The Power of an Hour: Effects of Candidate Time Expenditure in State Legislative Elections

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Abstract

Using survey data from more than 500 legislative candidates in 17 states during the 2008 election, I examine whether state house candidates who devote more time to their campaign win a larger share of the major-party vote. Consistent with previous work studying campaign spending in state legislative elections, I find a positive and significant association between campaign time and vote percentage for challengers–but not incumbents–in incumbent-contested elections.

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A considerable amount of research has sought to determine whether and how campaign spending affects election outcomes. Challengers' spending is commonly found to be an important determinant of their electoral success, but there is less evidence that incumbent spending affects the results of either congressional or state legislative elections. While this is good news for challengers, money is typically not easy for them to raise, and challengers in legislative elections at both the federal and state level tend to find themselves outspent by incumbents. Candidates who find themselves in such circumstances are likely to turn to another resource to make up the difference: their own labor.

For all the attention to the effect of spending, there have been few studies of the personal effort of political candidates (but see: Howell 1982). In this article, I leverage an original survey of state legislative candidates fielded during the 2008 election to determine whether candidates are able to win votes through hard work. There is little to impede an industrious challenger from expending effort on time-intensive voter contact methods. If such methods are effective means of increasing candidates' vote totals, then a thrifty challenger might find success if he/she is willing to devote a large amount of time to the campaign, even when outspent. Understanding the effect of campaign time therefore contributes to a fuller understanding of how political campaigns shape preferences and/or mobilize voters.

My analysis yields findings consistent with much of the existing work on the effects of campaign spending. While incumbents who devote more time to their campaign do not realize significant vote gains, challengers' campaign efforts result in positive and significant increases in their vote share. Specifically, a challenger who increases the number of weekly hours spent campaigning can expect to realize a significant gain in his/her share of the general election vote. This finding is robust to various aggregations of campaign time, and the observed effect of time on vote percentage is independent of the percentage of money in the race raised by the challenger. Thus, the results suggest that especially in close races, challengers can swing the outcome by expending a large amount of their own time on various tasks. In total, these findings advance our understanding of campaign effects, particularly

in the context of state legislative elections.

1 Campaign Resources and Votes

Since candidates must expend financial resources in order to do just about anything intended to garner votes, much existing work has focused on how campaign spending affects a candidate's electoral success. A great deal of research has determined that congressional challengers realize vote gains from their campaign spending, while incumbents' spending does little to increase their vote share (e.g., Jacobson 1978; 1980; 1990; Ansolabahere and Gerber 1994).[1] The disparate effects for incumbent and challenger spending in congressional contests is largely consistent with analysis of state legislative elections: Studies in a range of states and years have generally held that while campaign spending in state legislative contests leads to more votes on average, challengers typically realize higher gains-per-dollar than incumbents–but the marginal returns of their spending diminish as more money is spent (Glantz, Abramowitz, and Burkart 1976; Welch 1976; Owens and Olson, 1977; Caldeira and Patterson 1982; Giles and Pritchard 1985; Tucker and Weber 1987; Gierzynski and Breaux 1991; Cassie and Breaux 1998).

Even if challengers do receive a greater benefit from spending than incumbents, they still face a difficult task. Incumbents enjoy a clear electoral advantage over their competition in both federal and state elections (Ansolabehere and Snyder 2002). Part of this advantage is certainly monetary: While incumbents can easily raise funds as needed to combat a strong challenge–and therefore generally control more money than their competition at all phases of an election–challengers who fail to raise funds early rarely exhibit success later (Krasno, Green, and Cowden 1994). Challengers' ability to raise money is at least partially constrained by prospective donors' assessments of their viability, as they must often confront

[1] At least one previous study has determined that spending matters very little in congressional elections (Levitt 1994), while others have found that both incumbents and challengers realize vote gains from higher spending (Green & Krasno 1988; Gerber 1998). Benoit and Marsh (2008) found that once variable advantages of incumbency in a given election are accounted for, incumbent spending increases incumbent vote share.

the paradoxical reality that donors are less likely to contribute to them due to concerns about their likelihood of winning, but they cannot win without money.

Hard work might offer challengers a solution to this problem. Compared to a money supply limited by donor skepticism or contribution regulations, the candidate is likely to possess much greater control on the amount of time he/she personally devotes to the campaign. Absent personal obligations, for candidates who are not required to work, the only external constraint on campaign time is the number of hours in a day; even those with full-time jobs have the ability to invest at least some time into the campaign each week. Thus, even in elections where strong incumbents face inexperienced challengers, there is often little to stop the latter from spending some amount of time canvassing precincts, courting interest groups, writing emails and blog posts, or phoning voters.[2] With efficient use of campaign time, a challenger might therefore parlay increased visibility from a low-cost "shoe leather" campaign into viability.

The good news for challengers is that even low-cost methods of mass mobilization can be effective, so long as the message is well-targeted and/or delivered in an intimate fashion. For instance, a positive effect on turnout has been demonstrated when phone solicitations come from volunteers who engage voters in a personal way (Nickerson, Friedrichs, and King 2006; Nickerson 2006; Nickerson 2005; Ramirez 2005; Wong 2005). Face-to-face canvassing techniques appear to be particularly effective mobilization methods (Gerber and Green 2000; Niven 2001; Niven 2002; Green, Gerber, and Nickerson 2003; Michelson 2003; Bennion 2005; Parry et al. 2008). Thus, even in the absence of much money, most candidates have the means to effectively reach voters if they they are willing to work. This is particularly true in state legislative elections, which are more likely than congressional ones to feature personal methods of voter contact–such as handing voters a handbill on their doorstep–over mass media campaigning (Hogan 1997).

[2]All campaign activities impart some financial costs: Canvassing usually requires planning and printed material, e-campaigning requires a computer, etc. (See: Hogan 1997). I therefore assume that a challenger has at least minimal financial resources. The larger point however is that these activities are cheaper than mass-media broadcast advertising.

While canvassing and phoning are less expensive means of voter contact than television advertising, they do impart their own unique costs. Specifically, personal voter contact is labor-intensive and places substantial demands on a candidate's time. The impact of such efforts is therefore likely to depend on candidates' willingness to invest a significant amount of personal time in them. For instance, a candidate who devotes more effort to door-to-door canvassing will meet more people, share more information, and have the opportunity to persuade more voters. Thus, candidates who spend more time on their campaign–especially if that time is focused on voter contact–should be expected to realize vote gains on Election Day. As noted above however, nearly all evaluations of state legislative campaigns' monetary spending leads to greater vote gains for challengers than for incumbents, and so one might expect similar disparate effects for expenditures of time.

In the only existing study of the effect of candidate time in state legislative elections, Howell (1982) found little relationship between a candidate's campaign effort and his/her vote receipt. However, that study was conducted during an odd-year (1979) election in Louisiana, whose "open primary" system marks it as atypical among American states. Considering both the time elapsed since it was conducted and the uniqueness of Louisiana elections, it is not clear that Howell's (1982) study generalizes to more recent state legislative elections in other states.[3] The effect of campaign time on both candidate vote margins and voting behavior is therefore largely an open question.

Given that spending is generally viewed as a proxy measure of campaign activities (Ansolabahere and Gerber 1994), it seems reasonable to expect the expenditure of candidate *time* to demonstrate an effect similar to that of monetary spending. As noted above, evaluations of spending in state legislative elections have consistently found that it positively affects vote totals on average–in a nonlinear fashion–with challengers receiving greater benefit (Glantz, Abramowitz, and Burkart 1976; Welch 1976; Owens and Olson, 1977; Caldeira and Patter-

[3]Moreover, Howell's modeling approach does not account for the likelihood that the relationship between campaign effort and vote margin is non-linear, with diminishing returns as a candidate spends more time on the campaign. As such, the analysis in Howell (1982) is susceptible to Type II error.

son 1982; Giles and Pritchard 1985; Tucker and Weber 1987; Gierzynski and Breaux 1991; Cassie and Breaux 1998). If the expenditure of campaign time affects election margins in the same fashion, then an analysis of campaign effort should find a positive effect of candidates' personal campaign time on vote percentage that is greater for challengers than for incumbents. Thus, I expect that greater effort by a candidate–and a challenger especially–in a state legislative election should enhance the percentage of the two-party vote that he/she receives.

