Electoral Studies 35 (2014) 115–122

Contents lists available at ScienceDirect

Electoral Studies

journal homepage: www.elsevier.com/locate/electstud

The impact of candidate name order on election outcomes in North Dakota

Eric Chen [a], Gábor Simonovits [b], Jon A. Krosnick [c,d,e,*], Josh Pasek [f]

[a] Public Policy Program, Stanford University, Stanford, CA 94305, USA
[b] Department of Political Science, Stanford University, Encina Hall, Stanford, CA 94305, USA
[c] Department of Communication, Stanford University, Stanford, CA 94305, USA
[d] Department of Political Science, Stanford University, Stanford, CA 94305, USA
[e] Department of Psychology, Stanford University, Stanford, CA 94305, USA
[f] Department of Communication Studies, University of Michigan, 105 S. State Street, 5413 North Quad, Ann Arbor, MI 48109, USA

ARTICLE INFO

Article history:
Received 10 April 2013
Received in revised form 22 April 2014
Accepted 28 April 2014
Available online 15 May 2014

Keywords:
Elections
Name order effect
Electoral law

ABSTRACT

A number of studies have explored the possibility that the ordering of candidates' names on the ballot might influence how those candidates perform on election day. Strong evidence of an order effect comes from investigations of election returns in states that implemented quasi-random assignment of candidate name orders to voters. Although most such studies have identified benefits for earlier-listed candidates, much of the evidence comes from a limited set of elections in only a handful of states. This paper expands our understanding of order effects to 31 general elections held in North Dakota between 2000 and 2006; these include all state-wide races involving 2 candidates. A primacy effect appeared in 80% of the contests. The first ballot position reaped the largest benefits in non-partisan contests and in presidential election years. These findings are consistent with earlier studies from other states and provide evidence in line with proposals that a lack of information and ambivalence underlie candidate name order effects.

1. Introduction

After the controversial presidential election of 2000, serious questions were raised about the importance of ballot formats (Herrnson et al., 2008). In particular, the design of the so-called butterfly ballot in Palm Beach, Florida fueled a lively scholarly and policy debate about the possibility that the arrangement of candidate names on the ballot could give some candidates an unfair advantage (see Wand et al., 2001). Although recently-recognized idiosyncrasies such as the butterfly ballot are surely important, another more general issue regarding ballot format has been of interest to political scientists for decades: the ordering of candidate names.

Much of the literature that has accumulated on this topic suggests that candidates gain a greater share of the vote when they are listed first than when they are listed later. Interestingly, as dictated by law, George W. Bush's name was listed first on every Florida ballot during the 2000 presidential election (see Krosnick et al., 2004).[1] Hence, if name order effects do indeed occur regularly in general election voting, a seemingly trivial aspect of ballot design may have had tremendous political consequences for the U.S. and the world in an election won by the slimmest of margins.

* Corresponding author. Department of Communication, Stanford University, Stanford, CA 94305, USA. Tel.: +1 650 725 3031.
E-mail addresses: ericchen1@gmail.com (E. Chen), gabor@stanford.edu (G. Simonovits), krosnick@stanford.edu (J.A. Krosnick), jpasek@umich.edu (J. Pasek).

[1] In Florida, the first candidate on the ballot is the nominee of the Governor's party.

http://dx.doi.org/10.1016/j.electstud.2014.04.018
0261-3794/

Table 1
Existing ballot order studies on U.S. elections.

Study	Location	Election type	Year	Number of races	Significant name order effects …
Alvarez et al. (2006)	CA	All statewide races	1998	8	Not observed
Darcy (1986)	CO	All statewide races	1984	22	Not observed
Ho and Imai (2006)	CA	Gubernatorial race	2003	1	Observed for minor candidates
Ho and Imai (2008)	CA	All statewide races	1978–2002	80	Observed for minor candidates and in primaries
Koppell and Steen (2004)	NYC	All statewide Democratic primaries	1998	79	Observed
Krosnick et al. (2004)	OH	All statewide races	2000	192	Observed
Krosnick et al. (2004)	ND	All statewide races	2000	14	Observed
Krosnick et al. (2004)	CA	President and Senate	2000	2	Observed
Meredith and Salant (2013)	CA	Local elections	1995–2008	7846	Observed
Miller and Krosnick (1998)	OH	All statewide and countywide races	1992	118	Observed
Pasek et al. (2014)	CA	All statewide races	1976–2006	76	Observed

Note: We omit studies that analyzed elections that involved races with only one name order per race and studies that did not report proper statistical significance tests. For a review of those studies, see Miller and Krosnick (1998).

