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THE IMPACT OF CANDIDATE NAME ORDER ON ELECTION OUTCOMES

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Abstract Perceived obligations of citizen duty may compel some people to cast votes in democratic elections even when they lack sufficient information to make informed choices. Psychological theories of choice suggest that, under such circumstances, voters may be influenced by the order in which candidates' names appear on the ballot, biasing people toward candidates listed early (when voters can generate reasons to vote for the candidates) or late (when voters can only generate reasons to vote against the candidates). Consistent with this reasoning, analyses of 1992 election returns in Ohio revealed that reliable name-order effects appeared in 48 percent of 118 races, nearly always advantaging candidates listed first, by an average of 2.5 percent. These effects were stronger in races when party affiliations were not listed, when races had been minimally publicized, and when no incumbent was involved. Furthermore, name-order effects were stronger in counties where voters were less knowledgeable about politics. All of this suggests that ballot structure influences election outcomes when voters lack substantive bases for candidate preferences. However, the magnitude of name-order effects observed here suggests that they have proba-

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bly done little to undermine the democratic process in contemporary America.

The Impact of Candidate Name Order on Election Outcomes

Contemporary American elections often confront voters with tremendously challenging tasks. In California, for example, citizens have routinely been asked to vote on a dozen ballot issues on topics ranging from insurance reforms to tort claims, school funding, or the confidentiality of AIDS tests (Allswang 1991; Beck 1997, p. 250). And in all states, voters have sometimes been asked to make choices in well over two dozen races, ranging from high visibility contests to races for offices so obscure that many voters probably could not describe the job responsibilities associated with them. In 1911, for instance, voters in Cleveland, Ohio, were confronted with 74 candidates for city offices, 12 candidates for board of education, 14 candidates for municipal court judges, and 32 candidates for constitutional convention (Davies 1992). And matters were no better in 1992: Cleveland voters were asked to cast ballots in more than 40 county- and statewide races, plus a number of district-wide races.

Because races for highly visible offices (e.g., for U.S. President and Congress) receive a great deal of news media attention, often involve well-known incumbents, and usually involve explicit endorsements of candidates by political parties, voters who wish to make substance-based choices can do so in principle. However, candidates in such races rarely take clear and divergent stands on specific policy issues (Berelson, Lazarsfeld, and McPhee 1954; Page 1978), and media coverage of such contests usually focuses on the horse race rather than on the candidates' records and policy positions (Patterson 1994). The cognitive demands of sifting through lots of such media coverage and extracting useful, substantive information about candidates' positions are therefore probably so substantial as to outstrip most voters' incentives to do the work (Downs 1957). Therefore, people rely on only a small subset of substantive information to make such vote choices, pursuing what Popkin (1991) called "low information rationality."

Media coverage of races for less visible offices (e.g., attorney general, auditor, judge, sheriff, coroner, or board of education) is often much more limited, making it even more difficult for voters to make choices based on substance (e.g., Graber 1991). People pursuing low information rationality can sometimes rely on cues, such as party affiliation, which can help them identify candidates with whom they are likely to agree on policy issues (Campbell, Converse, Miller, and Stokes 1960; Miller and Shanks 1996). But party affiliations are often not listed on the ballot for the very

racers that receive the least media coverage. Alternatively, people can rely on name recognition: the candidate whose name sparks a stronger sense of familiarity may be seen as most likely to be the incumbent, who by virtue of his or her presumed experience may be considered the safer choice (Jacobson 1987; Mann and Wolfinger 1980). But because holders of low visibility offices probably get very little media attention during their tenures, voters may only rarely recognize their names.

What do people do when no such cues are present at all to guide their choices? If someone knows nothing about any of the races being run on a particular election day, he or she is likely to stay home rather than cast a ballot (Delli Carpini and Keeter 1996), in line with political theorists' notion that democratic governance should be carried out only by those citizens who are able to do so responsibly (see Dahl 1989; Pennock 1979). But in some years, large numbers of people go to the polls to vote in a few highly visible contests, yet they are asked to vote in minimally publicized races for relatively obscure offices as well. The higher rolloff rates typical of such races presumably reflect some voters' choices to abstain because they lack sufficient knowledge (Burnham 1965; Robinson and Standing 1960; Vanderleeuw and Engstrom 1987). However, other people may feel that being a "good and responsible democratic citizen" requires them not only to go to the polls but also to cast votes in all listed races, even when they know only a little about the candidates and have not made a firm choice among them before entering the voting booth.

In this article, we explore one possible phenomenon that may occur under such circumstances, whereby the structure of a ballot influences the outcome of an election. Specifically, the votes people cast may be influenced by the order in which the candidates' names appear on the ballot. Below, we first review psychological theories regarding the effects of order on choices and spin out from that literature some predictions regarding elections. We then review past studies of name-order effects in elections, illustrating that their findings are of surprisingly limited value. Finally, we document the prevalence of name-order effects in the 1992 elections in Ohio and explore the conditions under which those effects were most likely to occur. In doing so, we will gain new insights into the processes by which citizens cast votes in contemporary American elections.

A Psychological Theory of Name-Order Effects in Elections

One psychological theory of order effects predicts "primacy effects," which are biases toward selecting the first object considered in a set (Krosnick 1991). People tend to evaluate objects with a confirmatory bias. Specifically, people usually begin a search of memory for information about

an object by looking for reasons to select answer choices rather than reasons not to select them (Klayman and Ha 1984; Koriat, Lichtenstein, and Fischhoff 1980). Because of this, when considering a list of political candidates, voters probably search memory primarily for reasons to vote for each contender rather than reasons to vote against him or her. When working through a list, people think less and less about each subsequent alternative, because they become increasingly fatigued and short-term memory becomes increasingly clogged with thoughts. Therefore, people may be more likely to generate supportive thoughts about candidates listed initially and less likely to do so for later listed candidates, biasing them toward voting for the former.

This theory is consistent with dozens of experiments that presented objects visually and nearly always found bias toward selecting initially offered options (for review, see Krosnick and Fabrigar, in press). For example, when students take multiple-choice knowledge tests, they are biased toward selecting answers offered early in a list, so they tend to answer items correctly more often when the correct answer is listed first than when it is listed last (Cronbach 1950; Mathews 1927). When people are told that an experimenter will imagine a series of questions and they should guess which of a set of offered response choices is the correct answer, people tend to select the first ones listed (Berg and Rapaport 1954). And when people are asked to taste a set of beverages or foods (e.g., four brands of beer) and select their favorite, they are biased toward choosing the first one they consider (Coney 1977; Dean 1980). Therefore, voters may well manifest the same sort of bias in elections.¹

However, people attempting to retrieve reasons to vote for a candidate may occasionally fail completely, retrieving instead only reasons to vote against him or her. If this happens for all candidates in a given race, cognitive fatigue and short-term memory congestion would presumably bias a citizen toward generating more reasons to vote against the first-listed candidate than reasons to vote against later listed candidates. This would induce a recency effect, which is a bias toward selecting candidates listed last (see Schwarz, Hippler, and Noelle-Neumann 1992; Sudman, Bradburn, and Schwarz 1996).

Name order might also influence the votes cast by people who have no information at all about the candidates in a race but nonetheless feel compelled to vote in all races in order to be “good citizens.” According to Simon’s (1957) notion of satisficing, people are inclined to settle for the first acceptable solution to a problem they confront, especially when the costs of making a mistake will be minimal. Therefore, if a citizen feels compelled to vote in races regarding which he or she has no substan-

1. In contrast, when objects are presented orally, there is an overwhelming trend toward selecting the alternative presented last (for a theoretical account of this, see Krosnick 1991).

tive basis for choice at all, he or she may simply settle for the first name listed, because no reason is apparent suggesting that the candidate is unacceptable.

Thus, there is abundant theoretical justification for the hypothesis that the order of candidates' names on ballots may influence voters' choices in some races. If people simply settle for the first-listed contender when they have no information at all about a race, primacy effects will occur. Primacy effects would also be expected in races about which voters do have some information when they can generate at least some reasons to vote for each of the candidates. But when voters can retrieve only reasons to vote against competitors, recency effects would be expected.

Order-based choice should be least likely when voters are highly knowledgeable about candidates and have made substance-based choices before election day (Lodge, McGraw, and Stroh 1989). Therefore, name-order effects should be strongest in races that have received little news media coverage and among voters who are exposed to little or none of such coverage. Order-based choice should also be most common in races that do not offer voters heuristic cues, such as party affiliations of the candidates or incumbency-based name recognition. Cognitive fatigue is likely to build as a voter considers race after race on a long ballot, which may increase the likelihood of name-order effects. Also, races listed toward the end of a ballot may be perceived as less important than those near the beginning, so voters may be less motivated to cast votes carefully in the former and may therefore be more influenced by name order.

Previous Studies of Name-Order Effects

Although a number of studies have been conducted to test for name-order effects on voting, these studies turn out to be of limited value. In order to assess a name-order effect unambiguously, a study must randomly assign groups of voters to receive different name orders (see, e.g., Aronson, Ellsworth, Carlsmith, and Gonzales 1990; Crano and Brewer 1973; Judd and Kenny 1981; Kidder and Judd 1986). Observed differences between these groups of voters must then be subjected to tests of statistical significance to assess whether they are likely to have occurred by chance alone or whether they are likely to represent real effects of name order. However, most of the 24 previous studies of name-order effects did not involve assignment of voters to different name orders at all but rather looked at whether, when combined across a large number of elections, candidates listed in different positions did better or worse on average (Bagley 1966; Bakker and Lijphart 1980; Benn 1970; Brook and Upton 1974; Brooks 1921; Byrne and Puschel 1974; Hughes 1970; Kelley and McAllister 1984; Lijphart and Pintor 1988; Mackerras 1968, 1970; Masterman 1964;

Mueller 1970; Nanda 1975; Robson and Walsh 1974; Upton and Brook 1974, 1975; Volcansek 1981). Most of these studies found that candidates did better when listed early (e.g., Bakker and Lijphart 1980; Benn 1970; Brook and Upton 1974; Brooks 1921; Hughes 1970; Kelley and McAllister 1984; Lijphart and Pintor 1988; Mackerras 1968, 1970; Masterman 1964; Mueller 1970; Robson and Walsh 1974; Upton and Brook 1974; Volcansek 1981). But because candidates' names were most often listed alphabetically, these differences between the positions might have been due to alphabetic-based name preferences instead of name order.²

