ABSTRACT
Previous studies of election returns in Ohio (1992), New York (1998), and California (1978-2003) indicate that voters may be influenced by the order in which candidates’ names are presented on the ballot. I obtained and analyzed election data from the general elections held in North Dakota during the years 2000 to 2006. North Dakota offers a naturally occurring randomized experiment suitable for statistical analysis due to the unique ballot rotation procedure it implements statewide. My analyses revealed a consistent name-order effect benefiting candidates listed first on the ballot in general elections by an average of about 1 percent. These effects were stronger in races that did not list party affiliation on the ballot, races held during presidential election years, races involving female candidates, races without incumbents, and in races for the more minor political offices. Furthermore, I found that ballot order could have significantly influenced the outcome of 3 of the 36 statewide races in this study. Finally, I examined the issue of ballot order effects from a policy perspective. Through a survey of legal challenges that have been brought up in state courts, I analyzed the effectiveness of social science research in convincing courts of the compelling need for election law reform.

Keywords: name order effects, ballot layout, ballot design, moderators, election law reform

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1. Introduction

In 2000, then Texas governor and Republican candidate George W. Bush was elected President of the United States by winning 271 electoral votes to then Vice President and Democratic candidate Al Gore's 266 electoral votes. The outcome of the 2000 presidential election rested pivotally on Bush's controversial victory in Florida, which carried 25 electoral votes. The official federal election results (Federal Election Commission, 2001) revealed that Bush received a total of 2,912,790 votes in Florida, compared to Gore's 2,912,253 votes, representing a slim margin of victory of only 537 votes, or less than \(1/100\)ths of a percent of the nearly 6 million votes cast in the state of Florida. The closeness of the 2000 presidential race brought to light a rarely discussed yet potentially significant flaw in our political system - that the manner in which elections are administered can unintentionally influence their outcomes. As a result, numerous scholarly investigations have been conducted to examine the effects that various administrative factors may have upon the electoral process.

One such factor believed to have influenced the outcome of the 2000 presidential election was the specific layout design of election ballots in Florida. The format of the ballots used in Palm Beach County - the so-called butterfly ballot - has been shown to have caused people to vote for a candidate that they did not actually prefer (Brady et al. 2001). Consequently, the seemingly insignificant aspect of ballot design may have inadvertently decided the presidency of the United States in 2000. While the case of the butterfly ballot may have been an extreme example, the dramatic incidence in Palm Beach County has drawn attention to the importance of ballot layout and its potentially detrimental effects upon our democratic process.

Another relevant aspect of ballot design is the order in which candidates' names are listed on the ballot. Political scientists have long agreed that the candidate whose name is listed first on
the ballot receives a significant advantage in the number of votes received (Miller and Krohnick 1998; Brockington 2003). Researchers believe that this is because candidates in many races often do not take clear and definitive stances on specific policy issues, and media coverage often focuses on the horse race, rather than on the candidates’ actual records and policy positions (Patterson 1994). Consequently, the cognitive demands of sifting through copious amounts of media coverage to extract substantive information about candidates’ positions are often substantial and diminish many voters’ incentives to research their options (Downs 1957). Ultimately, people choose to rely on only a small subset of the substantive information available to them while making their voting decisions, often exhibiting “low information rationality” (Popkin 1991). Because of this tendency, voters sometimes do not base their decisions entirely upon rational decision-making and can be subconsciously influenced by the position in which a candidate’s name is listed on the ballot, often choosing the candidate listed first or earlier on the ballot.

Due to the possibility of such ballot order effects, some political candidates have gone so far as to bring lawsuits to prevent incumbent candidates from being listed first on the ballot. Yet most states still assign one candidate this crucial top position on every election ballot, instead of implementing methods to eliminate this bias, such as through rotating the order of candidates’ names, precinct by precinct, which would lead to greater randomization. In fact, only twelve states currently use some form of name order rotation, whether in all races or only in certain elections (Krohnick et al. 2004). Current practice in many states thus maintains an inherently unequal playing field for political candidates running for office, with those candidates not listed first on the ballot at a substantial disadvantage.
This thesis expands upon previous research on ballot order effects to determine how the location of candidates’ names on the ballot can influence election results. I conducted this study by analyzing whether occupying the first position on a vertical election ballot adds to a candidate’s vote tallies. In particular, I conducted a statistical analysis of all federal and statewide election results from 2000 to 2006 in North Dakota, a state that implements candidate name rotation by precinct. As compared to previous studies, North Dakota’s unique rotation procedure provides for a more truly randomized, naturally-occurring experiment which allows researchers to test for ballot order effects. I discuss these advantages at the end of the next section, after reviewing previous studies done on ballot order effects in other states. Further, because I gathered election data from 36 races across four election years, I was able to contribute additional analysis comparing the magnitude of order effects not only across different types of races in the same year, but also for similar offices across different election years.

2. Previous Research

During the past decade, scholars have attempted to determine whether the layout or ordering of candidate names displayed on ballots have had inequitable effects upon election outcomes. Most of the literature acknowledges the existence of ‘ballot order effects’, but is varied in its assessment of the size as well as political significance of these effects. Some studies have attempted to identify the circumstances which may increase the magnitude of ballot order effects, such as in general elections or primary elections. In this section, I first present previous research which develops a behavioral model of voting and then discuss more recent empirical studies done on ballot order effects, in addition to case studies on ballot order that have been conducted internationally.
2.1 Behavioral Model of Voting

In 1998, Miller and Krosnick conducted a seminal study examining how the order of candidate names on election ballots might have an effect upon voters' decision-making processes. They drew upon Herbert Simon's (1957) principle of "satisficing" and treated the act of voting as a cognitive task, in which voters select the most accessible satisfactory option among alternatives, even if the selection is not optimal. For example, when voters lack substantive information about a list of candidates, they often rely upon cues such as name familiarity or a candidate's political party to help them make a decision. Miller and Krosnick developed upon previous psychological research that confirmed "recency" and "primacy" effects, which demonstrated that the order in which options are presented affects the likelihood that an option will be chosen.

When alternatives are presented orally, such as in telephone interviews, psychological research predicts that a "recency" or "latency" effect will occur in which the last option presented is most likely to be retained by the interviewee. On the other hand, when options are presented visually, such as on multiple choice tests, the first option listed often presents itself as the best available choice among the alternatives presented to the test taker, and a "primacy effect" is therefore expected. Krosnick cites numerous studies that previously demonstrated such a systematic pattern, stating that "whenever a visual presentation study has uncovered a response order effect, it has always been a primacy effect. And in studies involving oral presentation, nearly all response order effects documented were recency effects" (Krosnick 1999, p. 551).

With regards to voting decisions, Miller and Krosnick note that when voters have a tendency to look for reasons to vote for a candidate, such a confirmatory bias leads people to become biased towards voting for candidates listed earlier because "people think less and less
about each subsequent alternative (as) they become increasingly fatigued and short-term memory becomes increasingly clogged with thoughts” (p. 294). On the other hand, they also note that it is sometimes possible for voters to only find reasons to vote against particular candidates, thus creating a situation in which the voter comes up with more reasons not to vote for candidates listed earlier in the list and ultimately biases them to choose candidates listed last.

Ho and Imai (2006a) built upon this model of voter decision-making behavior by using a simple decision-theoretic cognitive costs model of voting. The model assumes that voters are sincere in making their decisions and opt to maximize the benefits associated with each candidate, subject to the costs imposed by voting, such as processing the information about each candidate in the order that they are printed. The authors state that individuals will choose a candidate without looking at the remainder of the ballot “if the perceived marginal benefit of subsequent candidates, discounted by the probability of the pivotal vote, exceeds the cognitive cost of processing the merits of an additional candidate” (Ho and Imai 2006a, p. 4). Such a model implies that cognitive costs are higher when there is less information available about the candidates in a race and when there are more candidates to research. Thus, Ho and Imai hypothesize that order effects should be larger for elections with more candidates, for minor party than for major party candidates, for off-year elections than presidential election years, for smaller political offices rather than larger offices, and for races listed on nonpartisan ballots rather than those that list party affiliation.

The next section discusses recent major studies conducted on ballot order effects that attempt to evaluate the merits of this behavioral model of voting. These studies were conducted on general elections in Ohio, primary elections in New York, and both general and primary elections in California.
2.2 Empirical Tests on Ballot Order

While there were many studies conducted prior to 1990 that attempted to identify the effect of name order on voting, many of them had serious methodological flaws. Most of these 24 prior studies on name order effects did not assign voters different name orders at all, instead looking at how candidates over a large number of elections performed in different positions on the ballot (Miller and Krosnick 1998). Because of this, the results of previous studies were flawed since they could not effectively draw any causal inferences about the effect of ballot position on vote share. Two of the previous studies (Darcy 1986; Gold 1952) that were found to be methodologically sound in this regard found no order effects, yet Darcy examined only partisan races in Colorado while Gold examined an election that conducted its voting by mail, characteristics of an election that Miller and Krosnick asserted could minimize or even eliminate any observable order effects (p.317).

Instead, Miller and Krosnick analyzed the 1992 general election results within three counties in Ohio, a state which rotated the order of candidate names on the ballot by precinct. They found that reliable name-order effects appeared in 48% of the 118 statewide and local races they studied. In nearly all those cases, the candidate listed first gained an average advantage of 2.5% of the votes received. Of the significant name-order effects observed, they attributed 89% of them to resulting from primacy effects.

Four findings were consistent with Miller and Krosnick’s argument that voter knowledge regulates the magnitude of name-order effects: (1) ballot order effects were stronger for races that received less media coverage, (2) they were stronger for races with the highest rates of rolloff, in which voters chose to abstain from voting on some races, suggesting that they knew relatively little about the candidates, (3) differences in name-order effects were correlated with
differences between counties in the amount of formal education of their electorates and (4) name-order effects were weaker in races involving incumbents, showing the impact of familiarity with the candidates upon decision making (p.316).

While the results of Miller and Krosnick’s study produced statistically significant results, the authors argued at the time that these ballot order effects were not substantively important, suggesting that such bias has “probably done little to undermine the democratic process in contemporary America” (Miller and Krosnick 1998, p. 292). This assertion has since been contested in further studies that have tested for the presence of these effects not only in other types of elections, but also in different states and different countries.

For example, Koppell and Steen (2004) studied the impact of name order effects on the 1998 Democratic primary in New York City. In these contests, the order of candidates’ names was rotated by precinct. Their statistical analysis was somewhat unconventional because they considered ballot positions as recipients of votes, regardless of whose name was in each slot. This differed from the more customary use of considering each candidate as the recipient of votes. Koppell and Steen (2004) found that in 71 of the 79 individual contests, candidates that were listed in the first ballot position received a greater proportion of the vote. By studying primary elections as opposed to the general elections examined by Miller and Krosnick (1998), Koppell and Steen found a greater order effect in primaries. The researchers found that being listed in the first ballot position increased a candidate’s vote percentage by about 2% in the statewide primary races, while increasing by about 4% for the local primary races.

Koppell and Steen’s study revealed that 161 of the 180 candidates studied received an “extra” amount of votes when listed first. More importantly, in 7 out of the 71 contests exhibiting primacy effects, the advantage granted to the first position candidate exceeded the margin of
victory, which implies that the ballot order effect could have significantly influenced the outcome of those elections if a single candidate had instead held the top position on all ballots. Because of these results, Koppell and Steen stressed the importance of ballot order and specifically its unique impact on primaries, since there are many jurisdictions in the United States that are clearly dominated by one major party, making the primary often the only potential venue for meaningful competition (Herrnson 2000; Jacobson 2001). Additionally, the authors emphasized that primaries are important because they shape the alternatives that are presented to voters in elections for major offices such as U.S. Senate or Governor and argued that ballot order effects can undermine the democratic principle of fair play (Koppell and Steen, p. 269).

Meredith and Salant (2007) further supported the position that ballot ordering significantly affects the results of elections. They studied a dataset of California multi-member district local elections, and found that in more than 5% of them, the candidate who was listed first won office as a result of ballot ordering. Their analysis focused on the ballot ordering effects on city council and school district elections in California and Ohio. Meredith and Salant used multi-member districts in order to isolate the order effects that cannot be done when studying single-member districts. This is because unlike in single-member districts, voting for the first candidate in a multi-member district does not exhaust all available votes.

Additionally, Meredith and Salant analyzed the characteristics of voters or districts to determine if these variables could moderate ballot order effects. Their results demonstrated that ballot order effects are path dependent as candidates perform more poorly when they are listed immediately after higher quality candidates. They came to this conclusion after running a series of regressions that tested for differences in candidates’ vote shares when they were listed third relative to when they were listed first. This was done to determine whether either of the two
previously listed candidates affected the third listed candidate, and the results were statistically significant. Their conclusion is that the “presence of history-dependent evaluation implies that ballot rotation schemes that always list a candidate behind the same other candidate will not be unbiased with respect to list orderings” (Meredith and Salant 2007, p. 24). They therefore argue for rotation schemes to be implemented which take into consideration the number of times a candidate is listed behind every other candidate, in addition to looking at the number of times each candidate is listed in a particular position.

Ho and Imai (2006a, 2006b) also conducted several studies testing for ballot order effects: first, they used the California alphabet lottery to estimate the causal effect of ballot order on candidates for elections held in California from 1978 to 2002 (2006a) and second, they studied the causal effect of being listed on the first ballot page (as opposed to the previous study analyzing the effect of being placed in the first slot on the ballot) during the 2003 California gubernatorial recall election (2006b).