The current study expands our understanding of candidate name order effects by complementing earlier studies of general elections in California and Ohio using a novel electoral context, that of North Dakota. This study is also the first to use multilevel modeling to explore name order effects, a technique that allows us to more effectively leverage variations in name ordering both across precincts and between contests. To accomplish these goals, we start by discussing the theoretical and empirical bases for expecting a first-position advantage and identifying a set of variables that might influence the size of an order effect. We then describe the data collected to test these possibilities, results of analyses examining the prevalence of order effects and the conditions that are associated with very large effects, and how these results compare with earlier findings.

1.1. Existing research on ballot order effects

Candidate name order may influence voters who are unable to select a candidate on substantive grounds. This could happen if a voter lacks information needed for the choice (Brockington, 2003; Miller and Krosnick, 1998) or feels deeply conflicted about a set of competing candidates, seeing advantages and disadvantages to each of them (Pasek et al., 2014). Paralyzed by lack of or abundance of information about candidates, voters might make their choices on the basis of heuristic cues. In such situations, evidence from psychology indicates that people often select the first option among a set of alternatives (see Krosnick and Presser, 2010 for a review of literature on the effects of order of choice alternatives).[2] On a ballot, this tendency might yield an advantage for candidates listed first (see Pasek et al., 2014).

Many studies of natural experiments and quasi-experiments have documented an advantage for candidates listed first (for a list of studies in U.S. elections, see Table 1). Krosnick et al. (2004), Miller and Krosnick (1998), and Pasek et al. (2014) found statistically significant primacy effects in many types of general election races, primarily in Ohio and California. Koppell and Steen (2004) reached similar conclusions about Democratic primaries in New York City. And Meredith and Salant (2013) reached the same conclusion regarding local elections in California.[3]

Some studies have explored what types of contests, candidates, and voters are the most prone to order effects. Candidate name order appears to be more consequential in contests that receive less media attention – local races and primaries – and when ballots do not list candidates' party affiliations (Ho and Imai, 2006; Miller and Krosnick, 1998; Pasek et al., 2014). Order effects also tend to be larger in election years with higher turnout (e.g., in Presidential election years), perhaps because they attract voters who are interested in only a subset of the contests (Pasek et al., 2014). Contests for open seats have also demonstrated larger order effects than those with incumbents (Miller and Krosnick, 1998).

Some recent studies have produced different results. For example, Ho and Imai (2008) identified name order effects for all candidates in primary elections and for minor party candidates in general elections but did not find evidence of statistically significant primacy effects for major party candidates in general elections. Alvarez et al. (2006) also found no evidence of significant name order effects in general elections. However, Pasek et al. (2014) demonstrated that these conclusions are most likely type 2 errors due to limited statistical power.

1.2. The need for replication

Thus, examined at a distance, it might seem that the existing literature on name order effects documents a robust finding that is well understood in terms of moderators and the underlying psychological processes. But in fact, this may be too optimistic of a conclusion. Most importantly, the majority of general election data analyzed in recent years comes from a narrow slice of time (the late

[2] Another possible explanation is that voters could believe that candidates listed at the top of the ballot are of higher quality (Kim, Krosnick, and Casasanto, 2014).

[3] Outside of the U.S., King and Leigh (2009) found significant name order effects in Australian elections, Faas and Schoen (2006) found such effects in Bavarian state elections, and Geys and Heyndels (2003) found them in municipal elections in Brussels. Marcinkiewitz (2014) found similar effects in Polish parliamentary elections.

1990s) just in California, where only one of various possible methods was used to assign name orders to voters. And the wave of work immediately prior was dominated by analysis of data from Ohio elections, where another method of name order assignment was used. Therefore, in order to have confidence in the generalizability of the name order effect, evidence from other states that employ other name order assignment procedures in general elections would be desirable to add to the literature.

Such evidence would also help to address the increasing concern across the social sciences about the replicability and generalizability of published findings. The importance of replication has been highlighted recently by a variety of high profile social science studies, the findings of which have failed to replicate in repeated assessments (Francis, 2012). Evidence of publication bias (Gerber and Malhotra, 2008a, 2008b; Fanelli, 2013) and of the so-called "decline effect" (Schooler, 2011) has also aroused skepticism about the degree to which published findings are the result of p-hacking (Simmons et al., 2011) and questions the ability of social sciences to be "self-correcting" (Ioannidis, 2012). Therefore, scientific progress now, more obviously than in the past, hinges on openness to publishing studies that seek to replicate prior findings using new methods and new data collected in new contexts, recognizing that stimuli are random rather than fixed (Judd et al., 2012).

