



Influence of ‘Cognitive Sophistication’ on Ballot Layout Effects

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The layout of the ballot affects voting behaviour. Candidates in ‘critical’ (top and bottom) positions in multi-column ballots obtain a larger percentage of the vote in multi-column ballots than in a single-column ballot. In the present paper, we analyse whether the socio-economic characteristics of the electorate affect the prominence of such Ballot Layout Effects. We analyse preferential votes obtained by 897 candidates in the 1995 Regional Elections in Brussels. We find that the cognitive sophistication of the electorate, as proxied by its education level, reduces the strength of the observed Ballot Layout Effects.

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Introduction

Since the 2000 US presidential elections, a consensus has grown that the ‘butterfly’ ballot in Palm Beach, Florida affected the results of the presidential race.¹ It has been shown that the specific layout of the ballot form caused people to vote for the ‘wrong’ candidate, that is, for a candidate that was not their preferred candidate (Wand *et al.*, 2001). Given the closeness of the Palm Beach race, it cannot be excluded with certainty that the misleading effect of the ballot form has actually decided on who became the president of the United States. While being an extreme example, the US case has drawn attention to the importance of the layout of ballot forms in the democratic process. In Palm Beach, the issue was that the ballot form may have misled some voters. Still, Ballot Layout Effects can be more general. Geys and Heyndels (2003) demonstrate how the ballot layout affected results for the May 1995 elections of the Brussels Regional Government. Candidates received significantly more preferential votes in districts where their names appeared in ‘critical’ positions (at the top or the bottom of the ballot form).

Knowing that Ballot Layout Effects exist is insufficient. The next pressing question is what affects the occurrence and size of these effects. To analyse this



question, it should be observed that a large literature exists on a highly related phenomenon, viz. Ballot *Position* Effects. These refer to the fact that politicians whose names appear in given positions (first, second, third,...) obtain more (less) votes *irrespective* of the visual presentation of the candidate list. Such Ballot Position Effects can be seen as the political version of response-order and framing effects that are commonly observed in survey measurements. A noteworthy feature in this closely associated research field is the finding that a better-informed population is less susceptible to various position and framing effects. Indeed, it has been shown that position effects are stronger where the population is lower in 'cognitive sophistication'. In the present paper, we test whether similar influences can be observed for Ballot Layout Effects. To be more precise, we investigate whether or not Ballot Layout Effects are more prominent in districts where the electorate scores lower in 'cognitive sophistication' as proxied by its average level of education.

The paper is structured as follows. The next section reviews the literature on Ballot Position and Ballot Layout Effects and the subsequent section gives information on the institutional context of the 1995 elections of the Brussels Regional Government and on the different layouts that were used. Next, our empirical analysis — based on a data set for 897 candidates — is summarized. We find clear empirical evidence for the presence of Ballot Layout Effects. Crucially, we find that cognitive sophistication significantly reduces the size of these effects. The last section concludes.

Ballot Position and Ballot Layout Effects Literature

The order of candidates on the ballot sheet affects their electoral success. This empirical observation is commonly referred to as Ballot *Position* Effects (for a review, see Darcy and McAllister, 1990; Miller and Krosnick, 1998). The prototype situation is one where a number of candidates running for a single office are ranked alphabetically in a single column on a ballot form and where those candidates who are ranked high — early in the alphabet — obtain more votes *ceteris paribus*. However, not only the *top* position may bring electoral advantage. Several studies find that candidates listed near or at the *end* of the ballot receive more votes than we would expect if no positional effects were present (e.g. Byrne and Pueschel, 1974, 781–782). Other studies, considering elections with 'longer ballots', find that the lowest as well as the highest ballot positions are advantaged (Bain and Hecock, 1957, 72–75; Robson and Walsh, 1974, 200). This is referred to as the 'J-curve pattern' (Mueller, 1970, 399; Darcy and McAllister, 1990, 8). This combination of first and last position effects is by some scholars



interpreted as an indication of a voter's tendency to skip the middle positions when faced with long candidate lists (Robson and Walsh, 1974; Bowler *et al.*, 1992, 564).

Darcy and McAllister (1990, 5) and Miller and Krosnick (1998) find that the characteristics of the electoral race play an important mitigating role. In their review study, Darcy and McAllister (1990, 5) show that in elections where the candidates run as members of a political party ('partisan elections') and where the partisan affiliation of the candidate is presented on the ballot, the top position no longer appears to create a significant advantage to the candidate. Miller and Krosnick (1998) analyse data on precinct-level voting behaviour in all races of the 1992 elections in the three largest counties of Ohio. Several procedures of name-rotation were used across precincts. They then calculate the difference in vote shares obtained by a candidate when in first or second position (in a two-candidate race) and the difference in vote shares when (s)he was in first or last place (in a multi-candidate race). Candidates listed first had a significant advantage thus indicating the presence of position effects. These effects were stronger 'in races where party affiliations were not listed, when races had been minimally publicized and when no incumbent was involved' (Miller and Krosnick, 1998, 291). They conclude that 'ballot structure influences election outcomes when voters lack substantive bases for candidate preference' (Miller and Krosnick, 1998, 291).