Beginning in 1975, California state law (Assembly Bill 1961, codified in California’s Election Code Sections 13111-13114) has required that the Secretary of State draw a random alphabet for each election to determine the order of candidates for the first assembly district, and additionally, that candidate order be systematically rotated throughout the remaining assembly districts (Ho and Imai 2006a). Consequently, elections in California closely represent a naturally occurring randomized experiment created by California law which mandates the rotation of ballot orders.

Ho and Imai (2006a) studied races from 13 general elections and 8 primary elections and found that if an order effect does exist, it is more likely to occur in local elections that are not highly publicized or where the candidates are non-partisan and unknown to most voters. Their
analysis revealed that ballot order in general elections significantly impacts minor party candidates, while having negligible effects on major party candidates in the California races they studied. However, Ho and Imai (2006a) found that in primaries, being listed first significantly increased the vote share for both major and minor party candidates, and may have even affected the outcome of 12% of the primary races studied. They found that candidates in Democratic or Republican primaries boosted their vote roughly 1 to 2 percentage points when taking the first ballot position. These findings were consistent with Koppell and Steen’s results of the Democratic primaries in New York City. Finally, Ho and Imai found the largest overall effect for nonpartisan races, in which candidates increased their share of the vote by roughly 2 percentage points when listed first on the ballot in the general election (2006a).

In their second study, Ho and Imai (2006b) were able to exploit California’s mandated randomization-rotation procedure to estimate the causal effects of being listed on the first ballot page on a candidate’s vote share. They obtained data on the page placement of 135 candidates in each district and then investigated whether voters were able to act as if they were fully informed. The results of Ho and Imai’s analysis was that being listed on the first ballot page did lead to a statistically significant increase in vote shares for more than 40% of the minor candidates, while having no significant effect on the top two major candidates (2006b).

One group of scholars who have rejected the impact of ballot order effects studied data from the 1998 general election in California to test whether the relative position of candidate names had a statistically significant effect upon their vote shares. Alvarez, Sinclair, and Hasen (2006) implemented three methodological improvements relative to Miller and Krosnick’s 1998 study: (1) they incorporated control variables into a multivariate statistical model to account for the differences in vote shares across districts (for example, ideology, partisanship and
demographic attributes of census tracts), (2) their analysis focused on both primacy and latency effects, rather than on just primacy as most of the previous literature had done, and (3) they used a more appropriate statistical framework for estimating the marginal effects of name order for multiparty data, holding the control variables constant (Alvarez et al. p. 11-12)

Based on their study of general elections held in California in 1998, Alvarez, Sinclair, and Hasen found no substantiating evidence for candidates benefiting from either being listed first or last on the ballot. They found that when a name order effect actually did occur, it was very small and evenly distributed between both primacy and latency. They argued that even the largest observed positive increase received for being listed first of 2.59% was not “large enough to influence anything but a very small fraction of races that are close” (p. 24). This conclusion, however, is highly dependent upon the interpretation of “small,” as some would argue that any order effects that could influence the outcome of even a few races should be considered significant. Alvarez, Sinclair and Hasen also suggested that the previous work done by Koppell and Steen, as well as Ho and Imai, showed significant ballot order effects because they studied primary elections rather than general elections, and thus hint at future research to determine whether ballot order effects may indeed be smaller and less salient in general elections.

2.2.1 International Case Studies

The study of ballot order effects has extended beyond the United States, as several research studies in the past decade have been conducted internationally as well. In this section, I discuss two such studies performed in Australia and Belgium.
Australia

Because voting is compulsory in Australia, one of the first countries to implement randomized ballot ordering, the country’s electoral history presents an ideal opportunity to test for the effect of ballot ordering on elections. King and Leigh (2006) studied federal election results dating back to 1984, when Australia first introduced random ordering of candidate names on their ballots.

Australia offers numerous advantages for research because of the large number of elections using randomized ballot order which provides a greater sample size and because of its compulsory voting requirements which causes vote counts to be more representative of the effect of ballot order on the typical citizen, as opposed to the effect on the average voluntary voter, as is studied in the United States. The average voluntary voter may be more politically knowledgeable than the average citizen, and would therefore be less likely to be influenced by ballot position. Consequently, the order effect might be expected to be higher in Australia since everyone, including those who are the least knowledgeable about politics, are required to vote, as compared to in the United States, in which voluntary voters are presumed to have at least some knowledge about which candidates they will vote for prior to entering the voting booth.

The authors found that there were no ballot order effects for women candidates; males gained 1.4 percentage points when listed at the top of the ballot while women gained no advantage. They also found that the ballot order effect was larger in electorates in which English fluency was lower. King and Leigh believed the reason English fluency had a greater impact on the ballot order effect was because it reflected the inability of citizens to distinguish political parties, or even between candidates themselves (King and Leigh 2006, p.12).
The effects were politically important because approximately 10% of races were decided by margins of less than 1.4 percentage points. While the Australian switch to randomized ballot ordering was intended to minimize the unfair advantage it afforded candidates with last names beginning early in the alphabet, the switch did not actually abolish ballot order effects, since the first position advantage was instead distributed randomly among the candidates. This is because Australia does not rotate its ballots, but rather creates a random name ordering for all ballots. Finally, Leigh and King rejected the notion that compulsory voting, which increases the number of ignorant voters, would increase the ballot order effect in Australia as compared to similar studies conducted in the United States which have shown higher estimates of the ballot order effect.

**Belgium**

Further research was conducted on the different types of electorates within districts that would be more likely to be affected by ballot order. Previous literature has noted the greater impact of order effects upon primary elections rather than general elections (Koppell and Steen 2004; Ho and Imai 2006a), and has also noted media coverage as another factor (Miller and Krosnick 1998). Geys and Heyndels (2003) examined whether the socio-economic characteristics of the electorate affected the impact of ‘ballot layout effects.’ They analyzed preferential votes garnered by 897 candidates in the 1995 Regional Elections in Brussels.

With Belgium’s transition from paper balloting to computerized voting in 1991, Geys and Heyndels took advantage of a unique opportunity to analyze whether ballot layout affected the voting behavior of its citizens. To test whether the composition of the electorate affected the intensity of ballot layout effects, Geys and Heyndels used a simple model in which a politician’s
preferential votes were used as an estimate of that candidate’s popularity. The candidate’s position was identified as a crucial predictor of their preferential vote share. They then investigated whether ballot layout effects were more prominent in districts where voters scored lower in ‘cognitive sophistication.’ In order to test this hypothesis, Geys and Heyndels used average level of education as a proxy for ‘cognitive sophistication’ and found that the advantage of candidates in earlier ballot positions was indeed lower in voting districts in which the average educational level was higher. Their results further supported Miller and Kroscn's finding that voter knowledge influences the magnitude of name-order effects.

2.3 Implications for Election Reform

Krosnick, Miller and Tichy (2004) sought to analyze the consequences of voting systems affected by inherent biases such as ballot order effects. They argued that making improvements in the current American electoral process to minimize such discrepancies would increase public faith, trust and belief in equity in the American electoral process. Krosnick and Miller revised their previous statement from 1998, indicating that name order does in fact have “more than a slim chance” of affecting the outcome of a close election. For instance, the authors argued that 4 of the 188 races they examined in Ohio in 1992 and North Dakota and California in 2002, would have had different results if the use of only a single name order had been used, depending on which was chosen. Even though this represented only 3% of the races they examined, the authors underscored the implications that candidate name orders ought to be balanced for future elections and that revisions to the ballot creation process ought to be considered. Their analysis also had implications for the well-documented advantage of incumbents in winning their elections, arguing that some states’ election procedures such as in Massachusetts, where the incumbent
running for reelection is always listed first, institutionalize and maintain name order bias in the political system, ultimately undermining electoral fairness.

Finally, Krosnick, Miller, and Tichy (2004) found that even in very highly-publicized and contested races, such as the 2000 presidential election, name order mattered. Their evidence suggested that President Bush received more votes when listed first than when listed later in each of the three states they examined, which could have substantially affected the outcome of the 2000 presidential election had such effects been present in other states as well.

Furthermore, Geys and Heyndels (2003) found that such effects point to an inefficiency in the democratic process. They highlighted additional consequences that could stem indirectly from ballot order effects, for example the fact that parties may interpret a high number of votes for individual politicians as indications of support for their political views, when this may not actually be the case. Such a misinterpretation might give parties a skewed idea of what issues deserve greater prominence on their political agendas.

Most of the scholarly literature has also considered how to balance the concern over ballot order effects against the costs and confusion associated with implementing rotation or randomization of name ordering procedures in elections. The research conducted by Meredith and Salant (2007) indicated that policy makers ought to use more sophisticated rotation and randomization procedures to mitigate these order-effects. Koppell and Steen (2004) argued that electronic voting technologies could be employed in future elections which would make rotation of candidate names easier, and could even rotate names by voter. This would not only eliminate the ballot position effect but also provide an excellent source of data analysis for future studies of this phenomenon.
In contrast, others such as Alvarez, Sinclair, and Hasen (2006) suggested that in the absence of strong evidence showing that a voting procedure systematically works against a particular group of voters or candidates over another, courts should ultimately allow states and localities to continue to set their own rules regarding the order of candidate names on their ballots.

This thesis makes an original contribution to the previous literature in several ways. First, I conducted analysis for ballot order effects in another state in which these effects have not been studied extensively. Given that only seven states in the U.S. implement candidate name order rotation on a consistent basis for all elections, my study of North Dakota adds to the studies conducted in Ohio and California by determining the significance of order effects and their influence upon election outcomes in another state. Second, North Dakota’s unique randomized rotation design allows for a much closer approximation to a pure random assignment of ballot orders than the rotation procedures used in California and Ohio (discussed in detail in Section 3.2). Third, because of the wide-ranging nature of my study (36 races over 4 years), I am able to test for the moderating effects of certain election characteristics such as by election year, type of election race such as senator or insurance commissioner, and presence of an incumbent. While most of the previous studies which confirmed the presence of statistically significant ballot order effects were conducted in primary elections or in local races, my study shows that ballot order effects are not only statistically significant in the general elections for statewide offices, but these effects could also have influenced the outcomes of races in North Dakota.
3. Study Design

3.1 Data Collection

To conduct this study, I obtained election data from the general elections held in North Dakota during the years 2000 through 2006. North Dakota is one of seven states in the U.S. which rotates candidate names of all races from precinct to precinct according to a standard rotation procedure. The other six states are California, Ohio, Kansas, Wyoming, Idaho and Montana (Dencker et al. 2006). While the rotation procedure is determined and mandated by the Secretary of State of North Dakota, it is the individual county auditor's responsibility to implement this procedure for each and every ballot within their county. I therefore called each county auditor in each of the 53 counties in North Dakota, often on multiple occasions, during the summer of 2007 in order to collect the necessary election data and ballot rotations for each precinct for each election year.

In total, I obtained ballot rotation orders and precinct vote counts for 36 statewide races across the four election years. (14 races in 2000, 2 races in 2002, 13 races in 2004, and 7 races in 2006. See Appendix, Table 1 for a list of the specific races.) These 36 races consisted of a total of 85 candidates running for political office (74 male and 11 female), as 31 of the 36 races involved only two candidates. The statewide races for Justice of the Supreme Court in 2002, 2004 and 2006 were not included in my study because those races only listed one candidate running for the position, and would thus be uninformative in revealing name order effects. I succeeded in obtaining actual ballot orders or rotation instructions for 544 precincts in 2006 (out of 567 total precincts), 539 in 2004 (out of 607), 533 in 2002 (out of 666) and 358 precincts in
2000 (out of 696). I discuss reasons for the noticeable decline in the number of precincts from which I obtained election records, along with other data collection challenges, in Section 3.3.

3.2 North Dakota Ballot Rotation Procedure

While the rotation procedure in North Dakota is similar to the ones used in other states that rotate candidate names by precinct, there are some differences in the rotation process not only for the state of North Dakota as compared to others, but also slight changes implemented from year to year within the state. I will summarize the procedures used in this section, starting with the first election year I studied.

For the elections in 2000, each county auditor ordered the precincts in her county from largest to smallest, based on the number of votes cast in that precinct for the gubernatorial race in the previous general election, in compliance with North Dakota’s statewide election law. Thus for the 2000 election, county auditors were to rank their precincts by votes cast for governor in the 1996 election. Next, the auditor was instructed to draw the order of candidate names randomly by lot and this order was to be used on the ballot of the first precinct and then subsequently rotated for the remaining precincts down the list. To rotate candidate names from the first precinct to the next down the list, the procedure instructs the auditor to move the candidate listed in the top slot down to the very bottom of the list, while moving all other candidates up one spot respectively. This process was continued for the remaining precincts in the county until each precinct received an order of candidate names for that political race. Each candidate was thus guaranteed to be listed first in an equal, or nearly equal, number of precincts.

Rotation was then repeated for all other statewide and local races as well using the same process until all precincts received a distinct ballot with different orders for each race listed on its
ballot. (Local races were only listed and rotated on those ballots which had precincts located under the jurisdiction for that particular local office). Table 2 in the Appendix provides an example of how rotation would be performed in a particular county for the 5-candidate presidential race in 2004. Note that once the initial random order is drawn for the first precinct, a candidate will always be surrounded by the same two candidates listed either before or after him, for all ballots within that county. Thus in the case presented in Appendix 2, Bush is always listed directly after Nader and/or directly before Kerry on the ballot.

Numerous counties experienced redistricting during the 2002 and 2004 election years, and consequently, were not able to order their precincts based on the number of votes cast for governor in those precincts for the 2000 election since new precinct boundaries had been drawn. I estimated that of the 53 counties, 28 counties redistricted from 2000 to 2002 and 16 counties redistricted from 2002 to 2004, with a total of 34 counties that had a different number of precincts in either 2002 or 2004 from their precinct total in 2000. Because of this, counties that redistricted in 2002 or 2004 were instructed by the Secretary of State to redraw the order of precincts randomly to determine the order in which candidate names would be rotated from precinct to precinct. However, several counties failed to follow these instructions, which will be discussed in Section 3.3.