The remaining six name-order studies all compared voters who received different name orders to one another. However, four of them failed to report statistical significance tests of the observed differences between the orders (Mueller 1969; Scott 1972; White 1950) or computed them improperly (Bain and Hecock 1957, pp. 73–88).³ Furthermore, some of the observed differences suggested that candidates were advantaged when listed first (e.g., Mueller 1969); others suggested that candidates were advantaged when listed last (e.g., Scott 1972); still others suggested that candidates were advantaged when their names appeared in the middle of a list (e.g., Scott, 1972); and, in still other cases, no differences appeared at all (e.g., Bain and Hecock 1957, pp. 73–88). Because this heterogeneity could simply reflect random variation in the absence of any robust name-

2. In fact, preferences for names with initials early in the alphabet are likely to emerge for at least three reasons. First, people tend to like their own initials more than other letters (Johnson 1986; Nuttin 1985), and this bias is apparent in many countries (Kitayama and Karasawa 1997). Because people's last initials are concentrated primarily in the first half of the alphabet, a majority of people will be biased toward liking candidates whose last initials are in the first half of the alphabet (e.g., in the 1996–97 Columbus, Ohio, telephone book, 655 pages listed names with last initials in the first half of the alphabet, whereas only 374 pages listed names with last initials in the second half; see also Masterman 1964; Robson and Walsh 1974). Second, people are likely to have special positive regard for political candidates who share their own initials, because similarity enhances attraction (see Byrne 1971). And because more people in the general public have last initials early in the alphabet than late, this too would lead to a bias in an electorate as a whole toward electing candidates whose initials are early in the alphabet. Finally, the greater prevalence of such names in the general public means that everyone will be exposed to them more often, and mere exposure enhances liking (Zajonc 1968). Therefore, order effects apparent in studies that involved only alphabetical listings of candidate names (which constitute a majority of this literature) do not provide clear evidence about name-order effects.

3. When each voter is individually assigned to a name order independently of all other voters, the number of observations on which a statistical test should be computed is the total number of voters participating in the study. But when groups of voters (i.e., all those in the same precinct) are assigned to name orders, so that all members of a group receive the same order, it is inappropriate to use the total number of voters as the basis for computing the statistical significance of observed differences (see Darcy and McAllister 1990, p. 8; Judd and Kenny 1981, pp. 55–57). Such an approach will yield statistical tests that are too liberal, thus making observed differences seem less likely to have occurred by chance alone than is actually the case. Statistical tests in such studies must instead be based on the number of groups of voters (in most cases, precincts). Because Bain and Hecock (1957, pp. 73–88) should have computed their significance tests in this fashion but did not, their results overestimate the level of statistical significance of the differences they observed.

order effects, it is difficult to conclude from these studies that any observed differences were in fact attributable to name position.

The only two studies that did not suffer from one of these design flaws were conducted by Darcy (1986) and Gold (1952). And surprisingly, these investigations found no name-order effects at all. However, given the strong theoretical basis for expecting such effects and the limited number of informative studies done to date, it seemed worthwhile to further explore whether name-order effects occur, to assess their nature, magnitude, and prevalence, and to determine when they are most likely to occur.

To this end, we analyzed precinct-by-precinct in-person vote returns from all of the races in the 1992 elections held in the three largest counties in Ohio—Franklin, Cuyahoga, and Hamilton.⁴ To set the stage for our findings, we will describe the voting systems used in each county, the races run in each, and the methods each employed to rotate name orders across precincts.

Voting Methods

FRANKLIN COUNTY

In 1992, 879 precincts in Franklin County (which contains the state capital, Columbus) used a mechanical voting system, and 384 precincts used an electronic voting system.⁵ In the mechanical voting booths, candidate names were listed beneath a heading for each race, and voters pushed down levers next to the names. The electronic booths were similar to the mechanical booths in terms of the physical layout of races and candidate names, but next to each race heading was a small flashing red light. When the voter pressed a button to cast a vote in a race, the light became constantly illuminated.

CUYAHOGA AND HAMILTON COUNTIES

In the 2,036 precincts in Cuyahoga County (which contains the city of Cleveland) and the 1,041 precincts in Hamilton County (which contains the city of Cincinnati), voting was done via punch cards. Voters were given (1) a booklet that listed the races and candidate names, (2) a 3.25" × 7.5" card with 228 small, perforated, sequentially numbered squares on

4. We were unable to analyze absentee votes because name order is rotated from ballot to ballot, and records are not kept of vote totals separately for the different name orders.

5. Electronic voting booths were placed in precincts chosen by local politicians, and those precincts were not comparable to those that received mechanical booths (see Nichols and Strizek 1995). Therefore, we cannot infer effects of voting method from comparisons of voting in the mechanical and electronic booths, because voters were not randomly assigned or even functionally randomly assigned to one of the two methods.

it, and (3) a pointed metal poker. The numbers on the squares corresponded to numbers listed next to the candidates' names in the booklet, and voters poked out squares to indicate their preferred candidates.

Races

In 1992, many races appeared on the ballot in all precincts in a county (called countywide races); these included races for U.S. President, U.S. Senate, county commissioner, prosecuting attorney, and common pleas judge. Other races appeared in the precincts of only a single district (called district-wide races); these included races for U.S. representative, state representative, and state senator.⁶ We analyzed the results of all countywide and district-wide races in the three counties except the five-candidate race for U.S. representative in Cuyahoga County, because it involved only 20 precincts and therefore did not offer sufficient statistical precision to estimate name-order effects.⁷ In total, we tested for name-order effects in 37 races in Franklin County, 53 races in Cuyahoga County, and 28 races in Hamilton County. Appendix A reports the average position of each race on the ballot across the precincts in which the race appeared, the number of candidates in each race, and whether the ballot displayed the party affiliations of the candidates.

Name Rotation

The procedures used to rotate name-order across precincts were different in each county, were rather complex, and are explained in detail in appendix B. The process started with listing all of the precincts in the county in an order determined by size of city, date of precinct creation, and the spelling of the precinct names. Then, for each race, a series of different name orders were developed, beginning first with an alphabetical ordering of the candidates. Each additional name order was created by moving the first-listed candidate to the end of the list until each candidate had been listed first in one and only one order. The number of name orders created therefore equaled the number of candidates in the race. The first name order was assigned to the first-listed precinct; the second name order was assigned to the second precinct; and this assignment procedure continued, rotating repeatedly through the name orders, until every precinct had been

6. Some of these districts were U.S. Congressional districts, and others were districts designed especially for races for the state senate, the state house of representatives, or the county board of education.

7. Two races in Franklin County, seven in Cuyahoga County, and eight in Hamilton County involved only one candidate and were therefore not useful for testing our hypotheses.

assigned to a name order. This was done independently for each race, without regard to the rotation scheme used for the other races on the ballot.

Although this sequential assignment method is clearly not the same as random assignment, it seems likely to have produced equivalent groups of precincts to receive different name orders. To assess this objectively, we first examined whether the groups of precincts that received different name orders differed from one another with regard to the average number of votes cast per precinct, the average number of registered voters per precinct, or the average percentage of registered individuals who turned out to vote. If these groups were essentially equivalent, then they should not have differed in these regards.

To conduct this analysis, we created what we call an “order variable” for each race, ranging from 1 to the number of candidates in the race (where 1 meant the candidates were listed in alphabetical order, 2 meant the first candidate alphabetically had been moved to the end of the list, and so on). All precincts that received the same name order in the race were assigned the same value. Precincts in which a race was not run were not assigned any value on that variable.

In Franklin County, for example, one order variable was created for the eight-candidate presidential race (with eight levels: 1 = precincts receiving the first order, 2 = precincts receiving the second order, and so on up to 8). Another order variable was created for all the eight-candidate countywide races (with three levels representing each of the three name orders). And another order variable was created for all the countywide two-candidate races (with two levels representing the two name orders, alphabetical and reverse alphabetical). Twelve additional order variables were created, one for each of the 12 district-wide races for U.S. representative, state senator, and state representative. Each of these races involved a unique subset of the precincts in the county, so different subsets of precincts received each name order for those races. This procedure led us to create a total of 15 order variables for Franklin County, 24 for Cuyahoga County, and 14 for Hamilton County.⁸

Using each of these 53 order variables as the independent variable, we conducted a series of one-way analyses of variance predicting the average

8. An alternative would be to create only one order variable for each county, representing the different ballots used in the county. For example, in Franklin County, 24 ballots were created, and each precinct was assigned to receive one of these ballots (see appendix B for an explanation of why this number is 24). We could test whether the 24 groups of precincts receiving different ballots differed from one another in terms of demographic characteristics, voting behavior, and so on. However, a more powerful and efficient test of a name-order effect in a two-candidate race, for example, would lump together all precincts that received the candidate names in alphabetical order, and compare their votes to those of a conglomeration of all the precincts that received the candidate names in reverse alphabetical order. We took this latter approach and therefore constructed a number of different order variables for use in races differing in number of competing candidates and number of precincts in which the race was run.

number of voters who participated in the election, the average number of registered voters, and the average percentage of voter turnout in each precinct. Of the 159 analyses conducted, only two effects were statistically significant ($p < .05$). As many as 8 of these 159 tests would be expected to yield statistically significant results by chance alone, and any correction for family-wise error would decrease the alpha level for each test so much that none of the differences would be significant (Keppel 1991). Therefore, the precinct groups seem equivalent in these regards.

We also conducted a second set of tests, using data from the 1990 U. S. Census of Cuyahoga County.⁹ We conducted one-way analyses of variance using the 24 order variables for that county to predict demographic variables that predict voter turnout and/or vote choice—educational attainment, income, age, race, gender, marital status, employment status, and home ownership (see, e.g., Miller and Shanks 1996; Rosenstone and Hansen 1993). In the 696 analyses of variance conducted, only five effects were statistically significant ($p < .05$), whereas as many as 35 of these tests would be expected to yield statistically significant results by chance alone. Consequently, we found no evidence to challenge the assumption that the precinct groups in Cuyahoga County were equivalent. And given that the rotation method used in Cuyahoga County was comparable to those used in Franklin and Hamilton Counties, this analysis suggests that the precinct groups in those counties are likely to have been quite similar as well.