Position effects are not only present in the political context. Each 'closed' survey question is likely to be confronted with the same issue. Closed questions present two or more alternatives to the respondent from which (s)he has to choose. The influence of the order of the alternatives on the individual's choices is generally known as Response-Order Effects (Schuman and Presser, 1981, 56). Survey research in various contexts has abundantly shown such effects to exist. An important aspect of this wide research field is that not only the characteristics of the study matter (such as the order of the responses), but also the characteristics of the individuals answering the survey questions. In fact, it has been frequently argued that respondents with higher education levels can be expected to be less influenced by the order of the options (Hyman *et al.*, 1975; Schuman and Presser, 1981). Empirical analyses using indirect measures of 'cognitive sophistication' — such as the level of formal education or student grade point averages — have been generally supportive of this hypothesis (e.g. Krosnick and Alwin, 1987; Narayan and Krosnick, 1996; Johnson *et al.*, 1999). Hence, education (or 'sophistication') reduces the strength of Response-Order Effects.

Ballot *Layout* Effects can be considered a special case of Ballot Position Effects. Indeed, a list of candidates can be presented on the ballot form in different ways. The possibility that this presentation might affect electoral



outcomes has received only minor attention. Mueller (1970) was the first to discover an effect of ballot layout while examining the 1969 LA Junior College Board primary election in which 133 candidates ran for office. These could not be matched on one single page and were distributed over as much as seven ballot pages. Mueller (1970, 399, *italics added*) found that ‘the candidates listed last on *each page* received some 5000 votes more than one would expect on the basis of other considerations’. Although he treats his findings as a case of Ballot Position Effects, we believe that this is not entirely satisfactory. Indeed, the candidates listed last on page 1–6 cannot be considered as candidates in the last place on a ballot. Rather, they are presented on the last place of a *part* of the ballot due to its layout.

After Mueller’s (1970) publication, interest in the subject remained low to non-existent. Nonetheless, since the 2000 US presidential elections, a number of additional studies have been performed that try to estimate the effect of the ‘butterfly’ ballot in Palm Beach, Florida on the result of the election. Wand *et al.* (2001), for example, find that the ballot was such that it may have misled voters into voting for another than their preferred candidate. They show that the butterfly ballot may have decided the elections to the advantage of President Bush Jr.

The study of Geys and Heyndels (2003) is — as far as we know — the only study of layout effects that deals with elections outside the United States. It focuses on the 1995 elections for the Brussels Regional Government. This election provides the authors with a quasi-experiment. Although the voters in each of the eight voting districts (‘cantons’) were invited to choose among the same set of candidates, three different ballot layouts were used (see also the next section). Hence, the eight voting districts in Brussels could be separated into three groups according to the layout used. The analysis shows that candidates in ‘critical’ (top and bottom) positions in multi-column ballots obtained a significantly larger share of the preferential votes of their party in these multi-column ballots than in the single-column ballot. Clearly, the layout of the ballot — that is, listing the candidates in one or more columns — affected the share of a party’s preferential votes obtained by the individual candidates.²

It is important to realize that the three cases of Ballot Layout Effects described here are still substantially different from one another. The layout effects in the 2000 US presidential elections are mainly due to the misleading character of the ballot paper. This is not the case for the elections considered in Mueller (1970) and Geys and Heyndels (2003). Still, even these are significantly different. The 133 candidates that Mueller (1970) analyses were presented to the voter on separate sheets, while the candidates in the Brussels elections (up to 75 for each party) were shown to the voter in separate columns on one single sheet (per party).



Brussels Elections of 1995

The Belgian political system is based on proportional representation (PR). Seats are allocated on the basis of the votes obtained by the respective parties. Valid votes can be cast in two different ways. First of all, the voter can vote for a political party (one party). In this case, the voter implicitly agrees with the order in which the candidates are presented on the list. Secondly, he can select a number of candidates from a given party and cast one or more preferential votes (Marsh, 1985). In case the voter casts a party vote as well as one or more preferential votes, his vote does not become invalid, but the preferential votes are disregarded in the counting process. During elections in the mid-1990s, about six out of every 10 ballots at the federal and provincial level contained votes for a particular candidate (Janssens and Dewachter, 1995; Smits and Thomas, 1998). At the local level, this increases to little over 80% (Wauters, 2000). However, such votes tend to be used to support candidates ranked high upon the list and not those on lower positions (Smits and Wauters, 2000, 289). Consequently, only a small number of candidates on lower positions are able to overturn the order of the list and obtain a seat at the expense of higher ranked candidates. For example, over the period 1919–1991, only 0.64% of all representatives in the federal Chamber were elected outside the order of the list and 0.04% of all Senators (Smits and Thomas, 1998).