Scholars should be particularly concerned about replication for name order studies given that many studies on the name order effect used the same data, or at least data that partially overlaps with that analyzed in proceeding studies (cf. Table 1). Although consecutive analyses of the same data can yield new insights (for instance, on the moderators of order effects), the fact that a positive finding replicates on the same (or an overlapping) dataset should not increase our certainty in the generalizability of the finding.

In this paper, we report the results of an analysis that complements past work. We expand the body of evidence by examining voting in a set of general elections in North Dakota across multiple years. The name ordering system in North Dakota features a near-random assignment of name orders to precincts. The process begins by ordering the precincts in a county according to their size, in descending order. Name order is randomly determined in the largest precinct in each county, and then, the top name is moved to the bottom of the list in the next precinct, and this procedure is repeated until name orders have been assigned to all precincts in the county.[4] Thus, North Dakota avoids systematic assignment biases that can emerge when using a single rotation system across the entire state (cf. Ho and Imai, 2006).

2. Data and empirical strategy

We obtained election data from all statewide elections held in North Dakota between 2000 and 2006 (see Online Appendix A for a description of the data collection procedure; see Chen, 2008 for additional information on how the data were collected). During the summer of 2007, we contacted each auditor[5] in the 53 counties in North Dakota to collect election returns and candidate name orders for each precinct in each election year. In total, we obtained name order rotations and precinct vote counts for all 36 statewide general election contests across the four election years (14 races in 2000, 2 races in 2002, 13 races in 2004, and 7 races in 2006; see Table 2 for a listing of two-candidate contests in these years). We coded variables to indicate whether an incumbent ran in each race (there were 5 open seat races out of 31 total two-candidate contests) and categorized races into major races that were highly publicized (U.S. Senate, U.S. House of Representatives, and Governor; no Presidential contests had only two candidates) and minor ones (all other contests).

To estimate name order effects, we compared the performance of each candidate when listed first with how those same candidates performed when listed in later positions. An estimate of this benefit can be produced by regressing the Democratic vote share in each precinct on an indicator variable coded as 1 if the Democrat was listed first on the ballot and 0 otherwise. The difference between first position performance and second position performance is a measure of the benefit of being listed first.[6] If no Democrat was running in a particular contest, we chose a candidate at random (this was true for the contests for Supreme Court in 2000 and for Superintendent in 2000 and 2004 as these were non-partisan races). We estimated this advantage for each contest.[7]

The moderators hypothesized to influence the size of the name order effect vary across contests rather than within contests. Therefore, their influence was explored using multilevel modeling. Precinct-level Democratic vote shares were clustered at the county and contest levels to produce estimates of the moderators' effects. This strategy was preferable to aggregating on the contest-level because the later technique ignored the hierarchical structure of the data and the fact that the number of precincts varied across elections.

Multilevel modeling also offers a series of additional benefits. Because each ordering of names appeared multiple times within each contest, we were able to borrow statistical power from within-contest variations to improve the precision of estimates of the influence of the moderators (cf., Jackman, 2009). Variations in voting patterns across precincts for each candidate as well as those across candidates are used to estimate the standard errors for the

[4] For a more detailed account of the ballot rotation procedure used in North Dakota, see Chen (2008).

[5] Although the rotation procedure is mandated by the Secretary of State of North Dakota, individual county auditors implemented the procedure for each ballot within a county.

[6] In the analyses of order effects within contests, we estimated the regression coefficients parameters via OLS and obtained standard errors via non-parametric bootstrap. That is, we estimate the standard error of the estimated effect from the variance of the effect sizes across the bootstrap sample. The results are robust to using different procedures to obtain confidence intervals.

[7] The rationale for focusing on the performance of the Democratic candidate is that choosing a single candidate type improves our precision when estimating random effects in the hierarchical model; we assume that the vote share of the Democratic candidate is correlated across contests and counties.

Table 2
Number of precincts providing data for each two-candidate race analyzed.