Results

PREVALENCE OF EFFECTS

Tables 1 and 2 report tests of name-order effects in the two-candidate races and in races involving more than two candidates, respectively. The first column in table 1 shows the difference between the percentage of votes each candidate received when listed first and second on the ballot in Franklin County and the significance of this difference. The next two columns list comparable results for Cuyahoga and Hamilton Counties, respectively. In table 2, the first column lists the statistical significance of the F -statistic assessing whether any reliable difference between votes

9. We examined only Cuyahoga County in this analysis because we were only able to obtain a data set mapping Census data to voting precincts for that county (M. J. Salling, personal communication). In that data set, demographic statistics for the 1991 precincts in Cuyahoga County were calculated using the block data from the 1990 U.S. Census as follows. When a precinct included only a part of a block, the proportion of the area of the block that fell within the precinct was multiplied by the census counts for that block. Then, these figures were added to the census counts for all blocks that fell completely within a precinct to yield totals for that precinct. The precincts were redrawn between 1991 and 1992, and only 1,980 were the same in both years; we confined our analysis to these.

Table I. Difference between the Percent of Votes Received in Different Name Orders in Two-Candidate Races

| | Percentage Difference | | |
|---------------------------|-----------------------|--------------------|-----------------|
| | Franklin County | Cuyahoga County | Hamilton County |
| U.S. representative I | .35 (589) | .25 (772) | .02 (381) |
| U.S. representative II | ... | 1.67 (393) | ... |
| State senator I | 2.96 (379) | .53 (119) | 1.37 (356) |
| State senator II | 4.89*** (456) | ... | ... |
| State representative I | .91 (125) | -.78 (154) | -.57 (145) |
| State representative II | -1.31 (118) | -.12 (155) | 3.00 (112) |
| State representative III | -1.11 (137) | .64 (159) | 1.98 (125) |
| State representative IV | -.44 (122) | -.72 (155) | 1.88 (110) |
| State representative V | 2.26 (123) | 1.18 (145) | 1.33 (133) |
| State representative VI | 3.70 (159) | 1.03 (156) | ... |
| State representative VII | 2.20 (126) | ... | -2.11 (151) |
| State representative VIII | ... | 1.23 (167) | .34 (144) |
| State representative IX | ... | .89 (159) | ... |
| State representative X | ... | 1.39 (163) | ... |
| County commissioner I | 4.08*** (1,263) | 1.72*** (2,031) | ... |
| County commissioner II | 3.17*** (1,263) | .62 (2,031) | 1.28 (1,041) |
| County commissioner III | ... | ... | 1.10 (1,041) |
| County auditor | 3.09*** (1,263) | ... | ... |
| Prosecuting attorney | 4.06*** (1,263) | .75 (2,031) | 1.24 (1,041) |

Table I. (Continued)

| | Percentage Difference | | |
|--------------------------|-----------------------|--------------------|--------------------|
| | Franklin County | Cuyahoga County | Hamilton County |
| Common pleas clerk | 3.26*** (1,263) | 1.19 (2,031) | 1.81 (1,041) |
| Sheriff | 2.74*** (1,263) | .75 (2,031) | 1.31 (1,041) |
| County recorder | 3.50*** (1,263) | ... (2,031) | .21 (1,041) |
| County treasurer | 2.79** (1,263) | 1.44** (2,031) | -.21 (1,041) |
| County engineer | ... (1,263) | ... (2,031) | 2.80* (1,041) |
| Coroner | 3.17*** (1,263) | ... (2,031) | 1.28 (1,041) |
| Supreme Court justice I | 5.02*** (1,263) | 1.80*** (2,031) | 2.86*** (1,041) |
| Supreme Court justice II | 5.04*** (1,263) | .62 (2,031) | 4.00*** (1,041) |
| Court of appeals I | ... (1,263) | 3.43*** (2,031) | .52 (1,041) |
| Court of appeals II | 4.60*** (1,263) | 2.39*** (2,031) | ... (1,041) |
| Court of appeals III | 4.25*** (1,263) | ... (2,031) | ... (1,041) |
| Court of appeals IV | 3.85*** (1,263) | -.93** (2,031) | ... (1,041) |
| Common pleas judge I | ... (1,263) | 2.78*** (2,031) | .06 (1,041) |
| Common pleas judge II | 3.75*** (1,263) | .79* (2,031) | ... (1,041) |
| Common pleas judge III | 3.63** (1,263) | .50 (2,031) | ... (1,041) |
| Common pleas judge IV | 4.82*** (1,263) | 1.73*** (2,031) | ... (1,041) |
| Common pleas judge V | 2.15*** (1,263) | .40 (2,031) | ... (1,041) |
| Common pleas judge VI | 1.99** (1,263) | 1.39 (2,031) | ... (1,041) |
| Common pleas judge VII | 3.91*** (1,263) | ... (2,031) | ... (1,041) |
| Common pleas judge VIII | 1.74* (1,263) | -.35 (2,031) | ... (1,041) |

Table I. (Continued)

| | Percentage Difference | | |
|--------------------------|-----------------------|---------------------|--------------------|
| | Franklin County | Cuyahoga County | Hamilton County |
| Common pleas judge IX | ... | 1.11*** (2,031) | ... |
| Common pleas judge X | ... | 1.21*** (2,031) | ... |
| Common pleas judge XII | ... | 3.36*** (2,031) | ... |
| Common pleas judge XIII | ... | 2.37*** (2,031) | ... |
| Common pleas judge XIV | ... | -.18 (2,031) | ... |
| Common pleas judge XVI | ... | -.84 (2,031) | ... |
| Common pleas judge XVII | ... | -1.96*** (2,031) | ... |
| Common pleas judge XVIII | ... | -.40 (2,031) | ... |
| Common pleas judge XIX | ... | .43 (2,031) | ... |
| Common pleas judge XX | ... | .77* (2,031) | ... |
| Common pleas judge XXI | ... | -.53 (2,031) | ... |
| Common pleas judge XXII | ... | 1.18** (2,031) | ... |
| Common pleas judge XXIII | ... | .15 (2,031) | ... |

NOTE.—The difference in vote percentage across orders in this table is reported for the candidate whose last name appeared earliest in the alphabet. Significance levels are derived from *t*-tests. In parentheses under each percentage difference is the number of precincts that contributed data to each *t*-test.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 2. Tests of Differences between the Percent of Votes Received in Different Name Orders in Races That Involved More Than Two Candidates

| Candidate | Franklin County | | Cuyahoga County | | Hamilton County | |
|-------------------------|---|--|---|--|---|--|
| | Significance of ANOVA Comparing All Positions | Difference between First and Last Position | Significance of ANOVA Comparing All Positions | Difference between First and Last Position | Significance of ANOVA Comparing All Positions | Difference between First and Last Position |
| U.S. President: | | | | | | |
| Bush | n.s. | .28 | n.s. | .46 | n.s. | -.38 |
| Clinton | n.s. | .46 | n.s. | .38 | n.s. | .39 |
| Fulani | $p < .001$ | .32*** | n.s. | .14 | n.s. | .02 |
| Gritz | n.s. | .10*** | $p < .001$ | .13*** | n.s. | -.04 |
| Hagelin | $p < .001$ | .08** | n.s. | .09*** | n.s. | .04 |
| Larouche | n.s. | .06* | $p < .001$ | .06*** | n.s. | -.09 |
| Marrou | $p < .001$ | .26*** | $p < .01$ | .11 | n.s. | .66 |
| Perot | n.s. | .55 | n.s. | .46 | n.s. | -.03 |
| N | 1,263 | | 2,031 | | 1,041 | |
| U.S. Senate: | | | | | | |
| Dewine | $p < .01$ | 3.37*** | n.s. | 1.06 | n.s. | -.11 |
| Glenn | $p < .05$ | 2.26* | n.s. | .30 | n.s. | -.52 |
| Grevatt | $p < .001$ | 3.83*** | $p < .001$ | -.07 | $p < .05$ | .05 |
| N | 1,263 | | 2,031 | | 1,041 | |
| U.S. representative II: | | | | | | |
| Cordray | $p < .01$ | 2.88*** | ... | ... | ... | ... |
| Pryce | $p < .001$ | 2.35* | ... | ... | ... | ... |
| Reidelbach | $p < .001$ | 4.10*** | ... | ... | ... | ... |
| N | 724 | | ... | ... | ... | ... |

| U.S. representative II: | | | | | | | | | |
|----------------------------|----------------|------|-----|-----|-----|-----|-----|-----------------|--------|
| Berns | ... | ... | ... | ... | ... | ... | ... | ... | .55* |
| Grote | ... | ... | ... | ... | ... | ... | ... | n.s. | 3.09 |
| Mann | ... | ... | ... | ... | ... | ... | ... | n.s. | 1.19 |
| <i>N</i> | ... | ... | ... | ... | ... | ... | ... | 659 | |
| U.S. representative III: | | | | | | | | | |
| Gudenas | ... | ... | ... | ... | ... | ... | ... | n.s. | ... |
| Henley | ... | ... | ... | ... | ... | ... | ... | <i>p</i> < .001 | ... |
| Rothschild | ... | ... | ... | ... | ... | ... | ... | n.s. | -.07 |
| Stokes | ... | ... | ... | ... | ... | ... | ... | n.s. | .92*** |
| <i>N</i> | ... | ... | ... | ... | ... | ... | ... | 845 | 2.39 |
| State senate II: | | | | | | | | | |
| Dunning | ... | ... | ... | ... | ... | ... | ... | n.s. | 1.22 |
| Stakes | ... | ... | ... | ... | ... | ... | ... | n.s. | .64 |
| Suhadolnik | ... | ... | ... | ... | ... | ... | ... | n.s. | .27 |
| <i>N</i> | ... | ... | ... | ... | ... | ... | ... | 486 | 1.63 |
| State representative VIII: | | | | | | | | | |
| Briggs | n.s. | 3.88 | ... | ... | ... | ... | ... | ... | ... |
| Ryman | <i>p</i> < .05 | .78 | ... | ... | ... | ... | ... | ... | ... |
| Thomas | n.s. | 3.90 | ... | ... | ... | ... | ... | ... | ... |
| <i>N</i> | 173 | ... | ... | ... | ... | ... | ... | ... | ... |
| State representative XI: | | | | | | | | | |
| Barna | ... | ... | ... | ... | ... | ... | ... | n.s. | 1.89 |
| Mottl | ... | ... | ... | ... | ... | ... | ... | n.s. | 1.68 |
| Obuch | ... | ... | ... | ... | ... | ... | ... | n.s. | .70 |
| <i>N</i> | ... | ... | ... | ... | ... | ... | ... | 160 | ... |

