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Coping with complexity: Ballot position effects in the Finnish open-list proportional representation system

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ABSTRACT

Many studies show that the order of candidates' names on the ballot has an effect on voting. Less informed and indifferent voters may simplify the voting process by using the ballot position of candidates as a voting cue. By studying six parliamentary elections in Finland, this study first demonstrates that the relationship between ballot position and preference votes follows a reversed J-shaped curve. Candidates listed early on the ballot win the most preference votes, while candidates listed near the end have an advantage over those listed in the middle. Furthermore, the ballot position effect grows stronger with the complexity of the electoral environment. The ballot position effect increases as the number of candidates on the party list increases, the candidates-to-seats ratio increases and the number of incumbents on the list decreases.

1. Introduction

Numerous studies, spanning nearly one hundred years, show that the order of candidate names on the ballot causes bias in election outcomes across different types of electoral systems (for overviews of the literature, see Blom-Hansen et al. 2016, 173–174; Darcy and McAllister 1990, 7–14; Edwards 2015, 173; Miller and Krosnick 1998, 295–297). Candidates tend to receive more votes if they are listed early, or even near the end on the ballot paper. Less informed and indifferent voters may simplify the voting process by using the ballot position of candidates as a voting cue (Blom-Hansen et al., 2016, 182; Darcy and McAllister 1990, 14; Marcinkiewicz and Stegmaier 2015, 483–484; Ortega Villodres 2008, 437) or they become biased toward selecting earlier- or later-listed candidates due to mental fatigue (Kim et al. 2015, 527; Miller and Krosnick 1998, 293–294). Although the ballot position effect is substantially small compared to other predictors (Alvarez et al. 2006, 41–42; Blom-Hansen et al., 2016, 182; Kim et al., 2015, 526–527), it is essential to examine if, to what extent and under what electoral conditions ballot order affects the way voters make decisions.

This study contributes to the extensive literature by demonstrating how the size of the ballot position effect in an electoral system with intraparty preference voting varies according to the complexity of the electoral environment. The conditional effect of electoral complexity is an understudied area of research. Studies of both single-member and multi-member districts systems mostly focus on elections with relatively few candidates in small electoral districts (Spac 2016) and therefore also relatively low electoral complexity. Generally, the complexity of the electoral environment has been highlighted as an important factor shaping voters' decision-making process (Klingemann and Wessels 2009; Kroh 2003; Lau and Redlawsk 2006; McDermott 1997) and increasing the likelihood that voters rely on ballot position as a voting cue (Blom-Hansen et al., 2016; Darcy and McAllister 1990). Few efforts have, however, been made to empirically test the conditional effect of electoral complexity on the tendency to use ballot position as a voting cue (but see Barker and Lijphart 1980; Muraoka 2019) or to specify what electoral complexity can entail.

We advance our understanding by showing that the ballot position effect increases with the complexity of the electoral context. Our theoretical argument is that cognitive complexity increases when voters are presented with long lists of candidates running under different party labels. Additional demands are placed on voters when many of these candidates are relatively unknown, since name recognition (deriving from, for example, incumbency status) is a candidate attribute that voters often rely on to simplify their voting decision. Thus, as the costs for information acquisition grow and processing become increasingly hard to manage, more voters are likely resort to easily available cues such as a candidate's position on the ballot. Our empirical analyses demonstrate that the ballot position effect grows stronger with 1)

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increasing number of candidates on the ballot, 2) increasing candidates-to-seats ratio and 3) decreasing number of incumbents on the ballot.

To demonstrate how greater cognitive demands imposed on voters exaggerate the ballot position effect, we use data from a relatively complex and demanding open-list proportional representation system (OLPR).[1] In Finland, voters are required to cast a preference vote for a single candidate. Most parties present long lists of candidates in each multi-member district. Intraparty competition is high in the Finnish electoral system because the personal votes alone determine which candidates are elected from each party list (after the mandates have been allocated to the parties). Although this is a within-country study, there is large variation in number of candidates, candidates per won seat and incumbents, both across ballot lists and electoral districts. We are also able to compare the ballot position effect under alternative structures applied to construct party lists: alphabetical and rank-ordered lists. On alphabetical lists, the candidates are listed according to surname. On rank-ordered lists, the order of the candidates is determined by the party's district organization or according to the number of votes in the party's primary elections. The straightforward design of the Finnish electoral system, including only one preference vote and not allowing voters to cross out candidates or to vote for candidates from other parties, further makes is a suitable context for identifying ballot position effects. The data set includes over 12,000 candidates in six Finnish first-order parliamentary elections from 1999 to 2019.

2. Theory

2.1. Informational shortcuts

While the rational voter, according to the classical version of spatial theory of voting (Downs 1957), will choose a candidate (or a party) that most closely aligns with his or her preferences, abundant research has shown that voters decision-making process often is ill fitted with such expectations (Bartels 1996; Converse 1964). Rather than gathering and systematically analyzing all available information on parties and candidates voters tend to apply various heuristics, or shortcuts to information, that facilitate their choice (Feld and Grofman 1991; Lau and Redlawsk 2006). Based on past experiences and accumulated knowledge, many of the cues help voters to make reasonable assumptions regarding the political views of candidates (Lupia, 1994; Popkin, 1991). The extent to which voters apply such heuristics is contingent not only on their individual capacity (Johns and Shephard 2007; Popkin 1991; Zaller 1990), but also on the electoral context in which they make their decision (Klingemann and Wessels 2009; Kroh 2003). Information shortcuts become particularly useful in cognitive demanding electoral contexts that contain, for example, many parties and candidates. The large amount of available information in such environments tend to be too burdensome for voters to manage (Lau and Redlawsk 2006).

Research also show that the types of heuristics that voters use vary according to task complexity. As the task at hand becomes more complex, voters tend to rely more heavily on simplifying decision heuristics (Lau and Redlawsk 2001). Simplifying heuristics can be secondary information about candidates, such as gender, age, occupation or ethnicity; information that often is utilized to make assumptions about a candidate's political views. This can be compared to primary information about candidates (e.g., ideological beliefs, issue positions and political experience) which is considered to be more demanding for voters to process but leading to more informed choices (Brockington 2003). Others even resort to relying on politically irrelevant cues (Muraoka 2019) or tertiary information (Brockington 2003) such as a candidate's ballot position. *Ballot order effect* (Blom-Hansen et al., 2016; Darcy and McAllister 1990; Marcinkiewicz and Stegmaier 2015) or *name-order effect* (Kim et al., 2015; Miller and Krosnick 1998) both refer to the phenomenon when candidates win more votes simply due to their placement on the ballot, typically at the top or at the end of the ballot. It is important to note, however, that selecting a candidate that is placed high on a party list is not necessarily always to be considered as irrational behavior. If the list order is controlled and ranked by the party, list position is indeed a powerful cue, signaling that the party considers this candidate as a suitable representative (Lutz 2010; Marcinkiewicz and Stegmaier 2015). In cases where lists are unranked, and candidates are presented in for example alphabetical order, it is however to be characterized as a suboptimal strategy, lacking political relevance (Devroe and Wauters, 2016).