2 Data and Method

One reason for the relatively small number of studies examining the effect of campaign activities is that the manner in which candidates use their time is not easily observed. Especially compared to campaign spending–which must be publicly disclosed–determining the amount of personal time that candidates invest in their campaign therefore presents some challenges. I address this problem using data obtained from a survey of major-party, lower-house candidate populations fielded in eighteen states during the 2008 general election. The sampling frame for the 2008 survey included the candidate populations of Alaska, Arizona, Colorado, Connecticut, Delaware, Hawaii, Iowa, Maine, Michigan, Minnesota, Missouri, Montana, New Mexico, Ohio, Rhode Island, Vermont, West Virginia, and Wisconsin. Though there are no Southern states in the sample, the included states are geographically diverse and range in ranking of Squire's (2007) index of legislative professionalization from third (Wisconsin) to forty-third (Maine).[4] As such, the states included in the survey comprise a relatively good selection of the various conditions in which state legislative candidates run in the United States.

The survey was conducted in multiple waves via three media: mailed instruments, an electronic interface, and telephone. Candidates received up to eight contacts by a combi-

[4] At least one state in each of the the five quintiles of that measure is included in the survey frame, though data from Arizona is excluded from this analysis, as it employs two-member districts (see below).

nation of these methods.[5] Of 2,971 candidates in the population, the survey yielded 1,022 responses overall, for a response rate of 34.4%. This rate is consistent with previous surveys of elite candidate populations (Francia & Herrnson 2003; Howell 1982). Response rates for selected states ranged between 23.7% in Rhode Island and 49.5% in Arizona. Appendix 1 contains state-by-state response rates, as well as basic characteristics of both the sample and candidate population in the survey frame.

As the objective of this article is to examine the effect of campaign time in incumbent-contested single-member district elections, I retain survey data from districts in which only one candidate is elected. As such, 120 respondents running in multimember districts–including all candidates from Arizona–are excluded from the analysis. I also exclude 121 respondents–mostly incumbents–who were running without major-party opposition, 197 candidates who were running in open-seat elections, and 44 candidates who did not complete relevant portions of the survey, such as their name (which allowed information about their elections to be included in the data) and/or information about their campaign time (see below). Accordingly, 537 candidates from the original survey remain in the sample, of which 307 are challengers.[6]

In addition to a battery of standard demographic questions, respondents supplied the amount of time (in weekly hours) they personally spent on a number of activities "during the first week of October," including fundraising, public speeches, field activity, electronic campaigning, media relations, research, strategy, phoning voters, sending mailings, and the courting of interest groups.[7] I supplement the survey data with information about each candidate's vote totals and fundraising performance, obtained from the appropriate regulatory agencies of each state. I also add demographic and political characteristics of each legislative

[5]There are no apparent significant differences on either the outcome measures or the independent variables of interest between responses collected via mail, Internet, and phone.

[6]Due to data missing on other covariates employed in the regression models described below, those models are constructed using data from 525 candidates.

[7]The question was worded as follows: DURING THE FIRST WEEK OF OCTOBER, what is your best estimate of how many hours you, yourself, spent engaged in the following activities? Please complete the table below, listing your NUMBER OF HOURS, and NOT A PERCENTAGE OF TIME. If you accepted public funding, do not include time spent qualifying for public money as part of the fundraising category.

district to the dataset, obtained from Lilley *et al.* (2007). The full survey instrument can be found in Miller (2014).

The utilization of self-reported campaign time as an independent variable creates one potential problem in the analysis: Though workers have been shown to accurately self-report their time spent working after the fact (Jacobs 1998), candidates might have inflated the number of hours they reported devoting to their campaign in order to appear as more "hard-working." Fortunately, such an inflation–assuming that it occurred in a relatively uniform fashion–would bias only the constant in a regression analysis, and would affect neither the coefficients nor the standard errors in the models reported below. Moreover, the mean level of self-reported weekly campaign time was about 47 hours, which seems like a reasonable figure. As such, there is no obvious reason to doubt the internal validity of the findings.[8]

I examine the relationship between a candidate's campaign effort and electoral success using OLS regression models in which candidate vote percentage in incumbent-contested, single-member districts serves as the dependent variable. I fit four models: In each, the independent variable of interest is the total number of weekly hours that a candidate reported devoting to various tasks. Each model features a different independent variable reflecting weekly campaign activities: The first is an additive index of the total number of weekly hours that the candidate reported devoting to the campaign, regardless of category. The second is an index of the total of all activities except fundraising. The third sums all activities except fundraising, research, and staff meetings, reflecting all time categories that can defensibly be linked to close candidate-voter interaction. Finally, the fourth construction of the independent variable is the number of weekly hours that the candidate reported devoting solely to "field" activities such as canvassing, door-knocking, and sign-posting.[9]

[8] All findings reported below are robust to specifications in which data are modeled only from the 503 candidates who reported spending fewer than 100 hours per week on the campaign.

[9] Given the number of available time categories that candidates could select, there are several defensible strategies for indexing campaign time (Howell 1982). However, factor loading from a principal components analysis of all ten categories of candidate activities did not appear to be theoretically meaningful. I therefore believe that the independent variables described here present the least arbitrary and most transparent approach, if one accepts the premise that fundraising is an inherently different activity than those represented in the other categories.

Thus, the independent variables reflect a range of definitions for "campaign time," from the most inclusive (all activities) to a narrow category of time (field activities) spent closely interacting with voters. I also fit two specifications for each model: one with state fixed-effects, and one without.[10] Confidence in the findings should be higher if they are robust across model specifications and constructions of the independent variable.

Previous research has determined that campaign spending imparts diminishing returns in state legislative elections; that is, the estimated effect of the first dollar of spending on a candidate's vote total is greater than that of subsequent spending (Tucker and Weber 1987). The same logic holds for the likely effect of campaign time, even when expressed in weekly hours. Challengers in particular should realize gains from campaign activities as their efforts raise awareness of their campaigns among voters. However, following findings in the campaign finance literature discussed above, it seems reasonable to expect a nonlinear character to the relationship between campaign effort and vote margin across the range of possible campaign hours, as candidates likely realize greater vote gains from the first hour spent campaigning than they do from the last.[11] The time variables in all models are logged to account for this possibility, and should return the effects of various campaign activities while allowing for a non-linear relationship between campaigning and vote percentage.[12]

I proceed by first fitting models using data pooled from all respondents (hereafter,

[10]State fixed effects should absorb state-level differences in areas such as legislative professionalization or geographic size of districts.

[11]There are at least two possible reasons to believe that candidates realize diminishing returns from their campaign activities. For one, given a limited amount of time in a week, candidates likely prioritize impactful activities. For instance, if they are unsure whether they will have more than 30 hours to campaign in a given week, it seems reasonable that candidates will use those first hours for activities they believe will be particularly helpful to their cause–such as field canvassing or fundraising–leaving other tasks such as policy research or website maintenance for later. Second, weekly hours aggregate into total hours, just as total campaign spending is calculated from a series of smaller purchases. Time spent in the field, or on other publicly focused activities, creates a public awareness of the campaign as voters encounter and process information about the election. Thus, if weekly campaign time can serve as a proxy for the total amount of time spent on a race, one should reasonably expect the first hours to impart larger gains than the last, as harder-working candidates will give voters multiple moments to consider their candidacy.

[12]In cases where time variables included observations for which candidates reported 0 hours, 1 hour was added to all responses to prevent non-random missing data in the analysis. The findings in all models reported below are robust to specifications in which non-logged time expenditures serve as the independent variable.

