ballot. Approximately 43% of citizens prefer approval voting, whereas 36% of citizens prefer the one-mark ballot.

One explanation as to why citizens may prefer ranked voting is that this voting rule creates different election results that are more favourable to my sample. To test whether this is the case, I first determine whether ranked voting is preferred in the laboratory groups where the election results were different under ranked voting than under the one-mark ballot. In three of the eleven groups, the winner was different in the second election under ranked voting, than under the second election using the one-mark ballot (See Appendix E – Groups 1, 3 and 11).

Figure 6 compares the differences in mean satisfaction with the voting rule in the laboratory groups where the winner was the same under all voting rules to groups where the winner was different under ranked voting in comparison to the one-mark ballot. The difference between the mean level of satisfaction under ranked voting and the one-mark ballot is much larger in the groups where the winner was different under ranked voting (difference in means of 1.7 points), than in the groups where the winner was the same under all three voting rules (difference in means of 0.3 points). Thus, the level of satisfaction toward ranked voting is only significantly higher when ranked voting creates different election results.

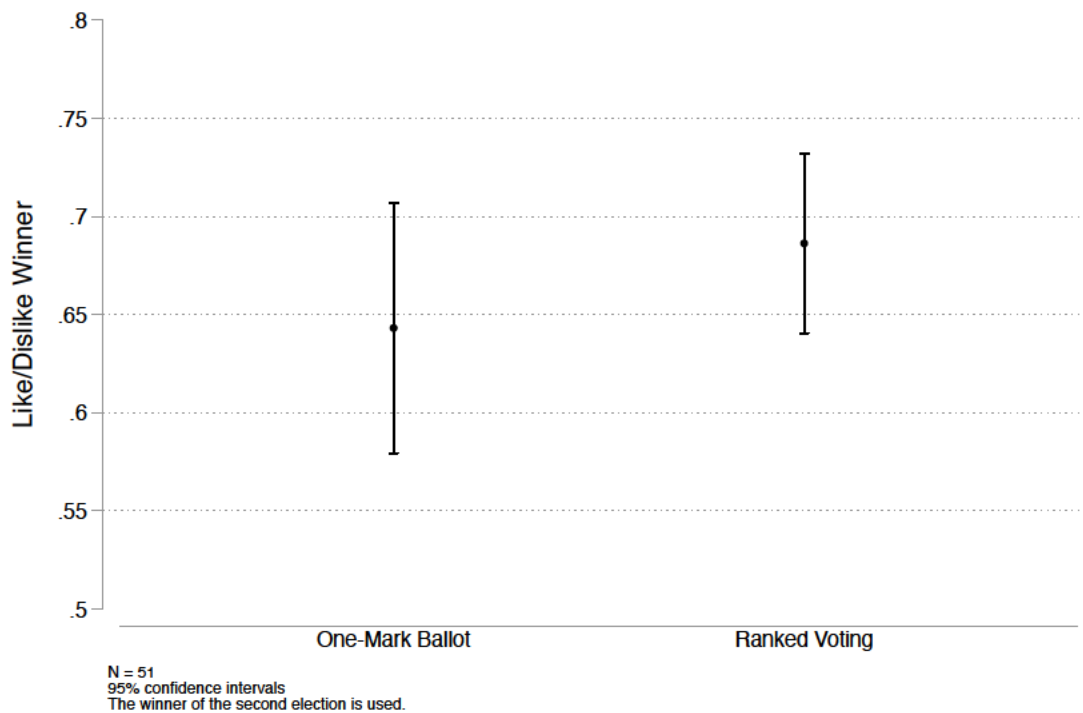
Figure 6. Effect of the Variations in Election Results on Mean Satisfaction with the Voting Rule



95% confidence intervals
The winner of the second election is used.

Next, I compare the average like/dislike score of the winner with ranked voting to the winner with the one-mark ballot in the three groups in which the winner was different under ranked voting. Figure 7 indicates that individuals' mean level of appreciation for the winner is 0.05 points higher under ranked voting than under the one-mark ballot on a scale ranging from 0 to 1. The difference in the mean level of appreciation for the winner is however not statistically significant. The mean level of appreciation toward the winner is 0.64 under the one-mark ballot and 0.69 under ranked voting on a scale from 0 to 1. The median is 0.7 under both voting rules. Although the sub-sample consists of only three groups (51 participants), these results raise questions as to whether or not citizens are truly more satisfied with ranked voting or whether they are simply more satisfied with ranked voting when the results are different under this system.