Apart from the idea that ballot position serves as a voting cue, scholars have been inspired by various ideas in the psychological literature to understand the micro-foundations of ballot position effects. Such explanations include *satisficing* and *primacy* or *recency* effects due to decision fatigue. Satisficing theory predicts that voters select the first acceptable candidate to appear when sifting through a list. Since satisficing voters may start their review of the list of candidates from the bottom or from the top, such behavior can give rise to ballot positions effects favoring candidates placed on the top or at the bottom of a list. Primacy effects occur if voters look for reasons to vote for a candidate (confirmatory bias) and have superior recall of initially offered or early options because the cognitive load becomes increasingly difficult to manage as voters evaluate more and more candidates. Recency effects occur if voters retrieve reasons to vote against early evaluated candidates (disconfirmatory bias) as they become cognitively fatigued working down a list and therefore select the last presented alternative (Miller and Krosnick 1998, 293–294; see also Koppell and Steen 2004, 269). While the micro-foundations of the ballot position effect is a fascinating topic, such underlying mechanisms are difficult to distinguish without experimental research designs. In this study, focusing on how the complexity of the electoral context shapes the ballot position effect and utilizing register data, the scope is limited to identify the magnitude of the ballot position effect and its contextual variation.[2]

2.2. Complexity of the electoral environment and the ballot position effect

Voting for candidates according to their placement on the ballot has been found to be less prevalent if the ballot provides information about, for example, party label (Darcy and McAllister 1990, 13) and incumbency status (Mueller 1970, 402) of candidates.[3] Furthermore, the magnitude of the ballot position effect can vary according to whether candidate voting is optional or compulsory (Darcy and McAllister 1990, 12), whether candidate lists are alphabetical or party-ordered (Lutz 2010, 170), the salience of elections (Blom-Hansen et al., 2016, 174) and the number of candidates on the list (Barker and Lijphart 1980, 523; Muraoka 2019). It therefore appears likely that the ballot position effect takes different forms in different contexts, and that its effect is stronger

[1] Open-list proportional representation systems come in a large variety of forms. They vary in terms of, for example whether preference voting is optional or mandatory, whether voters may cast one or multiple preference votes and whether candidate votes are exclusive, transferable to other candidates or pooled at the party or sub-party levels (Carey and Shugart 1995). We fully acknowledge that the Finnish OLPR system is not the most cognitively demanding one. Electoral systems with multiple candidate votes and transferable votes, such as the single transferable vote (STV) and the alternative vote (AV), can be argued to offer an even more complex electoral environment for voters to manage. Some OLPR systems add further layers of complexity by allowing voters to cast multiple preference votes, strike out candidates and vote for different candidates from several lists (e.g., Switzerland).

[2] This said, we find little reason to expect that the underlying mechanisms of satisficing, primacy and recency effects would play out differently, dependent on the electoral contexts under scrutiny in this study.

[3] These findings come from studies involving interparty competition, i.e. where candidates from different parties are listed on the same ballot.

in more complex voting systems or in low-information elections. This expectation is well in line with previous research showing that the electoral context, not the least the information environment, is shaping voters' decision-making process, making them more or less susceptible to easily available cues such as socio-demographic traits or incumbency status (McDermott 1997; Lau and Redlawsk 2006), or to politically irrelevant cues, such as ballot position or surname (Cunow 2014; Muraoka 2019).

According to Muraoka (2019), there are two *central* systemic factors that combined increase the complexity of electoral choice and, as a consequence, the tendency of voters to apply easily available, but politically irrelevant, cues: *the number of candidates running* and the *distinction between candidate- and party-centric systems*. These are in fact the same systemic features that Carey and Shugart in their seminal study (1995) identified as central for shaping the incentive structure for individual candidates to cultivate a personal vote. The first factor, the number of candidates running, is related to district magnitude. As districts grow in size, the number of nominated candidates tend to increase, as does the number of options voters face. A greater number of candidates running makes information processing for voters more costly. Considering that parties under proportional representation have a tendency to nominate more candidates than the number of seats they hope to win, voters are often faced with a choice set-up that goes far beyond their general capacity for information processing.

A large number of candidates does not, however, automatically increase the complexity for voters. The extent to which it does is related to if the system is party- or candidate-oriented. In party-oriented systems with closed lists (CLPR), voters are only faced with a choice between pre-ranked party ballots. Since voters do not choose between the candidates listed on such ballots, a larger number of candidates is not likely to increase the complexity of the electoral choice, neither do these nominated candidates have an incentive to cultivate a personal vote (Carey and Shugart 1995). In electoral systems, which offer voters not only a choice *between* parties but also *within* parties, the number of candidates will however matter a great deal. In such systems, for example open-list proportional representation (OLPR), an additional layer is added to the decision-making process, especially if preferential voting is *compulsory*, as voters in these systems are expected to identify not only a suitable party, but also a suitable candidate in order to cast a vote. Candidates running for election in these contexts are, in turn, highly incentivized to craft individualized campaigns. A large number of candidates, mixed campaign messages and a two-level decision-making process all contribute to decreasing the usefulness of party-level cues, and to increasing the cognitive demand voters face as they need some type of information on the candidates running. This can, in turn, be expected to increase the usage of easily available, but politically irrelevant cues such as ballot placement, since also less informed voters are forced to discriminate between candidates (Darcy and McAllister 1990).

The length of a party list is hence likely to increase complexity under systems that offer or require intraparty choice. Not only do longer lists involve a larger number of alternatives for voters to differentiate between, and to inform themselves about, but the information environment is also influenced by a higher level of competition between candidates and their efforts to cultivate a personal vote. In the presence of long candidate lists, it can hence be expected that a portion of the voters use ballot position as an informational shortcut to economize the cost of gathering information in a complex electoral setting. There are however also other factors that might influence voters' tendency to resort to suboptimal decision-making strategies under complex electoral environments, both of which are related to the availability of easily available politically relevant cues: the logic by which candidates are presented on the ballot and the number of high-quality candidates.

There are different arrangements concerning how candidates are presented on the ballot paper to the voters. A basic distinction is between ballots with a partisan structure (or rank-ordered lists) and an alphabetical structure (Montabes Pereira and Ortega Villodres 2002; Ortega Villodres 2003, 2008). With a partisan ballot structure, the parties themselves rank the candidates on the ballot paper. The parties tend to place prominent, experienced and publicly known candidates at the top of the list (Lutz 2010). This way, by ranking the candidates, the parties provide voters with a strong cue for how to vote (Katz 1994; Marcinkiewizc and Stegmaier 2015). Rank-ordered ballots therefore tend to be less complex for voters. Alphabetically ordered list, in turn, increase complexity, since a candidate's position on the ballot does not reveal anything about his or her quality from the perspective of the party leadership.

Another factor that affects voters' voting strategies is the availability of information shortcuts with high political relevance. Long lists, particularly alphabetically ordered ones that consist of candidates *lacking* powerful vote-earning attributes such as name recognition, experience or locality, will increase the cognitive demands placed on voters (Cunow 2014). This is likely to be the case for parties that win only one or a few seats.[4] Despite relatively low prospects of winning many seats, parties are for tactical reasons likely to field a maximum number of candidates.[5] The prospects of such parties to have a large selection of candidates with strong vote-earning potential to put forward are, however, not very high. In addition, we can expect candidates running for a party that will win only one or a few seats, to campaign with lower intensity, further decreasing the likelihood that they become well-known to voters. If, on the other hand, a substantial share of the candidates on the list are incumbent MPs – known as one of the most powerful vote-earning attributes a candidate can possess (Butler 2009; Erikson 1971; Gelman and King 1990) – larger share of voters can be expected to apply such heuristics, rather than resorting to a vote based on the candidate's position on the ballot.

2.3. Hypotheses

To summarize, we have discussed how voters may use simplifying voting cues such as ballot position when they are faced with a complex set of voting decisions and information demands become difficult to manage. Below we formulate three main hypotheses regarding the shape and size of the ballot position effect in an open-list proportional representation system with preference voting for individual candidates. First, we expect that some voters, who are primarily concerned with choice of party, use ballot position as a voting cue to select a candidate. The formal hypothesis is as follows:

H1. The position of candidates on a list matters for the percentages of preference votes they win.

For a more detailed account of our expectations, our first hypothesis can be divided into two sub hypotheses, of which the first states that some voters are biased towards the first, or early, options presented on party lists. Hence, early listed candidates are expected to receive systematically more votes.

H1a. Candidates listed in the beginning of a party ballot win a higher percentage of preference votes than candidates listed later on the ballot.