Election	Year			
	2000	2002	2004	2006
Agriculture Commissioner	357	–	538	543
Attorney General	357	–	538	543
Governor	358	–	–	–
U.S. House of Representatives	–	532	532	543
Insurance Commissioner	357	–	538	–
Public Service Commissioner	357	532	538	543
Secretary of State	357	–	538	543
U.S. Senate	357	–	538	–
State Auditor	357	–	538	–
State Treasurer	357	–	538	–
Superintendent	343	–	532	–
Supreme Court	344	–	–	–
Tax Commissioner	357	–	538	543

Note: Dashes indicate instances in which a two-candidate contest did not take place in a given year.

moderators; these estimates are more precise than a traditional regression because of a principle called statistical shrinkage (Steenberg and Jones, 2002). An alternative and perhaps more intuitive approach to assessing these moderators is to take the average first position benefit in each contest (as estimated in a contest-level analysis) and regress them on moderators that are thought to influence the size of the primacy effect. The multilevel approach improves on that by recognizing the proportion of the within-contest variance that can be attributed to the moderators (Steenberg and Jones, 2002).

To generate estimates of relations between contest-level variables and behaviors at the precinct level, we estimated a multilevel model using the lme4 package in R. Democratic vote shares in each precinct for each contest were predicted using covariates that were estimated at the precinct-within-contest level (level 1) and those that were consistent across contests or counties (level 2). The influence of contests and counties were treated as random effects that could alter the intercept for expected vote shares. Covariates could then be treated as fixed effects at level 1, level 2, or – for interaction terms – across levels (allowing the model to borrow statistical power from variations on both levels). Hence, the use of cross-level interactions in the current study recognizes the clustering of moderator and name ordering within contests while treating each assignment of a name order as an independent (though interrelated) trial.

Position as the first-listed candidate in a contest varied across precincts and candidates and was treated as a level 1 covariate. Main effects for all moderators – major contest, presidential election year, incumbent status, and partisan vs. nonpartisan race – varied at the contest level and were treated as level 2 covariate fixed effects. Cross-level interaction terms were used to estimate the size of the moderation on the first-position benefit.

As Alvarez et al. (2006) pointed out, in races with more than two candidates, the vote shares of the candidates in a given race are linearly dependent, so conventional methods are not suited to test the significance of order effects for *each candidate* in a given contest. In our sample, only 5 out of the 36 contests featured more than two candidates; we therefore opted to analyze races with more candidates separately.

3. Results

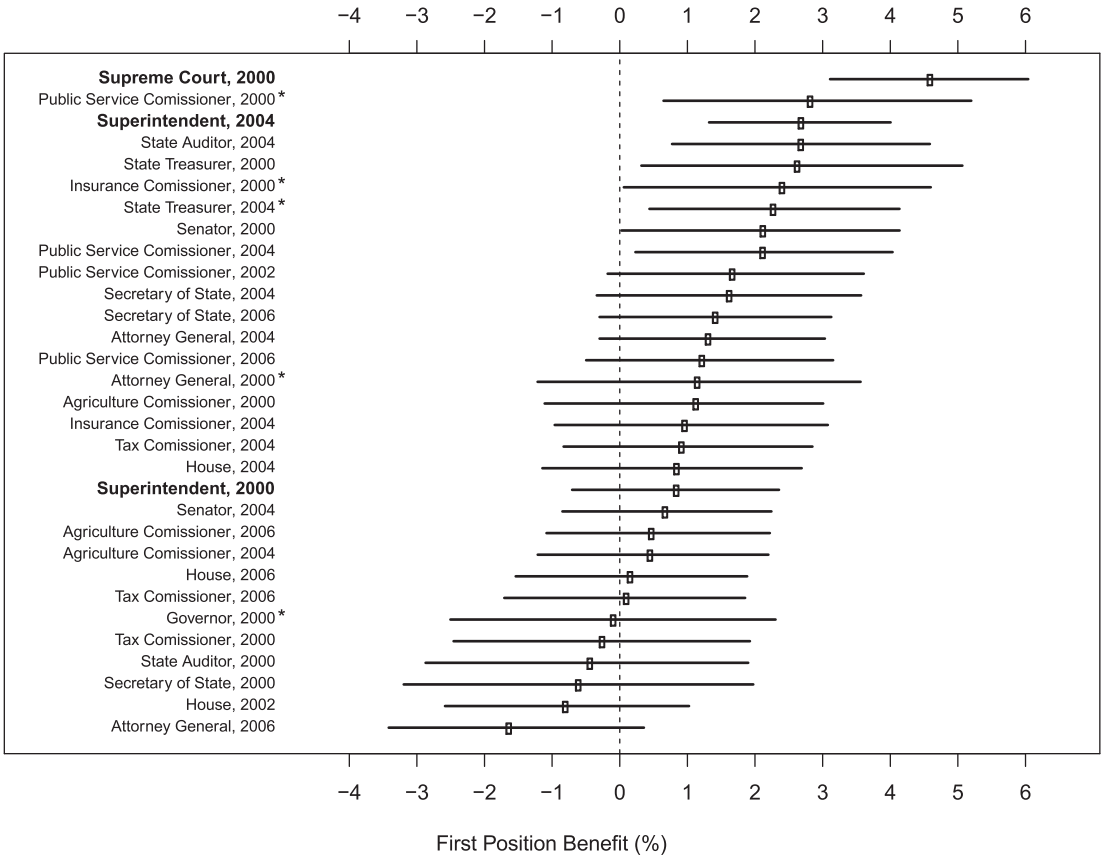
A difference in the direction of primacy appeared for 80% of the two- candidate races (25 out of 31, see Fig. 1). The mean effect across races was 1.17 percentage points, which was significantly different from zero ($p < .001$), and the median effect was 1.15 percentage points. The primacy effect was statistically significant ($p < .05$) for 9 of the races. None of the differences indicating an advantage of being listed second was statistically significant. Primacy thus appeared far more frequently than would be expected by chance ($p < .001$ binomial test).