Figure 7. Appreciation of the Winner in Groups Where the Winner is Different Under Ranked Voting



Another explanation as to why I find that ranked voting is preferred to approval voting and the one-mark ballot, may be that my sample consists of left-leaning students with a higher level of political interest. Previous studies have shown that individuals on the left of the political spectrum tend to prefer preferential ballots and are more open to electoral reform, whereas those with a greater interest toward politics are more indifferent toward voting systems (Müller and Jankowski 2019; Blais et al. 2015). To confirm that this is not the case, I estimate the interactive treatment effect of the voting rule with both ideology and political interest. These interaction effects are not significant (See Appendix H for the full regression models). Thus, citizens' satisfaction toward ranking is not moderated by ideology nor political interest, which suggests that the effect found in the sample also exists within the population.

As a final robustness check, I measure whether citizens' preference for ranked voting depends on the size of the group that they are in. The electoral results mechanically tend to vary more from one voting system to the next in the smaller experimental groups (See Appendix E). Thus, it is important to confirm that the effect of the voting rule on citizens' level of satisfaction is not significantly different in the experimental groups with less participants than those with more participants. To confirm that this is not the case, I created a dummy variable where the groups with 16 or less participants (5 of the 11 groups) are coded as 1, and the others at 0. I then measure the interaction effect of the size of the group and the voting rule on citizens satisfaction. Given that the interaction effect is not significant, it is possible to infer that the variation in the group sizes does not affect the main results. I derive similar results when using the size of the group as a continuous variable. See Appendix I for the full regression models.

Chapter 6. Conclusion and Discussion

While a great deal is known about the consequences of electoral institutions on voting behaviour and party systems, few studies have focussed on citizens' views toward voting rules. This master's thesis explores three particular aspects of the ballot structure that may explain voters' preferences: the degree to which voters can express their opinions on the ballot, the electoral outcome that voting rules produce, and the difficulties involved in casting a ballot. This study also aims to determine whether individual traits and competencies, more specifically people's need to evaluate, need for cognition and numeracy, influence preferences in voting rules. To measure the impact of these factors on citizens' satisfaction with the voting rule, this research draws on data from an original within-subject laboratory experiment, in which 192 participants voted for real parties during the 2019 Canadian federal election. Participants had the opportunity to vote using the current one-mark ballot, approval voting and ranked voting and were also exposed to the results of each election within their group.

6.1 Summary of the Results

The literature in political science and psychology on electoral systems and decision making allowed me to develop six distinct hypotheses within the framework of this master's thesis. First, I expected individuals to prefer ranked voting and to a lesser extent approval voting over the one-mark ballot, because of the differences in the freedom of expression that each of these voting rules render. In contrast to previous research (Müller and Jankowski 2019; Blais et al. 2015; Blais et al. 2020), this study shows that citizens have a preference for ranked voting over approval voting and

one-mark ballots, which they like equally. Thus, my first hypothesis is partly confirmed. Citizens favour ballots that allow them to rank-order the options, but not those that allow them to equally support more than one party.

My second hypothesis stated that citizens should be more satisfied with voting rules that generate results that they like. This hypothesis is confirmed as the more participants liked the winner of the election, the more they were likely to be satisfied with the voting rule. This suggests that individuals consider partisan self-interest when evaluating electoral rules.

For my third hypothesis, I expected individuals to favour voting rules that they find easy to use and understand. Alas, this study fails to conclude whether or not individuals favour voting rules for their simplicity. Subjects indicated that all ballot structures were easy to use. This may be explained by the fact that the participants were highly educated, young, and interested in politics. Thus, they easily understood how to cast their ballot and how votes were tabulated under ranked and approval voting. Subjects were also asked to rank order a maximum of three candidates. It is possible that individuals feel that ranking is more difficult when they need to express their views on a greater number of options. The evaluation of the simplicity of the electoral system may also have acted as a proxy for their satisfaction toward the voting rules. In other words, participants may have declared ranked voting to be easy because this ballot structure was their favourite. Another explanation is that ranked voting and approval voting are easier for voters to use and understand than we think. Further research is necessary in order to disentangle the exact role of simplicity in shaping citizens' judgments about different voting methods.

My final three hypotheses referred to individuals' traits and abilities. Voters with a high need to evaluate are proven to have more political opinions and prior beliefs on candidates, and thus I expected for these individuals to express their opinions on numerous candidates with more

ease. More specifically, I anticipated for individuals with a higher need to evaluate to favour ranked voting the most, followed by approval voting and the one-mark ballot the least (*Hypothesis 4*). Similarly, I predicted that a higher need for cognition (*Hypothesis 5*) and numeracy (*Hypothesis 6*) would result in a greater satisfaction with ranked voting and to a lesser extent approval voting over the one-mark ballot. Citizens with greater need for cognition are more satisfied and stimulated by complex tasks and individuals with higher numeracy perform numerical tasks with more facility. Therefore, I expected these individuals to prefer more complex voting rules than individuals that score lower on these scales. However, my results show that people's need to evaluate, need for cognition and numeracy do not influence their preferences in voting rules. Hence, the rejection of *Hypotheses 4, 5* and *6*. This may be explained by the fact that on average individuals in the sample were highly educated, more interested in politics and did not think that the three voting rules were very difficult to use.