Candidates who are listed at the end of party ballot can also have a special advantage. Some voters may begin scanning party lists from the end. Last-listed candidates are, just as first-listed ones, easier to spot on the ballot paper or in party advertisements compared to copartisans listed in the middle of the list. Hence, there are studies where the relationship between ballot position and number of votes is a reversed J-

[4] We thank one of the anonymous reviewers for pointing us in this direction.

[5] OLPR involves pooling of votes at the level of parties. This incentivizes parties to run full lists (each vote a candidate can win contributes to the party vote total), and gives theme little reason to care about the distribution of votes across candidate, since it does not matter for how many seats the party will win (Shugart and Taagepera 2017).

shaped one. For example, Mueller (1970, 399) observed that "while those at the top of the list gain considerable advantage from their ballot position, those at the very end also gain a bit" and therefore "the worst position on the ballot is not at the end of the list, but shortly before it" (see also Bain and Hencock 1957, 72–75; Robson and Walsh 1974, 200). However, a (reversed) J-shaped curve can also occur if candidates are ordered by the party since voters may protest and vote against top-ranked candidates by choosing candidates at the bottom of the list (Marcinkiewizc and Stegmaier 2015, 473–474). The first hypothesis is accompanied with the following one:

H1b. Candidates listed in the end of a party ballot win a higher percentage of preference votes than candidates listed in the middle of the ballot.

If the party presents ranked lists of candidates rather than applying alphabetical ordering, it should decrease voters' tendency to apply politically irrelevant cues. As discussed above, in case of pre-ranked lists, parties tend to strategically place their most experienced and well-known candidates at the top of a list, providing voters with easily available information that is expected to facilitate their decision-making process. Candidates listed first should therefore win more votes than those positioned both in the middle and the end of a party list, contributing to a stronger and more linear ballot position effect. In a study of intraparty competition in Finland (1999), ballot position had a significant linear effect on the number of votes for candidates running under the label of the Social Democratic Party, which in most constituencies pre-ranked the candidates on the ballot according to the number of votes in primary elections (Ortega Villodres 2003). The second main hypothesis is as follows:

H2. The advantage of being listed early is more pronounced for non-alphabetical rank-ordered lists where the candidates are ordered by the party leadership or according to votes in primary elections.

As discussed in section 2.2, our main theoretical argument is that more voters are expected to resort to suboptimal decision-making strategies the more complex the electoral environment is. We hence expect that the tendency of some voters to vote for candidates near the top, or the bottom, of the ballot increases with the complexity of the electoral context. Ballot positon as a voting cue should be particularly evident if candidates are listed alphabetically:

H3. The size of the ballot position effect increases with the complexity of the electoral context on alphabetically ordered lists.

Complementing the effect of ballot type outlined in H2 above, the complexity of the electoral context is in our study defined in three different ways, leading us to present three sub-hypothesis. We expect the strength of the ballot position effect to increase as the number of candidates grows (Geys and Heyndels 2003, 149).

H3a. The size of the ballot position effect increases as the number of candidates on the list increases on alphabetically ordered lists.

Similarly, we expect that choice complexity increases with the number of copartisans competitors for each seat won. This does not only mean that voters face a larger set of alternatives to choose from. Also, the higher the number of copartisans per seat won, the lower the overall success of the list at the district level tends to be (see Arter 2013, 102), indicating a lower number of well-known and intensively campaigning candidates. In contrast, the lower the candidates-to-seats ratio is, the more likely there are multiple candidates with political experience and name recognition, which decreases the cognitive demands put on voters.

H3b. The size of the ballot position effect increases as the candidates-to-seats ratio increases on alphabetically ordered lists.

Further, incumbency signals actual political experience and provides valuable name recognition. We therefore expect that the strength of the ballot-order effect varies with the presence or absence of incumbents and that these effects are played out differently for alphabetically ordered and rank-ordered lists. With a lower share of incumbent MPs on the list, the cognitive demands placed on voters increase (Cunow 2014), as does the need for voters to resort to politically irrelevant cues, causing a stronger ballot position effect on alphabetically ordered lists.

H3c. The size of the ballot position effect increases as the share of incumbent MPs on the list decreases on alphabetically ordered lists.

3. List order and intraparty preference voting in Finland

Finnish voters find themselves in a complex voting setting. The information and cognitive demands placed on the voters are high under the Finnish open-list PR system because the voters are obliged to choose a single candidate from a large number of aspirants. Moreover, candidates are nested within parties and votes that are cast for individual candidates are pooled at the party level (Cox 1997). Political competition hence takes place at two levels: between parties as collective actors and between candidates running for the same party (von Schoultz 2018). OLPR is generally considered as a relatively easy playground for parties (Shugart and Taagepera 2017). Since the distribution of votes between candidates does not matter for the overall performance of the party in terms of seat winning, parties have low incentives to manage the internal competition within a party list. From the perspective of rank order effects this is important, since it implies that candidates generally earn their votes based on individual efforts, rather than due to specific support from the party.

The two hundred seats in the *Eduskunta* have in the 1999–2019 period been distributed in 13–15 constituencies, using the D'Hondt highest average method. District magnitude (*M*) has ranged from 1 to 36. The Finnish electoral system is what Rein Taagepera (2007) labels a "simple" system, since it lacks a mechanism that links the share of votes a party receives at the national level with the distribution of seats at the district level. For strategical reasons, parties tend to run full lists, which signifies 14 candidates per constituency, or if *M* exceeds 14, as many candidates as there are seats to be distributed (von Schoultz 2018). In the largest constituency in the 2019 election, *M* was as high as 36, which meant that most major parties ran lists with 36 candidates, and that the total number of candidates on offer in the constituency amounted to 492. This implies that a large share of the nominees is constituted by 'top-up candidates' (Arter 2013), candidates that do not stand a chance and do not have the ambition to become elected. Such candidates are nominated to attract the support of specific subgroups of voters, and to make sure that all potential party voters can identify a suitable candidate on the list.

Candidates are presented to voters on a large sheet of paper, listed in numerical order (starting with No. 2) and divided into columns by party. The sheet is displayed at the polling station and in the polling booth and candidates are presented by name, title and place of residence (municipality). In order to cast a vote, voters write the number of their preferred candidate on the ballot paper. The sole criterion in determining the party internal ranking of candidates is the amount of preference votes each candidate receive (Reynolds et al. 2005).

Finnish electoral law does not stipulate a specific order by which parties are to present their candidates on the ballot. The vast majority of the Finnish parties list candidates in strict alphabetical order, which implies that voters are unable to use the order of presentation as a cue to what the party leadership considers a high-quality candidate. Some parties, most commonly the Social Democratic Party with a more distinct culture of intra-party democracy, have deviated from the common patter and used party primaries to rank their candidates (Helander 1997; Raunio 2005). Other parties, often minor ones without representation in parliament, have opted for ordering candidates on their ballots according to the directives of the party leadership. Parties entering alliances also have a higher tendency to present ranked lists, due to a more distinct need for vote concentration to one candidate order to win a seat (Arter 2013). The choice of which strategy to apply (as well as nomination procedures overall) is decentralized and takes place at the district level (Lundell 2004, 39). The same party can hence use different strategies (alphabetical or rank-ordered ballots) across districts.

Table 1 provides information on the two basic types of lists, alphabetical and rank-ordered, for the eight major Finnish parties represented in the *Eduskunta* between 1999 and 2019. With a few exceptions, the other parties have presented alphabetically ordered lists of candidates. Over time, the number and share of rank-ordered party list has decreased. If we only look at the major parties, 72 percent of these parties' lists were alphabetically ordered in 1999. This number steadily increased to around 95 percent by the end of the 2010s.

4. Data, measurement and method

Our data consist of candidate information from six Finnish parliamentary elections: 1999, 2003, 2007, 2011, 2015 and 2019. The extensive database includes the total number of votes received by individual candidates, along with their ballot position and biographical data.[6] The main sources used to collect data were websites with official electoral statistics.[7] These were supplemented with information from other relevant sources when needed.[8] 12,955 candidates are present in the original sample. Our final sample, after excluding lists with less than three candidates and candidates with missing values, consists of 12,319 candidates.