Over the last decades, an important organizational change is taking place in Belgian elections. Progressively more voting districts are introducing computerized voting instead of the traditional pencil and paper ballot. In 1991, two of the 208 Belgian voting districts pioneered in using computerized voting. In the general and regional elections of 1995 and 1999, computerized voting was applied in 23 and 64 districts, respectively. This transition from manual to computerized voting offers a unique opportunity to analyse whether the layout of the ballot form affects the voting behaviour of the electorate. Indeed, the size of the computer screen makes it impossible to maintain the traditional way of presenting the candidates to the voter. Instead of one long row of candidates per party (as had been the case under manual voting), it often proves necessary to display the candidates of each given party over several columns.

The (s)election of the 75 members of the Brussels' Regional Parliament is organised in eight districts. These are purely administrative entities. The lists of candidates and parties are the same in each district. Crucially, the *order* in which the candidates appear on the voting bulletin is identical across districts. The outcome of the election is obtained by the simple aggregation of the results in each district. In 1995, the elections in the eight Brussels' districts were characterised by a major organisational difference. Four of these districts used the computer to register votes, while the remaining four districts maintained the traditional manual ('pencil and paper') voting. Owing to the size limitations



1	23.	45.	67.
2.			
			...
...			75.
22.	44	66.	

Figure 1 LO-22 format.

of the computers screen and the massive number of parties (23!) and candidates (maximum 75 per party), this meant that the voters in each of these districts were presented voting bulletins in a different format (or layout). In the ‘manual districts’, a single form on which all parties and candidates appeared was provided. The parties were listed next to each other, while the candidates for each party were ranked in one column under their respective party names. In ‘computerized districts’, a stepwise procedure was used. Voters were first shown a screen with the different political parties competing in the election. Once they made their choice about which party to support, the list of candidates for this party appeared on the screen. Unlike in the ‘manual’ layout, this list was now distributed over different columns. The layout implications of this can easily be observed in Figure 1. This figure shows the layout used in three of the four computerized districts (Brussels, Sint-Jans Molenbeek and Sint-Gillis): the candidates were ordered in three columns of 22 and one column of nine politicians. In the fourth computerized district (Sint-Joost-ten-Node), candidates were ordered in five columns of 15. In what follows, we denote these formats as LO-22 and LO-15, respectively. The ‘manual’ format is denoted as LO-75.

Factors Facilitating Ballot Layout Effects

Geys and Heyndels (2003) demonstrate the existence of Ballot Layout Effects in the context of the Brussels’ election discussed in the previous section: the position where a politician’s name appears on the ballot affects the preferential votes he/she obtains. From a normative point of view, such layout effects



clearly point to an inefficiency in the democratic process. In an ideal world, electoral outcomes should not depend on the layout of the ballot form. And while it has been argued by Geys and Heyndels (2003) that the observed effects had little immediate political consequences in the Brussels' situation, the Palm Beach election is there to remind that marginal (layout) effects may have considerable political implications. For these reasons, minimizing Ballot Layout Effects is an important policy issue. In order to do so, it is important to understand their precise nature and to have an insight into facilitating factors.

The literature on choice biases in cognitive psychology gives us an idea about factors that are important for the strength and existence of such biases. One important factor that shows up in this literature is the composition of the population. The education level of the population, for example, is often argued to be an important tempering influence on the appearance and strength of biases due to question wording, tone or order and response order (Hyman *et al.*, 1975; Schuman and Presser, 1981). Krosnick and Alwin (1987) and Narayan and Krosnick (1996) find empirical support for the hypothesis that people with higher formal education levels — who are argued to have a higher level of 'cognitive sophistication' — are less influenced by question design. Furthermore, Smith and Levin (1996) find that people with a higher natural tendency to engage in and enjoy thought are hardly affected by 'framing effects' (cf. Tversky and Kahneman, 1981). Stanovich and West (1998) find that subjects with higher 'cognitive capacity' are less prone to a number of choice biases such as outcome bias, if-only thinking, overconfidence bias and hindsight bias.

To investigate whether the composition of the electorate affects the presence and/or intensity of Ballot Layout Effects, we test a simple model of politicians' preferential votes:

$$PV_{i,j} = \beta POP_{i,j} + \mu_{i,j}$$

where $PV_{i,j}$ is the number of preferential votes obtained by politician i in district j . The underlying idea of the equation above is that preferential votes are essentially an estimate of politician's (latent) popularity $POP_{i,j}$ and that this estimate has an error term $\mu_{i,j}$. The latter is composed of a systematic — layout related — and an unsystematic part. More specifically,

$$\mu_{i,j} = \gamma C_{i,j} + \delta ELEC_j^* C_{i,j} + \varepsilon_{i,j}$$

The presence of Ballot Layout Effects refers to the fact that preferential votes are a biased estimate of a candidate's popularity. $C_{i,j}$ is a dummy variable, indicating whether or not a candidate's name appeared in a 'critical position' in that particular district j . If this is the case, then $C_{i,j} = 1$. Else, $C_{i,j} = 0$. Critical positions are, following the literature on Ballot Position Effects, identified as those positions at the top or the bottom of a column. However, candidates

ranked first (75th) are at the top (bottom) in any of the layouts. Moreover, these are ‘special’ in themselves as they are typically reserved for highly popular politicians.³ Therefore, these politicians will be treated separately in the empirical work (see further). This implies that there are no critical positions for layout LO-75; for LO-22 these critical positions are 22, 23, 44, 45, 66 and 67; for LO-15 these are positions 15, 16, 30, 31, 45, 46, 60 and 61.