Beginning with the 2006 election year, the standard rotation procedure was revised further. The revisions were enacted to account for the possibility that precincts in some counties were much larger than others within the same county, and that a candidate could have been randomly assigned the first position on ballots in the largest precincts within the county due to the precinct orders which were drawn by lot in redistricted counties in 2002 and 2004. For example, consider Stutsman County, which had 18 precincts in 2004. For the two-candidate
races, each candidate was listed first on the ballot for an equal number of precincts (9), yet because the precincts varied significantly in size (6 precincts had more than 1,000 voters, while 12 precincts had fewer than 450) one candidate was listed first for a total of 5,829 voters, while the other candidate was listed first for only 4,406 voters. Consequently, one candidate was listed in the first position on ballots for 32% more voters in Stutsman County than was the second candidate. So even though the number of precincts in which candidates were listed first was assigned evenly in 2004, the voting populations that were exposed to each of the two different ballot orders could be quite unequal.

The 2006 ballot rotation algorithm was created to compensate for this deficiency. The number of registered voters in each precinct was used as a basis to assign each specific ordering of candidate names to precincts to represent as close to an equal number of registered voters as possible. Different ballot orders were first assigned to the precincts with the most registered voters. Then, the remaining precincts were assigned ballot orders in such a way that each order appeared to an approximately equal number of registered voters. For example, after each name order in a two-candidate race was assigned the two largest precincts, a running subtotal of total voters was kept, so that the name order with the lowest subtotal was assigned the next largest precinct. This allowed for each candidate running for office to be listed first for a nearly equal number of voters, rather than just an equal number of precincts. In 2006 in Stutsman County, which then had 14 precincts instead of 16, each candidate in a two-candidate race was listed first in 7 precincts each. The count of voters this time, however, was 3,636 voters for one ballot order and 3,648 voters for the other ballot order – a far more equitable distribution.
3.2.1 Unique Random Assignment of Ballot Orders

The rotation procedure used in North Dakota provides a naturally occurring randomization experiment that offers an exceptional opportunity to examine the effects of ballot position on election outcomes. Furthermore, North Dakota’s rotation procedure over the years studied represents a significant improvement on the random treatment of ballot orders over the rotation procedures used in Ohio and California, the other states where ballot order effects have been studied extensively.

In Ohio, the initial ballot order assigned to the first precinct is determined by listing the candidates in alphabetical order, and this alphabetical ordering of candidates is then rotated across all precincts within the state (Miller and Krosnick 1998). The rotation procedure such as the one used in Ohio thus does not address the correlation problem introduced by Meredith and Salant (2007) that one candidate will always follow another candidate on the ballot (except when that candidate is listed first). The ballot orders used in the studies on elections in Ohio were thus not entirely random since the rotation of names maintained an alphabetical ordering of the candidates’ names. The ballot orders in North Dakota avoid this problem since each county draws up its own initial ballot order for each political race, thus making it unlikely that any one candidate will always be listed behind the same candidate within the entire state.

While the order of candidate names is determined randomly, and not alphabetically, for the first assembly district in California using the random alphabet lottery, candidates are still rotated based on this initial order across all 80 state assembly districts (Ho and Imai 2006a). This means that California also suffers from the problem of one candidate always being listed behind another. This can have significant effects, for example, if a candidate is always listed behind a “higher quality candidate” such as an incumbent or one with great name recognition. A second
problem that arises is that the candidate names are rotated throughout the state according to assembly district number, starting from Assembly District 1 and ending with Assembly District 80. Such a nonrandom rotation order of districts leads to the possibility of correlation problems between ballot orders and the demographic characteristics of the districts that they are assigned to.

For example, in a two-candidate race in California, one candidate will always be listed first in all odd-numbered assembly districts, while the other candidate will always be listed first in the even-numbered assembly districts. A problem of periodicity will occur if the vast majority of odd-numbered districts are located along the coast. This is problematic because such districts may carry demographic characteristics that are correlated with the particular ballot order, such as the percentage of registered Democrats, or percentage of the population that are immigrants. Because of potential periodicity in the numerical listing of the districts, the rotation procedure could produce different groups of districts which receive a certain ballot order, thus leading to a nonrandom assignment of name orders to districts, which violates the assumption of independent and identically distributed variables as required for ordinary least squares (OLS) regression analysis.

North Dakota’s rotation procedure avoids this periodicity problem. First, for elections conducted in 2004 and prior, the order of precincts was based on the number of votes cast for governor in the previous election. While this precinct ranking would not differ drastically from election year to election year, there have been cases of precincts that have flip-flopped in the precinct rotation order because of slight changes in their sizes over the years. The more significant modification came in counties that redistricted in 2002 and after and were thus forced to determine the order of precincts used to rotate candidate names by random lot. As discussed in
the previous section, at least 34 of the 53 counties redistricted at least once between 2002 and 2004, thus drawing their precinct orders at random. Additionally, the ballot order assignment algorithm instituted in 2006 added another measure to help ensure that ballot orders were not assigned to precincts in the same way across years. These unique characteristics of the ballot rotation procedure used in North Dakota from 2000 to 2006 present a more truly randomized assignment of ballot orders to precincts, reducing the potential for correlation between ballot orders and precinct characteristics.

3.3 Data Collection – Challenges

While the rotation procedure in North Dakota offered several advantages over previous studies conducted on order effects, this is not to say that the data collection process came without any problems. During the extensive process of data collection and data entry, it became readily apparent that there would be numerous difficulties in ensuring the accuracy of my results.

The first challenge that presented itself during the data collection process was the unavailability of detailed records kept on ballot rotations for some counties during the elections held in 2000, 2002 and even in 2004. Most records were kept on paper, and many counties simply discarded records of their ballot order and precinct rotations several months after the election. Even though the North Dakota Secretary of State mandates that election records be kept by each county for at least 22 months, a few counties, such as Billings County, did not do so. This was one of the main reasons why the yield in obtaining ballot records declined from 96% in 2006 (data collected from 544 precincts out of a total of 567 precincts) to 89% in 2004 (538/607), 80% in 2002 (533/666) and then dropped dramatically to only 51% (358/696) for the 2000 elections. The decreasing yield in percentage of precincts that I obtained ballot orders from
is a direct function of 1) the decreasing likelihood of the county keeping ballot records on file the more distant in time the election was held, 2) the recent conversion to electronic record-keeping and computerization of the ballot rotation algorithm implemented statewide in 2006, and 3) the reduction in the number of precincts in the state due to redistricting, which reduced the overall number of precincts in North Dakota by close to 19% from 2000 to 2006.

In addition to the problem of obtaining actual ballot records, which decreases the power of statistical analysis by reducing sample size, another factor that could affect the accuracy of my results is that for some of the data entered, I had to base ballot orders upon incomplete documents sent to me by several county auditors. Out of 39,399 ballot order observations in my data set, I estimate that 5,780 of them, or nearly 15%, were based on incomplete documents. For example, some counties would only have one ballot from an election year on file, and I would then enter in the remaining ballot orders for the races in that county using the procedures described above, based upon this single election ballot. This could lead to errors in two ways: First, the ballot sent to me may not actually have been the order assigned to the first precinct in that county. One possibility is that the auditors sent me the sample ballot that is sent out to all voters prior to the election, but this sample ballot may not necessarily have been the ballot used for the first precinct in the rotation. Second, the rotation may not have been implemented correctly by the county auditor in that election year either because 1) they did not correctly understand the rotation procedure for candidate names as required by the Secretary of State as outlined above or 2) they did not correctly rank the order of precincts based upon largest to smallest votes cast for governor in the prior election.

Citizens do not expect their elected government officials to make egregious mistakes when performing their assigned duties, yet when it came to the county auditors who
implemented the ballot rotations in North Dakota, I discovered this to be a rather tenuous expectation. In actuality, I came across numerous errors made by the auditors and rotations that were quite puzzling.

For example, Grant County maintained the same number of 7 precincts from 2000 to 2004, meaning that according to the standard rotation procedure, these 7 precincts should have been ranked for the 2004 ballots according to the number of votes cast for governor in the 2000 election. Instead, the precincts in Grant County were ranked and rotated exactly by sequential numerical order, from precinct 31-1 (St. Joseph) to 31-7 (Raleigh), not by number of votes cast. The correct precinct rotation for 2004 would have called for ranking precinct 31-5 (Elgin) first, since it had the most votes cast for governor in the 2000 election (449), followed by precinct 31-3 (Carson) with the second most votes cast (387), precinct 31-4 (New Leipzig, 191 votes), precinct 31-6 (Leigh, 133), precinct 31-7 (Raleigh, 131), precinct 31-2 (Leipzig, 94) and finally ending with precinct 31-1 (St. Joseph) with 53 votes cast for governor in 2000. I examined the precinct rotation order used for Grant County in 2000 (there were no records kept for 2002) and they appear to follow the correct order of precincts of 5-3-4-6-7-2-1 (assuming that the 1996 votes cast for governor would also lead to the same ranking of precincts as one based on 2000 votes). Interestingly, the auditor of Grant County was brand new in 2004, and this may therefore explain the discrepancy in rotations.

McKenzie County had 17 precincts from 2000 to 2004, and therefore the precinct rotations for the ballots in 2002 and 2004 should be based on the ranking of votes cast in each precinct from 2000. However, it appears that the auditor based the 2004 precinct rotation on the number of votes cast in each precinct during the 2002 election. This would be incorrect since the
2004 precinct rotation should have been based on the 2000 election, since there was no gubernatorial race held in 2002.

Griggs County made several procedural errors in the way they rotated candidates’ names on their ballots in 2004. First, Precinct 23-2 (Cooperstown City Hall) received two versions of the ballot because the precinct was divided by county district lines, and therefore one section of Precinct 23-2 voted on the 2nd District County Commissioner race, while the other section did not. However, the candidate names for federal and statewide races should remain the same within the same precinct, yet the Griggs County auditor incorrectly rotated the federal and statewide races within Precinct 23-2 as well. I thus had to throw out all data points from this precinct for all the 2004 races, since I could not tell which particular name ordering was used for the total vote counts of Precinct 23-2. Second, it appears that the auditor ranked the 7 precincts exactly in numerical order, as occurred in Grant County, from precincts 23-1 to 23-7. However, the auditor made a second procedural error when rotating the name orders by precinct, by moving candidates’ names downward instead of upward as specified by the Secretary of State rules. A second interpretation is that the auditor ranked the precincts by reverse numerical order, from 23-7 to 23-1 and then correctly rotated candidates’ names upward. Either way, the precincts were not ranked correctly based on the number of votes cast for governor in 2000, since that would have lead to an order of precincts of 3-2-6-1-4-7-5.

Even in 2006, when the name order rotation algorithm was computerized and performed by the Secretary of State instead of by each individual county auditor, I identified an error in the way precincts were assigned orders in Foster County, as they did not follow the aforementioned algorithm which attempted to distribute orders as equally to voters as possible. For two-candidate races, the candidate name orders for Precincts 2 (Carrington Research Extension Center) and 4
(Schoolhouse Café) were switched, and in the four-candidate race for senator, Precincts 2 and 3 (McHenry Fire Hall) were swapped in terms of their candidate name orders as well.

When I asked these auditors to tell me exactly why the mistakes I noticed were made, or to explain to me in greater detail how the process was conducted in their county, many were completely unknowledgeable about the rotation rules, and for some, I had to inform them of how the rotation procedure should have actually been performed.

One example of this situation occurred during my correspondence with the county auditor of Oliver County. Based on the 2000 votes for governor, the 7 precincts should have been ranked in the order of 7-1-2-6-5-3-4 for the 2002 and 2004 elections. While 2002 was ranked in that correct order, the Oliver County auditor wrote me stating that the precinct order for 2004 was actually 7-1-6-2-5-3-4, reversing the order of Precincts 6 and 2. The auditor’s statement actually coincided with the correct rank of precinct vote counts in the immediately preceding election in 2002, but not 2000. After further investigation, I was able to obtain electronic copies of the ballots used in Oliver County from a local printer’s office that performed the printing duties for that county for 2004. This was encouraging because one set of ballots revealed the correct precinct rotation of 7-1-2-6-5-3-4, so it was likely the auditor was simply mistaken in her written statements to me and over the phone about what the precinct order used in 2004 was. However, the printer’s files for some reason also contained a second set of ballots that used an unexpected ranking of 7-2-1-6-5-3-4. I contacted the printer’s office about this, and they informed me that the rotations were changed due to an error in the rotation on the primary election ballots, and that the ballots were corrected for use for the general election. I decided to give the auditor and printer’s office the benefit of the doubt by sticking with the initial set of printer’s ballots that were in the correct order.
Golden Valley County's auditor also did not seem to understand the rotation process correctly. I received a written statement from her confirming that "in the 2002 & 2004 elections this rotation would start with the largest precinct (#5) and go down to the smallest precinct (#1)." However, after examining the 2000 voting abstract myself, I noticed that the ranking of precincts from largest to smallest should have been 5-4-2-3-1, not in exact reverse numerical order. After contacting the auditor to ask about the discrepancy, she simply told me that this order was simply "always the way it's been done" and could not explain why Precinct 2 was not ranked ahead of Precinct 3, even though there were 90 votes cast for governor in 2000 in Precinct 2 and only 83 votes cast in Precinct 3.

While such procedural errors and discrepancies were fortunately identified, they do not necessarily undermine the accuracy of my data since the ballot orders should still correspond to the vote counts in those precincts, regardless of whether that precinct received the wrong order. This is because the citizens simply voted off of the name order that they saw on their ballots and the fact that they didn't receive the exact order that they should have, while procedurally incorrect, should not affect the results of my analysis.