6.2 Discussion

This study has important implications as electoral systems are fundamental institutional features of society and have repercussions on individuals' satisfaction in democracy. For the past decade, local, regional and federal governments have contemplated reforming their electoral system. These reforms are most often preceded by costly referendums. However, the cases of British Columbia, Prince Edward Island, Ontario and the United Kingdom serve to show that these efforts are not necessarily supported by the majority of the population. Many Canadians seem to prefer the current plurality rule to any other alternative. In the same vein, scholarly work has found that citizens are more satisfied with one-mark ballots over preferential ballots such as ranked

voting (Blais et al. 2020; Müller and Jankowski 2019). If this is the case, then why do participants in this study express a greater satisfaction toward ranked voting?

My experimental design has the advantage of allowing individuals the experience of casting a vote under different voting rules and to see the results that these rules can generate in the context of a real election. Consequently, the internal validity of the study is greater as real elections are simulated and individuals can gain a better understanding of what the different options entail. However, although the laboratory environment allows this study to be more realistic than previous research on the topic, mock elections do not necessarily convince subjects that “the stakes are real” (Maloy 2019, 108). Thus, citizen behaviour and their preferences may be different in real life scenarios. For example, people may have stronger preferences with regard to the voting rules when they are faced with the true consequences of electoral reform. In comparison to referendums on electoral reform, the sample of this study is not representative of the Canadian population in its entirety. As mentioned above, the sample consists of young and educated citizens living in Quebec. Another limit of the design is that only the parties and not the candidates were listed on the ballots, which differs from real federal elections in Canada. Future research should look into citizens’ preferences toward different voting rules with a more representative sample, in different electoral contexts, and in environments where electoral reform is a current topic of debate.

Another limit to the study is that given the size of the sample, it is hard to truly determine whether or not citizens prefer ranked-choice voting for a better expression of preferences or for the results that it produced in the context of this laboratory experiment. Electoral rules had a bigger effect on the outcome of the election in the case of this experiment than in a real electoral context, because there was a maximum of 20 participants voting in every election and few votes could change the winner of the election. Additional analyses showed that the mean satisfaction for ranked

voting was significantly greater in elections where ranking produced different results. The winner of the elections under ranked voting was slightly more liked on average than the winner using the other two voting rules in these groups, though the difference was not statistically significant. Further research is necessary in order to gain a better understanding of the exact mechanisms that shape citizens preference toward ranked voting. This work shines light on the importance of considering the electoral consequences of voting rules on citizens preferences. Citizens may not be interested in electoral reform or may not want to change voting systems before truly experiencing the voting process and the electoral consequences with different voting rules.

Another aspect to take into consideration is the type of ranked voting used in this experiment. Ranking with a point system like the variation of the Borda Count in this study is rarely used for elections, but much easier for individuals to understand. The ranked-choice voting system used in certain legislations in the United States is more confusing as the tabulation of the votes is more laborious and voters' first (second, third, etc.) choice may not count. With a point system type of ranked voting every rank order of votes contributes to the total vote count. This may be the reason why the subjects indicated that this system was simple to use, and consequently felt greater satisfaction towards the voting rule.

This study introduces a new design to study citizens' preferences for voting rules in a laboratory experiment. Future work should investigate how better expression of electoral preferences, electoral outcomes, and simplicity of the electoral rules, influence support for electoral reform and increase confidence in the democratic process. It is crucial for voting theorists, reform groups, and political elites to put forward voting rules that are approved by the electorate, easy to implement and that accurately represent voter preferences. Recent errors in the vote count of the mayoral Democratic primaries using ranked-choice voting in New York City raise questions

and concerns as to the potential impact of voting rules on voter confidence (Astor 2021). The New York City Board of Elections posted preliminary election results on June 29th, 2021 that they later revoked because they had mistakenly counted 135,000 test ballots (New York City Board of Elections 2021). Following this event, the Republican Senator, Tom Cotton, from Arkansas tweeted: “Ranked-choice voting is confusing, complicated and it’s ripe for fraud. How can anyone trust that a voter’s fourth-place choice was accurately tabulated on the eighth round of ranking? Look at the debacle in New York City right now” (Cotton 2021). Even though the vote count mistake was not a direct consequence of ranked-choice voting, this error should alert officials to the importance of adopting voting rules that foster greater trust in the voting process. Thus, politicians and electoral reform groups should perhaps consider more simple types of ranked voting such as the Borda Count.