Table 2. (*Continued*)

| Candidate | Franklin County | | Cuyahoga County | | Hamilton County | |
|----------------------------|---|--|---|--|---|--|
| | Significance of ANOVA Comparing All Positions | Difference between First and Last Position | Significance of ANOVA Comparing All Positions | Difference between First and Last Position | Significance of ANOVA Comparing All Positions | Difference between First and Last Position |
| State representative XII: | | | | | | |
| Cain | ... | ... | n.s. | .71 | ... | ... |
| Misenik | ... | ... | n.s. | .75 | ... | ... |
| Popovich | ... | ... | n.s. | -.63 | ... | ... |
| <i>N</i> | ... | ... | 139 | | ... | ... |
| State representative XIII: | | | | | | |
| Cline | ... | ... | n.s. | .40 | ... | ... |
| Johanek | ... | ... | n.s. | .16 | ... | ... |
| Nagin | ... | ... | n.s. | 1.44 | ... | ... |
| Pringle | ... | ... | n.s. | .53 | ... | ... |
| <i>N</i> | ... | ... | 139 | | ... | ... |
| County commissioner I: | | | | | | |
| Chabot | ... | ... | ... | ... | n.s. | -.09 |
| Mirlisena | ... | ... | ... | ... | n.s. | .20 |
| Sykes | ... | ... | ... | ... | n.s. | .37 |
| <i>N</i> | ... | ... | ... | ... | 1,041 | |
| Board of education I: | | | | | | |
| Norton | $p < .001$ | 2.68*** | ... | ... | ... | ... |
| Pfeifer | $p < .001$ | 5.14*** | ... | ... | ... | ... |
| Smith | $p < .001$ | 5.11*** | ... | ... | ... | ... |
| <i>N</i> | 1,263 | | ... | ... | ... | ... |

| | | | | | | | | | |
|---------------------------------|------------|---------|------------|---------|------------|---------|------------|---------|-----|
| Board of education I: | | | | | | | | | |
| Costanzo | ... | ... | $p < .05$ | 2.65** | ... | ... | ... | ... | ... |
| Francioli | ... | ... | $p < .001$ | 1.97*** | ... | ... | ... | ... | ... |
| Hawk | ... | ... | n.s. | 2.63* | ... | ... | ... | ... | ... |
| <i>N</i> | ... | ... | 1,389 | | ... | ... | ... | ... | ... |
| Board of education I: | | | | | | | | | |
| Hahn | ... | ... | ... | ... | ... | ... | $p < .001$ | 2.90*** | ... |
| Hubbell | ... | ... | ... | ... | ... | ... | $p < .001$ | 2.26*** | ... |
| Price | ... | ... | ... | ... | ... | ... | $p < .001$ | 4.21*** | ... |
| <i>N</i> | ... | ... | ... | ... | ... | ... | 1,041 | | ... |
| Board of education II: | | | | | | | | | |
| Brickner | ... | ... | $p < .001$ | 1.39 | ... | ... | ... | ... | ... |
| Case | ... | ... | n.s. | .58 | ... | ... | ... | ... | ... |
| Fabek | ... | ... | $p < .001$ | -.19 | ... | ... | ... | ... | ... |
| Hamilton | ... | ... | $p < .001$ | -.55 | ... | ... | ... | ... | ... |
| Smith | ... | ... | $p < .001$ | .41 | ... | ... | ... | ... | ... |
| Tighe | ... | ... | $p < .001$ | .41 | ... | ... | ... | ... | ... |
| Tryon | ... | ... | $p < .001$ | .18 | ... | ... | ... | ... | ... |
| <i>N</i> | ... | ... | 641 | | ... | ... | ... | ... | ... |
| Chief Justice of supreme court: | | | | | | | | | |
| Gorman | $p < .001$ | 6.04*** | $p < .001$ | 2.30*** | n.s. | .44 | | | |
| Haffey | $p < .001$ | 2.03*** | $p < .001$ | 1.83*** | $p < .001$ | .52** | | | |
| Moyer | $p < .001$ | 6.27*** | $p < .001$ | 2.67*** | $p < .01$ | 2.04*** | | | |
| <i>N</i> | 1,263 | | 2,031 | | 1,041 | | | | |

NOTE.—*N* indicates the total number of precincts contributing data to each one-way ANOVA.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

received by a candidate in any of the name positions appeared in Franklin County. The second column shows the difference between the percent of votes received by the candidate when he or she appeared first and last on the ballot in Franklin County, as well as the significance of this difference. The next two columns list the same results for Cuyahoga County, and the last two columns are for Hamilton County. As these tables make clear, significant name-order effects were quite common in the three counties. Of the 118 races, 57 (or 48 percent) showed statistically significant order effects.¹⁰

DIRECTIONS OF EFFECTS

Nearly all (95 percent) of the significant effects for the two-candidate races were primacy effects (i.e., cases wherein candidates received more votes when listed first than when listed last; see table 1). The significant primacy effects for these races ranged from .79 percent to 5.04 percent and averaged 2.74 percent. Only two statistically significant recency effects (i.e., cases wherein candidates received more votes when listed last than when listed first) appeared, and their magnitudes were .93 percent and 1.96 percent.

This trend toward primacy effects was apparent even in the instances in which differences between name orders were not statistically significant. Three-quarters of the nonsignificant differences for the two-candidate races were in the direction of primacy effects. Moreover, the average magnitude of the nonsignificant two-candidate primacy effects (1.14 percent) was more than 50 percent greater than that of the nonsignificant two-candidate recency effects (.74 percent).

Characterizing the directions of the statistically significant name-order effects for races that involved more than two candidates is a bit complex. To do so, we followed a procedure outlined by Aiken and West (1991) involving ordinary least squares (OLS) regressions treating precincts as the unit of analysis. First, we created a variable called "order" for each *candidate*, coded 1 for precincts in which he or she was listed first, 2 for the precincts in which he or she was listed second, and so on. Then, the mean of order across all the precincts was subtracted from the candidate's order score in each precinct. Next, we estimated the linear effect of name order on the proportion of votes a candidate received, via the following equation:

$$\text{Vote Percentage} = b_1(\text{Order}) + e. \quad (1)$$

And finally, we estimated the quadratic effect of name order on votes via the following equation:

10. With an alpha level of .05, statistically significant name-order effects should appear in up to 5 percent of the races in each county by chance alone. Because significant effects occurred much more often than that, these effects are most likely not due simply to the fact that we have conducted a large number of tests.

$$\text{Vote Percentage} = b_2(\text{Order}) + b_3(\text{Order})^2 + e. \quad (2)$$

When b_3 (shown in column 3 of table 3) is not significantly different from 0, the effect of order is not quadratic. One should therefore interpret only b_1 (shown in column 1 of table 3), which represents the linear effect of order on votes. A statistically significant negative b_1 indicates a primacy effect, and a statistically significant positive b_1 indicates a recency effect.

If b_3 is statistically significant, the effect of order is nonlinear. A primacy effect would be indicated by either of two results: (1) significant, negative b_2 and b_3 , or (2) significant, negative b_2 and significant, positive b_3 . A recency effect would be indicated by either (1) significant and positive b_2 and b_3 , or (2) significant, positive b_2 and significant, negative b_3 . Both primacy and recency effects would be indicated if b_2 is nonsignificant and b_3 is significant and positive. And if b_2 is nonsignificant and b_3 is significant and negative, candidates were advantaged when they appeared in the middle of the list.

The last column of table 3 explains the nature of each name-order effect as diagnosed using this approach.¹¹ Eighty percent of the significant name-order effects for candidates in races with more than two contenders were primacy effects. Both primacy and recency effects occurred for four candidates (10 percent), and four candidates (10 percent) did best when listed in the middle. This trend toward primacy effects was also apparent even when name-order effects were not statistically significant: 81 percent of the candidates who had nonsignificant name-order effects in races with more than two contenders manifested trends toward primacy effects, whereas only 19 percent showed trends toward recency effects.

MODERATION BY RACE CHARACTERISTICS

Next, we tested the hypotheses that name-order effects would be most prevalent in nonpartisan races, in races about which voters knew relatively

11. In Cuyahoga and Hamilton Counties, candidates' names were always listed vertically, so tests of nonlinear effects are readily interpretable. But in Franklin County, candidates' names could have been listed vertically in some precincts, horizontally in others, and both vertically and horizontally in others. For example, the names of competitors in a three-candidate race could have appeared in any one of the following three configurations:

| | | |
|---|-------|-----|
| 1 | 1 2 3 | 1 2 |
| 2 | | 3 |
| 3 | | |

The configuration used in any given precinct was determined by the number of races and candidates, the types of races, and the space limitations of the voting machines used there. Although it is impossible to reconstruct which arrays each precinct used in 1992, a candidate receiving more votes when listed first than when listed last would clearly indicate a primacy effect occurred. Layouts that involved simultaneous vertical and horizontal arraying would presumably weaken recency effects and might create apparent middle effects by putting candidates in the middle of an order at the end of a row. So we should

little, in races not involving incumbents, and in races listed toward the bottom of the ballot. It was easy to assess partisanship status of the race, presence of an incumbent, and race position, but voter knowledge had to be gauged indirectly. To this end, we employed two indicators. First, we conducted a content analysis of news media coverage of the various races, presuming that the more news media attention was devoted to a race, the more voters probably learned about its candidates. We simply counted the number of times each candidate was mentioned in a news story, editorial, or picture caption in the major newspapers of the three counties (the *Columbus Dispatch*, the *Cleveland Plain Dealer*, and the *Cincinnati Enquirer*) between September 1 and November 3, 1992. We then summed the resulting figures for all candidates in a given race to yield an estimate of publicity for that race. Because the resulting figures were highly skewed (see columns 4, 8, and 12 in appendix A), we computed the log of news coverage to normalize the distribution.