However, these errors did cause me to scrutinize the other name orders that I had to rotate myself according to the standard rotation procedure after receiving just the first ballot from that county, due to multiple levels of potential inaccuracy: 1) the auditors may not have followed the correct upward rotation procedure for candidate names, 2) they may not have completely understood the precinct ordering rules and thus used an incorrect precinct order, and 3) the first ballot order that some auditors sent to me and identified as corresponding to the first precinct in the list may not actually have been the order used in the first precinct.
Because of these potential sources of error, I specified the particular rotations within my data set that were obtained in this manner and could thus be considered of questionable validity. This allowed me to run separate regressions – one on the full data set which includes all orders obtained (whether visually confirmed or determined myself by following the correct rotation procedure), and a separate regression using just ballot rotations that I was able to visually confirm either through a documented Excel spreadsheet or a copy of the actual ballot from the county auditor. Unlike the actual copies of the ballot sent to me by mail or electronically as pdf files, the Excel spreadsheets are also slightly questionable since they too were created by the auditors and also subject to human error or lack of knowledge. I stress here that I could not confirm such Excel documentation to the highest degree of authenticity either, but gave them the benefit of the doubt after checking them for any potential errors, and therefore included them as ‘accurate’ in my data set.

If the orders I rotated myself were indeed performed incorrectly by the county auditor that year, I believe that these errors would increase the randomness of the votes corresponding to name orders. This would ultimately decrease the likelihood of identifying statistically significant ballot order effects since votes would be more evenly or randomly distributed among all the ballot positions, rather than receiving greater vote percentages in either the first or last positions on the ballot, as the psychological theories of vote choice on primacy and recency effects would lead us to expect.

3.4 Model Testing for Prevalence and Direction of Order Effects

In my analysis, I first test for name-order effects in both 31 two-candidate races as well as the 5 races involving more than two candidates. For the former, I will calculate the percentage
difference in votes that a candidate receives when listed first as opposed to when listed second on the ballot, and then determine whether this difference is statistically significant. For those ballot order effects determined to be statistically significant, I then characterize the directions of these effects to see whether primacy or recency effects predominate. The two-candidate races are easier to analyze, since that requires simply looking at the sign of the percentage difference in votes between first and second positions to identify the prevalence of the primacy or recency effect.

Analyzing the direction of effects for races with more than two candidates will follow the procedure outlined by Aiken and West (1991) and utilized by Miller and Krosnick (1998), using ordinary least squares (OLS) regressions. An ‘Order’ variable is created for each candidate and takes on a value of 1 for precincts in which he was listed first, 2 for precincts in which he was listed second, etc. (see Appendix, Table 2 for an example of assigning the ballot ‘Order’ variable for each of the five candidates for the 2004 presidential race.) Miller and Krosnick then make an adjustment to the ‘Order’ variable to allow for analysis of both primacy and recency effects in a model including ‘Order’ as a quadratic term. The mean of the ‘Order’ variable across all precincts is then subtracted from each candidate’s ‘Order’ score in each precinct. Thus, the ‘Order’ variable for all races with differing number of candidates is centered such that the middle ballot position receives a score of 0 in each race.

Once ‘Order’ has been coded, I will test for the linear effect of name order on the proportion of votes a candidate receives in a race. ‘Vote Percentage’ is thus estimated using the following equation:

\[ \text{Vote Percentage} = \beta_1 \text{ (Order)} + \epsilon \]  

(1)
The quadratic effect of name order on votes is estimated using the following equation:

\[ \text{Vote Percentage} = \beta_2 \text{ (Order)} + \beta_3 \text{ (Order)}^2 + \epsilon \]  

(2)

If the effect of ballot order on a candidate's vote share is linear, then from Equation (1), a statistically significant negative \( \beta_1 \) indicates a primacy effect, since this means that as order increases, a candidate is listed farther down the ballot, and his expected vote share decreases. A statistically significant positive \( \beta_1 \) on the other hand, means that a candidate's vote percentage increases as he is listed farther down the ballot, thus indicating a recency effect.

However, if \( \beta_3 \) in Equation (2) is statistically significant, the effect of order is nonlinear. The interpretation for primacy and recency effects would then be as follows:

Primacy effects would be indicated by either:

1. Significant, negative \( \beta_2 \) and \( \beta_3 \);
2. Significant, negative \( \beta_2 \) and significant, positive \( \beta_3 \).

Recency effects would be indicated by either:

3. Significant, positive \( \beta_2 \) and \( \beta_3 \);
4. Significant, positive \( \beta_2 \) and significant, negative \( \beta_3 \).

Note that \( \text{(Order)}^2 \) is the greatest when a candidate is either listed first or listed last, since the mean of order was subtracted from each candidate's order score.

In cases where \( \beta_2 \) is non-significant, then a significant, positive \( \beta_3 \) would indicate both primacy and recency effects existed, while a significant, negative \( \beta_3 \) indicates that candidates were actually advantaged when placed in the middle of the list. These interpretations of the nonlinear regression follow the methodology of Miller and Krosnick (1998).
3.5 Moderators: Election Characteristics

After analyzing the statistical significance and direction of the ballot order effects, I then test for the influence of certain factors such as election characteristics or electorate demographic variables on the magnitude of the order effect in North Dakota. Examples of the conditions of an election that I examine include whether an incumbent was running in the race, whether the race was listed on a no-party ballot, and whether the race was held during a presidential election year. In this section of analysis, I ask whether the ballot order effect differs across different types of races, years, or candidate characteristics. The following are six variables relating to candidate and election characteristics and the hypotheses for how they might moderate order effects:

Gender of Political Candidate

King and Leigh (2006) found that the ballot order effect was negligible for female candidates, while males gained about a 1.4% advantage when listed first. A potential hypothesis is that while some voters tend to vote based upon position, they will refrain from voting for the first candidate listed if she is female. This theory would then support the claim that females did not receive any advantage when listed first on the ballot.

Races with an Incumbent

Miller and Krosnick (1998) showed that races with incumbents usually exhibited lower ballot order effects. One contributing factor is that incumbents enjoy name recognition from holding office for many years, in addition to their well-documented advantage in raising campaign funds. Therefore in races with an incumbent running, voters can rely upon name cues rather than upon the position of names when voting. Mann and Wolfinger (1980) hypothesized
that candidates whose name generates more familiarity with the voter could likely be seen as the incumbent, and thus would be a good choice to vote for based upon their presumed experience.

*Party Affiliation*

Ho and Imai (2006b) found that ballot order effects were greater for minor party candidates, supporting the hypothesis that candidates who are lesser known receive greater votes when they are listed first on the ballot. Major party candidates often enjoy greater recognition, and thus voters would not be influenced as much by order when voting if they already know something about a candidate or can at least infer policy stances from their party affiliation. Order effects for minor party candidates, on the other hand, have been found to be greater, since the candidates and their party positions are much lesser known, and their vote shares are often substantially lower than the percentage of votes that the two major political parties receive.

Similar to the name recognition of incumbent status, party affiliation is often used by voters as a voting cue. Voters lacking substantive knowledge can rely on party affiliation to help them identify candidates with whom they are likely to share similar positions on policy issues (Miller and Shanks 1996). In races that are listed on ballots without party affiliation then, it is expected that ballot order effects would be greater, since voters have less information about the candidates and thus cannot rely simply on voting along one’s party ties.

*Publicity of Races*

Miller and Krosnick (1998) showed that the publicity of a race often influences order effects, as more highly publicized races tend to exhibit smaller order effects since voters go into the voting booth with a particular candidate whom they will vote for already in mind. Koppell
and Steen (2004) also supported this finding, showing that minor local races exhibited roughly a 4% first position advantage, while the major statewide races exhibited half the average first position advantage of about 2%.

*Presidential Election Years vs. Non-Presidential Election Years*

Ballot order effects are hypothesized to be smaller during non-presidential election years, since there is much lower voter turnout, and thus voters who do vote during non-presidential election years are on average more knowledgeable about the political process and the candidates running for each office. Ho and Imai (2006a) examined the differences between on-year versus off-year elections to determine the degree to which order effects are driven by small uninformed groups of voters who turn out primarily for the most prominent races such as the Presidency. They confirmed that order effects were generally larger during on-year general elections in California, with some candidates gaining about two percentage points when listed first during on-years, while exhibiting no gains at all in off-year elections (Ho and Imai 2006a, p. 22).

*Number of Candidates Running in the Election*

The behavioral model of voting outlined previously suggests that as the number of candidates for a race increases, the cognitive costs associated with examining and researching all the available options increases as well, to the point that voters may tend to satisfice. Ho and Imai (2006) found in their analysis of primary and general elections in California, that “ballot order effects roughly increase monotonically in the number of candidates, lending further credence to the cognitive cost model” (Ho and Imai 2006a, p. 22). Meredith and Salant’s (2007) analysis of
California multi-member district local elections also showed that the benefits of being listed first on the ballot increased as the number of candidates increased (p. 14).

3.6 Model Testing Influence of Election Characteristics on First Position Advantage

To test for the moderating effect of these election characteristics, I added dummy variables for candidates who ran in races with these conditions to the data set. A dummy variable was coded 1 for candidates running in races held during presidential election years (2000 and 2004) and 0 for non-presidential election years (2002 and 2006). Dummy variables were also included for the gender of candidates (1 for female, 0 for male), candidates running in races with an incumbent (1 for those running either as an incumbent or against one, 0 for those races lacking incumbents), and a dummy variable for candidates running in any of the major races (1 for those running for president, senator, or house representative, 0 for candidates not running in those elections). Finally, I included a dummy variable for the number of candidates running in that particular race (ranging from 2 to 5). Table 1 in the Appendix shows which particular races contained female candidates and incumbents. Note that 30 out of the 36 races (83%) in North Dakota that I examined had incumbents running in them. In fact, many of the current office holders in North Dakota have held their positions for many terms, including State Auditor and Agriculture Commissioner (12 years), Secretary of State (15 years), Public Service Commissioner 3 (16 years), and Superintendent of Public Instruction (24 years) (North Dakota State Government, 2008). The high proportion of races involving incumbents could thus significantly influence the magnitude of the ballot order effects that I find.

To test for the impact of these moderators, I constructed a new data set with a data point for each of the 85 candidates I studied. The dependent variable in these analyses would predict
the actual gain in vote percentage when a candidate was listed first, rather than on a candidate's overall vote percentage as before. This "First Position Advantage" was computed in two ways and thus two separate models were used to test for the effect of moderators on predicting the boost in vote share a candidate received when listed in the first position on the ballot.

The first way of computing the first position advantage was called 'FirstAdv'. This variable predicts the difference between the mean percent of votes a candidate received when listed first and the mean percent of votes he or she received when not listed first. The second variable, called 'FirstvLast', predicts the difference between the percent of votes a candidate received when listed first and when he or she was listed last. These two percentages were calculated for each of the 85 candidates. Note that the values for the two dependent variables are equivalent for candidates who ran in two-candidate races since comparing first versus last is the same as comparing first versus not last when there are only two positions. And because two-candidate races make up the majority of the data set, the only differences in the two dependent variables occur in the 5 races with more than two candidates running. Consequently, the differences between 'FirstAdv' and 'FirstvLast' are expected to be minimal.

Next, I predicted the individual effects of each election characteristic as a dummy variable on the two 'first position advantage' indicators. Dummy variables were coded for 'Female', 'Incumbent', 'Presidential Election Year', 'Major Race', and 'Number of Candidates' as described above. The following are the general forms of the two models I use in this section:

\[ \text{FirstAdv} = \beta_1 \text{(Dummy for Election Characteristic)} + \epsilon \]  
(3)

\[ \text{FirstvLast} = \beta_2 \text{(Dummy for Election Characteristic)} + \epsilon \]  
(4)

Finally, I include all dummy variables in a full model to predict their effects on both first position advantage variables, while controlling for the other election characteristics:
FirstAdv = β₁ (Presidential Election Year) + β₂ (Female) + β₃ (Incumbent) + β₄ (Major Race) + β₅ (Number of Candidates) + ε

(5)

FirstvLast = β₁ (Presidential Election Year) + β₂ (Female) + β₃ (Incumbent) + β₄ (Major Race) + β₅ (Number of Candidates) + ε

(6)

The interpretation of the β coefficient for each respective dummy variable represents the effect of that election characteristic on the percentage gain (or loss) in vote share when a candidate is listed first on the ballot, keeping the other conditions constant.

3.7 Moderators: Demographic Characteristics

To compare order effects across voters, I would test whether a relationship emerges between certain demographic characteristics of the electorate and the strength of the ballot order effect. I would analyze whether the characteristics of voters, such as race or income, could moderate the effect of ballot position on election results. I would test four hypotheses about why people might be more likely to vote for the candidate in the first position, by examining the following variables:

Percentage of Voters who learned English as a Second Language (% ESL)

Electorates with a higher percentage of voters who do not speak English as their primary language are more likely to vote for the first available option because of the inability to distinguish between the political parties, and even between the candidates (King and Leigh 2006). Because of the inability to make informed choices, such voters are more likely to
satisfice. Thus precincts with higher levels of ESL speakers in its population would be expected to exhibit larger ballot order effects.

*Average Level of Education*

Lower levels of educational attainment could cause indifference or political apathy towards political candidates and elections, thus causing voters to take less time in making their decisions in the voting booth. More educated individuals are usually more informed, thus making use of their political knowledge to choose candidates in a way that is consistent with their preferences (Delli Carpini and Keeter 1996). Conversely, those who lack knowledge are less able to effectively translate their interests into political action, thus possibly casting their votes based on the first available option presented. Lower levels of education would then be expected to increase ballot order effects.