"pooled" models); the unit of analysis in the pooled models is the individual candidate who ran in contested-single member races in which an incumbent was seeking re-election. The candidate's percentage of the two-party vote serves as the dependent variable. These models also account for the fact that campaign effort is certainly not the sole determinant of a candidate's vote margin. For instance, a candidate whose party has traditionally performed well in a given district can reasonably expect to achieve a higher percentage of the vote. One who demonstrates strong financial performance vis-à-vis his/her opponent should also be expected to do well (Gierzynski and Breaux 1991). Incumbency should also boost a candidate's vote total, as name recognition and political experience are crucial elements in a candidate's ability to reach more voters (Ansolabehere and Snyder 2002). Similarly, so-called "quality" candidates–generally defined as those who have previously won election to a lower office–have been shown to perform better against incumbents in state legislative elections compared to those who have never run a successful campaign (Van Dunk 1997). Finally, given the partisan trends in the 2008 general election, Democrats might be expected to perform better than Republicans, all else equal.

With those possibilities in mind, I add to all models control variables including the lagged vote percentage for the candidate's party in the previous (2006) legislative election, as well as the percentage of total money spent in the 2008 race (between the two major-party candidates) that the candidate controlled. The models also include dichotomous indicators for whether the candidate was a Democrat, as well as two additional indicators reflecting the candidate's political experience: The first is coded one if the candidate was an incumbent, and the second is coded one if a non-incumbent candidate was a "quality challenger" who had previously been elected to any political office.[13] Finally, I hold constant the population of the candidate's district (in thousands), accounting for the fact that an hour spent on personalized tactics such as field canvassing in a small district might reasonably be expected to persuade a larger percentage of the electorate than in a more populous one.

[13]Inexperienced challengers therefore serve as the referent category.

As noted above, incumbents typically begin in a superior strategic position, and it seems reasonable to expect that the relationship between resource expenditure and vote margin differs between incumbents and challengers (e.g. Jacobson 1990). I therefore include multiplicative interaction terms in the pooled models to account for the strong likelihood that incumbency moderates the relationship between resource expenditure and vote margin; these terms are the product of the incumbency dummy variable and the relevant independent variable for campaign time in each model. The inclusion of these interactions makes for less straightforward interpretation of model coefficients, but facilitates a more complete depiction of how challengers might leverage campaign time differently than incumbents.

While the pooled models yield a snapshot of the relationship between campaign effort and vote percentage in the whole sample, one obvious shortcoming of modeling responses from all candidates who responded to the survey is that the activities of the candidate's opponent are not always known. This is problematic since the outcome of the race is likely to depend on the efforts of *both* candidates in an election. Thus, absent data from both major-party candidates in a given district, the relationship between campaign effort and election results may not be accurately expressed. Restricting the analysis to data from 176 candidates in the 88 districts in which *both* members of the major-party candidate pair responded to the survey provides a possible solution to this problem, as the activities of both candidates in a district can enter the model in those races. Accordingly, I proceed with the construction of separate models (hereafter "paired models") constructed from these incumbent-challenger dyads.

The paired models employ legislative districts–or more specifically, the election occurring therein–as the unit of analysis, with the incumbent's vote percentage serving as the dependent variable. The independent variables of interest in the paired models are of the same construction as those in the pooled models, except that the former include the activities of both the challenger and the incumbent. As such, the independent effect of a challenger's campaign time can be examined while holding the incumbent's effort constant, and vice

versa. The paired models also include a series of controls relative to the incumbent, including the percentage of the vote that the incumbent received in the previous (2006) election, the percentage of the total money in the race that the incumbent controlled, and a dummy variable indicating whether the incumbent was a Democrat. I also include the percentage of the vote received by third-party candidates (if any) in the race, and as above, add the district population (in thousands).

Similar to the approach to the pooled models described above, I fit two specifications of the paired model for each of the four independent variable constructions. The first is an additive combination of the covariates described above. The second specification includes multiplicative interaction terms between the incumbent's previous vote percentage and both challenger and incumbent time, in order to account for the possibility that the effect of each candidate's time expenditures might be moderated by the incumbent's popularity in the district. Specifically, the challenger might reasonably be expected to realize smaller relative gains from campaigning in a district in which the incumbent is particularly strong.

Parsing the data to districts in which both candidates responded to the survey raises obvious concerns about representativeness of the paired sample. However, Table 1–which contains descriptive statistics from data used to construct both the "pooled" and "paired" models–should assuage most such concerns, for three reasons. First, data from the full "pooled" sample indicates that on average, incumbents won their races with about 62% of the vote and controlled about 68% of the money spent in the election, compared to 39.2% and 32.6%, for challengers, respectively. In both cases, means for incumbents and challengers in the "paired" sample are quite similar. Moreover, these figures are fairly typical of most incumbent-contested races, given the well-documented electoral advantages of incumbency at all levels of American government (see: Ansolabehere and Snyder 2002). Second, mean weekly time is also comparable between the two samples, with a facially reasonable range between 45.9 hours for full-sample incumbents to 49.1 for paired-sample challengers. Third, across all variables, only two obvious anomalies present themselves when comparing the full

sample to the paired sample: Among challengers, the paired sample contains lower percentages of men (61.4%) and Democrats 40.9%) than the full sample. With those exceptions, the paired sample appears to approximate the characteristics of the pooled sample quite well.[14]

3 Results

Figure 1 depicts a more in-depth view of data for three key variables in the pooled sample, segmented by candidate experience. Specifically, mean values–as well as 95% confidence intervals about the mean–are portrayed, in addition to a graphical representation of the distribution of data for the total amount of time that candidates spent on their campaign, the percentage of the vote that they received, and the percentage of the money in the election that they controlled. Means and distributions are shown separately for incumbents, "quality" challengers who had previously been elected to a political office, and inexperienced challengers. There are several patterns worth noting. First, Figure 1 confirms the intuitive notion that financial resources accrue disproportionately to incumbents. Specifically, the bottom-left pane of Figure 1 shows that incumbents have little difficulty raising sufficient funds, controlling on average about 68% of the funds in their races. That is significantly higher than the average percentage of money raised by either experienced challengers (35.5%) or inexperienced challengers (31.1%).[15]

Similarly, the top-right pane of Figure 1 suggests that incumbents performed significantly better on Election Day than challengers; the mean share of the two-party general election vote for incumbents was 61.8%, compared to 38.7% and 40.9% for inexperienced and experienced challengers, respectively. Consistent with previous research (Van Dunk 1997), experienced challengers also won a significantly higher share of the vote than their inexperienced colleagues.[16] Again, these results are not terribly surprising given the well-documented

[14] t-tests indicate no significant differences between male and female challengers or incumbents, or between Democratic and Republican candidate groups.

[15] One-tailed tests indicate that experienced challengers controlled a significantly higher share of the funding in their races than inexperienced challengers (p=.0415).

[16] One-tailed test, p=.0119.

Table 1: Descriptive Statistics

Characteristics of Candidates and Districts in Full "Pooled" Sample, By Incumbency