Another indirect indicator of knowledge is the rolloff percentage for a race—the proportion of people who participated in the election but abstained from making a choice in that race. One common reason why people choose not to cast votes in a race is that they lack sufficient information about the candidates (Burnham 1965; Robinson and Standing 1960; Vanderleeuw and Engstrom 1987). Therefore, races with higher rolloff rates should manifest larger name-order effects.¹² Rolloff and the log of news coverage were correlated $-.43$ ($p < .01$; $N = 118$), confirming that higher rolloff occurred for less publicized races.

To test the impact of the four hypothesized moderators, we constructed a new data set composed of one data point from each of the 118 races. This was done because the attributes with which we sought to predict name-order effect magnitude were characteristics of races. To construct the dependent variable in the analyses to be described next, we computed the absolute value of the difference between the percent of votes a candidate received when listed first and the percent received when he or she was listed last. Such a percentage was calculated for each candidate and then averaged across all candidates in a race in order to yield a single figure for each race, larger values indicating more impact of name order.

We first regressed the vote percentage difference on a variable coded 1 for partisan races and 0 for nonpartisan races, a variable representing

be cautious if, when compared to Hamilton and Cuyahoga County, Franklin County manifests an unusually high number of effects other than primacy, because such effects could have been created by the unusual layouts used.

12. One might imagine that the people who roll off are precisely those who would be most likely to manifest name-order effects, so higher rolloff rates would be associated with smaller name-order effects. To the extent that this is true, it would work against our finding the predicted positive association between rolloff rates and name-order effect magnitude. Therefore, if we observe the predicted relation, it will have occurred in spite of this possibly countervailing force.

Table 3. Unstandardized Regression Coefficients Characterizing Significant Name-Order Effects in Races Involving Three, Four, Seven, and Eight Candidates

| Candidate | Equation 1 | Equation 2 | | Primacy, Recency, or Middle Effect |
|--------------------|-----------------|-----------------|------------------------------|------------------------------------|
| | Order (b_1) | Order (b_2) | Order ² (b_3) | |
| Franklin County: | | | | |
| Fulani | -.26*** | -.26*** | .10*** | Primacy |
| Hagelin | -.10*** | -.10*** | .03*** | Primacy |
| Marrou | -.15** | -.15** | -.01 | Primacy |
| Dewine | -.02** | -.02*** | -.01 | Primacy |
| Glenn | -.01* | -.01* | -.02 | Primacy |
| Grevatt | -.02* | -.02*** | -.02*** | Primacy |
| Cordray | -.01** | -.01*** | -.02 | Primacy |
| Pryce | -.01** | -.01** | -.03*** | Primacy |
| Reidelbach | -.02*** | -.02*** | -.02*** | Primacy |
| Ryman | -.01 | .00 | -.01* | Middle |
| Norton | -.01*** | -.01*** | .01* | Primacy |
| Pfeifer | -.03*** | -.03*** | .00 | Primacy |
| Smith | -.03*** | -.03*** | .02*** | Primacy |
| Gorman | -.03*** | -.03*** | .01* | Primacy |
| Haffey | -.01*** | -.01*** | -.01*** | Primacy |
| Moyer | -.03*** | -.03** | -.03*** | Primacy |
| Cuyahoga County: | | | | |
| Gritz | -.09* | -.11** | .05** | Primacy |
| Larouche | -.06*** | -.06*** | .03** | Primacy |
| Marrou | -.08* | -.08* | .04* | Primacy |
| Grevatt | .00 | .00 | -.01*** | Middle |
| Henley | -.01*** | -.01*** | .00 | Primacy |
| Costanzo | -.01** | -.01** | .00 | Primacy |
| Francioli | -.01*** | -.01*** | .00 | Primacy |
| Brickner | -.01* | -.01* | .01*** | Primacy |
| Fabek | .00 | .00 | .01*** | Primacy and Recency |
| Hamilton | .00 | .00 | .01*** | Primacy and Recency |
| Smith | -.01 | -.01 | .01*** | Primacy and Recency |
| Tighe | .00 | .00 | .01*** | Primacy and Recency |
| Tryon ^a | .00 | .00 | .00 | Middle |
| Gorman | -.01*** | -.01*** | -.01 | Primacy |
| Haffey | -.01*** | -.01*** | -.01*** | Primacy |
| Moyer | -.01*** | -.01*** | -.01*** | Primacy |

Table 3. (Continued)

| Candidate | Equation 1 | Equation 2 | | Primacy, Recency, or Middle Effect |
|------------------|-----------------|-----------------|------------------------------|---|
| | Order (b_1) | Order (b_2) | Order ² (b_3) | |
| Hamilton County: | | | | |
| Grevatt | .00 | .00 | -.01* | Middle |
| Berns | -.01* | -.01* | -.01** | Primacy |
| Hahn | -.01*** | -.01* | .00 | Primacy |
| Hubbell | -.01*** | -.01*** | -.02*** | Primacy |
| Price | -.02*** | -.02*** | -.01** | Primacy |
| Haffey | -.01* | -.01* | -.01*** | Primacy |
| Moyer | -.01*** | -.01*** | .00 | Primacy |

NOTE.—Order was coded 1 = first position, 2 = second position, and so on.

^a For Tryon, order raised to the fourth power is significant, meaning that he did best in the middle, though there is also some evidence of primacy and recency.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

the average number of races preceding a given race on the ballot (rescaled to range from 0 to 1), the amount of news coverage provided to a race (rescaled to range from 0 to 1), and a variable coded 1 for races involving an incumbent and 0 for races not involving an incumbent. Also included were two dummy variables to represent differences between the three counties in the prevalence of name-order effects. The first dummy variable was coded 1 for Franklin County and 0 for the other two counties, and the second was coded 1 for Cuyahoga County and 0 for the other two counties.

As table 4 shows, nonpartisan races did indeed show larger name-order effects than partisan races ($b = -1.34$; $p < .001$), meaning that these effects were smaller when a cue was available to help people cast substantively meaningful votes. Also as expected, more media coverage was associated with weaker name-order effects ($b = -1.56$; $p < .05$), consistent with the notion that these effects are especially prevalent when voters lack information about the competing candidates. And races involving incumbents manifested marginally significantly weaker name-order effects than races not involving incumbents ($b = -.32$; $p < .11$). Because our hypothesis regarding incumbents was directional, this latter effect can legitimately be tested one-tailed, and, done thusly, it is marginally statistically significant ($p < .06$). Surprisingly, name-order effects were smaller for races listed later on the ballot ($b = -1.79$; $p < .01$).

Table 4. Unstandardized Ordinary Least Squares Regression Coefficients Predicting the Magnitude of Name-Order Effects

| Predictor | Coefficient |
|-------------------------------------|--------------------|
| Partisan affiliation of candidates | -1.34**** (.34) |
| Race position on the ballot | -1.79**** (.65) |
| Amount of news media attention | -1.56** (.62) |
| Incumbency | -.32* (.20) |
| Franklin County vs. Cuyahoga County | 1.64**** (.24) |
| Hamilton County vs. Cuyahoga County | .27 (.24) |
| R^2 | .53 |
| n | 118 |

NOTE.—Standard errors appear below the coefficients in parentheses.

* $p < .11$.

** $p < .05$.

*** $p < .01$.

**** $p < .001$.

When we repeated this regression substituting rolloff for media coverage as a measure of knowledge, the results were comparable. Rolloff had a significant positive effect ($b = 1.63$; $p < .05$), meaning that stronger name-order effects appeared when rolloff was greater. And as in table 4, partisanship had a significant negative effect ($b = -.92$; $p < .05$); incumbency had a marginally significant negative effect ($b = -.33$; $p < .11$); and position had a significant negative effect ($b = -2.14$; $p < .01$).¹³

The dummy variables representing the counties in table 4 show that name-order effects were stronger in Franklin County than in Hamilton and Cuyahoga Counties, and the effects in the latter two counties were not different. The unstandardized regression coefficients estimating the

13. Because media coverage and rolloff are both indicators of voter knowledge, it is not theoretically sensible to enter them as predictors simultaneously in a single regression, because doing so would amount to entering the same theoretical predictor twice. When we did so, however, media coverage had a marginally significant negative effect ($b = -1.24$; $p < .10$), whereas the effect of rolloff was nonsignificant ($b = .76$; $p > .40$). The other predictors had effects comparable to those in table 4.

effects of these two dummy variables were 1.69 ($p < .001$; $N = 118$), contrasting Franklin County with Cuyahoga County, and .27 (n.s.; $N = 118$), contrasting Hamilton County with Cuyahoga County. Even for the five races that were identical across the counties (for President, U.S. Senator, and Chief Justice and two other seats on the Ohio Supreme Court), the average percentage difference due to name order for these races was larger in Franklin County (3.65 percent) than in Hamilton County (1.66 percent) or in Cuyahoga County (1.08 percent).

One possible explanation for this difference is the degree to which voters in the counties identified with one of the major political parties. People who identified with the Democratic or Republican Party were presumably better equipped to vote in races about which they know little but where the candidates' party affiliations were displayed on the ballot, so these voters might have been less likely to manifest name-order effects. In Ohio, the major parties also inform their members about which candidates they endorse in nonpartisan races by mailing lists to voters just prior to election day. Thus, even in races where the candidates' party affiliations are not displayed on the ballot, people who identify with a political party may be better able to make substantive choices. So if partisanship was stronger in Cuyahoga County and Hamilton County than in Franklin County, that could explain the differences between counties in name-order effect magnitude.

Data collected by Voter Research and Surveys (VRS 1992) from Ohio voters leaving the polls on election day in 1992 showed that 71 percent of voters in the region including Franklin County said they were Democrats or Republicans, compared to 73 percent in the region including Cuyahoga County and 75 percent in the region including Hamilton County.¹⁴ Thus, the area in which name-order effects were strongest was also the area in which voter partisanship was the lowest. However, the differences between areas were quite small, and the areas did not differ from one

14. Respondents to the VRS exit poll were recorded as having voted in one of five regions of the state, three of which included Franklin, Cuyahoga, and Hamilton Counties, respectively, but also included surrounding areas as well. Therefore, we could assess the characteristics of voters in the three counties approximately but not precisely. The response rate for the 1992 VRS exit poll across all precincts nationwide was 58 percent (Mitofsky and Edelman 1995). However, VRS used a weighting system to match the demographics of their sample to the demographics of the voting population. First, they selected a stratified sample of Ohio precincts proportionate to the number of votes cast in each precinct in the 1988 presidential election, such that every voter in the state had an equal probability of being chosen. In each selected precinct, data were gathered by approaching every n th voter as he or she left the polls on election day, where " n " was a fixed number for each precinct, varying across precincts. Participating respondents reported their race, gender, and age, and interviewers recorded the race, gender, and approximate age of selected voters who refused to participate. The data obtained from respondents were then weighted to mirror the demographics of all selected voters and the final vote returns for each precinct as closely as possible. Consequently, the exit poll data probably provide a reasonably accurate portrait of the 1992 Ohio electorate, especially in terms of demographics.

another reliably ($\chi^2(1) = 1.63$; n.s.; $N = 1,021$). Therefore, although rates of voter partisanship might account for a bit of the greater strength of name-order effects in Franklin County, there is almost certainly more to it than that.