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Appendix

Appendix A - Coding and Question Wording

Age:

“Quel âge avez-vous ?”

English Translation: “How old are you?”

Continuous variable coded from 18 to 84

Gender:

Question: “À quel genre vous identifiez-vous ?”

- Homme
- Femme
- Autre

English Translation: “What gender do you identify yourself as?”

- *Male*
- *Female*
- *Other*

Dichotomous variable, where 0 = male and 1 = female

Education:

“Quel est le plus haut diplôme que vous avez obtenu ? »

- Aucun
- Primaire
- Secondaire
- Collège/Cégep
- Technique
- Baccalauréat
- Maîtrise
- Doctorat

English Translation: “What is the highest level of education that you have completed?”

- *None*
- *Elementary School*
- *High School*
- *College/Cégep*
- *Technical Degree*
- *Undergraduate*

- *Masters*
- *Doctorate*

Continuous variable, where 0 = none and 1 = doctorate

University Program:

“Si vous êtes présentement étudiant, quel est votre programme d’étude ?”

English Translation: “If you are currently a student, what program of study are you enrolled in?”

Vote Intention:

“Avez-vous l’intention de voter aux prochaines élections fédérales, le 21 octobre 2019 ?”

- *Oui*
- *Non*

English Translation: “Do you intend to vote in the upcoming federal election on October 21st, 2019?”

- *Yes*
- *No*

Dichotomous variable, where 0 = no and 1 = yes

Intended Vote Choice:

“Si oui, pour quel parti avez-vous l’intention de voter ?”

- *Le Parti Conservateur du Canada*
- *Le Parti Libéral du Canada*
- *Le Nouveau Parti Démocratique du Canada*
- *Le Bloc Québécois*
- *Le Parti Vert du Canada*
- *Le Parti Populaire du Canada*
- *Autre*
- *Aucun*
- *Je ne sais pas*

English Translation: “If so, for which party do you intend to vote for?”

- *The Conservative Party of Canada*
- *The Liberal Party of Canada*
- *The New Democratic Party of Canada*
- *The Bloc Québécois*
- *The Green Party of Canada*
- *The People’s Party of Canada*
- *Other*
- *None*
- *Do not know*

Political Interest:

“En général, quel est votre niveau d’intérêt pour la politique ? Utilisez une échelle de 0 à 10 où 0 veut dire aucun intérêt et 10 veut dire énormément d’intérêt.”

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|----|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Aucun intérêt Énormément d'intérêt | | | | | | | | | | |

English Translation: “In general, how interested are you in politics? Use a 0 to 10 scale where 0 means not interested at all and 10 means extremely interested.”

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|----|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Not Interested at all Extremely Interested | | | | | | | | | | |

Continuous variable, where 0 = not interested at all and 1 = extremely interested

Ideology:

“En politique, les gens parlent parfois de gauche et de droite. Où vous situez-vous sur une échelle de 0 à 10, où 0 signifie « l’extrême gauche » et 10 signifie « l’extrême droite » ?”

| | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|----|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Extrême gauche Extrême droite | | | | | | | | | | |

English Translation: “In politics, people sometimes talk of left and right. Where would you place yourself on a scale from 0 to 10, where 0 means the extreme left and 10 means the extreme right?”

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|----|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Extreme left Extreme Right | | | | | | | | | | |

Continuous variable, where 0 = extreme left and 1 = extreme right

Need to Evaluate:

“J’ai des opinions sur presque tout.”

- Fortement d’accord
- Plutôt d’accord
- Plutôt en désaccord
- Fortement en accord

English Translation: “I have opinions on almost everything.”

- *Strongly agree*
- *Somewhat agree*
- *Somewhat disagree*
- *Strongly disagree*

Continuous variable, where 0 = strongly disagree and 1 = strongly agree

Need for Cognition:

“Quel type de problème préférez-vous résoudre ?”

- Problèmes simples
- Problèmes complexes

English Translation: “What type of problems do you prefer to resolve?”

- Simple problems
- Complex problems

Dichotomous variable, where 0 = simple problems and 1 = complex problems

Numeracy:

“Pour chacune des questions suivantes s’il vous plait cocher la case qui reflète le mieux vos capacités à faire les tâches suivantes :”

“Comment évaluez-vous votre capacité à travailler avec des fractions ?”

| | | | | | | | | | | | |
|---------------|---|---|---|---|---|---|---|---|---|----|------------|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| Très mauvaise | | | | | | | | | | | Très bonne |

“Comment évaluez-vous votre capacité à calculer un pourboire de 15% ?”

| | | | | | | | | | | | |
|---------------|---|---|---|---|---|---|---|---|---|----|------------|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| Très mauvaise | | | | | | | | | | | Très bonne |

English Translation: “How do you evaluate your capacity to work with fractions?”

| | | | | | | | | | | | |
|-----------------|---|---|---|---|---|---|---|---|---|----|-----------|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| Not good at all | | | | | | | | | | | Very good |

“How do you evaluate your capacity to calculate a 15% tip?”

| | | | | | | | | | | | |
|-----------------|---|---|---|---|---|---|---|---|---|----|-----------|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| Not good at all | | | | | | | | | | | Very good |

Continuous variable, where 0 = very little mathematic capacity and 1 = very strong mathematic capacity. The scores for each of the two questions above are added and then rescaled from 0 to 1.