Table 1
Alphabetical and rank-ordered lists in Finnish parliamentary elections, 1999–2019.

Party	List type	1999	2003	2007	2011	2015	2019
KESK	Alphabetical	13	14	14	14	12	12
	Rank-ordered	1	0	0	0	0	0
KOK	Alphabetical	14	14	14	14	12	12
	Rank-ordered	0	0	0	0	0	0
PS	Alphabetical	11	11	12	14	12	12
	Rank-ordered	3	3	2	0	0	0
SDP	Alphabetical	1	4	5	10	9	10
	Rank-ordered	13	10	9	4	3	2
VAS	Alphabetical	13	14	14	13	12	12
	Rank-ordered	1	0	0	1	0	0
VIHR	Alphabetical	11	12	12	14	12	12
	Rank-ordered	3	2	2	0	0	0
RKP	Alphabetical	6	5	4	6	8	8
	Rank-ordered	0	1	0	0	0	1
KD	Alphabetical	9	11	12	13	12	11
	Rank-ordered	5	3	2	1	0	1
8 major parties	Alphabetical	65	71	73	84	77	77
	Rank-ordered	25	19	15	6	3	4
All lists	Alphabetical	167	162	167	198	168	205
	Rank-ordered	76	38	34	24	12	27

Notes: The final two rows include all parties and lists in Finland. KESK = Centre Party of Finland; KOK = National Coalition Party; PS = Finns Party (prev. True Finns); SDP = Social Democratic Party of Finland; VAS = Left Alliance; VIHR = Green League; RKP = Swedish People's Party in Finland; KD = Christian Democrats in Finland.

The dependent variable, *preference vote share*, is log-transformed percentage of votes received by candidate *i* on list *j* in district *k* at election *t*. In other words, the variable measures each candidate's intraparty, or intralist, vote share. Since the variable has a skewed distribution towards low values, we bring it closer to a normal distribution by calculating its natural logarithm.

The main independent variable, *ballot position*, is the candidate's rank on the party list. Due to variation in the number of candidates nominated on lists, the variable is standardized to vary between 0 (the first candidate on the list) and 1 (the last candidate on the list) (see Marcinkiewicz and Stegmaier 2015). In addition, the squared term of ballot position is included to account for its possible non-linear relationship with vote share. *Alphabetical list* is a dummy variable which identifies lists where candidates are strictly alphabetically ordered by surname (yes = 1, no = 0). In contrast, candidates on (non-alphabetical) rank-ordered lists are listed according to the number of votes in primary elections or directives by the party leadership. Three variables capture the complexity of the electoral context. First, *number of candidates* is the raw number of candidates on the list. Lists with between three and 36 candidates are included in the sample. The variable is log-transformed because the dependent variable itself is in natural logs. Second, *candidates-to-seats ratio* (C:S ratio) is the number of copartisan competitors (C) divided by the number of seats (S) won by the list. This variable varies between 1 and 36. Third, *incumbents* is the percentage of re-election seeking incumbents on the list. Only candidates who were elected four years earlier are considered, not candidates who entered parliament in the middle of the term because members of parliament vacated their seats.

Finally, the models include a set of control variables, demonstrated to influence the electoral success of Finnish candidates in previous studies (e.g. Isotalo et al. 2020; Put et al. 2020; von Schoultz and Papageorgiou 2019). The control variables are: gender represented by *female* (1 = yes, 0 = no), *age* of the candidate (divided by 10) and its squared term, *employed* (1 = yes, 0 = unemployed, student or pensioner), *candidate in previous election* (1 = yes, 0 = no), *local councilor* who was elected in the previous municipal election (1 = yes, 0 = no), *celebrity* known from media, music, sports and alike (1 = yes, 0 = no), *native* who was born in his or her home municipality (1 = yes, 0 = no) and *population of home municipality* (log-transformed).

Multilevel regression analysis is an appropriate method for analyzing data with a hierarchical structure. We estimate three-level random-intercepts regression models with candidates (level 1) nested in lists (level 2) which are nested in electoral districts (level 3). Election-year-fixed effects, a dummy variable for each election except one, are included but not reported in the regression models.[9] The results from the multilevel regression analyses are presented in Tables 2–4.

5. Analysis

In this section, we test the hypotheses presented in section 2.3. Although our main interest is in the ballot position effect, we begin by evaluating the performance of the models and the control variables. Proportional reductions in variance components compared to an empty model (without any explanatory variables) were calculated. The results in Table 2 show that the proportion reduction in variance at level 1 is

[6] We thank Mattias Karlsson for excellent work on the data collection.
[7] The most frequently employed sources are the Ministry of Justice, www.vaalit.fi (official election results, ballot positions and ballot order), the Digital and Population Data Services Agency, www.dvv.fi (socio-economic data of candidates) and Statistics Finland, www.stat.fi (municipal data).

[8] Newspaper searches were conducted to code celebrity status of candidates.
[9] We also tested four-level models with candidates nested in lists nested in districts nested in elections. However, due to the low number of elections, there was no substantial intercept variation in outcomes across elections and the standard error was either zero or could not be determined.

Table 2
Estimation of the ballot position effect on candidates' preference vote shares.

	Model 1 All lists			Model 2 All lists			Model 3 All lists		
	Est.		(SE)	Est.		(SE)	Est.		(SE)
Fixed effects									
Age/10	.195	**	(.041)	.191	**	(.040)	.190	**	(.040)
Age/10 squared	–.026	**	(.004)	–.026	**	(.004)	–.026	**	(.004)
Female	.052	**	(.016)	.049	**	(.016)	.049	**	(.015)
Employed	.200	**	(.028)	.200	**	(.028)	.196	**	(.028)
Candidate in previous election	.623	**	(.017)	.614	**	(.017)	.594	**	(.017)
Local councilor	.556	**	(.019)	.553	**	(.019)	.555	**	(.019)
Celebrity	.697	**	(.052)	.691	**	(.052)	.672	**	(.052)
Native	.045	**	(.016)	.042	**	(.016)	.046	**	(.016)
Population of home municipality (ln)	.082	**	(.006)	.082	**	(.006)	.078	**	(.006)
Ballot position	–			–.941	**	(.089)	−2.831	**	(.221)
Ballot position squared	–			.735	**	(.087)	1.964	**	(.218)
Candidates (ln)	−1.259	**	(.032)	−1.204	**	(.033)	−1.183	**	(.033)
C:S ratio	.005	*	(.003)	.005		(.003)	.005	*	(.003)
Incumbents (%)	–.015	**	(.002)	–.015	**	(.002)	–.015	**	(.002)
Alphabetical list	–.012		(.030)	–.014		(.030)	.156	**	(.038)
Alphabetical list × Ballot position	–			–			.864	**	(.068)
Alphabetical × Ballot position squared	–			–			−1.464	**	(.237)
Election-fixed effects	Yes			Yes			Yes		
Random effects									
Level 3 variance intercept	.002		(.002)	.003		(.003)	.003		(.003)
Level 2 variance intercept	.058		(.008)	.061		(.008)	.069		(.009)
Level 1 variance residual	.675		(.009)	.666		(.009)	.654		(.008)
Model summary									
N Level 3: districts	17			17			17		
N Level 2: parties	375			375			375		
N Level 1: candidates	12,319			12,319			12,319		
Pseudo R^2 Level 3: districts	.964			.957			.962		
Pseudo R^2 Level 2: parties	.871			.865			.847		
Pseudo R^2 Level 1: candidates	.277			.287			.299		
Model deviance	30,506			30,356			30,172		

Notes. The pseudo R^2 values are proportion reduction in residual variance in comparison with an empty model with no independent variables.
$^{**}p < .01$; $^{*}p < .05$.

between 28 and 30 percent, which implies that the candidate-specific variables explain the variation in candidate success satisfactorily. The substantial reductions in the level 2 and level 3 variance intercepts, leaving little or no variation to explain, is primarily explained by the inclusion the number of candidates. Hence, most of the variation in preference vote share of candidates across lists and districts is due to how many candidates are on the lists.