The expected bias in the model corresponds with the existence of Ballot Layout Effects: politicians whose name appears in a ‘critical’ position are expected to have a significant benefit from this. Such a benefit may be stronger or weaker depending on the composition of the electorate. This notion is captured through $ELEC_j$. This is an indicator of characteristics of the electorate that may attenuate layout effects. To be more precise, in our empirical work $ELEC_j$ corresponds with the share of the population (above 20 years of age) holding a college or university degree. $\varepsilon_{i,j}$ is a random error term.⁴

The idea is simple: if preferential votes are an unbiased measure of politicians’ popularity, then β equals 1, while γ and δ are zero. Then, the only divergence between ‘actual’ and ‘measured’ popularity is random (reflected by $\varepsilon_{i,j}$). If Ballot Layout Effects occur, then γ and/or δ differ from zero. Defining critical positions as those where we expect politicians to obtain a systematic advantage, we expect $\gamma > 0$. If a higher educational level of the electorate weakens layout effects, then $\delta < 0$. It should be observed that the specification above assumes that the increase in votes from a critical position is constant among candidates. Each candidate in a critical position gains a certain *number* of votes. This is probably unrealistic. We may expect not the absolute but the *relative* number of votes gained to be constant, such that a candidate in a critical position increases his/her vote total with a given percentage. For example, candidates from large political parties (large in terms of votes obtained) can be expected to win more votes in absolute terms. Also candidates in positions that *ceteris paribus* are expected to receive more votes (in general: candidates who rank higher in the list of a party’s candidates, see further) may have a larger absolute advantage. To neutralize both these ‘scale-of-party’ and ‘position-in-list’ effects, it is necessary to re-specify the model. Following the literature on Ballot Position Effects, this is done by redefining the dependent variable as the relative share of preferential votes, $RPV_{i,j}$. The latter corresponds with the vote-share that candidate i obtains in the total of the preferential votes for his/her party in district j . This can be written as

$$RPV_{i,j} = \frac{PV_{i,j}}{\sum_{i=1}^{75} PV_{i,j}} \quad \text{with} \quad \sum_{i=1}^{75} RPV_{i,j} = 1$$



Of course, popularity has to be redefined in a similar way into $RPOP_{ij}$, which is the candidate's 'relative popularity'. The estimation equation then becomes

$$RPV_{ij} = \beta RPOP_{ij} + \gamma C_{ij} + \delta ELEC_j^* C_{ij} + \varepsilon_{ij}$$

The main obstacle for empirical purposes is that we do not have data on the elusive 'popularity', POP_{ij} (or $RPOP_{ij}$). Estimating the above regression is, therefore, impossible. A route around this obstacle is to estimate this popularity as a function of determining or correlating factors. We identify four such factors: position; use of Computerized voting; incumbency and gender.

Political parties present their respective candidates in a given order to the voter. As a general rule, positions higher in the list are reserved for more popular (influential) politicians. The reason is that 'list votes' play a crucial role in assigning mandates in Belgian elections. Indeed, only those candidates that reach a 'quota' (defined as the party's total vote over the number of seats it obtained plus one) are elected. In most cases, no other than the top candidate manages to reach this quota. To select the other candidates, the party's 'list votes' are distributed over the candidates in order of their appearance on the list until all seats are filled. As such, the candidates higher upon the list are (much) more likely to be elected. Given this importance of 'list votes', voters in practice only decide on the number of seats that a party obtains and not directly on who will end up filling these seats (De Winter, 1988, 20). Hence, in the Belgian context, the ordering of candidates is extremely important.

It is a common practice for the Belgian political parties to take popularity into account when designing their list of candidates. As a general rule, more popular politicians are ranked higher (Marsh, 1985). Surveying Belgian politicians who were active at the municipal level of government, Meier (2001, 57) finds that they regard the potential to attract votes as the single most important criterion for designing the party's candidate list. For empirical purposes, it is important to observe that when political parties 'translate' popularity into a rank, they transform popularity into an ordinal variable. This implies that extreme differences between candidates are levelled out. As a result, the relation between position and popularity is likely to be non-linear (the difference in popularity between the candidate ranked 75th and the one ranked 74th is likely to be much smaller than the difference in popularity between candidates 2 and 1).⁵

A second determinant of the (relative) preferential vote shares — RPV_{ij} — is the use of computerized voting. Deschouwer *et al.* (2000) show that the introduction of computerized voting in Belgium led to an increase in the number of preferential votes cast from an average of 0.87 when voting manually to an average of 1.28 preferential votes when voting by computer.