Fig. 1 presents 95% confidence intervals for the estimated name order effect in each race. Four interesting patterns emerged. First, almost all of the races in which a statistically significant primacy effect appeared were for minor offices (with the sole exception of the 2004 U.S. Senate race). Second, two of the three races with the largest primacy effects were non-partisan (bolded in Fig. 1). In the contests for Supreme Court Justice in 2000 and for Superintendent in 2004, candidates got 4.6% and 2.7% more votes, respectively, when listed first than when listed last. A third non-partisan contest, however, did not manifest a significant effect. Third, all of the contests with statistically significant name order effects took place in presidential election years. Finally, name order effects tended to be larger in competitions for open seats (denoted by asterisks in Fig. 1).

Fig. 2 presents the same analysis for races with more than two candidates. To generate a single statistic for each race, we estimated the average difference between the vote shares received by the Democratic candidate when listed first and listed later. Examining each of these contests individually, this difference was not significant. Given the small number of contests examined, we can conclude only that any name order effect for these contests was likely between −1.0 and .9 percentage points. Effects of around one-third of a percentage point might be expected for such contests based on Pasek et al. (2014) and would not be identifiable with this analysis.

The multilevel model's parameter estimates revealed that the name order effect in two-candidate contests was statistically significant and in the direction of primacy, $b = .012$, $p < .001$ (column 1 in Table 3).[8] To compare name order effects across different types of contests, we estimated the parameters of four equations, exploring each moderator separately (columns 2–5 in Table 3). These models included the main effect of the moderator on the Democratic candidate's vote share, as well as a cross-level interaction between the moderator and name order. We

[8] All reported *p*-values testing name order effects and moderators of name order effects in multilevel models are one-tailed, because we have strong a priori theoretical bases for anticipating the directions of the associations, past empirical studies reinforcing those predictions, and limited statistical power due to the small number of races being examined here.



Note: Circles represent the estimated name order effect on the Democratic candidate's vote share. Coefficients were obtained from OLS regressions predicting the Democratic candidate's vote share in each precinct with a dummy variable indicating the candidate's name order (first vs. second) in the precinct. Horizontal bars indicate the estimated 95 percent confidence intervals based on the percentiles of 1000 bootstrapping replications. Contests were ordered by the magnitude of gain. Asterisks denote open seat races. Names of non-partisan races are shown in bold.

Fig. 1. Name order effects in races with two candidates.

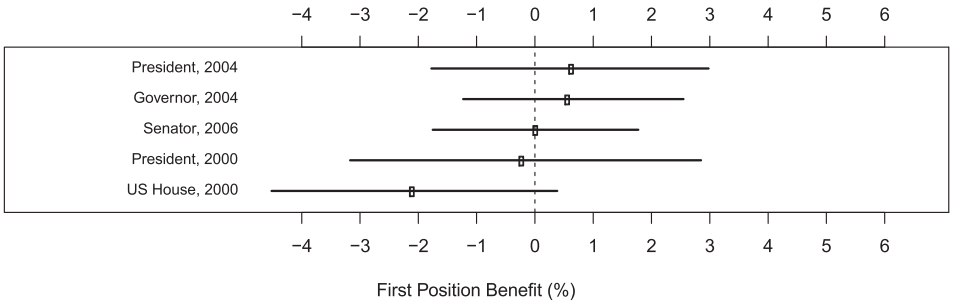
also estimated the parameters of an equation including all moderators (column 6 in Table 3).