Party – Like/Dislike:

“Que pensez-vous des partis politiques suivants ? Utilisez une échelle de 0 à 10. 0 veut dire que vous n'aimez pas du tout un parti, et 10 veut dire que vous l'aimez beaucoup.”

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|----|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|----|

Aime pas du tout Aime beaucoup

- Le Parti Conservateur du Canada
- Le Parti Libéral du Canada
- Le Nouveau Parti Démocratique du Canada
- Le Bloc Québécois
- Le Parti Vert
- Le Parti Populaire

English Translation: “What do you think of the following political parties? Use a scale from 0 to 10, where 0 means that you strongly dislike the party, and 10 means that you strongly like the party.”

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|----|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|----|

Strongly dislike Strongly like

- *The Conservative Party of Canada*
- *The Liberal Party of Canada*
- *The New Democratic Party of Canada*
- *The Bloc Québécois*
- *The Green Party of Canada*
- *The People’s Party of Canada*

Continuous variable for each political party, where 0 = strongly dislike the party and 1 = strongly like the party

Like Winner:

The previous question (Party – Like/Dislike) is used. The score given to the winning party in the second election with each voting rule is used. Continuous variable, where 0 = really dislike the party and 1 = really like the party

Like Winner (First Election):

The Party – Like/Dislike question is used. The score given to the winning party in the first election with each voting rule is used. Continuous variable, where 0 = really dislike the party and 1 = really like the party

Satisfaction with the Voting Rule:

“Sur une échelle de 0 à 10, à quel point êtes-vous satisfait de la façon de voter dans ces deux dernières élections (*name of the voting rule used*)? 0 signifie que vous n’êtes pas du tout satisfait et 10 signifie que vous êtes très satisfait.”

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|----|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|----|

Pas du tout satisfait Très satisfait

English Translation: “On a scale of 0-10, where 0 means “not at all satisfied” and 10 means “very satisfied”, how satisfied are you with the voting rule you have just used?”

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|----|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|----|

Not at all satisfied Very Satisfied

Continuous variable, where 0 = not at all satisfied and 1 = very satisfied

Preferred Voting Rule:

“Vous avez voté de trois façons différentes. Laquelle des trois trouvez-vous la plus satisfaisante ?”

- Vote par rangement (on vote pour son premier, son second et son troisième choix)
- Vote par approbation (on vote pour tous les partis qu’on appuie)
- Vote unique (on vote pour le parti qu’on veut appuyer)

English Translation: “You voted three different ways. Which of the three do you find most satisfying?”

- Ranked voting (we vote for our first, second and third choice)
- Approval voting (we vote for all the parties that we support)
- One-mark ballot (we vote for the only party that we want to support)

Categorical variable, where 1 = Ranked Voting, 2 = Approval Voting and 3 = One-Mark Ballot

Simple:

“Sur une échelle de 0 à 10, trouvez-vous qu’il est compliqué ou simple de voter avec les façons suivantes. 0 signifie que c’est très compliqué et 10 que c’est très simple.”

“Trouvez-vous qu’il est compliqué ou simple de voter par rangement (on vote pour son premier, son second et son troisième choix) ?”

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|----|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|----|

Très compliqué Très simple

English Translation: “On a scale of 0 to 10, do you find it complicated or simple to vote with the following rules. 0 means that it is very complicated and 10 means that it is very simple.”

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|----|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|----|

Very complicated Very simple

Continuous variable, where 0 = very complicated and 1 = very simple

Small Group:

Dichotomous variable, where 0 = group with more than 16 participants and 1 = group with 16 or less participants

Group Size:

Continuous variable ranging from 15 to 20.

Appendix B - Examples of Ballots and Election Results

Figure A1. One-Mark Ballot

Vote unique

Vous devez voter pour un seul parti. Vous devez cocher le nom du parti que vous désirez appuyer. Le parti qui aura le plus de votes sera déclaré élu dans votre groupe.