This means that the ‘measured popularity’ of politicians is higher in districts using computerized voting than in those districts where voting was manual. More important is the observation that the additional votes were not uniformly distributed among candidates. Politicians in lower ranks benefited more from the increase in preferential votes than did politicians in higher ranks. Comparison of the vote shares of the first-ranked candidates in the Brussels’ election is revealing: whereas in districts where voting was manual the first-ranked candidates obtained on average over 27% of the preferential votes in their party, they obtained less than 22% of these votes in computerized districts. As a general rule, the introduction of computerized voting appears to have been to the benefit of those candidates in lower positions.

Finally, two easily observable characteristics of the individual candidates can explain their vote shares. First, we expect candidates presently serving in the Brussels’ parliament (‘incumbents’) to have a higher popularity than their rank suggests. This is the case as incumbency in itself reflects that the politician has been popular (for whatever reason), but also because incumbent politicians typically have higher media exposure and political visibility (see Gelman and King, 1990; King and Gelman, 1991). Second, gender may be a relevant determinant of individual popularity. It has often been argued that women are systematically discriminated against. This would mean that they are ranked lower in the list than one would expect on the basis of their popularity only.⁶

All these arguments lead to the following empirical model:

$$\begin{aligned} \text{RPV}_{i,j} = & \alpha + \beta_1 \text{POS}_i + \beta_2 \text{POS}_i^2 + \beta_3 \cdot \text{COM}_j^* \text{POS}_i \\ & + \beta_4 \cdot \text{COM}_j^* \text{POS}_i^2 + \beta_5 \cdot \text{INCUM}_i + \beta_6 \cdot \text{FEM}_i \\ & + \gamma \cdot C_{i,j} + \delta \cdot \text{ELEC}_j^* C_{i,j} + \varepsilon_{i,j} \end{aligned}$$

where POS_i gives the politician’s rank in his/her party’s list. COM_j , INCUM_i and FEM_i are dummy variables. COM_j equals 1 in those jurisdictions where computerized voting was applied. INCUM_i equals 1 if the politician is an incumbent and FEM_i equals 1 if she is female. The predicted signs of the coefficients are as follows. As a general rule, more popular politicians are ranked in higher positions (lower values of POS_i). Thus, we expect $\beta_1 < 0$. Given that we expect political parties to be confronted with a ‘scarcity’ of political talent, we expect the position effect to be non-linear so that $\beta_2 > 0$. Casual observation of the political reality in the Brussels region (and, for that matter, in Belgian politics in general) may be taken to suggest that the smooth quadratic specification may not be able to capture fully the highly skewed distribution of preferential votes. Therefore, we test whether the addition of separate dummies for each position improves the specification. We employ the Bayesian Information Criterion (BIC, Schwartz, 1978) to direct our decision as to which position dummies to include in the regression. This criterion shows



that the optimal specification includes five position dummies capturing the advantageous effects from being among either the first four or the very last position in the list.⁷

The expected signs for the other variables are as follows. As the use of computerized voting is expected to have led to a shift in the preferential votes, away from the highly positioned candidates (those with low values of POS_i) towards the lower positioned candidates, we expect $\beta_3 > 0$ and $\beta_4 < 0$. Incumbents are expected to have more preferential votes *ceteris paribus*. As this is not the main focus of our analysis, we disregard the causality issue (they are incumbent because they are popular, they are popular because being an incumbent makes them more 'visible' to the electorate): $\beta_5 > 0$. If female politicians are discriminated against, then $\beta_6 > 0$. It should be observed that the claim that women are discriminated against might have led parties to take 'corrective' measures. To the extent that these imply an overreaction $\beta_6 < 0$. The other predicted signs have been discussed earlier: we expect $\gamma > 0$ and if a higher 'sophistication' of the electorate weakens the layout effects, then $\delta < 0$. The interaction term between candidates in critical positions and the 'sophistication' variable presents a test of the 'cognitive sophistication'-hypothesis. Cognitive sophistication is measured using educational attainment ($EDUC_i$), measured as the percentage of the population in the district above age 20 years that holds a college or university degree.

The empirical specification is estimated by pooled OLS using data on 897 candidates, each running in eight districts (leading to 7176 observations).⁸ The main results are in Table 1. Before discussing these, it should be noted that pooling the data is not 'self-evident': as we have multiple observations on the same candidates, observations are possibly correlated across districts. As a consequence, pooled OLS results may be biased, necessitating an alternative specification using fixed effects for each politician. Such a specification introduces a separate intercept (dummy) for each candidate. Formally, in the previous expression, α is replaced by α_i .⁹ A standard F-test is used to compare the pooled OLS specification (including the BIC position dummies) and the fixed effects specification. The null hypothesis of this test is that all candidate-specific intercepts are equal ($\alpha_i = \alpha$). The test shows that these intercepts are jointly insignificant ($F = 1.051$, $P > 0.15$). Hence, we can use the pooled OLS estimation.¹⁰

The results of the estimation are shown in columns (1) and (2) of Table 1. The full model is given in the first column while insignificant variables are dropped in the second.