The strongest predictors at the candidate level are celebrity candidate, local councilor and having been a candidate in the previous election, thus demonstrating the importance of personal reputation. A candidate's employment status is a standard indicator of socioeconomic status and therefore employed has a positive effect (as opposed to being unemployed, a student or a pensioner). The vote-earning effect of locality, a proxy for "knowing the area and its needs", is visible in that being a native who was born in the municipality they reside in attract more votes. The fact that most candidates receive the main share of support from their "home turf" also provides candidates from large municipalities with an electoral advantage. In terms of age, older candidates win fewer votes, while the differences are quite small between candidates in their 20s–50s when accounting for other variables. Female candidates win marginally more votes, all else equal. The candidates' preference vote shares decreases with the number of candidates and incumbents on the list, while the coefficient for candidates-to-seats ratio is close to zero and barely significant.

Model 2 in Table 2 includes both *ballot position* and *ballot position squared*. The ballot position variable was mean centered before creating the squared term to reduce multicollinearity. Simply by mean centering, the correlation between ballot position and its squared term was reduced from 0.96 to 0.14. The coefficients for ballot position and its squared term confirm the existence of a curvilinear relationship. This means that candidates at the beginning of the ballot win the most preference votes (H1a) and candidates at the very end of the ballot have an advantage over those closer to the middle (H1b). In Model 3, both *ballot position* and *ballot position squared* are interacted with *alphabetical list* to fit separate curves alphabetical and rank-ordered lists. All regression coefficients for the three main effects and the two interaction effects are substantial in size and statistically significant. Thus the results confirm that, all else equal, the relationship between ballot position and a candidate's preference vote share is curvilinear for both alphabetical and rank-ordered lists.[10] Going from Model 1 to Model 3, the change in level 1 pseudo R^2 is 1.2 percentage points, which indicates a

[10] An alternative approach is to examine the ballot position effect on which candidates were elected (see Edwards 2015; Meredith and Salant 2013).We ran a multilevel logistic model with a binary dependent variable (1 = elected, 0 = not elected). The model estimates are reported in Online Appendix (see Table OA1). For alphabetical lists, there is a slight indication of a curvilinear relationship between ballot position and if a candidate was elected (First = 13.7% likelihood of being elected; Vertex = 12.8%; Last = 14.2%). However, if we compare the predicted likelihoods, using Wald tests, we are not able to statistically confirm that the differences are significant (see Online Appendix, Table OA2). This is not surprising considering we are losing a lot of information having a dichotomous dependent variable. Further, in our analyzed sample, no or few candidates were elected from most party lists: 54 percent of the party lists did not win any seats, 25 percent won 1–2 seats, 15 percent won 3–4 seats, and 6 percent won 5–11 seats. This makes it less likely to find a substantial and robust relationship between ballot position and being elected. For ranked lists, on the other hand, there is a strong curvilinear relationship between ballot position and being elected.

Table 3
Estimation of the ballot position effect on candidates' preference vote shares according to the complexity of the electoral environment: alphabetical lists.

	Model 4 Alphabetical			Model 5 Alphabetical			Model 6 Alphabetical		
	Est.		(SE)	Est.		(SE)	Est.		(SE)
Fixed effects									
Ballot position	.435		(.504)	–.009		(.185)	–.743	**	(.127)
Ballot position squared	–.153		(.501)	.016		(.180)	.606	**	(.125)
Candidates	−1.214	**	(.043)	−1.302	**	(.035)	−1.278	**	(.035)
Candidates × Ballot position	–.369	*	(.051)	–			–		
Candidates × Ballot position squared	.236		(.182)	–			–		
C:S ratio	.004		(.003)	.015		(.004)	.004		(.003)
C:S ratio × Ballot position	–			–.050	**	(.014)	–		
C:S ratio × Ballot position squared	–			.042	**	(.014)	–		
Incumbents	–.016	**	(.002)	–.016	**	(.002)	–.023	**	(.003)
Incumbents × Ballot position	–			–			.027	*	(.011)
Incumbents × Ballot position squared	–			–			–.019		(.011)
Election-fixed effects	Yes			Yes			Yes		
Random effects									
Level 3 variance intercept	.000		(.000)	.000		(.000)	.001		(.002)
Level 2 variance intercept	.049		(.007)	.049		(.007)	.049		(.007)
Level 1 variance residual	.671		(.009)	.671		(.009)	.671		(.009)
Model summary									
N Level 3: districts	17			17			17		
N Level 2: parties	292			292			292		
N Level 1: candidates	10,510			10,510			10,510		
Pseudo R^2 Level 3: districts	1.000			1.000			.978		
Pseudo R^2 Level 2: parties	.901			.899			.900		
Pseudo R^2 Level 1: candidates	.276			.277			.277		
Model deviance	25,932			25,928			25,932		

Notes. The coefficients on the candidate-level control variables are not reported for space considerations. The pseudo R^2 values are proportion reduction in residual variance in comparison with an empty model with no independent variables.
$^{**}p < .01$; $^{*}p < .05$.

Table 4
Estimation of the ballot position effect on candidates' preference vote shares according to the complexity of the electoral environment: rank-ordered lists.

	Model 7 Rank-ordered			*Model 8 Rank-ordered*			*Model 9 Rank-ordered*		
	Est.		(SE)	Est.		(SE)	Est.		(SE)
Fixed effects									
Ballot position	–.218		(.220)	−1.622	**	(.098)	–.890	**	(.070)
Ballot position squared	.338		(.747)	.042	**	(.323)	2.199	**	(.238)
Candidates	−1.223	**	(.110)	−1.051	**	(.106)	−1.082	**	(.102)
Candidates × Ballot position	–.413	**	(.085)	–			–		
Candidates × Ballot position squared	.785	**	(.295)	–			–		
C:S ratio	.014		(.011)	.012		(.012)	.010		(.011)
C:S ratio × Ballot position	–			.042	**	(.009)	–		
C:S ratio × Ballot position squared	–			–.002		(.030)	–		
Incumbents	–.004		(.005)	–.004		(.005)	–.005		(.005)
Incumbents × Ballot position	–			–			–.044	**	(.005)
Incumbents × Ballot position squared	–			–			.011		(.017)
Election-fixed effects	Yes			Yes			Yes		
Random effects									
Level 3 variance intercept	.000		(.000)	.000		(.000)	.000		(.000)
Level 2 variance intercept	.142		(.026)	.166		(.029)	.146		(.026)
Level 1 variance residual	.498		(.017)	.495		(.017)	.483		(.017)
Model summary									
N Level 3: districts	17			17			17		
N Level 2: parties	142			142			142		
N Level 1: candidates	1809			1809			1809		
Pseudo R^2 Level 3: districts	1.000			1.000			1.000		
Pseudo R^2 Level 2: parties	.645			.585			.635		
Pseudo R^2 Level 1: candidates	.423			.427			.440		
Model deviance	4054			4057			4004		

See notes under Table 3.

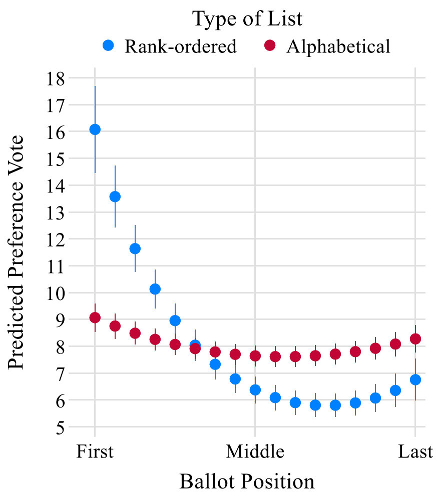

Fig. 1. Predictive margins of preference vote share with 95% CIs by ballot position and type of list.

relatively small effect size.