*Age*

Younger electorates generally exhibit greater uncertainty over their life cycle, which would also likely increase the impact of ballot order effects. Conversely, older electorates are likely to display lower working memory capacities, increasing the likelihood of cognitive fatigue if voting is viewed as a task involving significant cognitive costs. This particular demographic characteristic has not been extensively tested for in previous studies of ballot order, and it would be interesting to see if there is a relationship between a voter’s age and ballot order effects. Age categories would need to be further defined by the type of Census data that can be obtained at the precinct level.
Income

Ballot order effects could be partially the result of voters' disenchantment with the political outcomes produced by elections (King and Leigh 2006). Believing that the political process is ineffectual or unable to help their needs, less well-off and poorer electorates may exhibit greater indifference when voting for candidates and larger ballot order effects would therefore be expected in counties with lower levels of income.

3.7.1 Challenges in Precinct-Demographic Data Matching

A final challenge in my data collection has been incorporating the 2000 US Census demographic data (e.g., educational attainment, income, age, etc.) by matching them with corresponding precincts in North Dakota. In order to test whether these demographic characteristics of the electorate moderate ballot order effects, I would ideally have demographic data on the precinct level, since ballot orders vary from precinct to precinct. Unfortunately, demographic data provided by the US Census Bureau does not go to such a refined level. The lowest level in North Dakota at which the US Census reports demographic data is at the township level. Interestingly, the township sections turn out to be smaller than most of the precincts in North Dakota counties (US Census township levels in other states are usually larger than precincts). If the respective sizes of townships and precincts had been reversed, with multiple precincts located in a township, then mapping the demographic data could have been resolved by assigning the township demographic characteristics to those precincts located within the township. For example, if a particular township was recorded as consisting of 10% African Americans, each of the precincts within that township would be assigned that percentage. This
would not be a perfect solution, but would be a rough workaround which would allow for tests to
determine how such demographics might influence the magnitude of order effects.

Instead, in the situation in North Dakota with multiple township data points lying within
some precincts, I could likely aggregate the township data for each corresponding precinct. For
instance, if one township had 5% of households (10 out of 200) with an annual income of
$30,000 or less and another township data point revealed that 10% of its households (30 out of
300) earned an annual income of $30,000 or less, I could aggregate all relevant township data
and assign a value of 8% (40 out of 500) for that precinct. (Note that absolute numbers must be
aggregated, not the percentages reported in each precinct.) However, this solution would be
imperfect as well, and would likely be worse, since the township level data would not cover all
the individuals residing in that precinct.

The accuracy of this method of precinct-township mapping and data aggregation would
also be highly dependent upon the number of township data points available within a precinct.
Additionally, a final major roadblock to the study of demographic characteristics as moderators
of the ballot order effect in North Dakota is the difficulty of determining precinct boundaries and
within which precincts the particular township data points would lie. Due to redistricting,
precinct boundaries in North Dakota have changed dramatically from 2000 through 2006, and
thus would be extremely difficult to ascertain. Township levels also may cross into more than a
single precinct. These issues made it extremely difficult to match township demographic data
with their corresponding precincts in order to test for the influence of demographics on order
effects.

While I do not continue with demographic variable mapping or testing for their
moderating effects in this thesis, I leave the discussion of the hypotheses and methodology issues
here for future researchers who may decide to continue research in this area, whether in North Dakota or another state that randomizes ballots and maintains more easily obtainable precinct level demographic data. After resolving the demographic variable mapping issue, researchers could then run regressions testing for the influence of the demographic variables on the magnitude of the ballot order effect. Such results would be highly illuminating and would aid in our understanding of the ballot order phenomenon.

4. Results

I now discuss the results I obtained from analyzing the 36 election races by several different methods to identify the prevalence, direction, and statistical significance of the ballot order effect in North Dakota. I also discuss the moderating effects of the election characteristics I test for and finally conclude the section with a discussion of the substantive significance of my results.

4.1 Method 1: Comparison By Candidate

The first test I conducted was a simple analysis comparing the vote percentage that a particular candidate received when he or she was listed in the first position on the ballot as opposed to the mean vote percentage received when that same candidate was not listed first. Consider the vote percentages that each of the five presidential candidates received during the 2004 election (Bush, Kerry, Nader, Badnarik, and Peroutka) listed in Appendix, Table 3 (page 79). Bush received 64.2% of the vote when listed first on the ballot, while receiving an average of 63.2% when listed in positions two through five on the ballot. Thus Bush received a boost of close to 1 percentage point in precincts in which he was listed first. Kerry received 35.5% when
listed first, while receiving only 34.8% when listed in the other positions, for a first position boost in vote percentage of more than half a percent. As minor party candidates, Badnarik, Peroutka, and Nader received much smaller proportions of the overall vote count, and thus their differences in vote percentages when listed first and not first are much smaller in magnitude. Peroutka and Badnarik received an additional 1 to 4 hundredths of a percent increase in vote share when listed first, respectively, while for Nader, his vote percentage was negligibly smaller when listed first compared to the other ballot positions. It must be taken into consideration that while the effect sizes for the minor party candidates are rather small, an additional 4 hundredths of a percent boost for Peroutka still represents an additional percentage gain in votes of 22%, from the 18 hundredths of a percent of the vote share he received in precincts when he wasn’t listed first.

For four of the five candidates in the 2004 presidential election race, the vote percentage received when listed first was indeed larger than the average vote percentage when listed in the second through fifth positions on the ballots. The results after performing this same comparison analysis on the rest of the candidates revealed that out of the 85 total candidates, 65 received more votes when listed first on the ballot than when listed in the remaining positions. While these differences were not statistically significant, the fact that 77% (65 out of 85) of the candidates studied demonstrated a first position ballot advantage serves as a robustness check, at the very least supporting the tendency of primacy effects to predominate when options are presented visually.

It must be noted that the first position advantage for candidates in a two-candidate race must necessarily be equal. To illustrate this concept, let us consider the hypothetical race between candidates J and K. In precincts that list candidate J first, J receives (x) % of the vote,
while candidate K is listed second on those ballots and must receive \((1-x)\) \% of the vote. The other half of the precincts are assigned a ballot order in which K is listed first while J is listed second, with K receiving \((1-y)\) \% of the vote and J receiving \(y\) \% of the vote. The difference between vote shares when candidate J is listed first as opposed to second is thus \((x-y)\) \%. Candidate K’s difference in vote share when first as opposed to second is then \((1-y)\% - (1-x)\%\).

After rearranging, Candidate K’s first position advantage becomes \((x-y)\%\), which we note is equivalent to the first position advantage gained by Candidate J. Thus it may be argued that the number of candidates experiencing a first position advantage out of the 85 studied is overstated since the number of candidates demonstrating primacy effects is effectively doubled for each two-candidate race. This is balanced out however, by the fact that the number of candidates in two-candidate races who did *not* receive more votes when listed first is also double-counted as well. While the issue of correlation between vote shares in two-candidate races will lead to potential problems for the statistical methods discussed later, it does not significantly alter the robustness check of the tabulation results that confirm that most political candidates running for office experience a boost in votes when listed first on the ballot. The next tabulation method seeks to further corroborate this conclusion.

### 4.2 Method 2: Tabulation by Position

Next, I implement a method of analysis used by Koppell and Steen (2004) in which they consider the vote share obtained by each *ballot position* rather than by candidate. For example, for the 3-candidate 2004 governor race, I examined the percentage of the vote received by each position on the ballot, 1\(^{st}\) through 3\(^{rd}\). Since the rotation orders were randomized, each ballot position should theoretically receive \(1/n\) of the vote, where \(n = \text{number of candidates}\), or 33.33\%
in the case of the 2004 governor race. However, the tabulation by position method for the 2004 governor race reveals that the 1st position on the ballot (34.2%) received more than the expected vote share, while the other positions received less than expected (Appendix, Table 5). The fact that the 1st ballot position received a gain of about 1%, while the last position (33.04%) received nearly the expected amount possibly indicates that both primacy and recency effects were present, since the middle position on the ballot received the least percentage of votes (32.76%). This comparison also confirms that the primacy effect was stronger, since the 1st position received a greater percent of the vote than the last position on the ballot received. These results are consistent with previous studies which found both primacy and recency effects (Miller and Krosnick 1998; Alvarez et al. 2006).

I then performed the tabulation by position analysis for the remaining 35 election races. Appendix 4 shows the tabulation results for all 31 two-candidate races, with an expected vote share of 50% for each ballot position. Appendix 5 shows the results for the 5 races with more than two candidates, including the 2004 governor race. Of these 36 races, 29 of them (or 81%) revealed an advantage in votes received for the first position. More specifically, 24 of the 31 two-candidate races demonstrated that the first ballot position received more votes than the second position, while the first position in all 5 races with more than two candidates received more votes than the last position. These results further confirm the robustness of the primacy effect hypothesis.

4.3 Method 3: OLS Regression

After examining the direction of effects using the two tabulation methods, I then performed a standard regression analysis using the regression equation discussed in Section 3.6:
Vote Percentage = β₁ (Order) + ε

This equation predicts a candidate’s vote percentage using an ‘Order’ variable which, for example, was initially coded in the data set as 1 when a candidate was listed in the first position on the ballot and 5ᵗʰ when listed in the last position on the ballot for the five-candidate 2004 presidential race. Recall that the β₁ coefficient is interpreted as the average percentage increase when a candidate is listed in the first position as compared to other positions. So when β₁ is negative, as a candidate is listed lower on the ballot (the ‘Order’ variable increases) that candidate’s vote percentage decreases, meaning that a primacy effect predominates. After performing this regression on several races individually, the results for the order coefficients were not statistically significant at the 5% level. As a result of the lack of statistical significance from analyzing one race at a time, I next made several modifications to the data set in order to increase the statistical power of my analysis.

4.3.1 Modifications to Data Set

The primary and most significant modification I made was to stack the entire data set of all 36 races into one large data file, resulting in close to 40,000 observations of candidate ballot order and corresponding vote counts. After doing this, I addressed the correlation problem inherent within the observations of the two-candidate races. Because one candidate’s order on the ballot directly corresponds with the other candidate’s in a two-person election, when one is listed first, the other must necessarily be listed second. Additionally, as one candidate’s percentage of the vote increases in a two-candidate race, the other’s vote share must necessarily go down as well. These characteristics of two-candidate races result in double-counting of observations that would increase the magnitude of any observed order effects, and would violate
the conditions of independence required for OLS regression. Because the vast majority of my races were two-candidate races (31 of 36), I acknowledged the issue of correlation in the stacked data set by including only one candidate's observations of ballot order and vote percentage from each two-candidate race in the stacked data set. This was done by arbitrarily dropping one candidate's observations from each two-person contest, which resulted in a refined stacked data set totaling nearly 25,000 observations.

A second modification I made to the regression analysis was to add a dummy variable called 'Accurate,' with a value of '1' denoting that the ballot order for that candidate was directly verified from an actual ballot or explicit rotation file from the auditor. Orders that I rotated myself from a single initial ballot and precinct rotation order (as discussed in Section 3.3) were given a value of '0' since these orders and corresponding vote percentages were possibly prone to auditor error or miscommunication. The 'Accurate' dummy variable would enable me to perform separate regressions, one on the complete stacked data set of nearly 25,000 observations, and another using just the more accurate and verified ballot orders, with a total of 21,000 observations.

Finally, I made a third, significant modification which affects the interpretation of the 'Order' variable. This redefinition follows closely the procedure performed by Miller and Krosnick (1998) in which they standardized the middle 'Order' position at a value of '0'. For my data set, instead of coding ballot order starting with 1 for the first position, 2 for the second, etc., I coded ballot order to range from '-1' to '1'. Consequently, for a two-candidate race, the candidate in the first position would receive a '-1' for 'Order', while the candidate listed second would receive a '1'. For races with more than two candidates, positions were divided so as to be equally separated from each other between '-1' and '1'. Thus, for a three-candidate race, the
candidates were labeled with 'Order' variables of '-1', '0' and '1'. Table 6 in the Appendix demonstrates the newly assigned 'Order' variables from '-1' to '1' for the two-, three-, four-, five- and seven-candidate races.

After making these modifications, I then ran the single order regression on the complete stacked data set as well as the 'accurate' data set, in addition to running the order squared regression. I also ran this regression including only certain observations, such as for male candidates or female candidates only. These results are recorded in Table 7. Furthermore, I ran the single order variable regression on each type of race individually to determine the size and direction of the order effects for each particular race (Appendix Table 8) in addition to analyzing the order effects by election year (Appendix, Table 9).

Finally, I ran the regression models predicting the two different first position advantage variables. The results of the analyses of the election characteristics as moderators of the ballot order effect are presented in Tables 10(a-c) and 11(a-c) of the Appendix. Tables 10(a-c) present the influence on the 'FirstAdv' variable, while Tables 11(a-c) present the effect on the second variable 'FirstvLast'. Tables 10a and 11a are regressions performed on the stacked data set (with one candidate from each two-candidate race dropped), while Tables 10(b-c) and 11(b-c) include all 85 candidates. Tables 10(c) and 11(c) list the results of the regressions with only the 'accurate' ballot order observations. Because the first position advantage was assigned a candidate-specific variable, I had only 54 observations of 'FirstAdv' and 'FirstvLast.' To offset the loss of statistical power, I include all candidates in regressions for Tables 10(b-c) and Tables 11(b-c) and acknowledge the possibility of double-counting in order to increase statistical power. The differences between Tables 10(a-c) and 11(a-c) are not surprisingly different from each
other. Recall that 'FirstvLast' and 'FirstAdv' are fairly similar, since 62 of the 85 candidates ran in two-candidates races in which both measures of the first position advantage are identical.