Votre choix :

- Le Parti Libéral du Canada
- Le Parti Conservateur du Canada
- Le Parti Vert
- Le Nouveau Parti Démocratique du Canada
- Le Bloc Québécois
- Le Parti Populaire

Figure A2. Approval Voting Ballot

Vote par approbation

Vous devez indiquer quel(s) parti(s) vous désirez appuyer. Vous devez cocher les partis que vous désirez appuyer. Vous pouvez appuyer de 1 à 6 partis. Le parti qui aura le plus d'appuis sera déclaré élu dans votre groupe.

- Le Parti Libéral du Canada
- Le Parti Conservateur du Canada
- Le Parti Vert
- Le Nouveau Parti Démocratique du Canada
- Le Bloc Québécois
- Le Parti Populaire

Figure A3. Ranked Voting Ballot

Vote par rangement

Vous pouvez indiquer un premier choix, un second choix et un troisième choix. Le parti qui a votre premier choix recevra 5 points, le parti qui a votre second choix 3 points et celui qui a votre troisième choix 1 point. Le parti qui recevra le plus de points sera déclaré élu dans votre groupe.

| | | |
|---|---|---|
| <p style="text-align: center;">Choix 1 (5 points) :</p> <ul style="list-style-type: none"><input checked="" type="radio"/> Le Parti Libéral du Canada<input type="radio"/> Le Parti Conservateur du Canada<input type="radio"/> Le Parti Vert<input type="radio"/> Le Nouveau Parti Démocratique du Canada<input type="radio"/> Le Bloc Québécois<input type="radio"/> Le Parti Populaire | <p style="text-align: center;">Choix 2 (3 points) :</p> <ul style="list-style-type: none"><input type="radio"/> Le Parti Libéral du Canada<input type="radio"/> Le Parti Conservateur du Canada<input type="radio"/> Le Parti Vert<input checked="" type="radio"/> Le Nouveau Parti Démocratique du Canada<input type="radio"/> Le Bloc Québécois<input type="radio"/> Le Parti Populaire<input type="radio"/> Aucun | <p style="text-align: center;">Choix 3 (1 points) :</p> <ul style="list-style-type: none"><input type="radio"/> Le Parti Libéral du Canada<input type="radio"/> Le Parti Conservateur du Canada<input checked="" type="radio"/> Le Parti Vert<input type="radio"/> Le Nouveau Parti Démocratique du Canada<input type="radio"/> Le Bloc Québécois<input type="radio"/> Le Parti Populaire<input type="radio"/> Aucun |
|---|---|---|

Figure A4. Sample of Election Results (One-Mark Ballot)

Voici le résultat de cette troisième élection:

Le Parti Libéral du Canada a obtenu **1 vote(s)**.
Le Parti Conservateur du Canada a obtenu **0 vote(s)**.
Le Parti Vert a obtenu **0 vote(s)**.
Le Nouveau Parti Démocratique du Canada a obtenu **0 vote(s)**.
Le Bloc Québécois a obtenu **0 vote(s)**.
Le Parti Populaire a obtenu **0 vote(s)**.

Le parti gagnant est : **le Parti Libéral du Canada**

Appendix C

Figure A5. Certificate from the Institutional Review Board



N° de certificat
CERAH-2019-027-D

Comité d'éthique de la recherche en arts et humanités (CERAH)

CERTIFICAT D'APPROBATION ÉTHIQUE

Le Comité d'éthique de la recherche en arts et humanités (CERAH), selon les procédures en vigueur, en vertu des documents qui lui ont été fournis, a examiné le projet de recherche suivant et conclu qu'il respecte les règles d'éthique énoncées dans la Politique sur la recherche avec des êtres humains de l'Université de Montréal.

| Projet | |
|-----------------------|---|
| Titre du projet | Étude électorale 2019 |
| Étudiante requérante | Gabrielle Péloquin-Skulski, candidate à la maîtrise, FAS - Département de science politique |
| Sous la direction de: | André Blais, professeur titulaire, FAS - Département de science politique, Université de Montréal |

| Financement | |
|--------------------------------|--|
| Organisme | |
| Programme | |
| Titre de l'octroi si différent | |
| Numéro d'octroi | |
| Chercheur principal | |
| No de compte | |

MODALITÉS D'APPLICATION

Tout changement anticipé au protocole de recherche doit être communiqué au Comité qui en évaluera l'impact au chapitre de l'éthique.

Toute interruption prématurée du projet ou tout incident grave doit être immédiatement signalé au Comité.

Selon les règles universitaires en vigueur, un suivi annuel est minimalement exigé pour maintenir la validité de la présente approbation éthique, et ce, jusqu'à la fin du projet. Le questionnaire de suivi est disponible sur la page web du Comité.