A visual inspection of the curves helps us to further demonstrate the non-linear relationship between ballot position and electoral success. Fig. 1 presents predictive margins based on the statistical estimates in Model 3. The standardized ballot position variable is plotted against the predicted preference vote share.[11] Both curves can be described as reverse J-shaped: the highest number of preference votes for candidates in the beginning of a list, the lowest number of preference votes for candidates near the middle of a list and moderately high number of preference votes for candidates at the end of a list. For alphabetical lists, the lowest point of the parabola (i.e., the vertex) occurs at 0.59 on the standardized scale that runs from 0 (first on the list) to 1 (last on the list). For rank-ordered lists, the vertex, or turning point, is at ballot position 0.72.[12]

The statistical estimates in Model 3 also confirm Hypothesis 2: the ballot position effect is stronger for non-alphabetical rank-ordered lists than for alphabetical lists. As evident from Fig. 1, the two curves differ significantly. The first listed candidates on rank-ordered lists won on average 16.1 percent of the intraparty vote. The downward slope of the curve for rank-ordered lists is steep and reaches its minimum 5.8 percent of the vote at position 0.72 on the standardized scale. Candidates listed first on alphabetical lists won on average 9.1 percent of the vote. The red curve for alphabetical lists is flatter in shape with a much gentler slope. The predicted vote share is 7.6 percent at position 0.59 and 8.3 percent at position 1 (i.e., last on the list). Hence, the first-position advantage, compared to candidates two-thirds into the list, on alphabetical lists is 1.5 percentage points.

Next we assess if the ballot position effect on electoral success is stronger if more cognitive demand is placed on the voters. Here our main focus is on alphabetical lists because they impose the highest cognitive demands on the voter. Ballot position and its squared term are interacted with the (logged) number of candidates on the list, candidate-to-seats ratio and the percentage of incumbents on the list. The regression estimates are presented in Table 3 and predictive margins in Figs. 2–4. Relative differences in predictive margins are also presented to aid interpretation. The predictive margins for candidates at positions 0 (first), 0.59 and 1 (last) when the contextual variables are set to different values are first calculated. Then we calculate the ratio between pairs of predictive margins to determine, in relative terms, how much more votes a candidate at a certain list position won. These ratios, along with statistical post-estimation Wald tests of differences in predictive margins, are presented in detail in Appendix (Tables A1–A3).

In accordance with hypothesis 3a, the size of the ballot position effect increases as the number of candidates on an alphabetical list increases. The increasing ballot position effect is evident from the increasing ratios in Table A1 in Appendix as we go from few candidates to more candidates. On lists with 15 candidates (i.e., lower complexity), the ratio between the predicted preference vote for candidates placed on top of the list and on position 0.59 (vertex for alphabetical lists) is 1.18. In other words, candidates who are listed first win on average 18 percent more preference votes than those close to the middle. On lists with 35 candidates (i.e. greater complexity), candidates placed on top of the list win 32 percent more votes than those close to the middle of the list. Hence, the greater the number of candidates, the greater the relative gap between the first-placed candidate's vote share and his or her copartisans' vote shares. Also when we compare candidates listed first with candidates listed last, the relative gap increases with complexity: 8% on lists with 15 candidates and 21% on lists with 35 candidates.

The ballot position effect is even stronger when the cognitive demands increase due to a higher candidates-to-seats ratio (hypothesis 3 b) and a lower number of incumbents on the list (hypothesis 3c) on alphabetically ordered lists. Hence, electoral complexity is higher when the candidates-to-seats ratio is 25 compared to lower values (see Fig. 3). When the C:S ratio is set to 5, the relative advantage of first-listed candidates over those in the middle is 8 percent and 4 percent over those in the end. The differences increase as the candidates-to-seats ration increases from 5 to 25. First-listed candidates won 45 percent

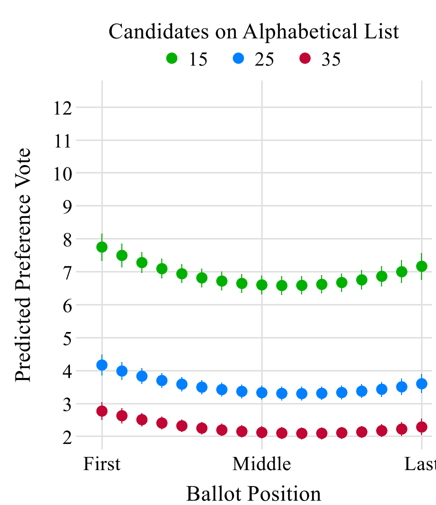

Fig. 2. Alphabetically ordered lists: predictive margins of preference vote share with 95% CIs by ballot position and at fixed values for number of candidates.

[11] For every candidate, ballot position is fixed at 17 evenly spaced values that range between 0 and 1 while holding all other independent variables at their actual values. Each candidate's predicted intraparty vote share is then calculated based on the estimated regression coefficients. Finally, the average of the predicted value at the specified values for ballot position for all the candidates is calculated and presented. While the predictions from our model are on a log scale, the predictive margins are presented in the original scale (we removed the bias of reverse transformation, from logarithms to the original scale, by including a function of the variance of the errors in our prediction).

[12] We statistically confirm through Wald tests that the predicted average vote share of candidates listed at the top of alphabetical lists is significantly higher than the predicted vote share of candidates in list position 0.59 (χ^2 (1) = 39.53, p < .001) and last list position (χ^2 (1) = 12.27, p < .001). Candidates last on lists also win significantly more preference votes than candidates on position 0.59 (χ^2 (1) = 10.13, p < .01). In a similar vein, candidates listed at the top on rank-ordered lists win significantly more preference votes than candidates in list position 0.72 (χ^2 (1) = 154.61, p < .001) and last list position (χ^2 (1) = 144.70, p < .001). The difference between candidates in the last position and in list position 0.72 is also significant (χ^2 (1) = 8.59, p > .01).

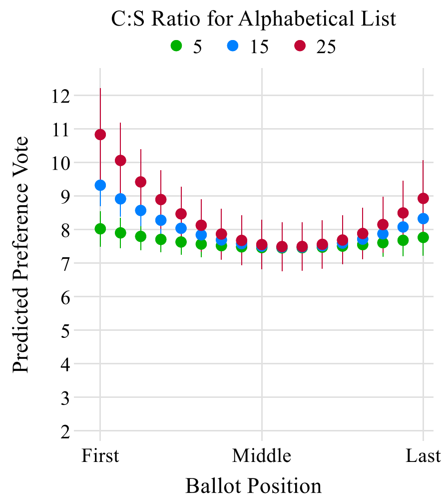

Fig. 3. Alphabetically ordered lists: predictive margins of preference vote share with 95% CIs by ballot position and at fixed values for candidates-to-seats ratio.

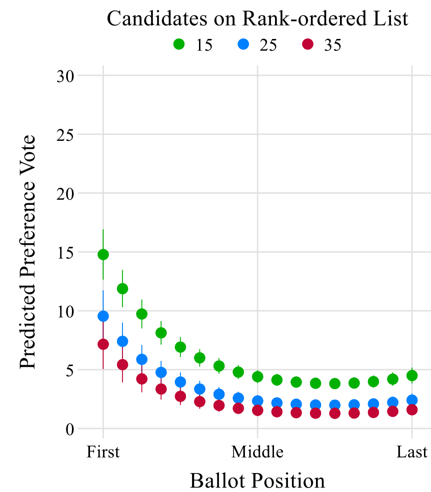

Fig. 5. Rank-ordered lists: predictive margins of preference vote share with 95% CIs by ballot position and at fixed values for number of candidates.