4.4 Discussion of Results

From Table 7, the order coefficient on the stacked data set was determined to be -0.457% and is statistically significant (p<.01). However, this does not represent the complete order effect of being listed first as opposed to last. Recall that 'Order' was coded from -1 to 1, meaning that the coefficient of -0.457% represents the change in vote percentage when a candidate moves from an 'Order' variable of 0 (in the middle) to 1 (the very last ballot position). Thus the full order effect from being listed first (-1) as opposed to last (1), is determined by doubling the reported coefficient to -0.914%, or a loss of about one percent. The same regression performed on the data set of confirmed ballot orders resulted in a slight increase of the order effect to -0.926%. Although the order effect found in North Dakota is somewhat smaller than the effects found in previous studies, the result is consistent in its finding of the direction of the order effect – candidates gain more vote share when listed first, while they lose vote share when listed in other positions. This confirms that for voting decisions made on election ballots, a primacy effect tends to predominate.

Regarding the magnitude of the order effect, there are several possible reasons for why it has been found to be slightly smaller in North Dakota. First, recall that previous studies which found large order effect sizes were usually conducted on primary elections (Koppell and Steen 2004; Ho and Imai 2006a) or on local races (Meredith and Salant 2007). On the other hand, studies conducted in general elections either found no significant order effects for major party candidates (Alvarez et al. 2006; Ho and Imai 2006a) or somewhat smaller order effects of about
2.5% (Miller and Krosnick 1998) as compared to primaries. Consequently, since my study was conducted on statewide races in general elections across the four election years, a smaller order effect could be expected. The results of my study are thus significant in showing that general elections still exhibit statistically significant order effects, even in general elections and for major party candidates.

A second qualitative observation of the effect size that may serve as an explanation is that North Dakota is a much less populated state (approximately 642,000 people) than either Ohio (11.35 million people) or California (33.9 million people) (United States Census, 2000). Because of this, many auditors I spoke with cited the very close and quaint nature of elections conducted in their precincts, as most people within a city or county know each other fairly well, an observation that directly contrasts with larger states such as California or large metropolitan areas such as New York City. It is also important to consider that North Dakota is the only state in the country that does not require any form of voter registration, which was abolished in the state in 1951. As the North Dakota Government page states, “North Dakota’s system of voting and lack of voter registration is rooted in its rural character, illustrated by numerous small precincts, where local election boards know most of the voters who enter the polls to vote on Election Day and may detect those who should not be voting in the precinct” (North Dakota State Government, 2005). As a result, voters in North Dakota may be more knowledgeable of, or at the least, more familiar with their elected government officials by virtue of their smaller state size, which may reduce the presence of ballot order effects while voting.

A third and final consideration regarding the overall ballot order effect size in North Dakota is that 30 out of 36 of these races featured incumbents. Because the presence of incumbents has been shown to decrease order effects by providing for name recognition as a
potential voting cue (Miller and Krosnick 1998), the fact that more than 83% of the races I examined involved an incumbent could have significantly decreased the order effects in North Dakota. Table 7 confirms the hypothesis about the influence of incumbents, showing that in races without an incumbent, the total order effect size is about -1.43%, while it decreases to only -.8% in races with an incumbent. The fact that I studied the general elections in North Dakota as opposed to primary elections, in addition to the high proportion of incumbent races involved, likely serves as the most parsimonious explanation for the relatively smaller order effects that I find in this study.

4.4.1 Results by Race and Year

The size of the order effects vary substantially, depending on the year as well as the type of election race. In presidential election years (2000 and 2004), the total order effect is about -1.2%, while decreasing significantly to -.15% in the off-years 2002 and 2006 (Table 7). For major races (President, Senator, and House Representative), the candidate listed first gained about .36% when compared to being listed last, while candidates gained more than 1.2% when listed first in all other races, or more than three times the order effect found in the major races.

The order effects for each individual race are examined more closely in Table 8 of the Appendix. While 9 of the 14 races reveal statistically insignificant order effects, notice that all order coefficients point to the predominance of primacy effects in all 14 races, combined across all 4 years. The order effects of the remaining 5 races further corroborate the hypothesis that races for less well-known offices do indeed exhibit larger order effects. The total order effects of being listed first to last for the State Treasurer, Insurance Commissioner, Public Service Commissioner, and Superintendent races range from -1.68% to -2.46%, nearly two to three times
the effect of -.914% found for the races as a whole. Even more salient is the statistically significant (p<.01) total order effect found in the Supreme Court Justice race of -4.62%, just above five times the average found in the other races.

The results from both the Superintendent and Supreme Court Justice races are particularly illuminating, since these races were run on non-partisan ballots. The Superintendent race exhibited over twice the observed order effect for the other races, as candidates gained an average of 1.98% when listed first as opposed to when listed last, while candidates for Supreme Court Justice gained more than 4.6% when listed first. These findings support the notion that party affiliation is often used as a voting cue (Miller and Shanks 1996) and that when party is not listed on the ballot such as for the Superintendent and Supreme Court Justice races, voters subconsciously resort to other cues such as ballot order when making their decisions.

I also examined how the order effects differed by election year (Table 9). The most notable trend is that the presidential election years of 2000 and 2004 exhibit much greater, statistically significant order effects than those in the non-presidential election years of 2002 and 2006. The order effects found in the presidential election years ranged from -1.09% to -1.27%, more than two times the total effect sizes found in the off-years, which ranged from only -.09% to -.46%. I discuss the implications of this finding in the next section on election characteristics.

Finally, the bottom of Table 7 also presents the results of the order squared regression model, which includes both the single order and order squared variables, and was used to test for any possible nonlinear relationships between name order and vote percentage in races with more than two candidates. Recall from Section 3.4, that this regression equation is:

\[
\text{Vote Percentage} = \beta_2 \text{(Order)} + \beta_3 \text{(Order)}^2 + \epsilon
\]  

(2)
The results of the order squared regression revealed an insignificant $\beta_2$ along with a positive significant $\beta_1$, which demonstrates the presence of both primacy and recency effects within the North Dakota data set. This means that candidates running in races with more than two candidates are likely to receive additional vote share not only when listed first on the ballot, but also when listed last. This finding supports previous studies which have proposed that candidates listed last on a ballot should benefit from a recency effect (Bain and Hecock 1957). The presence of both primacy and recency effects also confirms the psychological theory of voting proposed by Miller and Krosnick (1998) that voters are biased towards candidates listed earlier when they can generate reasons to vote for a candidate, while voters are biased towards those listed later when voters can only generate reasons to vote against a candidate (p. 291).

4.4.2 Effects of Election Characteristics

The results from the moderating effects of election characteristics reveal several distinctive conclusions. I focus mainly on the results of these characteristics from Tables 8, as well as Tables 10c and 11c in this discussion, since the models incorporating all 85 candidates while using only the verified ballots in the data set demonstrated the greatest statistical significance.

*Presidential Election Years vs. Non-Presidential Election Years*

Recall from Table 8 that the order effect increases substantially from about -.15% in non-presidential election years to -1.20% during presidential election years. Tables 10c and 11c confirm this result when predicting both ‘FirstAdv’ and ‘FirstvLast’, showing that candidates received an additional .832% to .865%, respectively, when listed first during a presidential
statistically significant ballot order effect of close to 1%, an effect size that would likely be much larger if North Dakota had fewer incumbent races.

**Full Model Including All Moderators**

Finally, I incorporated all the election characteristics as dummy variables in a full model predicting the first position advantage, and examined how the size and statistical significance of their respective coefficients changed. If an election characteristic no longer remained statistically significant as a predictor of first position advantage, this likely meant that its influence was significant when tested alone primarily because it was picking up the effects of some other election characteristics that have now been incorporated into the full model. If the moderator remained statistically significant in the full model, this would support the previous hypotheses that the characteristic has a unique influence upon the magnitude of the ballot order effect.

From Table 11c, the full model predicting 'FirstvLast' shows that most of the moderators still remain statistically significant, indicating that their influence on the size of the first position advantage is unique and unlikely due to random chance alone. The effect of presidential election years and number of candidates in a race remained about the same, while the effect of female candidates dropped from about 1% to .75% in the full model. While the effect of incumbents dropped slightly in statistical significance, its order coefficient increased from -.54% to -.88%.

The most noticeable change in the full model results occurred with the major races moderator, dropping in both significance and effect size, from -1.02% to only -.14% in the full model. This suggests that the decrease in first position advantage observed when candidates participate in the major races of president, senator, and house representative as opposed to the minor races are likely due to the other contributing moderators in the full model, such as the
presence of incumbents or the greater number of candidates in the major races. This makes sense when noting that 8 out of the 9 “major races” in my study involve incumbents (Table 1) and that of the 5 races in my study that involve more than two candidates, 4 of them are also categorized as major races (Table 5). Furthermore, of the 30 political candidates running for a major office, only one candidate was female. Therefore, when the moderating factors of incumbents, gender, and number of candidates participating in a race are incorporated along with major race in the full model predicting first position advantage, the effects of major race became less statistically significant and smaller in size.

4.5 Substantive Significance

While one concern with the results discussed is that most of the ballot order effects found within individual races have not been statistically significant, it is encouraging that the data do point in the correct direction with respect to sign, implying reliable advantages to the candidate who is listed in the first position on ballots. As discussed in Section 4.2, 81% of the races I examined reveal that the first ballot position received a greater percentage of the vote than the other ballot positions. I conducted a sign test which showed that finding that 29 of the 36 races reveal a primacy effect is unlikely a result of pure chance alone (p<.0005). Further, the fact that these results have been confirmed in such a high percentage of the races that I studied, along with in numerous other studies conducted on ballot order effects, suggests that the predominance of primacy effects I observe in this study are unlikely a result of simply random observations.

Second, the regression analyses detailed in Section 4.4 show that the average total order effect of being listed first as opposed to last for all statewide races in North Dakota is statistically significant (p<.02) and about .926% (for the stacked data set of confirmed ballots). Additionally,
a histogram of the first position advantage ('FirstvLast') by candidate is shown in Table 12. This advantage ranges from about -1.5% to greater than 4% for candidates, with a mean first position advantage of .86%, which is in line with the previous estimate of the ballot order coefficient. Ultimately, I conclude that candidates in the statewide races from 2000 to 2006 in North Dakota gained on average, roughly one percentage point when listed first as opposed to last on the ballot.

While many economics and political science studies often focus on the importance of attaining statistically significant results, as a researcher, one must also ask whether or not such findings lead to any substantive conclusions. What are the practical implications of statistically significant results from these academic studies? What are the potential impacts of the conclusion that candidates do indeed receive additional votes when listed first on the ballot have upon our society or our political system? Recall that this thesis began with an example of the controversial 2000 presidential election, stressing that even hundredths of a percent can make the difference in being elected President of the United States. However, aside from this rather unique and admittedly rare occurrence in our electoral history, it is important to consider whether the order of candidate names on ballots can influence our election outcomes on a consistent basis, so much so that we should actually care about it?

After carefully examining the margins of victory for each of the 36 races I studied (North Dakota Secretary of State 2008), I believe that the answer to this question is a resounding yes - ballot order can indeed influence election outcomes on a consistent basis. Specifically, in two of the races in this study, the advantage provided by being listed first on the ballot actually exceeded the margin of victory for those contests. In 2000, Kathi Gilmore won the state treasurer race by a margin of victory of 1.48% and Tony Clark won the public service commissioner race by a margin of 0.4%. Table 4 shows that the first position for both these races received an
additional 2.64% and 2.85% of the vote share, respectively, over the candidate whose name was listed second. A third race also came extremely close; the 2004 race for agriculture commissioner was won by Roger Johnson, by the tiny margin of 0.64% of the votes, while Table 4 shows that the advantage of being listed first for that race was 0.45%.

The implications of this finding are that, had ballot rotation not been implemented in North Dakota for these races and a single candidate had instead occupied the first position in all ballots within the state, the outcome may very well have been decided in favor of the candidate lucky enough to draw the top ballot position. The fact that the outcome of 8% of the races I studied (3 out of 36) could have been unduly influenced by candidate name order further substantiates the argument that ballot order can undermine the procedural fairness of our political elections and that more states ought to consider implementing name order rotation on their own ballots. Whether or not such arguments for election law reform based on social science research are accepted by our state courts has been another issue entirely.

5. Policy Implications: Election Law Challenges

Numerous United States court decisions and electoral statutes in all fifty states have relied upon a general assumption that the candidate who is listed first on the ballot receives additional votes simply because of his or her position. At the center of these legal challenges and appeals for instituting some form of ballot rotation or name randomization is the underlying notion that social science research has been correct and effective in proving the existence of ballot order effects. In evaluating cases concerning the ballot order effect, courts have sought to determine first, whether there is sufficient proof that a significant ballot order effect exists, and second, whether the presence of ballot order effects is sufficient justification for the
randomization of candidate names or rotation of ballot orders to ensure a fair election. In this section, I first examine cases in which courts have upheld that the existence of ballot order effects warrants some form of ballot rotation. I then discuss court cases which reject claims for election reform based upon the burdensome costs to society from implementing such changes.

5.1 Cases Affirming the Need for Ballot Rotation

In cases where courts have deemed that a ballot order effect does exist, the courts have argued that a failure to randomize or rotate candidate name order on ballots ultimately deprives all candidates of fair and equal access to votes, resulting in a violation of the Equal Protection Clause. In many of these cases, the plaintiffs filed complaints alleging that because their names were not listed first on the ballot, they suffered a disadvantage in garnering votes from the electorate. Courts have analyzed these claims, taking into account expert testimonies and many of the social science research studies on ballot order discussed previously, and have found in many of these cases that ballot order effects offered sufficient reason to implement measures to establish more unbiased voting systems. A failure to do so would result in the violation of political candidates’ equal protection rights.