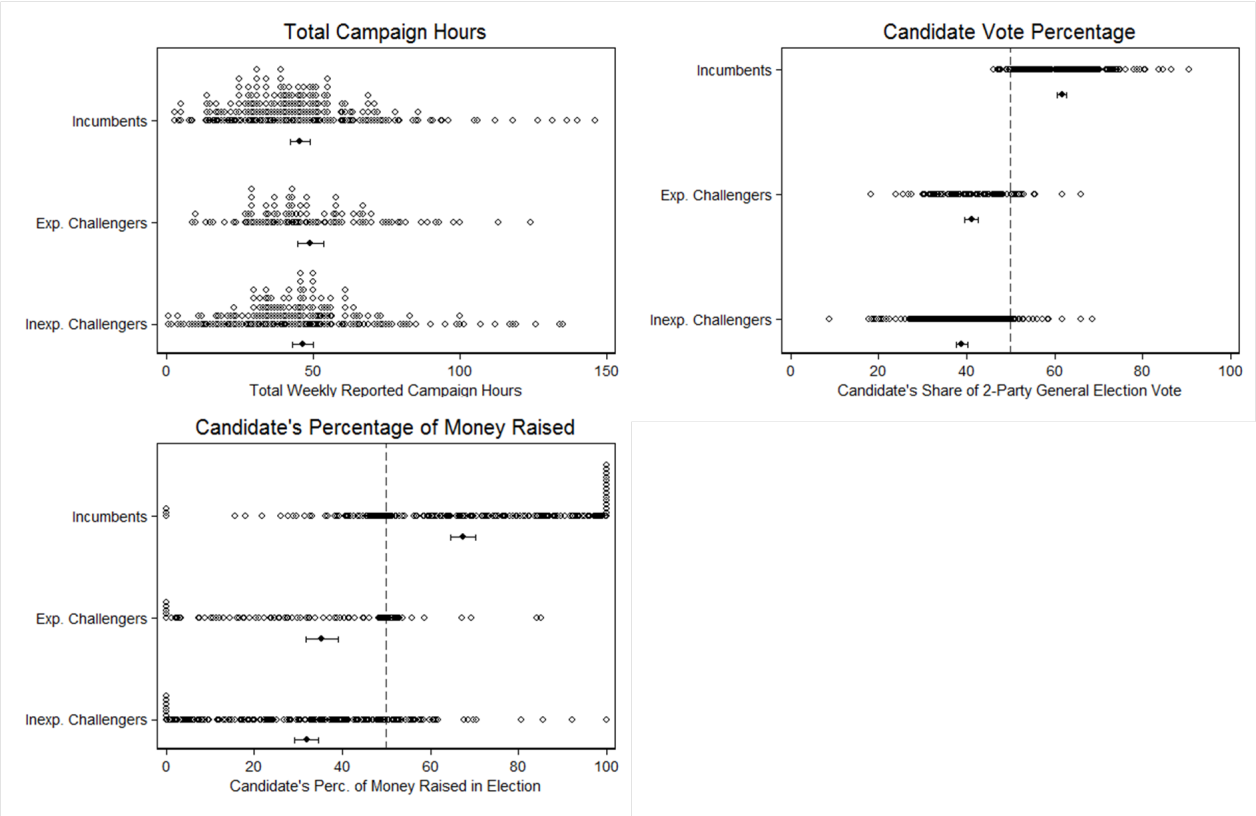
	Challengers, N=307				Incumbents, N=230			
Election Characteristics:	Mean	SD	Min	Max	Mean	SD	Min	Max
Perc. Two-Party Vote	39.4	8.7	8.8	61.8	61.9	8.2	46.2	90.7
Total Weekly Campaign Time	47.4	24.6	1	135	45.9	25.3	3	146
Candidate's Perc. of Funding	32.6	19.7	0	100	67.8	22.5	0	100
Percentage of Candidates:								
Previously Elected to an Office	34.1	-	-	-	-	-	-	-
Who Were Men	69.2	-	-	-	67.5	-	-	-
Who Were Democrats	57.1	-	-	-	62.0	-	-	-
Who Were White	92.9	-	-	-	91.5	-	-	-
District Characteristics:								
Population	34,673	27,161	3,717	121,065	32,822	27,157	3,723	119,386
Perc. Urban	62.7	34.7	0	100	64.9	36.2	0	100
Perc. White Residents	89.9	12.5	16.9	99.1	87.8	15.4	8.4	99.1
Household Income	$64,130	$21,985	$34,528	$240,513	$63,745	$23,283	$33,935	$240,513
Perc. W/ College Degree	19.4	9.2	6.8	49.8	19.9	8.9	5.0	49.8
Perc. Vote Received by Obama	51.8	11.7	19.5	88.9	54.3	11.3	20.4	88.3

Characteristics of Districts in "Paired" Sample, N=88

	Challengers				Incumbents			
Election Characteristics:	Mean	SD	Min	Max	Mean	SD	Min	Max
Perc. Two-Party Vote	39.2	7.2	21.2	52.7	60.8	7.2	47.3	78.8
Total Weekly Campaign Time	49.1	26.1	1	135	46.4	24.4	5	136.5
Candidate's Perc. of Funding	35.2	19.0	0	84.2	64.8	19.0	15.7	100
Percentage:								
Previously Elected to an Office	35.2	-	-	-	-	-	-	-
Who Were Men	61.4	-	-	-	69.3	-	-	-
Who Were Democrats	40.9	-	-	-	59.1	-	-	-
Who Were White	92.0	-	-	-	92.0	-	-	-
District Characteristics:								
Population	29,833	23,291	3,912	119,386				
Perc. Urban	60.0	37.7	0	100				
Perc. White Residents	90.2	11.7	16.87199	98.7				
Household Income	$65,830	$28,795	$34,629	$240,513				
Perc. W/ College Degree	20.0	9.1	7.2	49.8				
Perc. Vote Received by Obama	51.9	10.6	20.39021	75.9				

benefits of incumbency described above, coupled with incumbents' demonstrated fundraising prowess also on display in Figure 1.

Figure 1: Mean Percentage of Funding and Total Weekly Time Spent Campaigning



Yet, when mean weekly campaign hours (and confidence intervals) that candidates reported investing in their campaigns are considered, fewer differences are apparent. Inexperienced challengers spent about 46.5 weekly hours on their campaigns, which is about one more hour than than the mean total for incumbents. Experienced challengers devoted the most time to their campaigns on average, logging 49.5 mean weekly hours, though the difference between experienced challengers and incumbents is not statistically significant.[17] Figure 1 therefore suggests that while incumbents typically enjoy a superior relative financial position, candidates' time expenditures appear to exist on a fairly even playing field regardless

[17] One-tailed test, p=.0757.

of their incumbency status. As a resource that challengers possess on par with incumbents, the expenditure of personal time might therefore provide the former an opportunity to make vote gains.

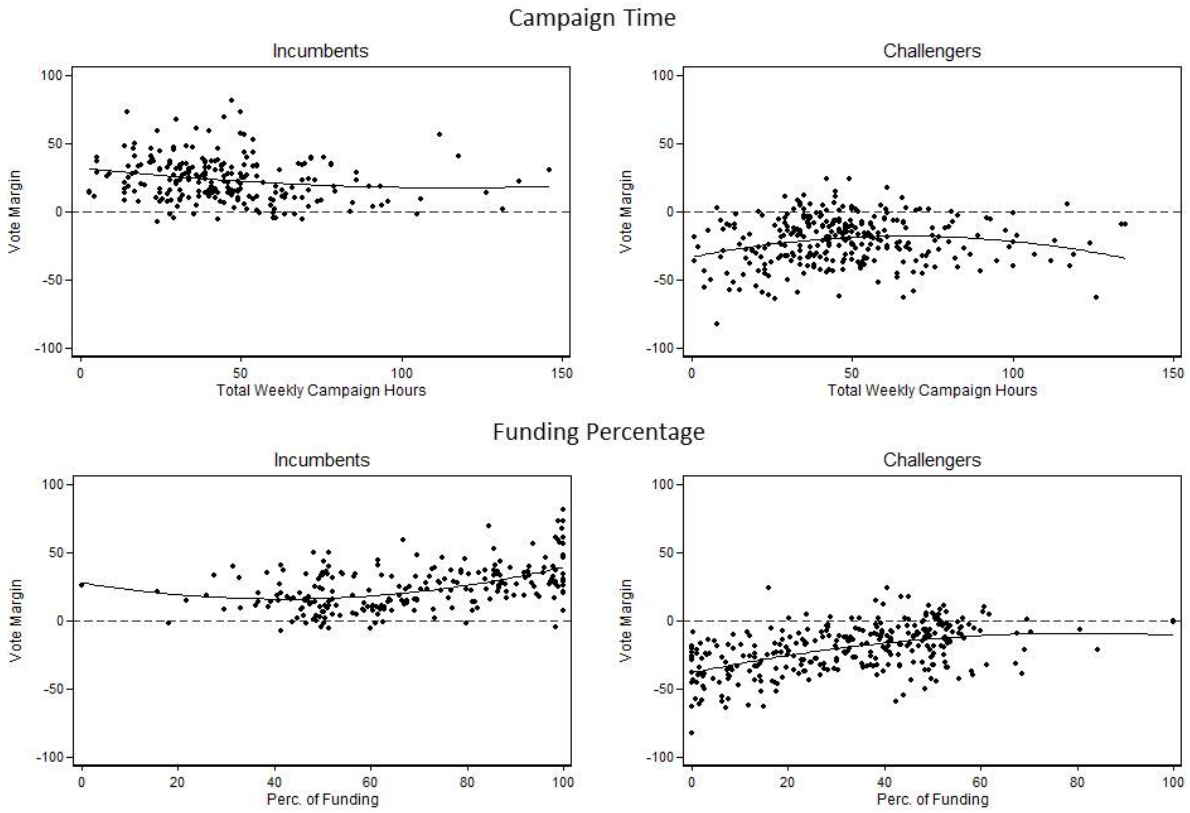
Figure 2 portrays values of two key variables plotted against candidates' vote margin: the number of weekly hours that candidates facing major-party competition in single-member districts reported devoting to the campaign, and the percentage of funding in the election that they controlled.[18] All scatterplots also include a quadratic line of fit. Data are plotted separately for challengers and incumbents, which yields preliminary evidence for a different relationship between campaign resources–here, time and money–and electoral success for the two types of candidate. The top-right pane of Figure 2 suggests that challengers' effort is positively correlated with their vote margin up to about 60 weekly hours of campaign time, with diminishing marginal returns thereafter. However, the top-left pane of Figure 2 implies a weak and *negative* correlation between campaign time and vote margin for incumbents, suggesting that at best, incumbents who spend more time on their campaign do not perform any better at the polls.