As expected, the name order effect was significantly larger in presidential election years than in off years ($b = .010$, $p = .001$; column 3 of Table 3). Also as hypothesized, the primacy effect was significantly weaker in major races than in minor races ($b = -.008$, $p = .02$; column 2 of Table 3). And the primacy effect was marginally significantly weaker in races with incumbents than in races for open seats ($b = -.007$, $p = .06$; column 4 of Table 3). Finally, the primacy effect was significantly stronger in non-partisan contests ($b = .017$, $p < .001$, column 5 of Table 3). When all four moderators were analyzed simultaneously (column 6 of Table 3), the primacy effect was significantly stronger in presidential election years than in other years ($b = .007$, $p = .03$), significantly stronger in non-partisan contests than in partisan contests ($b = .015$, $p < .01$), but not significantly different in races with incumbents vs. those for open-seats ($b = -.005$, $p = .15$) or major vs. minor races ($b = -.005$, $p = .13$). Note that the p-values for these latter two effects approached marginal significance.

Results obtained using the contest-level estimation strategy (i.e., regressing the average primacy effect in the 31 two-candidate contests on contest-level moderator variables) led to the same substantive results. Although this approach may be more intuitive, it understates our certainty about the moderator effects, so the standard errors were somewhat larger. Results obtained using this approach are presented in Online Appendix B.

4. Discussion

Although past studies of voting have nearly all shown a prevalence of primacy effects, methodological flaws in many older studies limited the edification afforded by this evidence. And recently, some publications have raised



Note: Circles represent the estimated name order effect on the Democratic candidate's vote share. Coefficients were obtained from OLS regressions predicting the Democratic candidate's vote share in each precinct with a dummy variable indicating the candidate's name order (first vs. later) in the precinct. Horizontal bars indicate the estimated 95 percent confidence intervals based on the percentiles of 1000 bootstrapping replications. Contests were ordered by the magnitude of gain.

Fig. 2. Name order effects in races with more than two candidates.

questions about the empirical approaches that have been used to estimate the effect of name order on election outcomes (e.g., Alvarez et al., 2006; Ho and Imai, 2006, 2008). Therefore, it is important that more studies using various appropriate analytic methods find their way into the literature.

The present study of North Dakota has limitations in comparison with some previously published studies. Because name order has been rotated in fewer races in North Dakota than elsewhere, the analyses reported here have more limited statistical power and focus on a narrower slice of contests than can be examined in other states. Nonetheless, the findings reported in this paper add to the accumulating literature on the topic and improve our understanding of these effects in a number of ways by exploring replicability and generalizability of name order effects in a context rarely studied previously.

Leveraging data from name order randomizations across thousands of precincts over a seven-year period in North Dakota revealed that being listed first advantaged most candidates across the races examined. Focusing on two-candidate contests avoided concerns that have been expressed about potential problems caused by non-independence in statistical analysis of name order effects in races with more than two candidates. And we found that the results reported here were robust across two different analytic approaches.

The results presented here constitute replications and extensions of previously published evidence documenting the benefit of being listed first. One might imagine that name order effects would vary in prevalence or magnitude across election years or across geography. But evidence of order effects in North Dakota replicating findings observed in California, Ohio, and New York reinforces confidence that primacy effects are a consistent feature of American elections.

Furthermore, our evidence of primacy effects in North Dakota elections resembles similar patterns observed in contests held in other countries (e.g. Brockington, 2003; King and Leigh, 2009). This suggests cross-cultural generality and implies that name order effects may be a psychological regularity whenever choices among candidates or parties are made, rather than a fluke of American electioneering. The magnitudes of name order effects observed here (i.e., consistent primacy effects ranging between zero and four percentage points in general elections) replicate those observed in earlier studies of other similar contexts, increasing our confidence in current understanding of the effect. Indeed, the small name order effects observed here for highly-publicized general election contests are in line with the findings of past studies that documented no name order effects in such races (e.g. Alvarez et al., 2006; Ho and Imai, 2008) and with the predictions of elaborate modeling processes (Pasek et al., 2014).