Joëlle Rouleau, présidente interimaire
Comité d'éthique de la recherche en arts et
humanités (CERAH)
Université de Montréal

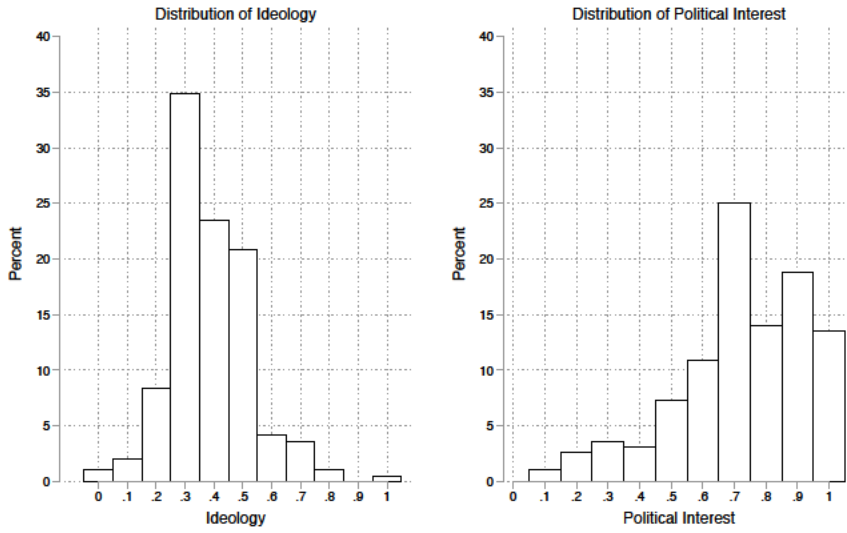
23 septembre 2019
Date de délivrance

1er octobre 2020
Date de fin de validité

1er octobre 2020
Date du prochain suivi

Appendix D

Figure A6. Distribution of Ideology and Political Interest



N = 192

Appendix E

Table A1. Winning Party in Each Election

| Group | Winner One Mark 1 | Winner One Mark 2 | Winner Approval 1 | Winner Approval 2 | Winner Ranked 1 | Winner Ranked 2 | Participants |
|--------------|----------------------------------|----------------------------------|------------------------------|------------------------------|----------------------------|----------------------------|---------------------|
| 1 | NDP | GREEN | NDP | GREEN | NDP | NDP | 20 |
| 2 | GREEN | GREEN | GREEN | GREEN | GREEN | GREEN | 20 |
| 3 | BLOC | BLOC | GREEN | GREEN | GREEN | GREEN | 16 |
| 4 | NDP | NDP | NDP | NDP | NDP | NDP | 19 |
| 5 | NDP | NDP | NDP | NDP | NDP | NDP | 15 |
| 6 | GREEN | NDP | NDP | NDP | GREEN | NDP | 16 |
| 7 | NDP | NDP | NDP | NDP | NDP | NDP | 18 |
| 8 | NDP | NDP | NDP | NDP | NDP | NDP | 19 |
| 9 | NDP | NDP | GREEN | NDP | NDP | NDP | 15 |
| 10 | NDP | NDP | NDP | NDP | NDP | NDP | 19 |
| 11 | GREEN | BLOC | GREEN | GREEN | LIBERAL | LIBERAL | 15 |

Appendix F

Table A2. Effect of Liking the Winner of the First Election

| DV = Satisfaction with the voting rule | |
|--|-------------------|
| Gender (women = 1) | 0.53* (0.25) |
| Education | -0.77 (0.83) |
| Age | 0.01 (0.02) |
| Ideology | 0.68 (0.97) |
| Political Interest | 0.02 (0.57) |
| Like Winner (First Election) | 3.16*** (0.75) |
| <i>Voting Rule</i> | |
| One-Mark Ballot (ref) | - |
| Approval Voting | -0.02 (0.22) |
| Ranked Voting | 0.62** (0.22) |
| <i>Order</i> | |
| 1 (ref) | - |
| 2 | 0.20 (0.22) |
| 3 | 0.12 (0.19) |
| Constant | 3.59*** (1.01) |
| <i>N</i> | 576 |
| <i>R</i> ² | 0.101 |

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix G

Table A3. OLS Regressions with Interactions Between Simplicity, Need for Cognition and Numeracy