A relatively similar relationship between money and vote percentage is apparent in Figure 2, at least for challengers. As with the expenditure of campaign time, the bottom-right pane indicates that as challengers progress from controlling very little of the money spent to half of it, they can expect substantial gains in their vote margin. However, these gains are non-linear, tapering at around 50%. Indeed, though there are fewer observations in the higher range of funding percentage, Figure 2 suggests that challengers who controlled 80% of the money spent in their election could expect to do about as well as those who spent half of the overall money. In contrast, funding percentage and vote margin are positively correlated for incumbents, most of whom spent more than 40% of the funding in their elections.[19]

[18]Margin is calculated as (100*(vote percentage-(1-vote percentage))). Values closer to zero indicate less distance between the major-party candidates, and values above zero indicate that the candidate won the election. I depict the percentage of money controlled–as opposed to the raw spending figure–to account for the fact that typical spending in legislative elections varies considerably between the states in the sample.

[19]The outlier at 0% skews the curve.

Figure 2: Weekly Campaign Time and Vote Margin



In tandem then, Figures 1 and 2 offer preliminary evidence for three conclusions. First, time is an evenly distributed resource, utilized in much the same fashion by challengers and incumbents alike. Second, both incumbents and challengers can expect to increase their vote total by being more successful fundraisers than their opponent, but gains for the latter are limited after about 50%. Third, challengers appear to receive a greater average benefit from their campaign efforts than incumbents.

Given the patterns in Figures 1 and 2, the relationship between campaign time and vote margin is worth deeper exploration. To that end, I now turn to Table 2, which contains regression coefficients and robust standard errors from Models 1-4, in which the candidate's share of the two-party general election vote serves as the dependent variable. The models

feature various constructions of time indices (described above) that capture the log of the weekly hours the candidate spent on various tasks, and include state fixed effects. All models also include multiplicative interactions designed to test whether incumbency moderates the relationship between campaign time and vote margin.

Table 2: OLS Regression Coefficients and Robust Standard Errors: Determinants of General Election Vote Percentage, Candidates in Single-Member Contested Elections

	All Activities (1)	All Activities Except Funding (2)	Publicly Focused Activities (3)	Field Activities (4)
Log of Weekly Hours	1.06	1.30	1.68*	1.47*
	(0.65)	(0.68)	(0.63)	(0.37)
Dummy: Candidate is Incumbent	19.45*	20.00*	21.81*	19.28*
	(3.57)	(3.67)	(3.61)	(2.15)
Log Hours X Incumbent	-2.08*	-2.26*	-2.84*	-2.57*
	(0.91)	(0.95)	(0.95)	(0.62)
Dummy: Experienced Challenger	1.01	1.01	0.99	1.06
	(0.82)	(0.81)	(0.80)	(0.80)
2006 Vote Perc. for Candidate's Party	0.16*	0.16*	0.16*	0.16*
	(0.02)	(0.02)	(0.02)	(0.02)
Candidate's Perc. of Funding in Race	0.15*	0.15*	0.15*	0.14*
	(0.01)	(0.01)	(0.02)	(0.01)
Dummy: Candidate is Democrat	3.13*	3.16*	3.16*	3.22*
	(0.61)	(0.61)	(0.61)	(0.60)
District Population (Thousands)	0.15	0.15	0.15	0.13
	(0.18)	(0.18)	(0.18)	(0.18)
Constant	20.11*	19.26*	18.21*	20.54*
	(4.10)	(4.17)	(3.89)	(3.34)
State Fixed Effects	Yes	Yes	Yes	Yes
Number of Observations	525	525	525	525
R^2	0.78	0.78	0.78	0.78
Root Mean Sq. Error	6.749	6.745	6.717	6.672

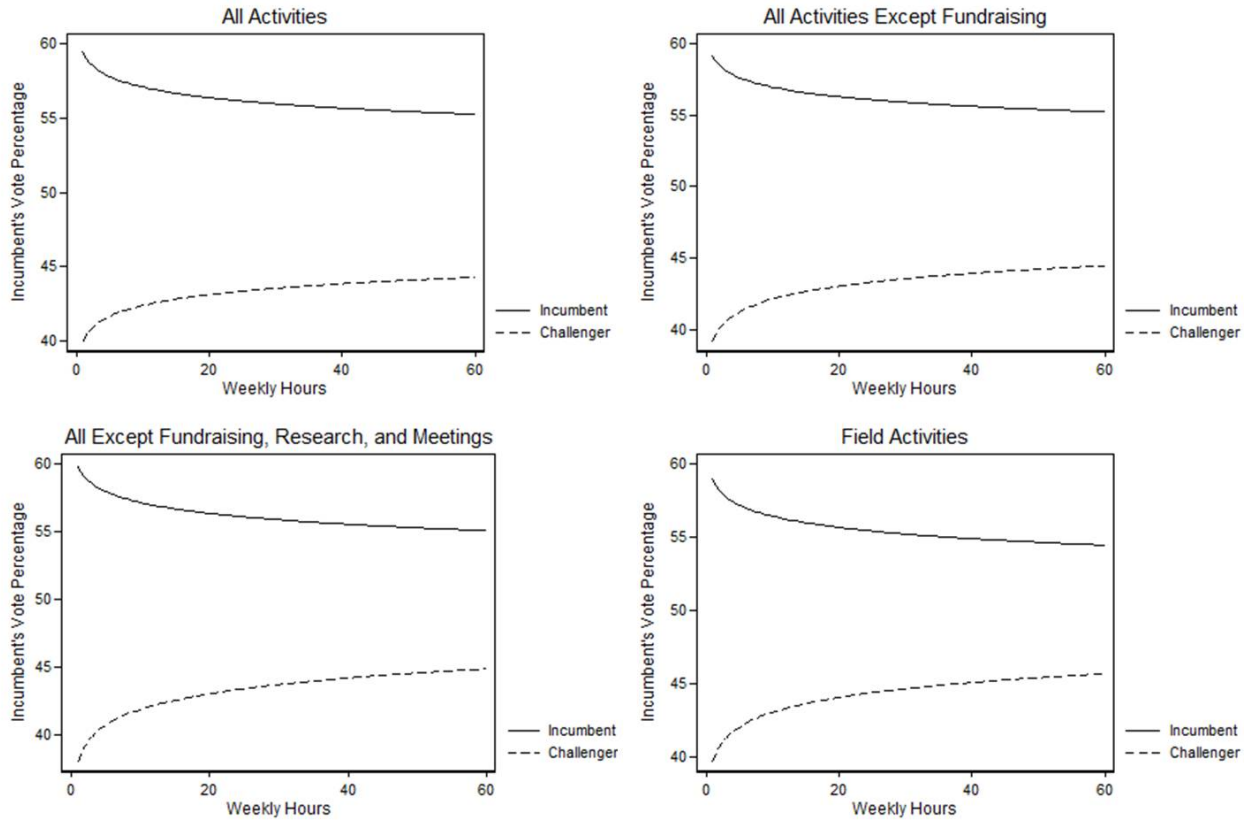
* $p<.05$. Robust standard errors in parentheses.
"Publicly focused activities" are all activities except fundraising, staff meetings, and personal research. "Field activities" encompass direct, personal voter engagement tasks, such as canvassing or "door-knocking."