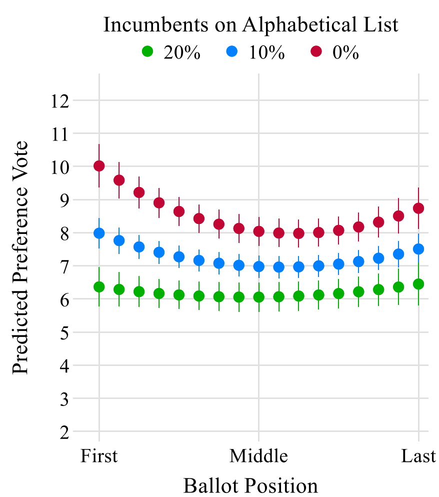

Fig. 4. Alphabetically ordered lists: predictive margins of preference vote share with 95% CIs by ballot position and at fixed values for percentage of incumbents.

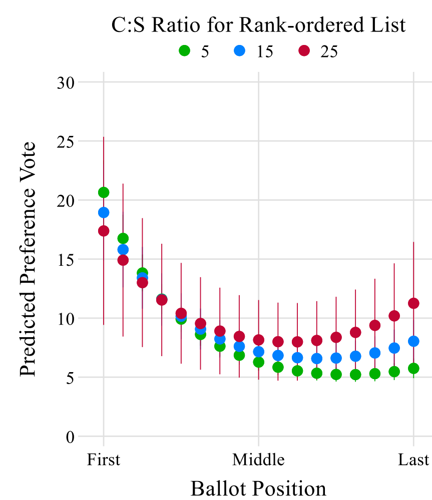

Fig. 6. Rank-ordered lists: predictive margins of preference vote share with 95% CIs by ballot position and at fixed values for candidates-to-seats ratio.

more votes than candidates in the middle and 19 percent more votes than those in the end when the C:S ratio is 25 (see Table A2 in Appendix). In Fig. 4, the differences between candidates on different list positions are negligible when the list is made up of 20 percent incumbents (i.e., lower complexity). The differences increase if we set the number of incumbents to first 10 percent and then to 0 percent (i.e., greater complexity). In the latter case, candidates positioned first win 26 percent more preference votes than those close to the middle of the list and 15 percent more than those positioned last (see Table A3 in Appendix).

For sake of comparison, we also examine the curves for the less prevalent, and for our purposes less relevant, rank-ordered lists (see Table 4 and Figs. 5–7). As expected, the conditional effects of the contextual variables are not as systematic for rank-ordered lists where the order of presentation provides voters with a distinct voting cue. Only when ballot position is interacted with the number of candidates on the list we find the anticipated conditional effect. On lists with 15 candidates (i.e., lower complexity), first-ranked candidates win 287 percent more preference votes than candidates on position 0.72 (vertex of rank-ordered lists). On lists with 35 candidates (i.e., greater complexity), candidates at the top of the list receive even more, 453 percent more preference votes than those three-quarters into the list. The differences between candidates in the end of the lists and three-quarters into the lists are much smaller: the relative gap increases from 18 to 23 percent as the number of candidates increase (see Table A4 in Appendix). Similar systematic differences cannot be observed rank-ordered lists when ballot position is interacted with the candidate-to-seats ratio and the number of incumbents (see Tables A5–A6 in Appendix). This suggests that voters are adequately aided by the fact that the candidates are ranked by prominence irrespective of the complexity of the choice environment.

We also perform a series of robustness checks by omitting different variables and including a control variable for incumbent candidates. Hence, the erroneous inclusion of irrelevant variables and exclusion of relevant variables may result in biased estimates for the variables of interest (Neumayer and Plümper 2017, 130–136). The regression estimates are reported in Online Appendix. First, the results are highly robust to the omission of other electoral complexity variables. A minimum number of electoral complexity variables are included in each model. List length must be controlled for in every model, however,

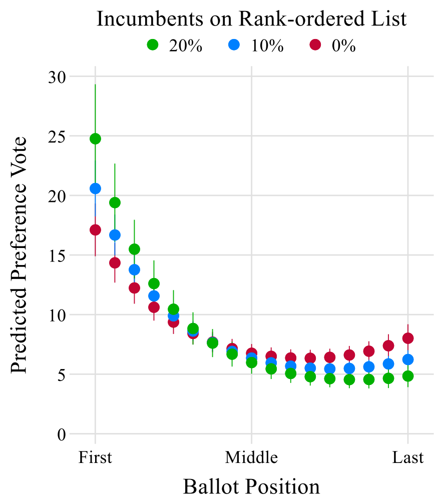

Fig. 7. Rank-ordered lists: predictive margins of preference vote share with 95% CIs by ballot position and at fixed values for percentage of incumbents.

because the number of preference votes for candidates depends on the number of candidates on the list (see Tables OA3 and OA4). Second, the substantive findings do not change with the exclusion of all candidate-level control variables (see Tables OA5 and OA6). Third, the inclusion of a dummy variable for incumbent candidate (or Member of Parliament) does not alter the main findings. Incumbency is a strong predictor of electoral success, but we did not include it in the main models because we included the contextual variable measuring the number of incumbents on the list. The regression coefficients for the electoral complexity variables even slightly increase in size (see Tables OA7 and OA8).

6. Discussion and implications

This study has expanded our understanding of ballot position effects in proportional representation systems with preference voting (see also Blom-Hansen et al., 2016; Geys and Heyndels 2003; Marcinkiewitcz, 2014; Marcinkiewitcz and Stegmaier 2015), particularly those with compulsory preference voting and alphabetically ordered lists (see also Ortega Villodres 2003). There is an alphabetic bias in the Finnish OLPR system and the relationship between ballot position and preference votes is non-linear (reversed J-shaped). Candidates listed first on an alphabetically ordered ballot win the most votes, while those being placed in the end provide a smaller competitive advantage in relation to those located closer to the middle of the list. The ballot position effect is much stronger on the less prevalent rank-ordered lists, which is as expected since these lists provide voters with a strong cue with regards to candidate quality and party preferences.

It is indeed difficult to compare the substantive ballot position effects across countries due to large variations in electoral rules and voting procedures. Nevertheless, in the Finnish case, we observed that the advantage of being listed first on an alphabetically ordered candidate list is, relative to being positioned two-thirds into the list, about 1.5 percentage points on average. Although it appears to be a weak effect, relatively few votes can determine the fate of individual candidates. In each of the six previous Finnish parliamentary elections, between 59 and 82 candidates lost by less than 1.5 percentage points to the list's last elected candidate. Hence, the ballot position can determine which candidate is elected and which is not.

More importantly, our results clearly showed that the tendency of voters to use ballot position as a voting cue grows with the complexity of the electoral environment. The information processing demands imposed on voters were expected to increase with a higher number of candidates on the list, higher number of copartisans per seat won and lower number of incumbents on the list. Task complexity increases when the alternatives presented on the list are many. Demands of the decision task also increase when most of the candidates on the list are relatively unknown to the voters due to fewer vote-earning attributes and/or lower incentives to run personal campaigns. For example, incumbency status and name recognition are two candidate attributes that voters often rely on in complex electoral environments. The conditional effects we found were systematic, suggesting that the advantage of being listed early, as well as being listed towards the end of the ballot on alphabetically ordered lists, is greater in more complex electoral settings. These contextual effects were not as obvious for ranked lists where parties' rank-ordering of candidates on the ballot serve as a voting cue.

The general implication of these findings is that demanding electoral systems, which offer many options but few politically relevant cues, can overwhelm some voters and lead to arbitrary choices. Less informed and indifferent voters are more likely to simplify the voting process by using ballot position as a voting cue, even when it fails to provide information about the quality of candidates. A well-informed electorate is essential to democracy. The ideal is that the election results accurately reflect the preferences of the public, but the quality of voting decisions might be compromised if voters make uninformed decisions and thereby would undermine democratic accountability and representation (Cunow 2014; Fowler and Margolis 2014). If some candidates systematically get an advantage due to their position on the list, it "undermines equality among individual candidates", offends "the democratic principle of fair play" (Koppell and Steen, 2004, 268) and "interfere with the election of the best qualified candidates for public office" (Edwards 2015, 184).