The difference between counties seems more attributable to differences in voter knowledge about the races. One indicator of people's knowledge about politics is their educational attainment; better-educated individuals tend to be better informed (Delli Carpini and Keeter 1996, pp. 182–88). As such, we might expect the magnitude of name-order effects to have varied inversely with the average educational attainment of voters in a county. And indeed, the VRS exit poll data show that the percentage of voters in the Franklin County region who had completed some college (52 percent) was significantly smaller than the percentages in the Cuyahoga County region (71 percent; $\chi^2(1) = 23.58$; $p < .01$; $N = 708$) and the Hamilton County region (65 percent; $\chi^2(1) = 15.55$; $p < .01$; $N = 841$), and the latter two regions did not differ significantly in this regard ($\chi^2(1) = 2.19$; n.s.; $N = 551$).¹⁵ Thus, the county containing the strongest name-order effects was also the county in which voters were least educated. This provides the most parsimonious explanation of the country differences we were able to uncover.

Discussion

SUMMARY

In the largest, tightly designed test of name-order effects in elections to date, we have found them to be remarkably prevalent and systematic in direction. Significant name-order effects occurred in 43 percent of the tests we conducted and in 48 percent of the races we examined. And 89 percent of the significant name-order effects we observed were primacy effects, whereby candidates listed early were advantaged. On average, the significant order effects increased a candidate's percentage of votes earned when listed first by 2.33 percent as compared to when he or she was listed last.

In exploring the factors that regulate name-order effects, we found some expected effects and one surprising one. First, name-order effects

15. An alternative possible explanation for the between-county difference that we observed is voting method. As we mentioned, residents of Cuyahoga and Hamilton Counties voted using the punch card method, whereas Franklin County residents used mechanical or electronic voting booths. One might imagine that the relative difficulty of the punch card method would discourage people from voting in races about which they knew little, whereas the mechanical or electronic voting booths may have encouraged people to cast ballots in all races by making them readily visible (see Nichols and Strizek 1995). However, rolloff rates were higher in Franklin County than in the other two counties, so we suspect that the between-county differences are not attributable to voting method differences.

were stronger in nonpartisan races than in partisan races. This finding reinforces the notions that partisan affiliations help voters choose among candidates and that parties as institutions facilitate democratic processes (Campbell et al. 1960; Miller and Shanks 1996).

Four of our findings are consistent with the notion that voter knowledge regulates the magnitude of name-order effects. First, name-order effects were stronger for races that had received less coverage by the news media. Second, name-order effects were stronger in races that had the highest rates of rolloff, suggesting that voters knew relatively little about the candidates. Third, differences between counties in the strength of name-order effects were perfectly correlated with differences between counties in the amount of formal education voters had, presumably an indicator of political knowledge. In addition, our evidence that races with incumbents manifested weaker name-order effects can also be viewed as showing that greater familiarity with candidates, even if only in the form of name recognition, discourages order-based voting. Taken together, all these findings suggest that increasing citizen involvement in politics and informing voters more about all races may reduce name-order effects. This conclusion is in line, of course, with evidence that political beliefs, attitudes, and behavior are more structured, more stable, and otherwise more normatively admirable among better educated and politically informed segments of the electorate (Delli Carpini and Keeter 1996; Zaller 1990).

Surprisingly, races at the end of the ballot showed smaller name-order effects than races at the beginning of the ballot, after we controlled for partisanship, voter knowledge, and incumbency. One might view this as suggesting that even the relatively long ballots used in Ohio in 1992 did not induce cognitive fatigue in voters and that voter motivation was no less for races listed later than for those listed earlier. However, it is also possible that voters who created name-order effects in races listed early on a ballot simply voted randomly later on the ballot (due to fatigue or reduced motivation), thereby creating an apparent decrease in the magnitude of these effects. We look forward to seeing this mystery resolved through future research.

RELATION TO PREVIOUS STUDIES

Confidence in our findings is bolstered by their consistency with three previous studies of name-order effects in experimental simulations of elections (Coombs, Peters, and Strom 1974; Kamin 1958; Taebel 1975). In two of these studies, respondents were asked to vote in hypothetical elections, were assigned to receive candidates' names in different orders, and were given little or no information about the candidates (Kamin 1958; Taebel 1975). Both studies found significant primacy effects, in line with our results. And in a third study, respondents were asked to vote for one

of two candidates about whom they had no information, and a strong bias toward voting for the first candidate listed was apparent (Coombs et al. 1974). This primacy effect weakened considerably when respondents were told about the party affiliations of the candidates and were told about their standings in public opinion polls (Coombs et al. 1974), reinforcing our evidence regarding partisanship and voter knowledge. The only surprise in these experimental studies is Taebel's (1975) evidence that name-order effects were weaker when races appeared relatively early on a ballot, adding further to the mystery on this matter. In general, though, our evidence about the 1992 Ohio elections dovetails reassuringly with evidence from experimental studies of hypothetical elections.

Our results may at first appear to be inconsistent with the two previous studies of this phenomenon that did not suffer from serious design flaws (Darcy 1986; Gold 1952), because neither of them found reliable name-order effects. However, these studies were different from ours in ways that probably explain this discrepancy. First, Darcy (1986) examined only partisan races held in Colorado, and we found that name-order effects are much less likely to occur in partisan than nonpartisan races. In addition, the Colorado counties Darcy (1986) examined used party-block ballots, in which all the Democratic Party candidates for all offices were listed in one column (labeled "Democratic"), and all the Republican Party candidates were listed in another column (labeled "Republican"). In half of the precincts, the Democratic column preceded the Republican column, and in the other half, the Republican column preceded the Democratic column. This type of ballot layout presumably encouraged voters to cast ballots based on candidates' party affiliations, because this information was extremely salient. Our results suggest that this minimized or eliminated name-order effects.

Gold (1952) examined the effect of name order in the 1951 American Anthropological Association elections, conducted by mail and giving voters all the time they needed to gather information about the candidates before making choices. This presumably reduced the likelihood of order-based voting. Consequently, the findings reported by Gold (1952) and Darcy (1986), can be viewed as consistent with those reported here.

A CAVEAT

As we pointed out early in this article, the best way to test for name-order effects is to assign precincts to different name orders randomly. The sequential assignment method used in Ohio is not strictly random, because assignment of a precinct to a name order was not done independently of the assignment of all other precincts to name orders. In principle, then, the process used could have been a victim of periodicity in the listing of precincts, producing nonequivalent groups of precincts. However, it is

reassuring that the precinct groups created in this way appeared to be comparable in terms of aspects of voting behavior and demographic attributes. Furthermore, it would be a remarkable coincidence if the precinct lists in all three counties incorporated the same periodicity for nearly all races, yielding the consistent pattern of primacy effects we observed. And finally, the experiments we mentioned earlier did, of course, find primacy effects, just as we did (Coombs et al. 1974; Kamin 1958; Taebel 1975). We therefore suspect that our findings are not illusory results of nonrandom assignment of precincts to name orders.

IMPLICATIONS

During the last 50 years, numerous lawsuits have been filed asserting that elections were lost or candidates were disadvantaged because they did not have their names listed first on a ballot (e.g., *Bolin v. Superior Court 1958*; *Culliton v. DuPage County Board of Election Commissioners 1976*; *Elliott v. Secretary of State 1940*; *Gould v. Grubb 1975*; *Kautenburger v. Jackson 1958*; *Ulland v. Growe 1978*; *Weisberg v. Powell 1969*). And in many of these cases, political scientists have been called on to provide expert testimony regarding the validity of such assertions. Much of the expert testimony offered has supported the conclusion that being listed first on a ballot does indeed advantage a candidate (e.g., *Bohus v. Board of Election Commissioners 1971*; *Bolin v. Superior Court 1958*; *Culliton v. Board of Election Commissioners of the County of DuPage 1976*; *Elliott v. Secretary of State 1940*; *Gould v. Grubb 1975*; *Kautenburger v. Jackson 1958*; *McLain v. Meier 1980, 1166*; *Sangmeister v. Woodward 1977, 463*; *Ulland v. Growe 1978*; *Weisberg v. Powell 1969*). But occasionally, the opposite has been asserted. For instance, Richard Smolka reviewed all available research on name-order effects and found that “there is virtually nothing at all been done on the subject much less anything been shown” and therefore that “there is absolutely no evidence upon which to base an opinion” (*Sangmeister v. Woodward 1977, 463*).

In this light, there is a striking irony to the results we have reported. The court testimony given by political scientists regarding name-order effects in recent decades was largely unsupported by the literature available when the testimony was given, vindicating Smolka. But the prevalence of name-order effects in Ohio in 1992 suggests that in fact, the bulk of testimony was correct in suggesting that name-order effects are common and advantage candidates listed early. Name-order effects do not always occur in every race, though, so one cannot infer that if name rotation was not done or was done improperly in a particular election, the outcome would have been meaningfully different than if such rotation had been done properly. Whether or not a name-order effect appears is a function of a number of contextual factors, so each race must be consid-

ered individually to determine whether its outcome was materially affected in this regard.

States such as Ohio, Idaho, and Montana require rotation of the order of candidates' names on ballots, increasing administrative burdens, the potential for error in counting votes, the number of different ballots that need to be printed, required financial outlays, and more (see, e.g., Darcy 1986). Perhaps in deference to these increased costs, other states (e.g., Nevada, Illinois, Georgia, and Colorado) do not legally require rotation of candidates' names. Because our results indicate that there is more than a slim chance that name order could affect the outcome of a close election, it clearly seems worthwhile for all states to assign positions to all candidates equally often across precincts. Indeed, four of the races we examined would have had different results if only one name order had been used, depending on which was chosen (the Franklin County races for county commissioner I, supreme court justice I, and court of appeals judge IV, and the Cuyahoga County commissioner I race). These four races represent only 3 percent of the races we examined, but they nonetheless suggest that effort be spent to balance name orders in future elections and that states without statutes requiring name rotation consider adopting them.