With regard to the effects of the independent variables of interest–time spent on the campaign in various areas–the models are quite consistent in terms of coefficient sign, size, and statistical significance. The coefficient for all time variables is positive and achieves statistical significance in Models 1-4. Since that coefficient is a component of the interaction term, its sign and significance indicates that there is a positive relationship between campaign time and vote share *for challengers*, on average; this relationship is statistically significant for the models of publicly focused activities and field activities. Moreover, the significant interaction term present in all four models suggests that the effect of time on vote share is significantly different for incumbents than for challengers. Specifically, the negative sign of that coefficient suggests that incumbents receive less benefit from campaigning on average than challengers do. Indeed, calculating the coefficients for the slope of campaign time for incumbents reveals that they are *negatively* signed for all constructions of the independent variable, and the standard errors on the effect of time spent by incumbents indicate that incumbents' time spent on field activities is significantly less than zero. As such, the models indicate that while challengers receive vote gains from the expenditure of their time, incumbents receive–at best–no positive return on their time investment. This relationship is similar to those described in much of the campaign finance literature (i.e., Jacobson 1990).

Given the fact that the time variables are both logged and involved in an interaction, the substantive size of the effect of candidate effort is not readily interpretable from the contents of Table 2. As such, the relationship between campaign time and vote percentage is perhaps more easily understood with the graphical depiction of average marginal effects in which campaign time is presented in its original (unlogged) scale. Figure 3 therefore depicts adjusted means derived from the four models in Table 2. The lines in each pane of Figure 3 reflect the predicted vote percentage for challengers and incumbents across a range of campaign time between zero and sixty hours per week. Figure 3 can therefore be viewed as depicting separately the predicted effect of campaign time on vote margin for incumbents and challengers.

Figure 3 indicates that challengers (dashed line) and incumbents (solid line) realized quite different returns in vote percentage from the weekly time they devoted to campaigning. In both cases, the relationship between campaigning and vote margin is non-linear, with steeper slopes apparent in the first twenty hours or so spent campaigning each week. Specifically, for challengers the slope is positive across the range of hours depicted in Figure 3, but diminishes with every hour spent campaigning. The effect for incumbents is an approximate mirror-image of that for challengers: The slope of the line for incumbents is negative, but becomes less negative across the range of weekly hours.

Figure 3: Predicted Share of Two-Party Vote



As such, Figure 3 suggests that challengers can expect to gain more votes with each hour than incumbents can expect to lose. For instance, a challenger who increases his/her total weekly time on field activities from 0 to 20 hours would expect to increase his/her expected share of the vote by 4.37 points, while the expected vote share for an incumbent taking the

same action would decrease by 3.29 points. Similarly, moving from 20 to 40 weekly hours of field activity increases the challenger's share of the vote by another 1.02 points, while the incumbent's diminishes by 0.76 points. And finally, increasing the weekly field effort from 40 to 60 weekly hours would net the challenger an additional 0.59 points of general election vote share, while the incumbent's would decrease by 0.44 points. Summing the field totals, all else equal, a challenger who increases weekly field time would increase his/her expected share of the vote by about 5.98 percentage points, while the expected vote share of the incumbent would decrease by roughly 4.5 points. A similar relative pattern is observable in all four constructions of the independent variable in Figure 3: Large gains for challengers (and losses for incumbents) in the first twenty hours, and small gains (losses) after the fortieth hour, with challenger gains outstripping challenger losses at all levels of effort. In sum, working hard is a good mechanism for the challenger to swing votes.

The coefficients and robust standard errors from Models 5-12 are contained in Table 3. Those "paired" models utilize data from legislative districts in which both the incumbent and challenger responded to the survey question regarding their weekly activities; the incumbent's vote percentage serves as the dependent variable in these models. As such, the models in Table 3 supply the independent effects of challenger campaigning, holding incumbent time constant, and vice versa. The even-numbered models in Table 3 include interaction effects to test whether the effect of campaigning is moderated by the incumbent's strength in the district, as measured by the incumbent's vote percentage in the previous (2006) election.

As with the pooled models, the results in Table 3 are consistent across specification and independent variable construction with regard to the sign, size, and significance of coefficients. The coefficient for challengers' campaign effort is negative and significant in all models, indicating that higher levels of challenger activity reduce incumbents' vote share, on average, which is well in-line with the findings from the pooled models reported immediately above. Also consistent with the pooled models, the coefficient for incumbents' campaign

Table 3: OLS Regression Coefficients and Robust Standard Errors: Determinants of Incumbent Vote Percentage, Candidates in Single-Member Contested Elections