One case in which the court found that a ballot order effect existed is the Illinois case of *Weisberg v. Powell*. In 1969, the plaintiff filed a lawsuit alleging that a voting system in which candidate names were listed on the ballot in the order in which their nominating petitions were filed with the Secretary of State was unconstitutional. The plaintiff claimed that the ballot system was intentional and purposeful discrimination and that it violated candidates’ equal protection rights. The Court sided with the plaintiff and found that the Secretary of State’s voting system did indeed deprive candidates of these rights, stating “it was adequately established that top
position on the ballot is one of a number of factors which tend to affect the outcome of an
election, and which may have a substantial effect although the degree varies with the
circumstances" (Weisberg v. Powell, p. 392).

Similarly, in a 1970 New York case, Holtzman v. Power, petitioners claimed that a
legislative amendment which reserved the first ballot position for incumbent candidates provided
for an unfair election whereby non-incumbent candidates were disadvantaged and consequently
deprived of their equal protection rights. The Supreme Court of New York sided with the
petitioners finding that, "as a matter of fact that there is a distinct advantage to the candidate
whose name appears first on a ballot. Aside from the factual determination, such a belief appears
to be so widespread and so universally accepted as to make it almost a matter of public
knowledge" (Holtzman v. Power, pp. 907-908). As a result of this court decision, the New York
state legislature imposed a rotation system to replace the incumbent-first rule, which
interestingly, only applied to New York City. A peculiar dual system was thus created in which
all the primary elections in New York City rotated candidate name order, while the ballots across
the rest of New York State received a uniform candidate name order. This dual system is what
allowed Koppell and Steen (2004) to conduct their research on the 1998 Democratic primary in
New York City.

In 1940, a Michigan state court reached a similar decision in Elliott v. Secretary of State,
stating that "it is not consistent with fairness or purity of elections or the avoidance of misuse of
elective franchise for election officials to prepare ballots in such a condition as will afford one
candidate or nominee an unfair advantage over rival candidates or nominees" (Elliott v.
Secretary of State, pp. 249-250). The court then directed officials to rotate the names on
nonpartisan ballots for the office of Justice of the Supreme Court in the general elections.
Cases in many other states have also determined that the first position advantage is in fact significant. In *Kautenburger v. Jackson*, the Arizona Supreme Court ruled that names appearing first on a ballot list had a distinct advantage and that the failure to alternate names on machine ballots deprived candidates of a fundamental equal protection right that was entitled to protection under the state of Arizona’s constitution. The court in *Groesbeck v. Board of State Canvassers* confirmed that it was a commonly known and accepted fact that in a primary or general election where a number of candidates for the same office are presented before the electorate, those whose names appear at the head of a ballot list are given a distinct advantage. In a more recent case held in 2006, *Akins v. Secretary of State*, the New Hampshire Supreme Court struck down a state law requiring the candidate from the previous election’s winning party to be listed first on the ballot, finding that the law violated the state constitution and remained an unnecessary factor in achieving a manageable ballot (*Akins v. Secretary of State*, p. 75).

As discussed in Section 2, incumbents were listed first on the ballot in most California statewide elections until 1975. That year, the California Supreme Court ruled in *Gould v. Grubb* that reserving the first ballot position for incumbents or placing candidate names in alphabetical order was unconstitutional on equal protection grounds. The Court went so far as to state that upholding the equality and integrity of elections by not conferring advantages to certain candidates was of more importance than utilizing a more efficient, yet biased voting system:

We recognize, of course, that the listing of candidates in alphabetical order is not entirely irrational, for such a system does promote efficiency in voting by making it easier for voters to locate the name of the candidate of their choice on the ballot, especially in races involving a large number of candidates. [...] However, because the substantial advantage which accrues to a candidate in a top ballot position may significantly distort the equality and integrity of the electoral process, the simple rationality of an alphabetical order procedure is not sufficient to sustain such a provision in this context. Instead, the disparate treatment resulting from such a classification scheme must be shown to be necessary to achieve a compelling governmental interest. (*Gould v. Grubb*, pp. 674-675)
The Gould court based its decision heavily on testimonies provided by Bain and Hecock (1957) and Scott (1972), who conducted ballot order studies on ten non-incumbent races in California. Scott found that the positional bias of being listed first added to a candidate’s vote total by at least 5 percent (p. 376), a figure that has often been quoted by the California Secretary of State since in justifying its rotation procedures.

Many of the cases that accepted ballot rotation as a necessary alternative to uniform or alphabetical placement of candidate names affirmed the significant advantage accorded to those candidates listed first on election ballots, relying on social science research citing ballot order effects. Nearly all cases established that the presence of order effects created a violation of the equal protection rights of candidates running for political office in gaining votes.

5.2 Cases Rejecting the Need for Ballot Rotation

While most of the cases affirming the need for ballot rotation relied on similar reasoning in their judgments, cases rejecting ballot rotation have relied on a wide-ranging array of reasons in doing so. Some courts have dismissed arguments for implementing the randomization and rotation of ballots, believing that the absence of such administrative procedures does not result in unfair elections. Others have found that their current election procedures were not a direct violation of the Equal Protection Clause as other courts have argued. For instance, in Koppell v. New York State Board of Elections, the court ruled that “as long as a state’s system of ballot placement treats all candidates in a nondiscriminatory manner, there is no constitutional right [for candidates] to a preferred position on a ballot” (p. 96). In fact, the Koppell decision in 1998 held that New York’s system of randomly selecting a candidate to hold the top ballot position on all ballots did not violate the U.S. Constitution.
In other cases, some courts have determined that evidence of the ballot order effect was inconclusive or too minimal to warrant ballot rotation. Other courts have relied upon arguments that the financial costs associated with the rotation of ballots was too great, or that the amount of voter confusion and potential for error vastly outweighed the perceived benefits of a more fair and just electoral process.

5.2.1 Proof of Ballot Order Effects is Minimal

While there were numerous studies conducted prior to 1980 that had shown through statistical evidence that ballot order effects existed, courts' acceptance of this social science research in deciding legal matters was far from universal. Though some courts at the time did hold that proof of ballot order effects was significant, still others questioned whether it was substantial enough to warrant a ballot rotation system in elections. Courts concurring with the latter view dismissed claims for the adoption of ballot randomization and rotation on these grounds.

In 1976, determining whether or not a ballot order effect existed was not an easy task as “range of expert opinion demonstrates that the advantage conferred by incumbency and by first position on the ballot is not one which is easily susceptible to measurement” (Clough v. Guzzi, p. 1065). Numerous studies such as the ones examined in Clough regarding the effects of single order ballots versus randomized or rotated ballots were conducted with varying results during the 1970s and 1980s. At this time, the opinions of social science experts on the matter varied widely and results from their studies often lacked validity because they could not be conducted under controlled laboratory conditions (Clough v. Guzzi). Due to the inability to accurately measure the
effects of ballot rotation, courts often declared that there was insufficient proof to warrant an enforcement of a ballot rotation system.

In the 1971 case of *Bohus v. Board of Election Commissioners*, the plaintiff alleged that the practice of placing Democrats on the top lines of ballots violated the Equal Protection Clause and sought injunctive relief. After a thorough assessment, the Court found that there was insufficient proof of a ballot order effect to award injunctive relief, ruling in favor of the defendants. The Court found that while “exactitude in proof of voting behavior may be an impossible goal in trials [and though it is] difficult to isolate one factor among many which affects the outcome of an election, […] the judge believed that the witnesses produced no cogent basis justifying their opinions that top placement was advantageous.” (*Bohus v. Board of Election Commissioners*, p. 824)

In addition to arguing the lack of indisputable proof confirming ballot order effects, courts have also determined in some instances that though some proof of position bias may exist, it is not enough to demonstrate a clear violation of rights. In *Graves v. McElderry*, the Court decided that “the small amount of position bias which might be present in any particular General Election as a result of the fact that the State has chosen to utilize an uniform office block ballot […] does not render the State’s classification […] of the Election Code an undue burden on the Oklahoma citizens’ First and Fourteenth Amendment rights” (*Graves v. McElderry*, p. 1581).

Similarly, in 1980 the appellants in *Bloomental v. Lavelle* alleged serious disadvantages due to the position of their names on the ballot, arguing that they suffered from a “double disadvantage” from not only being listed lower than their opponents, but also to the right of others on the ballot. While the *Bloomental* court acknowledged that the first position on a ballot may be advantageous, it argued that “not every limitation or incidental burden on the exercise of
voting rights is subject to a stringent standard of review” (Bloomenthal v. Lavelle, p. 1142). The court further stated that the plaintiffs could not establish a due process violation, since both the rights of candidates and the rights of voters were implicated in the matter, and that the voters’ rights in this case were fundamental. On this basis, the Court found that “nothing in the record supports a conclusion that any burden on the rights of the voters [had] been imposed other than that which is a natural consequence of the fact that only one candidate can be listed first” (p.1142). Because the Court found that the rights of voters had not been violated, it did not find sufficient justification for any violation of due process.

More recent court cases have refused to deem election procedures as unconstitutional simply on the grounds that many people believed that a first position advantage existed. In the 1994 case of New Alliance Party v. New York State Board of Elections, the plaintiffs filed an action declaring that it was unconstitutional to reserve the first position on ballots for the major political parties. The Court concluded that though a belief in the ballot order effect may exist, that belief alone was not sufficient to declare the use of organized ballot slots unconstitutional. In delivering its decision, the court stated that “position bias may be a commonly-held belief in this jurisdiction, but its imprecise and conditional nature preclude it from being characterized as a judicially noticed fact” (New Alliance Party v. New York State Board of Elections, p. 292). A trial court also reached a similar conclusion in 1999, in the case of New Jersey Conservative Party v. Farmer, colorfully holding that:

Plaintiffs seek an equal chance to obtain the votes of fools, namely, those voters who cast a vote without any reason or rationale at all. To succeed, plaintiffs have to show, first, there are any such voters or that there are more than a mere trifle of such voters. Plaintiffs must also demonstrate that [...] this so-called “windfall” vote, is violative of the standard of scrutiny required by the federal constitution. Plaintiffs’ claim fails on all levels (p.286). [...] Their belief alone is insufficient to form the framework for the creation of such a right. If the plaintiffs and defendants believed in the legitimacy of the Easter Bunny, this court would not be required to find as fact (or through
judicial notice) that such a creature truly exists (New Jersey Conservative Party v. Farmer, p. 288-289).

Finally, some courts have made the point that their states’ ballot order layouts do not cause any confusion for those voters who know which candidates they wish to vote for and such voters are perfectly capable of finding these candidates on the ballot. Because their ballots did not purposefully create any confusion for voters, the Superior Court of New Jersey ruled that challenges that favor ballot rotation cannot be based upon “a right to an equal chance to garner ‘confused’ voters. It also cannot be based upon a right to an equal chance to garner ‘disenfranchised’ voters, i.e. those voters who are dissatisfied with the major parties and will therefore cast their votes for professional wrestlers or whoever else might appear on the ballot” (New Jersey Conservative Party v. Farmer, p. 286).

In 1972, the Massachusetts Superior Court acknowledged in Tsongas v. Secretary of the Commonwealth that the failure to rotate candidates’ names on ballots may result in some positional bias but that such bias would be minimal since it would stem mainly from indifferent or careless voters. The Court did not see it fit to change the manner of the election solely on the grounds that positional bias could potentially exist among these indifferent and careless voters:

Even though we assume that the first ballot position of the incumbents deprived the candidates of an equal chance to benefit from the indifference of careless voters who had no personal choice but marked the first name, that speculative benefit did not override the rights of informed and intelligent voters to have their votes count as they were cast. (Tsongas v. Secretary of the Commonwealth, p. 713)

Many social science studies on ballot order have been conducted since the 1980s with much improvement in various statistical methodologies and in the accuracy of their reported results. Many of the courts in the cases cited above did not have the luxury of having access to these more recent studies, which have overwhelmingly demonstrated the predominance of primacy effects in elections with varying effect sizes. It is precisely because of the lack of
evidence confirming the first position advantage cited in these court cases that I hope this study of North Dakota can add to the current social science literature regarding ballot order effects. In this way, I hope that future courts will be less inclined to reject the appeals for election reform based on these grounds and instead actively consider ballot rotation measures as a worthwhile agenda. However, even if courts do accept the significance of the first position advantage, they have often cited other considerations for rejecting ballot rotation in their states.