A candidate's position is identified as a crucial 'predictor' of his/her preferential vote share. Table 1 shows that the preferential vote share of a candidate is negatively correlated with his/her position in the list. The further down the list a candidate is positioned, the lower the share of his/her party's



Table 1 Regression results

<i>Variables</i>	<i>(1)</i>	<i>(2)</i>
Constant	2.227***	2.264***
Position	-0.081*** (-0.53)	-0.081*** (-0.52)
Position ²	0.0008*** (0.42)	0.0008*** (0.41)
First	24.242*** (0.84)	24.244*** (0.84)
Second	4.657*** (0.16)	4.659*** (0.16)
Third	2.239*** (0.08)	1.822*** (0.06)
Fourth	1.785*** (0.06)	1.786*** (0.06)
Last	0.858 (0.03)	0.803 (0.03)
Position*computer	0.004* (0.03)	0.003*** (0.02)
Position ² *computer	-0.00001 (-0.01)	—
First*computer	-5.374** (-0.13)	-5.379** (-0.13)
Second*computer	-1.876** (-0.05)	-1.880** (-0.05)
Third*computer	-0.834 (-0.02)	—
Fourth*computer	-1.065** (-0.03)	-1.067** (-0.03)
Last*computer	-0.109 (-0.00)	—
Incumbent	0.808*** (0.06)	0.808*** (0.06)
Female candidate	0.183*** (0.03)	0.183*** (0.03)
Critical position	1.022*** (0.06)	0.991*** (0.06)
Education	0.002 (0.00)	—
Critical*education	-0.044*** (-0.04)	-0.041*** (-0.04)
R ² (adjusted)	73.19	73.20

N = 7176; standardized beta-coefficients between brackets.

*** sign at 1%; ** at 5%; * at 10%.

preferential votes (s)he obtains. This reflects the common practice of political parties to reserve the higher ranks for the more popular politicians. As expected, this relation is non-linear. The difference between two ensuing candidates becomes smaller the further down the list of candidates we go. Moreover, as revealed by the coefficients for the position dummies, politicians in the first, second, third, fourth and last positions obtain a significantly higher share of their party's preferential vote total.

Interestingly, the preferential vote share distribution is different when computerized voting is used. In fact, it is flatter in the computerized districts. This can be seen from the fact that the interaction terms are of the opposite sign than the position variables without interaction. The share of the party's preferential votes obtained by candidates in the first four positions is noticeably lower in the computerized format and their loss is distributed over the candidates further down the list. Hence, preferential votes are more evenly distributed among candidates when voting is done via computerized ballots.



Incumbents have a significant advantage. This is in line with the results from a large political science literature (see Gelman and King, 1990). We find, controlling for other factors, that the preferential vote share of incumbent politicians is 0.81% higher than that of candidates who did not have a seat in the Brussels parliament in the previous term. Also, women appear to obtain significantly better results than men *ceteris paribus*. Given all controls in the model, women have a preferential vote share that is 0.18% higher than that of men. This could point to the fact that women are systematically discriminated (or underestimated) in the sense that they are given positions too far down the list.

Our central point of interest is, of course, the Ballot Layout Effects. Table 1 clearly confirms the layout effects reported in Geys and Heyndels (2003): candidates in critical positions in the 1995 Brussels election have a significant advantage from being in such a position. This reflects the fact that in multi-column layouts, those politicians whose name appeared at the top or bottom of a column in a given district obtained significantly more votes there than in other districts. Crucially, we find that the 'cognitive sophistication' of the electorate plays an important mediating role. The interaction of education with the dummy for critical positions yields a statistically significant negative effect. This means that the advantage of candidates in critical positions is lower in those voting districts where the electorate has a higher education level. This effect is not only statistically significant, it is also quite strong. To see this, note that the education variable ranges from 11.00 to 21.76% of the population (above age 20 years) holding a college or university degree. The average gain for candidates in critical positions in the districts with the highest education level thus is estimated to be $\delta = [0.991 + (-0.041 \cdot 21.76)]$ or 0.099%, *ceteris paribus*. In the districts with the lowest education level, the average gain is equal to $[0.991 + (-0.041 \cdot 11.00)]$ or 0.540%, all else being equal. This result clearly indicates that 'cognitive sophistication' is a crucial determinant of Ballot Layout Effects. It demonstrates that the layout effects in the Brussels Regional elections were to a large extent related to the (lack of) 'cognitive sophistication' of the electorate.

Our results are very strong when regarding statistical significance. The size of the effects, on the other hand, appears to be relatively small. However, in relation to the share of preferential votes that these same candidates attain in LO-75 (when they are not positioned at the top or bottom of a column), they are actually quite sizeable. Indeed, candidates in critical positions on average obtained 0.64% of their party's preferential vote shares under LO-75. The estimated coefficients thus imply gains from being on the top or bottom position in a column that are certainly non-negligent. They indicate that candidates in 'sophisticated' districts obtain nearly 0.74% when in a critical



position, while these same candidates would obtain more than 1% of their party's preferential votes in the least educated districts.