Our results have some normative implications for electoral system design options, especially candidate selection rules. On the one hand, it is desirable that voters are empowered with voice and choice in electoral decisions (e.g., ability to express preferences for candidates within the same party list and to choose between multiple alternatives). On the other hand, greater freedom of choice increases the complexity of voting which carries greater risks for voter abstention and use of irrelevant voting cues. It is preferable to find the balance between freedom of choice and simplicity of choice. If preference voting is mandatory instead of optional, and if voters are faced with very long lists of candidates from many viable parties, there is the danger that electoral choice becomes too difficult for some voters to handle.

What can be done to minimize "perverse" or "unfair" results? One possibility is to randomize and rotate the names of candidates on the ballot to neutralize whatever ballot position advantage or disadvantage (Alvarez et al., 2006; Meredith and Salant 2013). But this may increase administrative costs of running elections by printing ballots in a variety of styles. Another danger is that randomization and rotation may increase voter confusion (Alvarez et al., 2006, 52). The candidates themselves can increase their efforts to let the voters know about their qualities, but this is likely to increase the personalization of politics whereby less focus is put on party reputations and policy platforms and more on individual traits (Karvonen, 2010). Perhaps the most realistic solution, applicable to electoral systems with high district magnitudes and preference voting, is to decrease the maximum amount of candidates that parties are allowed to nominate. A more limited menu for voters to choose from can, according to the findings presented in our study, increase the average quality of the choices made.

Data availability

Data will be made available on request.

Acknowledgments

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.electstud.2021.102330.

Appendix

Table A1
Predictive margins: preference vote share according to ballot position and number of candidates on alphabetical lists.

	Alphabetical lists				
	PM_i	PM_j	*Ratio*	$\chi 2$	*p*
15 candidates on list					
First vs. Vertex (0.59)	7.75	6.58	1.18	33.59	0.00
First vs. Last	7.75	7.17	1.08	8.75	0.00
Last vs. Vertex (0.59)	7.17	6.58	1.09	10.15	0.00
25 candidates on list					
First vs. Vertex (0.59)	4.17	3.30	1.26	33.87	0.00
First vs. Last	4.17	3.60	1.16	16.41	0.00
Last vs. Vertex (0.59)	3.60	3.30	1.09	5.55	0.02
35 candidates on list					
First vs. Vertex (0.59)	2.77	2.10	1.32	26.47	0.00
First vs. Last	2.77	2.29	1.21	15.00	0.00
Last vs. Vertex (0.59)	2.29	2.10	1.09	3.01	0.08

Notes. PM_i = predictive margin (preference vote share) for the first category (First or Last) in the first column; PM_j = predictive margin (preference vote share) for the second category (Vertex or Last) in the first column; *Ratio* = PM_i/PM_j; $\chi 2$ = chi-squared test statistic for the difference between the two predictive margins; *p* = statistical significance.

Table A2
Predictive margins: preference vote share according to ballot position and candidates-to-seats ratio on alphabetical lists.

	Alphabetical lists				
	PM_i	PM_j	*Ratio*	$\chi 2$	*p*
C:S ratio 5					
First vs. Vertex (0.59)	8.02	7.45	1.08	4.03	0.04
First vs. Last	8.02	7.76	1.03	0.86	0.35
Last vs. Vertex (0.59)	7.76	7.45	1.04	1.36	0.24
C:S ratio 15					
First vs. Vertex (0.59)	9.32	7.47	1.25	44.10	0.00
First vs. Last	9.32	8.32	1.12	14.10	0.00
Last vs. Vertex (0.59)	8.32	7.47	1.11	12.49	0.00
C:S ratio 25					
First vs. Vertex (0.59)	10.83	7.48	1.45	27.83	0.00
First vs. Last	10.83	8.93	1.21	10.59	0.00
Last vs. Vertex (0.59)	8.93	7.48	1.19	8.26	0.00

See notes under Table A1.

Table A3
Predictive margins: preference vote share according to ballot position and number of incumbents on alphabetical lists.

	Alphabetical lists				
	PM_i	PM_j	*Ratio*	$\chi 2$	*p*
20% incumbents on list					
First vs. Vertex (0.59)	6.36	6.07	1.05	0.90	0.34
First vs. Last	6.36	6.45	0.99	0.08	0.78
Last vs. Vertex (0.59)	6.45	6.07	1.06	1.60	0.21
10% incumbents on list					
First vs. Vertex (0.59)	7.98	6.96	1.15	21.71	0.00
First vs. Last	7.98	7.51	1.06	5.01	0.03
Last vs. Vertex (0.59)	7.51	6.96	1.08	7.32	0.01
0% incumbents on list					
First vs. Vertex (0.59)	10.02	7.98	1.26	37.52	0.00
First vs. Last	10.02	8.74	1.15	15.47	0.00
Last vs. Vertex (0.59)	8.74	7.98	1.09	6.61	0.01

See notes under Table A1.

Table A4
Predictive margins: preference vote share according to ballot position and number of incumbents on rank-ordered lists.

	Rank-ordered lists				
	PM$_i$	*PM*$_j$	*Ratio*	$\chi 2$	*p*
15 candidates on list					
First vs. Vertex (0.72)	14.78	3.82	3.87	130.73	0.00
First vs. Last	14.78	4.50	3.28	131.35	0.00
Last vs. Vertex (0.72)	4.50	3.82	1.18	10.53	0.00
25 candidates on list					
First vs. Vertex (0.72)	9.55	1.99	4.80	59.83	0.00
First vs. Last	9.55	2.41	3.96	59.98	0.00
Last vs. Vertex (0.72)	2.41	1.99	1.21	6.89	0.01
35 candidates on list					
First vs. Vertex (0.72)	7.16	1.30	5.53	37.85	0.00
First vs. Last	7.16	1.60	4.48	37.82	0.00
Last vs. Vertex (0.72)	1.60	1.30	1.23	4.99	0.03

See notes under Table A1.

Table A5
Predictive margins: preference vote share according to ballot position and candidates-to-seats ratio on rank-ordered lists.

	Rank-ordered lists				
	PM$_i$	*PM*$_j$	*Ratio*	$\chi 2$	*p*
C:S ratio 5					
First vs. Vertex (0.72)	20.65	5.27	3.92	147.18	0.00
First vs. Last	20.65	5.75	3.59	151.20	0.00
Last vs. Vertex (0.72)	5.75	5.27	1.09	2.85	0.09
C:S ratio 15					
First vs. Vertex (0.72)	18.95	6.59	2.88	55.08	0.00
First vs. Last	18.95	8.05	2.35	52.43	0.00
Last vs. Vertex (0.72)	8.05	6.59	1.22	8.46	0.00
C:S ratio 25					
First vs. Vertex (0.72)	17.39	8.23	2.11	9.78	0.00
First vs. Last	17.39	11.26	1.54	6.05	0.01
Last vs. Vertex (0.72)	11.26	8.23	1.37	4.44	0.04

See notes under Table A1.

Table A6
Predictive margins: preference vote share according to ballot position and number of incumbents on rank-ordered lists.

	Rank-ordered lists				
	PM$_i$	*PM*$_j$	*Ratio*	$\chi 2$	*p*
20% incumbents on list					
First vs. Vertex (0.72)	24.76	4.69	5.28	88.38	0.00
First vs. Last	24.76	4.85	5.11	93.35	0.00
Last vs. Vertex (0.72)	4.85	4.69	1.03	0.27	0.61
10% incumbents on list					
First vs. Vertex (0.72)	20.58	5.47	3.77	190.87	0.00
First vs. Last	20.58	6.23	3.30	192.25	0.00
Last vs. Vertex (0.72)	6.23	5.47	1.14	8.22	0.00
0% incumbents on list					
First vs. Vertex (0.72)	17.11	6.36	2.69	109.18	0.00
First vs. Last	17.11	8.02	2.13	87.59	0.00
Last vs. Vertex (0.72)	8.02	6.36	1.26	14.85	0.00

See notes under Table A1.

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