The current findings also bolster evidence from some past studies on moderators of name order effects. Specifically, we found name order effects to be larger in nonpartisan races, in line with findings reported by Miller and Krosnick (1998) and Ho and Imai (2008). And we found primacy effects to be larger in elections in presidential election years, which involve higher turnout, in line with results reported by Pasek et al. (2014). Differences in the magnitude of order effects across contests for different offices and between races for open seats and ones with incumbents running did not reach statistical significance in the combined model. However, the signs and magnitudes of these differences were in line with findings reported by Miller and Krosnick (1998) and Pasek et al. (2014), who identified larger effects for open seat contests and less publicized races, respectively.[9] Notably, because we analyzed many fewer contests than did Miller and Krosnick

[9] Although the influence of incumbency was not statistically significant in the combined model, the current estimate of .5 percentage points was slightly, but not significantly, larger than the .32 percentage point increase in the effect for open seats observed by Miller and Krosnick (1998). Similarly, although the .5 percentage point detriment for high visibility candidates in the current study was not significant, it was larger than the significant .23 percentage point benefit observed by Pasek et al. (2014). Therefore, the lack of significance here appears to be a function of both low statistical power and slight multicollinearity among the moderators.

Table 3
Parameter estimates from a hierarchical model estimating the impact of moderators of name order effects on the Democratic candidate's vote share in two-candidate races.

Predictor	Regression					
	1	2	3	4	5	6
First position[a]	.012*** [.002]	.013*** [.002]	.005˙ [.003]	.018*** [.004]	.010*** [.002]	.011* [.005]
Major office		.176*** [.043]				.202*** [.038]
First position × Major office[a]		−.008* [.004]				−.005 [.004]
Presidential election year			−.028 [.045]			−.041 [.033]
First position × Presidential election year[a]			.010** [.003]			.007* [.004]
Incumbent in the race				.011 [.054]		−.062 [.039]
First position × incumbent in the race[a]				−.007 [.004]		−.005 [.005]
Non-partisan race					.123˙ [.063]	.182*** [.048]
First position × non-partisan race[a]					.017*** [.005]	.015** [.006]
Intercept	.471*** [.002]	.443*** [.020]	.492*** [.040]	.462*** [.051]	.459*** [.022]	.503*** [.048]
Random effects by County (std. dev)	.068	.068	.068	.068	.068	.068
Random Effects by Contest (std. dev)	.109	.090	.111	.111	.103	.074
Residuals (std. dev)	.091	.091	.091	.091	.091	.091
N	14,474	14,474	14,474	14,474	14,474	14,474
N Counties (clustering)	49	49	49	49	49	49
N Contests (clustering)	31	31	31	31	31	31
AIC	−27,754	−27,753	−27,746	−27,740	−27,752	−27,730

Note: Coefficients are from a linear mixed model with contest-level and county-level random effects. Coefficients measure the change in the Democratic candidate's vote share compared to the omitted category (e.g., in the first column, precincts in which the Democratic candidate was listed last are the omitted category). Estimation was implemented via Restricted Maximum Likelihood. Standard errors are in brackets.
$^{***}p < .001$; $^{**}p < .01$; $^{*}p < .05$; $^{\cdot}p < .10$.
[a] The significance levels reported in these rows are from one-tailed tests. All other *p*-values in the table are from two-tailed tests.

(1998) and Pasek et al. (2014), the current study had limited statistical power to identify substantively small moderator effects and might therefore have made type 2 errors.

To the extent that name order effects occur, they should concern both electoral scholars and election practitioners. Specifically, an order effect might give an unfair advantage to a lucky candidate in a close race in a state that does not vary candidate name order. When name order effects are substantial in magnitude, they could prove decisive. Mitigating these effects requires that elections officials vary the order of candidates' names across voters, which is costly (see Alvarez et al., 2006; Miller and Krosnick, 1998). To provide guidance to election officials and courts of law in making the tradeoff between costs and fairness, it is important to know how frequently name order advantages candidates and how large order effects are likely to be. Our findings support the conclusion that fairness cannot be guaranteed without randomization or rotation of name order.

Appendix A. Supplementary data

Supplementary data related to this article can be found at http://dx.doi.org/10.1016/j.electstud.2014.04.018.

References

Alvarez, R.M., Sinclair, B., Hasen, R.L., 2006. How much is enough? The 'ballot order effect' and the use of social science research in election law disputes. Election Law J. 5 (1), 40–56.

Brockington, D., 2003. A low information theory of ballot position effect. Polit. Behav. 25 (1), 1–27.

Chen, E., 2008. Me First! Assessing the Significance of Ballot Order Effects on Elections in North Dakota. Honors Thesis,. Stanford University.