5.2.2 Ballot Rotation is Not Cost-Effective

One approach that courts have taken to determine whether to mandate name order rotation on election ballots has been to use a cost-benefit analysis to facilitate their decision-making. Courts have attempted to balance the financial costs of implementing ballot rotation against the benefits to the political process from minimizing the advantage garnered by candidates listed in the first ballot position. Some courts following this analysis have determined that the financial costs do outweigh the perceived benefits, stating that the state’s interest in cutting monetary costs was often sufficient basis to dismiss petitions calling for the rotation of ballots in elections (see Tashjian, 93 L. Ed. 2d at 565). Compared to the use of a single ballot, courts have argued that the generation of multiple rotated ballots would significantly increase the administrative costs of running elections. Alvarez noted that “ballots, sample ballots, and related materials must be printed in a variety of styles to track the proper ballot order as the order is rotated in each area. These costs are of course multiplied in jurisdictions that print ballots in multiple languages.” (Alvarez et al. 2006, p. 27)

The Massachusetts case of Clough v. Guzzi demonstrated the courts’ use of a cost-benefit approach in determining whether the practice of rotating ballots was in the state’s interest. In the
1976 case, the plaintiff brought suit alleging that the Massachusetts ballot system, which designated that incumbents be listed first on ballots, violated the Equal Protection Clause. Clough instead advocated a system of ballot rotation to ensure that all candidates had an equal chance of appearing first. The Court dismissed the plaintiff’s claim for ballot rotation, noting that implementation costs would likely place an undue burden on the state. In delivering its opinion, the Court asserted:

The [ballot rotation] system is more burdensome to administer and more costly because of the necessity of printing more than one ballot; some critics say that it is also more susceptible to tabulation error. Without meaning to overstate these difficulties, which may well be offset by the greater equity or appearance of equity provided by the rotational system, still we cannot say that a legislature could not rationally give some weight to them in declining to adopt such a system. (Clough v. Guzzi, p. 1068)

In the 1998 case of Sonneman v. Alaska, the Court upheld the constitutionality of an amendment ending the practice of ballot rotation, pointing out that “the State’s first interest is in reducing costs in printing ballots” (Sonneman v. Alaska, p. 639). The Court found that cost savings of approximately $64,000 per election cycle outweighed the minor benefits that candidates would derive from a system of rotating ballots (Alvarez et al., pp. 27-28). This finding was mirrored in Graves v. McElderry, where the Court ruled, “to the extent the State [...] wishes to save money, protect the efficiency of the electoral process, [and] avoid voter confusion, [...] any small burden upon citizens’ constitutional right which occurs [...] is outweighed by the importance of the State’s interest in achieving these purposes” (Graves v. McElderry, p. 1581). When courts have found that the benefits of implementing ballot rotation fail to outweigh these costs, they have rejected appeals for election law reform based upon the criteria of cost-benefit analysis.
5.2.3 Ballot Rotation May Result in Voter Confusion

As expressed in *Graves v. McElderry*, another consideration that courts have cited as a reason for dismissing election law reform is the voter confusion and implementation errors that would result from ballot rotation. Courts have recognized that the preservation of the integrity of the election process as well as the avoidance of voter confusion are important state interests (*American Party of Texas v. White*, p. 782). These sentiments have been embodied in several court decisions.

The process of randomizing and rotating names on ballots may induce voter confusion when voters are presented with ballots that are unfamiliar in appearance to the sample ballots that are often released prior to an election. Voters who are accustomed to alphabetically-ordered ballots or ballots listing certain parties or incumbents first may experience difficulty in locating these candidates when their names are randomized and rotated. Recognizing that such problems may arise, some courts have rejected the implementation of ballot rotation as a solution to mitigating the impact of ballot order effects.

In *Sonneman v. Alaska*, the appellant challenged the constitutionality of a statutory amendment that ended the practice of candidate name rotation on ballots. The Court found that the statutory amendment did not violate the Alaska Constitution and held that “the amendment was [...] intended to eliminate the confusion of voters who relied on single-order sample ballots and were confused when they found a different rotation of candidates’ names on their actual ballots” (*Sonneman v. Alaska*, p. 635). Paralleling the reasoning given in the *Sonneman* decision, the Oklahoma court in *Graves v. McElderry* dismissed the plaintiff’s claims against the use of its block ballot system on the grounds that this voting system was less likely to produce voter confusion. The Court ruled that the “defendants produced evidence to the Court that a
uniform, block ballot system is more cost efficient, less administratively burdensome, and less likely to cause voter confusion than a rotating ballot system [...] permits the efficient counting of straight party votes in Oklahoma’s General Elections” (Graves v. McElderry, p. 1580).

Similarly, in Tsongas v. Secretary of the Commonwealth, the Court noted that the rotation of candidates’ names on ballots “may complicate the problem of campaigning and even confuse the voter, since the ballots will have a variety of formats depending on the numbers of candidates for various offices” (Tsongas v. Secretary of the Commonwealth, p. 720). The 2003 California gubernatorial election serves as a relevant example of the voter confusion that the Tsongas court may have envisioned occurring in political campaigns with many candidates and a system of rotated ballots. Because the 2003 California gubernatorial election featured 135 candidates running for the position of California governor, randomization would have likely increased voter confusion. Finding a name on a ballot with an excessive number of candidates would be made more difficult if the names were randomized as compared to alphabetical ordering, and rotation would have further compounded the problem. Finally, the political candidates running in such large, confusing races would not be able to create campaign slogans to advertise their position on the ballot, such as “Vote for Smith, Number 118 on your ballot” (Alvarez et al. 2006).

Ultimately, some courts have found that the potential for voter confusion and difficulty faced by candidates in conducting campaigns in large races when names are randomized and rotated is substantial enough to reject the benefits of ballot rotation in establishing greater equity in the political process.
5.2.4 Ballot Rotation Results in Implementation Errors

In addition to the concerns over voter confusion, courts have also expressed qualms over other risks and errors that stem from the implementation of ballot rotation. Because ballot rotation entails the creation of a number of different ballots, there is potential for various mistakes to occur in the production, disbursement and tallying of ballots. In *Tsongas v. Secretary of the Commonwealth*, the Court noted that “[ballot rotation] creates extra work and some extra expense, and may create some risk of error and delay in counting paper ballots... [and] reduces the utility of sample ballots” (*Tsongas v. Secretary of the Commonwealth*, p. 720).

Such extra work can indeed create numerous sources of error in the name rotation, ballot creation, and vote tallying process, as discussed in significant detail in Section 3.3.

Numerous problems have already been identified in many states which have begun to use electronic voting machines and software in recent elections, most notably with Election Systems & Software (ES&S) voting equipment. Cases of incorrect vote tabulation, failure to record votes, faulty placement of candidate names with their parties on voting screens and other machine processing errors have been well-documented in states such as Florida, North Carolina, Texas, and Wyoming (Verified Voting, 2005). Election law reform instituting additional complex randomization and rotation procedures, precinct by precinct, in more states in the U.S. would likely increase the preponderance of mistakes, whether by county officials who would need to print and proof multiple ballots or the voting equipment designed to conduct the rotations and administer these ballots to the public. Courts have not been able to place an exact figure on the price of such implementation errors, but have often cited these costs as a necessary consideration when weighing the decision to implement election law reform.
6. Conclusion

The results from my analysis of the elections in North Dakota from 2000 to 2006 confirm previous research demonstrating that candidates receive a significant advantage when listed first on an election ballot. This first position advantage was greater in races which did not list party affiliation on the ballot, races held during presidential election years, races involving female candidates, races without incumbents, and in races for the more minor political offices. While the overall effect sizes ranged from 1 to 4 percentage points, such differences can be substantively significant. In very close elections, the manner in which candidate names are ordered can significantly influence the outcome of those elections, as I discovered was the case for three of the political races studied in North Dakota.

However, results confirming the presence of ballot order effects in social science research do not automatically justify a clarion call for election law reform. From a policy perspective, the benefits of ballot rotation procedures to our electoral process must be balanced against the costs to implementing such reform. After surveying numerous legal cases involving challenges to election law to remedy the problem of ballot order effects, it is apparent that state and federal courts do not always agree that order effects violate the fairness of competition for political office. Even in cases in which courts do accept that the ordering of candidate names impacts a candidate’s vote count, many fail to establish this finding as sufficient justification for overhauling current election law in many states due to concerns of prohibitive financial costs, voter confusion, and implementation errors.

We must ultimately consider the tradeoffs between such costs and the immense benefits of implementing candidate name randomization and rotation on ballots in states that still do not do so presently. Implementing rotation procedures across the country would not only help to
ensure that candidates running for political office receive as fair an election as possible, but would also help to re-instill voter confidence and faith in our political system. Whether the chance that a few races every year could be unduly decided by ballot order outweighs the costs of implementing election law reform is a policy issue I leave open to further scholarly discussion and future research.
# Appendix

## Table 1. List of North Dakota Statewide Races Examined, 2000-2006

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(14 races, 358 precincts)</td>
<td>(2 races, 533 precincts)</td>
<td>(13 races, 538 precincts)</td>
<td>(7 races, 544 precincts)</td>
</tr>
<tr>
<td>President *</td>
<td>House Representative</td>
<td>President</td>
<td>Senator</td>
</tr>
<tr>
<td>Senator</td>
<td>Public Service Comm. #</td>
<td>Senator</td>
<td>House Representative</td>
</tr>
<tr>
<td>House Representative #</td>
<td>Secretary of State</td>
<td>Governor</td>
<td>Secretary of State</td>
</tr>
<tr>
<td>Governor * #</td>
<td>State Auditor</td>
<td>Governor</td>
<td>State Auditor</td>
</tr>
<tr>
<td>Secretary of State</td>
<td>State Treasurer #</td>
<td>Secretary of State</td>
<td>State Treasurer * #</td>
</tr>
<tr>
<td>State Auditor #</td>
<td>Attorney General *</td>
<td>Attorney General</td>
<td>Tax Commissioner</td>
</tr>
<tr>
<td>State Treasurer #</td>
<td>Insurance Comm. *</td>
<td>Insurance Comm.</td>
<td>Tax Commissioner</td>
</tr>
<tr>
<td>Attorney General *</td>
<td>Agriculture Comm. #</td>
<td>Agriculture Comm.</td>
<td>Tax Commissioner</td>
</tr>
<tr>
<td>Agriculture Comm. #</td>
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<td>Tax Commissioner</td>
<td>Supreme Court Justice</td>
</tr>
<tr>
<td>Public Service Comm. *</td>
<td>Superintendent &amp;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tax Commissioner</td>
<td></td>
<td></td>
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<td>Superintendent &amp;</td>
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<tr>
<td>##, &amp;</td>
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</tr>
</tbody>
</table>

* Denotes race without an incumbent running (6)
& Denotes race listed on a no-party ballot (3)
# Denotes race with female candidate (11)

## Table 2. Sample Rotations for the 2004 Presidential Race including Assignment of ‘Order’ Variable

<table>
<thead>
<tr>
<th>Rotation 1</th>
<th>Rotation 2</th>
<th>Rotation 3</th>
<th>Rotation 4</th>
<th>Rotation 5</th>
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</thead>
<tbody>
<tr>
<td>Bush</td>
<td>1</td>
<td>Kerry</td>
<td>1</td>
<td>Badnarik</td>
</tr>
<tr>
<td>Kerry</td>
<td>2</td>
<td>Peroutka</td>
<td>2</td>
<td>Badnarik</td>
</tr>
<tr>
<td>Peroutka</td>
<td>3</td>
<td>Badnarik</td>
<td>3</td>
<td>Nader</td>
</tr>
<tr>
<td>Badnarik</td>
<td>4</td>
<td>Nader</td>
<td>4</td>
<td>Bush</td>
</tr>
<tr>
<td>Nader</td>
<td>5</td>
<td>Bush</td>
<td>5</td>
<td>Kerry</td>
</tr>
</tbody>
</table>
Table 3. Method 1: Comparison of Vote Percentages by Candidate, Mean Vote Percentages When Listed First vs. All Other Positions

<table>
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<th></th>
<th>First</th>
<th>Not First</th>
<th>Difference</th>
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</thead>
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<td></td>
</tr>
<tr>
<td>President</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gore</td>
<td>30.9</td>
<td>31.1</td>
<td>-.2</td>
</tr>
<tr>
<td>Bush</td>
<td>63.4</td>
<td>62.4</td>
<td>1.0</td>
</tr>
<tr>
<td>Buchanan</td>
<td>2.8</td>
<td>3.0</td>
<td>-.2</td>
</tr>
<tr>
<td>Phillips</td>
<td>.14</td>
<td>.15</td>
<td>-.01</td>
</tr>
<tr>
<td>Browne</td>
<td>.24</td>
<td>.21</td>
<td>.03</td>
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<tr>
<td>Nader</td>
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<td>3.0</td>
<td>-.1</td>
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<td>.16</td>
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<tr>
<td>Conrad</td>
<td>62.0</td>
<td>59.8</td>
<td>2.2</td>
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<td>Sand</td>
<td>40.2</td>
<td>38.0</td>
<td>2.2</td>
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<td>House Representative</td>
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<tr>
<td>Pomeroy</td>
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<td>52.3</td>
<td>-2.1</td>
</tr>
<tr>
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<td>45.8</td>
<td>-.2</td>
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<td>Hoeven</td>
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<tr>
<td>Jaeger</td>
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<td>Clayburgh</td>
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Table 4. Method 2: Tabulation by Position, Two-Candidate Races, 2000-2006

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<th>1st</th>
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<th>% Difference (1st - 2nd)</th>
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Table 5. Method 2: Tabulation by Position, Multi-Candidate Races, 2000-2006

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<th>6</th>
<th>7</th>
<th>% Difference (1st - Last)</th>
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<td>19.47</td>
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<td>20.29</td>
<td>12.53</td>
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<td>32.07</td>
<td>31.29</td>
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<td>2006 Senator</td>
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<td>12.53</td>
<td>12.53</td>
<td>12.53</td>
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The expected vote percentage for each position in a seven-candidate race is $1/7 = 0.1429$. 
Table 6. Recoding of Order Variable from -1 to 1.

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<td>0</td>
<td>.333</td>
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Table 7. Method 3: Regression Analysis, All 36 Races Stacked, Election Characteristics.

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<th>Order Coefficient (%)</th>
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<td>Stacked Data Set (Confirmed Ballots)</td>
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<td>Male Candidates</td>
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<td>-.403 **</td>
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<td>Presidential Election Year (2000, 2004)</td>
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</table>

Order Squared Regression
Order Coefficient      | .170     | 10385 |
Order Squared Coefficient | 2.46 ****| 10385 |

*p < .12, **p < .05, ***p < .02, ****p < .001
Reference List


**Legal Cases Cited**

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