Conclusion

Recent research has shown that Ballot Layout Effects exist. Moreover, the US experience has shown that layout effects may have far reaching consequences. Such *direct* political consequences have been moderate in the Brussels' election under consideration in the sense that only one candidate in a critical position was actually elected (Geys and Heyndels, 2003). Nonetheless, layout effects may — also in Brussels — have had relevant *indirect* consequences. For example, parties may interpret the high number of preferential votes for individual politicians as signals of support for the ideas they stand for. This may give these ideas a more prominent place on the political agenda than they 'deserve'.

The present analysis first of all confirms the existence of layout effects. However, the (strongly related) literature on Response-Order Effects and various choice biases has shown that the existence and size of the bias crucially depends on the level of 'cognitive sophistication' of the population. This paper analysed whether similar results could be found for Ballot Layout Effects. In other words, are these effects affected by the characteristics of the election and the electorate?

The results of our empirical analysis have shown that cognitive sophistication of the electorate does have a strong effect. A larger share of highly educated (or richer) voters significantly reduces the strength of Ballot Layout Effects. This is in line with the results from the literature on Response-Order effects (e.g. Krosnick and Alwin, 1987; Johnson *et al.*, 1999) and psychological research on framing effects (e.g. Smith and Levin, 1996). From a policy point of view this observation is of immediate relevance. Indeed, we argued that the presence of even moderate layout effects may have large political consequences, as witnessed by the recent presidential elections in the US. From a normative point of view, such layout effects are evidently inferior to a layout-neutral result. Election outcomes (and their political consequences) should *not* depend on the layout of the ballot form. The present empirical evidence adds a dimension to the normative argument by showing that the distorting effect of layouts is not homogenous among the electorate. More precisely, we find that the distorting layout effects are stronger among less educated voters. However, avoiding layout effects by randomizing the order of candidates or using additional layouts such that each politician has an equal probability of being on top (bottom) of a column may be hard to use in practice (for a discussion, see Geys and Heyndels, 2003).



The central results of our paper are the identification of ballot layout effects and, more importantly, the fact that the presence and magnitude of such effects depend crucially on the (sociological) characteristics of the electorate. Still, our empirical approach may have much wider application. The econometric method used to explain the preferential vote shares of individual candidates may be used to test a number of hypotheses on how political parties compose their list of candidates. Under the assumption that individual candidates prefer to be positioned as high as possible in the list (the system of 'list votes' offers them strong incentives for this), our approach allows to identify systematic biases in party list formation. One example, already taken up in our analysis, is the systematic discrimination of female candidates. A further exploration of this, also comparing more recent election results, can reveal possible changes in this discrimination.

References

- Bain, H.M. and Hecock, D.S. (1957) *Ballot Position and the Voter's Choice*, Detroit: Wayne State University Press.
- Bowler, S., Donovan, T. and Happ, T. (1992) 'Ballot propositions and information costs: direct democracy and the fatigued voter', *Western Political Quarterly* 45(2): 559–568.
- Byrne, G. and Pueschel, K.J. (1974) 'But who should I vote for Coroner?', *Journal of Politics* 36(2): 778–784.
- Darcy, R. and McAllister, I. (1990) 'Ballot position effects', *Electoral Studies* 9(1): 5–17.
- Deschouwer, K., Buelens, J. and Heyndels, B. (2000) *De invoering van het elektronisch stemmen in 1995 in 1999. De impact op het stemgedrag en op de verkiezingsuitslag*, unpublished report, Vrije Universiteit Brussel, Brussel.
- De Winter, L. (1988) 'Belgium: Democracy or Oligarchy?', in M. Gallagher and M. Marsh (eds.) *Candidate Selection in Comparative Perspective: The Secret Garden of Politics*, London: SAGE Publications, pp. 20–46.
- Gelman, A. and King, G. (1990) 'Estimating incumbency advantage without bias', *American Journal of Political Science* 34(4): 1142–1164.
- Geys, B. and Heyndels, B. (2003) 'Ballot layout effects in the 1995 elections of the Brussels' Government', *Public Choice* 116(1–9): 147–154.
- Hyman, H.H., Wright, C.R. and Reed, J.S. (1975) *The Enduring Effects of Education*, Chicago: University of Chicago Press.
- Janssens, P. and Dewachter, W. (1995) *De meervoudige voorkeurstem en de verkozenen buiten de nuttige volgorde: een experiment bij de provincieraadsverkiezingen van 1994*, Department of Political Science, KU Leuven, Leuven.
- Johnson, T., O'Rourke, D. and Severns, E. (1999) 'Effects of question context and response order on attitude questions', *Proceedings of the Section on Survey Research Methods of the American Statistical Association*, Alexandria, pp. 857–860.
- King, G. and Gelman, A. (1991) 'Systemic consequences of incumbency advantage in US House elections', *American Journal of Political Science* 35(1): 110–138.
- Krosnick, J.A. and Alwin, D.F. (1987) 'An evaluation of a cognitive theory of response-order effects in survey measurement', *Public Opinion Quarterly* 51(2): 201–219.
- Marsh, M. (1985) 'The voters decide?: Preferential voting in European list systems', *European Journal of Political Research* 13(4): 365–378.