Darcy, R., 1986. Position effects with party column ballots. Western Polit. Q. 39 (4), 648–662.

Fanelli, D., 2013. Positive results receive more citations, but only in some disciplines. Scientometrics 94 (2), 701–709.

Faas, T., Schoen, H., 2006. The importance of being first: effects of candidates' list positions in the 2003 Bavarian state election. Elect. Stud. 25 (1), 91–102.

Francis, G., 2012. Publication bias and the failure of replication in experimental psychology. Psychon. Bull. Rev. 19 (6), 975–991.

Gerber, A.S., Malhotra, N., 2008. Publication bias in empirical sociological research: do arbitrary significance levels distort published results? Sociol. Methods Res. 37 (1), 3–30.

Gerber, A., Malhotra, N., 2008. Do statistical reporting standards affect what is published? Publication bias in two leading political science journals. Q. J. Polit. Sci. 3 (3), 313–326.

Geys, B., Heyndels, B., 2003. Ballot layout effects in the 1995 elections of the Brussels' government. Pub. Choice 116 (1), 147–164.

Herrnson, P.S., Niemi, R.G., Hanmer, M.G., Bederson, B.B., Conrad, F.C., Traugott, M.W., 2008. Voting Technology. Brookings Institution, Washington, DC.

Ho, D.E., Imai, K., 2006. Randomization inference with natural experiments: an analysis of ballot effects in the 2003 California recall election. J. Am. Stat. Assoc. 101 (475), 888–900.

Ho, D.E., Imai, K., 2008. Estimating causal effects of ballot order from a randomized natural experiment: the California alphabet lottery, 1978–2002. Pub. Opin. Q. 72 (2), 216–240.

Ioannidis, J.P., 2012. Why science is not necessarily self-correcting. Perspect. Psychol. Sci. 7 (6), 645–654.

Jackman, S., 2009. Bayesian Analysis for the Social Sciences. Wiley, New York.

Judd, C.M., Westfall, J., Kenny, D., 2012. Treating stimuli as a random factor in social psychology: a new and comprehensive solution to a pervasive but largely ignored problem. J. Person. Soc. Psychol. 103 (1), 54–69.

Kim, N., Krosnick, J. and Casasanto, D. Moderators of candidate name-order effects in elections: an experiment. *Polit. Psychol.*, 2014

King, A., Leigh, A., 2009. Are ballot order effects heterogeneous? Soc. Sci. Q. 90 (1), 71–87.

Koppell, J., Steen, J.A., 2004. The effects of ballot position on election outcomes. J. Polit. 66 (1), 267–281.

Krosnick, J.A., Miller, J.M., Tichy, M.P., 2004. An unrecognized need for ballot reform: the effects of candidate name order on election outcomes. In: Rethinking the Vote: the Politics and Prospects of American Election Reform. Oxford University Press, New York, pp. 51–74.

Krosnick, J.A., Presser, S., 2010. Questionnaire design. In: Handbook of Survey Research, (second ed.). Emerald Group, West Yorkshire, England.

Marcinkiewicz, K., 2014. Electoral contexts that assist voter coordination: ballot position effects in Poland. Elect. Stud. 33, 322–334.
Meredith, M., Salant, Y., 2013. On the causes and consequences of ballot order effects. Polit. Behav. 35, 175–197.
Miller, J.M., Krosnick, J.A., 1998. The impact of candidate name order on election outcomes. Pub. Opin. Q. 62 (3), 291–330.
Pasek, J., Schneider, D., Krosnick, J.A., Tahk, A., Ophir, E., 2014. Prevalence and moderators of the candidate name-order effect: evidence from all statewide general elections in California. Pub. Opin. Q. in press.
Schooler, J., 2011. Unpublished results hide the decline effect. Nature 470 (7335), 437.
Simmons, J., Nelson, L., Simonsohn, U., 2011. False-positive psychology: undisclosed flexibility in data collection and analysis allow presenting anything as significant. Psychol. Sci. 22 (11), 1359–1366.
Steenberg, M.R., Jones, B.S., 2002. Modeling multilevel data structures. Am. J. Polit. Sci. 46 (1), 218–237.
Wand, J.N., Shotts, K.W., Sekhon, J.S., Mebane, W.R., Herron, M.C., Brady, H.E., 2001. The butterfly did it: the aberrant vote for Buchanan in Palm Beach County, Florida. Am. Polit. Sci. Rev. 95 (4), 793–810.