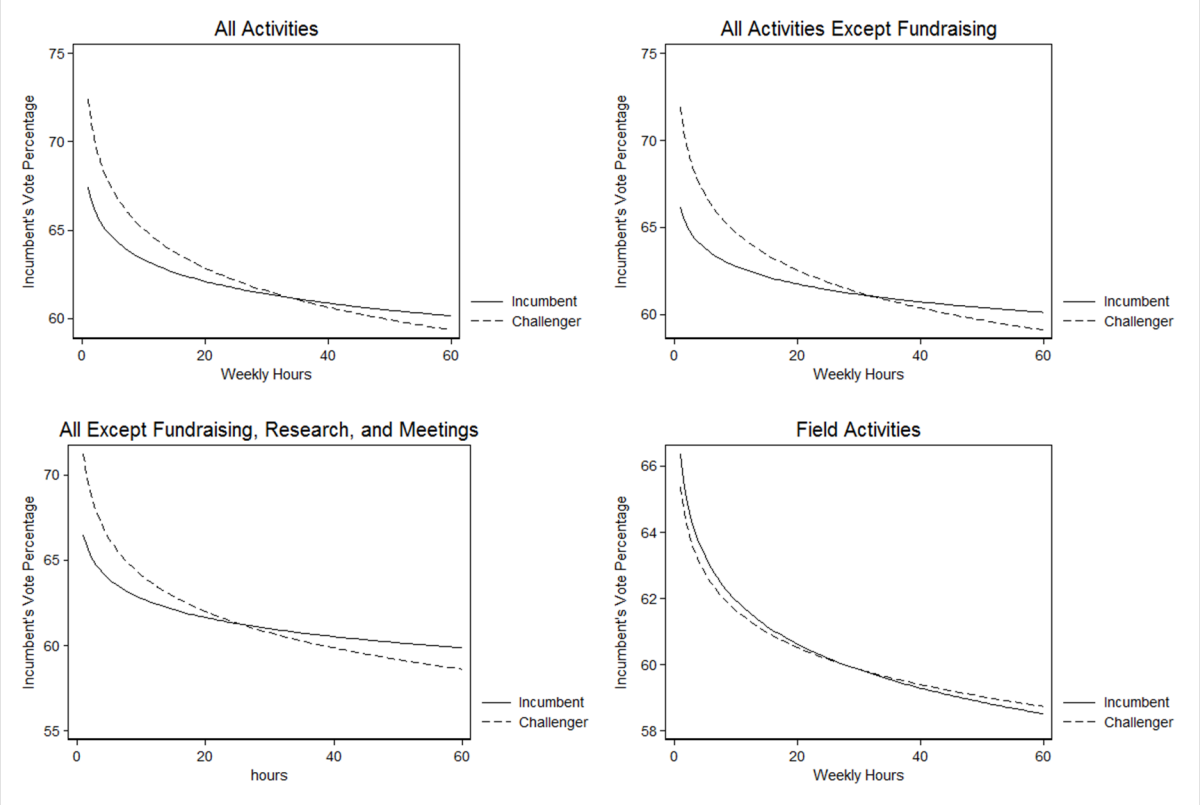
	All Activities (5)	All Activities (6)	All Activities Except Funding (7)	All Activities Except Funding (8)	Publicly Focused Activities (9)	Publicly Focused Activities (10)	Field Activities (11)	Field Activities (12)
Log Weekly Hours: Challenger	-3.29*	-11.88*	-3.35*	-12.23*	-3.41*	-12.66*	-2.24*	-11.28*
	(1.14)	(5.42)	(1.11)	(5.15)	(1.05)	(3.32)	(0.78)	(3.43)
Log Weekly Hours: Incumbent	-1.33	-6.09	-1.04	-5.49	-1.00	-5.22	-1.57*	-6.21*
	(1.20)	(4.66)	(1.20)	(4.74)	(1.13)	(4.73)	(0.76)	(2.97)
Dummy: Experienced Challenger	-1.51	-2.10	-1.74	-2.34*	-1.66	-2.33*	-1.65	-2.41*
	(1.13)	(1.17)	(1.11)	(1.14)	(1.10)	(1.10)	(1.13)	(1.17)
Incumbent's Vote Perc., 2006	0.19*	-0.60	0.19*	-0.59	0.19*	-0.56	0.15*	-0.46*
	(0.05)	(0.48)	(0.05)	(0.46)	(0.05)	(0.36)	(0.05)	(0.21)
Incumbent's Perc. Of Funding	0.09*	0.09*	0.09*	0.09*	0.08*	0.09*	0.09*	0.09*
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.04)	(0.03)
Dummy: Incumbent is Democrat	-0.32	-0.43	-0.27	-0.43	-0.32	-0.62	0.39	0.10
	(1.16)	(1.11)	(1.15)	(1.11)	(1.14)	(1.10)	(1.14)	(1.10)
District Population (Thousands)	-0.05*	-0.04*	-0.06*	-0.05*	-0.06*	-0.05*	-0.08*	-0.08*
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
Third Party Candidate(s) Vote Perc.	1.52*	1.26*	1.51*	1.28*	1.53*	1.32*	1.20*	1.46*
	(0.47)	(0.45)	(0.45)	(0.42)	(0.47)	(0.41)	(0.41)	(0.38)
Chal. Hours X Inc. 2006 Vote Perc.	-	0.14	-	0.14	-	0.15*	-	0.15*
		(0.09)		(0.08)		(0.05)		(0.05)
Inc. Hours X Inc. 2006 Vote Perc.	-	0.07	-	0.06	-	0.06	-	0.07
		(0.07)		(0.07)		(0.07)		(0.04)
Constant	62.52*	112.96*	61.38*	110.53*	61.17*	108.75*	58.62*	97.05*
	(6.70)	(30.18)	(6.28)	(28.48)	(5.83)	(23.50)	(5.52)	(13.90)
Observations	88	88	88	88	88	88	88	88
R^2	0.45	0.49	0.45	0.50	0.46	0.53	0.44	0.52
Root Mean Sq. Error	5.613	5.466	5.591	5.430	5.548	5.280	5.651	5.337

* $p<.05$. Robust standard errors in parentheses. "Publicly focused activities" are all activities except fundraising, staff meetings, and personal research.

"Field activities" encompass direct, personal voter engagement tasks, such as canvassing or "door-knocking."

time is negatively signed in all paired models, but achieves statistical significance only in Models 11 and 12, in which the independent variable is the amount of time that incumbents devoted solely to "field" activity. None of the interaction effects involving incumbent time are statistically significant. However, in the two narrowest constructions of the independent variable (publicly focused activities and field activities), the interaction coefficients suggest that challengers' efforts are significantly less effective in districts where the incumbent enjoys higher levels of popularity. Thus, the conclusions from the paired models are much the same as those from the pooled models: Though their efforts might be less effective on average in districts where conditions are favorable for the incumbent, challengers can positively affect their vote percentage by investing more time in their campaign. For incumbents, increased hours are–at best–unrelated to their ultimate vote percentage.

Figure 4: Predicted Incumbent Share of Vote



Again, due to the logged variables and presence of interactions in some of the models, plotting the average marginal effects over a range of unlogged campaign hours provides a more readily interpretable picture of the relationship between campaign time and vote share. Figure 4 depicts the adjusted means of incumbent vote share derived from the even-numbered models in Table 3 (those that include the interaction terms) across a range of campaign time for both incumbents and challengers. Since the dependent variable in the paired models is the incumbent's share of the vote, given the coefficient signs in Table 3, all four panes of Figure 4 depict negative, non-linear relationships for both incumbent and challenger effort. Figure 4 suggests that challenger effort is particularly effective at reducing incumbent vote share in the first ten hours. That said, as with the pooled models, the slope of the line for challenger effort is steeper than that for incumbent campaign time across the range of time in three of the four paired models. It is worth reiterating here, however, that none of the effects for incumbent campaigning in Models 5-10, Table 3 achieve statistical significance at conventional levels.

A slightly different picture emerges, however, when only "field" activities are included as an independent variable (lower-right pane). The paired field model (Model 12, Table 3) predicts an incumbent vote share of 65.5% when the challenger spends no time in the field, and 66.4% when the incumbent does no field work. Unlike the other three models whose adjusted means are depicted in Figure 4, the slope for incumbents' field activities is slightly steeper than that for challengers, indicating that the field activities of the former are associated with a more rapid erosion of incumbent vote share, on average. That said, the two curves are not dramatically different. However, Models 11 and 12 in Table 3 indicate that the slope for incumbent field activity is statistically distinguishable from zero. In short, the relationship between field work and incumbent vote share for the two groups is quite similar, and a campaign in which both candidates are investing considerable time in field activities appears to mark a strong incumbent challenge.

The findings with regard to incumbent field activity notwithstanding, there is no obvious

reason why incumbents' campaigning should *cost* them votes. No doubt there is an element of endogeneity in the apparently negative relationship between campaign effort and votes for incumbents, but such an issue is less likely for challengers, who by definition have a more difficult task of assembling a vote plurality from non-voters, detractors, and those whose opinions of the incumbent have changed since the last election. Certainly some races seem less winnable than others for challengers at the outset, but in the vast majority of cases, challengers must defeat an opponent with a good chance of winning, and as a group should reasonably be expected to be less calculating with regard to the amount of time they spend on their campaign. In contrast, incumbents who believe they are not facing a threatening opponent have little incentive to work hard, but those who feel vulnerable likely respond to a perceived threat by spending both more money and more time on the campaign trail (see: Jacobson 1990).

Such self-selection among incumbents would create the appearance of a negative relationship between campaign effort and vote receipt, as incumbents who believe they are likely to perform worse invest more time in the campaign to stem their losses. It bears repeating however that only the relationship between incumbent *field* activity and incumbent vote percentage achieved statistical significance in the paired models. With the potential for reverse causation in mind, one possible explanation for the apparently acute negative effect of incumbents' field activities on their vote receipt is that political scientists (e.g. Gerber and Green 2000) and state legislative candidates (Miller 2014, Ch. 3; Miller 2011) alike recognize face-to-face canvassing as a particularly effective tool. When threatened with a strong challenge, it stands to reason that incumbents–particularly in low-media environments such as those of most state legislative races–will attempt to stem their losses with a "ground game."