One interesting implication of our evidence involves incumbents' well-documented advantage in winning elections. Although this phenomenon has been explained by a number of factors, including the ability of incumbents to amass greater stores of campaign funds, little if any attention has been paid to the fact that name-order effects may be partly responsible as well. In a number of states that do not require name rotation, the ordering schemes used give advantages to incumbents. For example, in Massachusetts, the incumbent running for reelection is always listed first. In New Hampshire, the candidate of the party that won the last election for an office is listed first. And in Georgia, Connecticut, and Maryland, the first candidate listed on the ballot for each office is that of the party that won the most recent election for governor of the state. Such schemes not only advantage incumbent candidates and parties and enhance the likelihood of stability of governmental personnel from election to election but also discourage divided government to a small degree by consistently according a small advantage to all members of a single party.

Our results also have interesting implications regarding preelection forecasting polls, which play important roles in the contemporary conduct of American politics (see, e.g., Crespi 1988). Although psychological theory anticipates primacy effects when options are presented visually, recency effects are expected when options are presented orally (see Krosnick 1991). This is thought to be so principally because when people hear a list of choices, they tend to think most about the last choice presented, and that thinking is dominated by a confirmatory bias. Consistent with this hypothesis, nearly all psychological experiments presenting choices

orally have found recency effects, and new experimental evidence shows that recency effects appear as well in preelection telephone surveys intended to forecast election outcomes (Visser, Krosnick, Marquette, and Curtin, in press).

In order for such surveys to forecast accurately in states such as Ohio that rotate candidate names across ballots, these recency effects must be eliminated by rotating name order across the survey respondents as well. Otherwise, candidates whose names are presented last in the telephone surveys will be forecasted to receive more votes than they actually will. And in states that do not rotate names on ballots, preelection telephone surveys must not only eliminate recency effects but must also incorporate the primacy effects we have documented into their forecasts. We look forward to future research exploring whether a technique can be developed for doing the latter effectively.

Finally, our findings have implications regarding the efficacy of democratic electoral systems. Name-order effects are instances in which non-substantive factors affect election outcomes. As Key puts it, "A basic condition for the health of a democratic order is the existence of procedures and machinery for the conduct of elections in whose fairness and neutrality a general confidence prevails" (1957, p. iii). Evidence of the impact of name order on election outcomes, he said, would suggest that "in earthly practice the majority will may be both influenced and distorted by the most humdrum minutiae of election procedure and administration" (Key 1957, p. iii).

Rather than viewing our evidence as bad news, as Key might have, we see it as more encouraging. Although name-order effects in the 1992 Ohio elections were prevalent, they were also quite small and concentrated among a subset of races. Furthermore, had name rotation not been done, the majority will could have been distorted in only 3 percent of the races. And given the magnitude of the name-order effects we did observe, it appears that only a very small minority of voters made what Key (1966) would presumably call "irresponsible" choices in this sense.

Appendix A

Table A1. Characteristics of the Races

| Race | Franklin County | | | | Cuyahoga County | | | | Hamilton County | | | |
|---------------------------|----------------------------|------|----------------------------------|------|----------------------------|------|----------------------------------|------|----------------------------|------|----------------------------------|------|
| | Average Position on Ballot | | Partisan or Nonpartisan (P or N) | | Average Position on Ballot | | Partisan or Nonpartisan (P or N) | | Average Position on Ballot | | Partisan or Nonpartisan (P or N) | |
| | No. of Candidates | News | No. of Candidates | News | No. of Candidates | News | No. of Candidates | News | No. of Candidates | News | No. of Candidates | News |
| U.S. President | 1.00 | 1563 | 8 | P | 1.00 | 8 | P | 1.00 | 8 | P | 1828 | |
| U.S. Senate | 2.00 | 192 | 3 | P | 2.00 | 3 | P | 2.00 | 3 | P | 135 | |
| U.S. representative I | 3.00 | 38 | 2 | P | 3.00 | 2 | P | 3.00 | 2 | P | 34 | |
| U.S. representative II | 3.47 | 123 | 3 | P | 3.00 | 2 | P | 3.00 | 3 | P | 89 | |
| U.S. representative III | ... | ... | ... | ... | 3.00 | 4 | P | ... | ... | ... | ... | |
| State senate I | 4.09 | 21 | 2 | P | 4.00 | 2 | P | 4.00 | 2 | P | 24 | |
| State senate II | 4.02 | 19 | 2 | P | 4.00 | 3 | P | ... | ... | ... | ... | |
| State representative I | 5.07 | 18 | 2 | P | 3.00 | 2 | P | 4.00 | 2 | P | 17 | |
| State representative II | 5.10 | 21 | 2 | P | 3.00 | 2 | P | 4.00 | 2 | P | 16 | |
| State representative III | 4.01 | 12 | 2 | P | 3.00 | 2 | P | 4.00 | 2 | P | 21 | |
| State representative IV | 4.03 | 11 | 2 | P | 3.00 | 2 | P | 5.00 | 2 | P | 20 | |
| State representative V | 4.13 | 16 | 2 | P | 3.00 | 2 | P | 5.00 | 2 | P | 15 | |
| State representative VI | 5.00 | 22 | 2 | P | 4.00 | 2 | P | ... | ... | ... | ... | |
| State representative VII | 5.03 | 22 | 2 | P | ... | ... | ... | 4.00 | 2 | P | 12 | |
| State representative VIII | 5.02 | 21 | 3 | P | 4.00 | 2 | P | 4.00 | 2 | P | 6 | |
| State representative IX | ... | ... | ... | ... | 4.00 | 2 | P | ... | ... | ... | ... | |
| State representative X | ... | ... | ... | ... | 3.00 | 2 | P | ... | ... | ... | ... | |
| State representative XI | ... | ... | ... | ... | 3.00 | 3 | P | ... | ... | ... | ... | |
| State representative XII | ... | ... | ... | ... | 4.00 | 3 | P | ... | ... | ... | ... | |
| State representative XIII | ... | ... | ... | ... | 3.00 | 4 | P | ... | ... | ... | ... | |

Table A1. (Continued)

| Race | Franklin County | | | | Cuyahoga County | | | | Hamilton County | | | |
|------------------------------------|----------------------------|-------------------|----------------------------------|------|----------------------------|-------------------|----------------------------------|------|----------------------------|-------------------|----------------------------------|------|
| | Average Position on Ballot | No. of Candidates | Partisan or Nonpartisan (P or N) | News | Average Position on Ballot | No. of Candidates | Partisan or Nonpartisan (P or N) | News | Average Position on Ballot | No. of Candidates | Partisan or Nonpartisan (P or N) | News |
| County commissioner I | 5.62 | 2 | P | 19 | 4.32 | 2 | P | 65 | 4.35 | 3 | P | 75 |
| County commissioner II | 6.62 | 2 | P | 18 | 5.32 | 2 | P | 59 | 5.35 | 2 | P | 61 |
| County commissioner III | ... | ... | ... | ... | ... | ... | ... | ... | 6.35 | 2 | P | 50 |
| County auditor | 7.62 | 2 | P | 47 | ... | ... | ... | ... | ... | ... | ... | ... |
| Prosecuting attorney | 8.62 | 2 | P | 38 | 6.32 | 2 | P | 35 | 7.35 | 2 | P | 26 |
| Common pleas clerk | 9.62 | 2 | P | 18 | 7.32 | 2 | P | 21 | 8.35 | 2 | P | 15 |
| Sheriff | 10.62 | 2 | P | 19 | 8.32 | 2 | P | 22 | 9.35 | 2 | P | 33 |
| County recorder | 11.62 | 2 | P | 18 | ... | ... | ... | ... | 10.35 | 2 | P | 12 |
| County treasurer | 12.62 | 2 | P | 13 | 10.32 | 2 | P | 17 | 11.35 | 2 | P | 21 |
| County engineer | ... | ... | ... | ... | ... | ... | ... | ... | 12.35 | 2 | P | 15 |
| Coroner | 14.62 | 2 | P | 12 | ... | ... | ... | ... | 13.35 | 2 | P | 16 |
| Board of education I | 15.62 | 3 | N | 3 | 13.32 | 3 | N | 3 | 14.35 | 3 | N | 11 |
| Board of education II | ... | ... | ... | ... | 13.32 | 7 | N | 4 | ... | ... | ... | ... |
| Chief Justice of the supreme court | 16.62 | 3 | N | 49 | 14.32 | 3 | N | 100 | 15.35 | 3 | N | 40 |
| Supreme Court justice I | 17.62 | 2 | N | 19 | 15.32 | 2 | N | 27 | 16.35 | 2 | N | 15 |
| Supreme Court justice II | 18.62 | 2 | N | 24 | 16.32 | 2 | N | 29 | 17.35 | 2 | N | 13 |
| Court of appeals judge I | ... | ... | ... | ... | 17.32 | 2 | N | 16 | 18.35 | 2 | N | 29 |
| Court of appeals judge II | 20.62 | 2 | N | 13 | 18.32 | 2 | N | 27 | ... | ... | ... | ... |
| Court of appeals judge III | 21.62 | 2 | N | 20 | ... | ... | ... | ... | ... | ... | ... | ... |