- Meier, P. (2001) 'Aandacht voor de man-vrouw verhouding in de lokale politiek', *Het Tijdschrift van Dexia Bank* 216: 49–62.
- Miller, J.M. and Krosnick, J.A. (1998) 'The impact of candidate name order on election outcomes', *Public Opinion Quarterly* 62(3): 291–330.
- Mueller, J.E. (1970) 'Choosing among 133 candidates', *Public Opinion Quarterly* 34(3): 395–402.
- Narayan, S. and Krosnick, J.A. (1996) 'Education moderates some response effects in attitude measurement', *Public Opinion Quarterly* 60(1): 58–88.
- Robson, C. and Walsh, B. (1974) 'The importance of positional voting bias in the Irish general election of 1973', *Political Studies* 22(2): 191–203.
- Schuman, H. and Presser, S. (1981) *Questions and Answers in Attitude Surveys: Experiments on Question Form, Wording and Context*, London: SAGE Publications.
- Schwartz, G. (1978) 'Estimating the dimension of a model', *Annals of Statistics* 6(2): 461–464.
- Smith, S.M. and Levin, I.P. (1996) 'Need for cognition and choice framing effects', *Journal of Behavioural Decision Making* 9(3): 283–290.
- Smits, J. and Thomas, I. (1998) 'Het gebruik van de meervoudige voorkeurstem bij de parlementsverkiezingen van 21 mei 1995', *Res Publica* 40(1): 127–168.
- Smits, J. and Wauters, B. (2000) 'Het gebruik van de voorkeurstem bij de parlementsverkiezingen van 13 juni 1999', *Res Publica* 42(2/3): 265–304.
- Stanovich, K.E. and West, R.F. (1998) 'Individual differences in rational thought', *Journal of Experimental Psychology: General* 127(2): 161–188.
- Tversky, A. and Kahneman, D. (1981) 'The framing of decisions and the psychology of choice', *Science* 211: 453–458.
- Wand, J.N., Shotts, K.W., Sekhon, J.S., Mebane Jr, W.R., Herron, M.C. and Brady, H.E. (2001) 'The Butterfly-did it: aberrant vote for Buchanan in Palm Beach County, Florida', *American Political Science Review* 95(4): 793–810.
- Wauters, B. (2000) *De kracht van de voorkeurstem in stad en dorp*, Department of Political Science, KULeuven, Leuven, 64pp.

Notes

- 1 We thank Jo Buelens for providing the election data and Kris Deschouwer and Bruno De Borger for helpful comments.
- 2 It should be observed (see also this paper's third section) that the introduction of differences in layout was accompanied by a transition from manual to computerized voting. Still, Geys and Heyndels (2003) show that the layout effect still occurs when different 'computerized' layouts are compared.
- 3 Position 75 is typically reserved for a popular politician who has no ambition to win a seat in the election under consideration, but who wants to support his/her party.
- 4 This may capture the fact that politician *i* obtains fewer votes than his popularity would suggest, for example because a relatively large number of 'his/her' voters did not turn out to vote. Even in the system of mandatory voting, turnout in Brussels hardly ever reaches 90%.
- 5 Only when latent popularity is uniformly distributed within each party (that is, when within each party there are as many candidates of each 'popularity level') the translation into an ordinal scale is linear. Whether this is actually the case is an empirical matter. Actually, non-linearities may be taken to reflect 'scarcity' of political talent (read: scarcity of highly popular politicians), that is, an under-representation of politicians with high popularity.
- 6 This issue has recently led to the legal imposition of gender equality: since the federal elections in 2003 parties are obliged to have as many men and women in their lists. Moreover, not all three first-ranked candidates can be of the same sex.



7 An F-test shows that all other position dummies are jointly insignificant.

8 As mentioned, 23 political parties participated in the elections. For our analysis, we concentrate on those parties that presented a sufficient number of candidates to fill all critical positions in the LO-22 format (leaving 12 parties). As 10 parties had 75 candidates while the others had a list of 73 and 74 candidates, respectively, this gives a total of 897 candidates. Analysing eight voting districts, we attain 7176 observations.

9 This intercept captures politician i 's 'average' relative popularity (controlling for the other independent variables). The fact that it captures *relative* popularity implies that the intercept also takes into account the effect of i 's fellow party-members' popularity (if i 's colleagues are highly popular, then this will translate into a lower relative vote share for i himself, and thus a lower value for α_i).

10 The fact that candidate-specific intercepts are all equal can be attributed mainly to the inclusion of the position dummies. Indeed, an F-test on a specification *without* these dummies gives a test-statistic of 2.40. Thus, the F-test rejects the hypothesis that all candidate-specific intercepts are equal and therefore suggests that a fixed effects specification is required. Importantly, the nature of the empirical conclusions — also with regard to the impact of 'cognitive sophistication' — is unaffected. Results are available upon request.