| | DV = Satisfaction with the voting rule | |
|---------------------------------|--|--------|
| Gender (women = 1) | 0.60* | 0.64* |
| | (0.26) | (0.27) |
| Education | -1.01 | -0.84 |
| | (0.89) | (0.87) |
| Age | 0.01 | 0.01 |
| | (0.02) | (0.02) |
| Ideology | -0.52 | -0.36 |
| | (0.86) | (0.89) |
| Political Interest | -0.13 | -0.17 |
| | (0.60) | (0.57) |
| Simplicity | 0.26* | 0.44** |
| | (0.10) | (0.14) |
| Need for Cognition | 0.19 | - |
| | (1.07) | |
| Numeracy | - | 2.81 |
| | | (1.56) |
| Simplicity x Need for Cognition | -0.06 | |
| | (0.13) | |
| Simplicity x Numeracy | | -0.35 |
| | | (0.20) |
| <i>Voting Rule</i> | | |
| One-Mark Ballot (ref) | - | - |
| Approval Voting | -0.04 | -0.07 |
| | (0.22) | (0.22) |
| Ranked Voting | 0.58** | 0.53* |
| | (0.22) | (0.22) |
| <i>Order</i> | | |
| 1 (ref) | - | - |
| 2 | 0.24 | 0.26 |
| | (0.21) | (0.21) |
| 3 | 0.15 | 0.19 |
| | (0.19) | (0.19) |
| Constant | 4.48*** | 2.71 |
| | (1.18) | (1.43) |
| <i>N</i> | 576 | 576 |
| <i>R</i> ² | 0.095 | 0.099 |

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix H

Table A4. OLS Regressions of Satisfaction with the Voting Rule with Interactions with Ideology and Political Interest

| DV = Satisfaction with the voting rule | | |
|--|-------------------|-------------------|
| Gender (women = 1) | 0.71** (0.26) | 0.71** (0.26) |
| Education | -1.01 (0.96) | -1.01 (0.96) |
| Age | 0.01 (0.02) | 0.01 (0.02) |
| Ideology | 1.18 (1.28) | -0.68 (0.93) |
| Political Interest | -0.09 (0.60) | 0.26 (0.89) |
| <i>Voting Rule</i> | | |
| One-Mark Ballot (ref) | - | - |
| Approval Voting | 1.13 (0.81) | 0.51 (0.77) |
| Ranked Voting | 1.63* (0.71) | 0.86 (0.77) |
| One-Mark x Ideology (ref) | - | - |
| Approval Voting x Ideology | -2.97 (1.96) | |
| Ranked Voting x Ideology | -2.61 (1.76) | |
| One-Mark x Political Interest (ref) | - | - |
| Approval Voting x Political Interest | | -0.73 (1.09) |
| Ranked Voting x Political Interest | | -0.32 (1.06) |
| <i>Order</i> | | |
| 1 (ref) | - | - |
| 2 | 0.21 (0.22) | 0.20 (0.22) |
| 3 | 0.11 (0.20) | 0.10 (0.20) |
| Constant | 5.71*** (0.97) | 6.18*** (1.01) |
| <i>N</i> | 576 | 576 |
| <i>R</i> ² | 0.049 | 0.044 |

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix I

Table A5. Moderation Effect of Being in a Small Group (Dummy Variable)

| | DV = Satisfaction with the Voting Rule |
|---------------------------------|---|
| Gender (women = 1) | 0.78** (0.27) |
| Education | -1.06 (0.96) |
| Age | 0.01 (0.02) |
| Ideology | -0.58 (0.93) |
| Political Interest | -0.03 (0.60) |
| Small Group | 0.11 (0.39) |
| <i>Voting Rule</i> | |
| Single Mark (ref) | - |
| Approval Voting | -0.20 (0.28) |
| Ranked Voting | 0.59* (0.24) |
| Single Mark x Small Group (ref) | - |
| Approval Voting x Small Group | 0.41 (0.50) |
| Ranked Voting x Small Group | 0.05 (0.43) |
| <i>Order</i> | |
| 1 (ref) | - |
| 2 | 0.33 (0.23) |
| 3 | 0.17 (0.18) |
| Constant | 6.22*** (0.94) |
| <i>N</i> | 576 |
| <i>R</i> ² | 0.047 |

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A6. Moderation Effect of Group Size (Continuous Variable)

| | DV = Satisfaction with the Voting Rule |
|--------------------------------|---|
| Gender (women = 1) | 0.75** (0.27) |
| Education | -1.03 (0.96) |
| Age | 0.01 (0.02) |
| Ideology | -0.63 (0.93) |
| Political Interest | -0.04 (0.60) |
| Group Size | -0.10 (0.10) |
| <i>Voting Rule</i> | |
| Single Mark (ref) | - |
| Approval Voting | -1.14 (2.15) |
| Ranked Voting | -1.62 (2.03) |
| Single Mark x Group Size (ref) | - |
| Approval Voting x Group Size | 0.06 (0.12) |
| Ranked Voting x Group Size | 0.13 (0.11) |
| <i>Order</i> | |
| 1 (ref) | - |
| 2 | 0.11 (0.22) |
| 3 | 0.04 (0.18) |
| Constant | 8.26*** (2.01) |
| <i>N</i> | 576 |
| <i>R</i> ² | 0.046 |

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$