| | | | | | | | | | | | |
|---------------------------|-------|-----|-----|-----|-------|-----|-----|-----|-------|-----|-----|
| Court of appeals judge IV | 22.62 | 2 | N | 34 | 20.32 | 2 | N | 13 | ... | ... | ... |
| Common pleas judge I | ... | ... | ... | ... | 21.32 | 2 | N | 20 | 20.35 | 2 | N |
| Common pleas judge II | 24.62 | 2 | N | 21 | 22.32 | 2 | N | 65 | ... | ... | ... |
| Common pleas judge III | 25.62 | 2 | N | 17 | 23.32 | 2 | N | 20 | ... | ... | ... |
| Common pleas judge IV | 26.62 | 2 | N | 16 | 24.32 | 2 | N | 24 | ... | ... | ... |
| Common pleas judge V | 27.62 | 2 | N | 35 | 25.32 | 2 | N | 22 | ... | ... | ... |
| Common pleas judge VI | 28.62 | 2 | N | 18 | 26.32 | 2 | N | 24 | ... | ... | ... |
| Common pleas judge VII | 29.62 | 2 | N | 20 | ... | ... | ... | ... | ... | ... | ... |
| Common pleas judge VIII | 30.62 | 2 | N | 28 | 28.32 | 2 | N | 24 | ... | ... | ... |
| Common pleas judge IX | ... | ... | ... | ... | 29.32 | 2 | N | 23 | ... | ... | ... |
| Common pleas judge X | ... | ... | ... | ... | 30.32 | 2 | N | 22 | ... | ... | ... |
| Common pleas judge XII | ... | ... | ... | ... | 32.32 | 2 | N | 19 | ... | ... | ... |
| Common pleas judge XIII | ... | ... | ... | ... | 33.32 | 2 | N | 18 | ... | ... | ... |
| Common pleas judge XIV | ... | ... | ... | ... | 34.32 | 2 | N | 22 | ... | ... | ... |
| Common pleas judge XVI | ... | ... | ... | ... | 36.32 | 2 | N | 19 | ... | ... | ... |
| Common pleas judge XVII | ... | ... | ... | ... | 37.32 | 2 | N | 17 | ... | ... | ... |
| Common pleas judge XVIII | ... | ... | ... | ... | 38.32 | 2 | N | 21 | ... | ... | ... |
| Common pleas judge XIX | ... | ... | ... | ... | 39.32 | 2 | N | 23 | ... | ... | ... |
| Common pleas judge XX | ... | ... | ... | ... | 40.32 | 2 | N | 25 | ... | ... | ... |
| Common pleas judge XXI | ... | ... | ... | ... | 41.32 | 2 | N | 19 | ... | ... | ... |
| Common pleas judge XXII | ... | ... | ... | ... | 42.32 | 2 | N | 18 | ... | ... | ... |
| Common pleas judge XXIII | ... | ... | ... | ... | 43.32 | 2 | N | 30 | ... | ... | ... |

NOTE.—“News” refers to the number of times a candidate in each race was mentioned in a news story, editorial, or picture caption in the major newspapers of the three counties.

^a After the U.S. Senate race, the position of races on the ballots varied from precinct to precinct, depending on the number of district-wide races (i.e., U.S. representative, state senator, and state representative) that appeared on the ballot in each precinct. Therefore, we calculated the average position on the ballot of each race across all precincts in the county in which it appeared.

Appendix B

Description of Name-Rotation Procedures

Even when state law requires that candidate name orders be rotated across precincts so as to put all candidates in each position on the ballot equivalently often, election officials have discretion to select a particular method to do so. And the method chosen has sometimes advantaged the party of the decision-making election official(s), thereby raising a question about whether the rotation method should be treated as effectively random assignment of precincts or voters to name orders (see Bain and Hecock 1957, p. 11; Darcy and McAllister 1990, p. 9; Gold 1952). Therefore, in order to determine whether the 1992 Ohio elections constituted a genuine experiment on the effects of name order involving functionally random assignment, it was important to confirm that the methods used for rotating candidate names were not biased. To do so, we spoke with officials of the boards of elections in the three counties at length and carefully examined all of their records of the 1992 elections. As is described below, the methods for rotating names in these counties have been the same for decades and seem quite immune to political bias.

FRANKLIN COUNTY

Each precinct in Franklin County was assigned to a particular ordering of candidates' names, and this assignment was done separately for lists of the mechanical precincts and the electronic precincts. On each list, the Columbus precincts were listed first, followed by those for the remaining townships, listed alphabetically. When a township contained more than one precinct, they were listed in the order in which the precincts had been created. The precincts listed first in a township were the ones that had been created earlier.

Once the lists were constructed, the precincts were numbered. To do so, the smallest number evenly divisible by the number of candidates in each of the races on the ballot was calculated. In 1992, races in Franklin County involved two, three, or eight candidates, so this number was 24. Therefore, the precincts were consecutively numbered 1, 2, 3, 4, . . . 23, 24; 1, 2, 3; and so on.

These numbers were then assigned to orders of names. For all the two-candidate races, the alphabetical and reverse-alphabetical orders were alternated from precinct to precinct, starting with the alphabetical order. For the three-candidate races, precincts numbered 1, 4, 7, 10, 13, 16, 19, or 22 received the candidates in alphabetical order. For the precincts numbered 2, 5, 8, 11, 14, 17, 20, or 23, the first candidate from the alphabetical order was moved to the end of the list. And for the precincts numbered 3, 6, 9, 12, 15, 18, 21, and 24, the candidate listed first in the second order was moved to the end of the list.

To assign name orders to precincts for the eight-candidate race for U.S. President, precincts numbered 1, 9, or 17 received ballots with the candidates listed in alphabetical order. Precincts numbered 2, 10, or 18 received ballots with the alphabetically first candidate moved to the end of the list. Precincts numbered 3,

11, or 19 received ballots with the third order, and so on. Thus, each candidate was placed first on the ballot in one-eighth of the precincts.

CUYAHOGA COUNTY

As in Franklin County, Cuyahoga County's name-rotation procedure began by listing the precincts. The precincts in the city of Cleveland were listed first, followed by those for the remaining townships, listed alphabetically. The precincts within townships that contained more than one precinct were listed in the order in which the precincts were created. Five of the precincts in Cuyahoga County were in business districts that contained no registered voters. Although these precincts were included in the rotation method, only 2,031 precincts were examined in our analyses.

Name orders were rotated separately for each page in voters' booklets. First, the smallest number evenly divisible by the number of candidates in each of the races on a page was calculated. The precincts were then consecutively numbered accordingly.

The first page in the punch card booklet listed the candidates for U.S. President. The second page listed the U.S. Senate race and district-wide races for U.S. representative, state senator, and state representative. The third page listed the races for county commissioner, prosecuting attorney, common pleas clerk, sheriff, county treasurer, county recorder, county engineer, and coroner. The district-wide State Board of Education races, as well as the Chief Justice of the Supreme Court, Justice of the Supreme Court, and first Court of Appeals races appeared on the fourth page. The fifth page listed the rest of the Court of Appeals races, as well as the first five common pleas judge races. The sixth and the seventh pages listed the rest of the races for common pleas judge.

Names were rotated for the race for U.S. President by numbering the precincts 1, 2, 3, 4, 5, 6, 7, 8, 1, 2, etc. and repeatedly moving the first candidate name to the bottom of the list. The three-candidate U.S. Senate race appeared on the second page in the punch card booklet with district-wide races that involved between one and five candidates. Therefore, the smallest number evenly divisible by the number of candidates in each race on this page varied for precincts in different voting districts. For example, the precincts in a district that included a two-candidate race for U.S. representative and a two-candidate race for state representative were numbered consecutively from 1 to 6 (e.g., 1, 2, 3, 4, 5, 6, 1, 2, etc.) until a precinct in a district with a different set of races was encountered, at which time the numbering started over again with 1. The precincts in a district that involved a four-candidate race listed on the same page as the U.S. Senate race were numbered consecutively from 1 to 12, until a precinct in a district with a different set of races was encountered, at which time the numbering started over again with 1. Name order was rotated for the district-wide races on the second page of the booklet using the same numbering system.

Rotation was done for all of the countywide two-candidate races except the two supreme court justice races and the first court of appeals race by numbering the precincts consecutively 1, 2, 1, 2, etc. In odd-numbered precincts, the candi-

dates in these races were listed in alphabetical order, and in even-numbered precincts the reverse-alphabetical order was used.

The three-candidate chief justice race and the two supreme court justice races and the first court of appeals race sometimes appeared on a page with a seven-candidate board of education race and sometimes with a three-candidate board of education race, depending on the voting district. The precincts in districts involving the seven-candidate race were numbered consecutively from 1 to 42, until a precinct in a district involving the three-candidate race was encountered, at which time the numbering started over again with 1. The precincts in districts involving the three-candidate board of education race were numbered consecutively from 1 to 6, until a precinct in a district involving the seven-candidate race was encountered, at which time the numbering began again with 1. The Franklin County method of moving the top name to the bottom of the list was used to rotate the candidates' names in all of these races.

HAMILTON COUNTY

In Hamilton County, the Cincinnati precincts were listed first, and the rest followed in alphabetical order. The precincts within townships that contained more than one precinct were listed as in Franklin and Cuyahoga Counties. Name orders were rotated among the precincts as in Cuyahoga County.

The first page in the booklet contained only the race for U.S. President. The second page contained the U.S. Senate race as well as district-wide races for U.S. representative, state senator, and state representative. The third page contained the races for county commissioner, prosecuting attorney, and clerk of court of common pleas. The races for sheriff, county recorder, county treasurer, county engineer, and coroner all appeared on the fourth page. The fifth page contained the state board of education, chief justice of the supreme court, and justice of the supreme court races. The sixth page contained the court of appeals race, as well as three one-candidate and one two-candidate common pleas judge races. Finally, four one-candidate races for common pleas judge appeared on the seventh page in the booklet.

The order of candidates' names for the race for U.S. President was rotated by numbering the precincts consecutively from 1 to 8. The three-candidate U.S. Senate race was always listed on a page with two-candidate district-wide races, and sometimes with an additional three-candidate district-wide race. Therefore, to rotate the U.S. Senate candidates, the precincts were consecutively numbered from 1 to 6 until a precinct in a district with a different set of district-wide races or different candidates was encountered, at which time the numbering started over again with 1. Name order was rotated for the district-wide races on this page using the same numbering system.

In every precinct, the three-candidate county commissioner race appeared on a page with the two two-candidate races for county commissioner, the two-candidate prosecuting attorney race, and the two-candidate clerk of common pleas race. Likewise, the three-candidate board of education and chief justice races, as well as the two-candidate supreme court justice races, appeared together in all

the precincts. Therefore, in order to rotate the names for all of these races, the precincts were numbered consecutively from 1 to 6.

The two-candidate races for sheriff, county recorder, county treasurer, county engineer, coroner, court of appeals, and court of common pleas were all listed on pages with races between pairs of candidates. Therefore, the rotation for these races was done by numbering the precincts consecutively 1, 2, 1, 2, etc. Odd-numbered precincts received the candidates for these races listed in alphabetical order, and even-numbered precincts received them in reverse-alphabetical order.

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