If reverse causation leads to the apparent negative correlation between incumbent effort and vote receipt, one might expect to observe incumbents in more competitive circumstances investing more time into their campaign than their "safer" colleagues. I investigate that

Table 4: Mean Hours Reported in Various Categories, by Incumbency Status and Candidate Party's Share of 2006 Vote

	Total Time	All Activities Except Fundraising	Publicly Focused Activities	Field Activities
Competitive Incumbents	49.5*	45.9*	41.1*	22.9*
Safe Incumbents	41.9	37.7	33.5	16.9
Competitive Challengers	48.6	43.2	37.9	22.1*
Difficult Challengers	46.5	42.2	35.6	17.5

* $p < .05$, Two-tailed tests.
"Safe Incumbents" received more than 60% of the vote in the 2006 election.
"Difficult Challenges" are those in which the party's candidate won less than 40% of the 2006 vote.

possibility in Table 4, which contains mean campaign hours tabulated by the competitiveness of the 2006 campaign, since incumbents who won with a smaller percentage of the vote likely view a strong challenge in the next campaign as more probable than those who won by a large margin.[20] Generally, the pattern in Table 4 is supportive of the premise that incumbents campaign more when they believe themselves to be vulnerable. As indicated in the top two rows of Table 4, incumbents in "competitive" districts–in which they received less than 60% of the vote–devoted almost 8 more weekly hours to their campaign than "safe" incumbents who won in 2006 with a vote share exceeding 60%. That pattern holds across all four of the time indices described above, and in all four instances the difference is statistically significant. In contrast, challengers display similar behavior regardless of the conditions of their race–with one exception: Challengers in districts where the incumbent won less than 60% of the vote in 2006 did devote significantly more time to the "ground game," spending about 4.5 more weekly hours on field activities. Overall however, incumbents appear to be much more likely to work harder when they are threatened.

[20]This assumption would be a safe one, as the correlation coefficient for incumbent vote share in 2006 and 2008 is .80.

Table 5: 2SLS Regression Coefficients and Robust Standard Errors: Determinants of Incumbent General Election Vote Percentage

	All Activities (13)	All Activities Except Funding (14)	Publicly Focused Activities (15)	Field Activities (16)
Log of Weekly Hours	-7.08	-7.02	-4.88	-2.03
	(24.09)	(23.55)	(14.61)	(5.72)
2006 Vote Perc. for Candidate's Party	0.53	0.53	0.55*	0.58*
	(0.39)	(0.35)	(0.26)	(0.17)
Candidate's Perc. of Funding in Race	0.13*	0.13*	0.13*	0.12*
	(0.06)	(0.05)	(0.04)	(0.03)
Dummy: Candidate is Democrat	1.97	2.06	2.23	2.87*
	(3.09)	(2.73)	(2.00)	(1.26)
District Population (Thousands)	0.30	0.28	0.22	0.25
	(0.59)	(0.53)	(0.36)	(0.42)
Constant	40.05	38.95	29.65	14.20
	(109.44)	(104.23)	(65.08)	(19.01)
Number of Observations	95	95	95	95
R^2	0.54	0.54	0.66	0.71
Root Mean Sq. Error	5.757	5.751	4.937	4.593

* $p<.05$. Robust standard errors in parentheses.
"Publicly focused activities" are all activities except fundraising, staff meetings, and personal research."Field activities" encompass direct, personal voter engagement tasks, such as canvassing or "door-knocking." Incumbent's share of money in 2006 election serves as an instrument for campaign effort in 2008.

One strategy for addressing the apparently endogenous relationship between incumbents' effort and their vote receipt is an instrumental variables framework. In their study of the effects of incumbent spending, Green and Krasno (1988) employ the incumbent's spending in the previous election as an instrument. Their rationale for doing so is that money spent in Election *t-1* will not have an impact on the votes an incumbent receives in Election *t*, but that incumbents who had to spend more in the previous election will see themselves as vulnerable. Unfortunately, the obvious analogue for an instrument in the present study would be the incumbent's mean weekly hours devoted to the 2006 campaign, which is impossible to observe. However, accepting Green and Krasno's premise that the financial environment in the previous election will shape the incumbent's thinking about his or her vulnerability in

the next one, then incumbent spending should also suffice as an instrument for vulnerability in 2008.[21] Following the estimation strategy in Green and Krasno (1988), I therefore model campaign effort for the 95 incumbents who were also contested incumbents in 2006, using a 2SLS model with state fixed effects and the incumbent's percentage of money in the previous (2006) campaign serving as an instrumental variable.[22]

Coefficients and robust standard errors from those models are contained in Table 5. While the coefficients for incumbent effort in Table 5 are all negatively signed–and substantively large–none achieve statistical significance in the 2SLS models.[23] In short, unlike Green and Krasno (1988)–whose 2SLS models returned a positive, significant effect of incumbent spending–my analysis suggests that while incumbents likely do not *lose* votes from campaigning, they appear to see very little return on the expenditure of their personal campaign time. While the effect of incumbents' campaign effort merits further exploration, when taken in the aggregate the findings in this article therefore offer strong evidence that challengers realize higher average vote gains from personal campaigning than do incumbents. I return to this point below.

4 Discussion/Conclusion

Scholarly analysis of campaign spending has generally rested on the assumption that spending serves as a proxy measure of hard-to-observe campaign activities. Presumably, spending will reflect a campaign's strategic priorities, and it seems reasonable to assume that campaigns spending larger sums of money are making a more visible attempt to win votes. Previous work has also established a positive association between campaign spending and

[21] Bivariate correlation coefficients between incumbent funding percentage in 2006 and total time; all activities expect fundraising; all activities except fundraising; staff meetings, and research; and field activities are -.08, -.10. -.11, and -.22, respectively.

[22] I opt for the percentage of money controlled–as opposed to incumbent spending–due to the inclusion of incumbents from states which vary considerably with regard to typical spending in a state legislative election.

[23] Substantive findings from models using non-logged independent variables are similar. These results may be obtained by request.

candidate vote receipts in state legislative elections, with challengers receiving a larger return on their campaign dollars than incumbents. Yet, challengers generally also have a harder time raising money, leaving many with little option but to husband scarce financial resources while focusing on low-cost methods of voter contact such as field canvassing, phoning, or mail preparation.

Such activities make significant demands on candidate time, and time costs are not reported on financial statements. While labor-intensive voter contact methods (such as field canvassing) will leave a monetary "paper trail" via the purchase of materials such as handbills and staff salaries (Dowling and Miller 2014), the intensity of a candidate's efforts in a given area is difficult to discern from campaign finance reports alone. As such, total spending is not always a good proxy for campaigns' efforts at winning votes (Ansolabahere and Gerber 1994). Given the difficulty with which candidate tasks are observed, it is understandable that little existing research has explicitly considered how the expenditure of candidates' personal time might be related to their electoral success. The evidence presented above therefore contributes to our understanding of campaign effects in legislative elections.

My findings are consistent with existing work that has studied the effect of campaign spending: Challengers typically realize a much larger vote gain from the expenditure of their personal time than incumbents. My analysis suggests that the expected return from additional campaign hours diminishes as challengers devote more effort to the campaign, decaying after about 40 weekly hours. Still, challengers' personal campaign effort imparts meaningful effects on their vote percentages. When challengers spend 40 hours per week on their campaign (relative to spending no time), they reduce the incumbent's share of the vote by roughly 10 percentage points. Moving from a "full-time" 40-hour week to 60 weekly hours shaves an additional 3 percentage points from the incumbent's vote total–certainly enough to swing a close election.

These findings are therefore promising for challengers. Challengers' personal time–one of the few resources that many have in any quantity–can help them to chip into an incumbent's

vote total. Moreover, challengers who have difficulty raising money–presumably due to donors skeptical of their chances–might be able to work their way to financial viability. Specifically, an efficient voter contact campaign in which the candidate invests a substantial amount of his/her weekly time can significantly increase his/her expected share of the vote. Such voter-contact activities could eventually result in the appearance of visible traces of progress in the form of yard signs, or increased discussion among local media and/or other elites. This could, in turn, raise perceptions of the candidate's viability among would-be donors, spurring additional contributions and fueling the campaign's positive momentum.

In contrast, my analysis offers little good news for incumbents. At best, the models presented above suggest that incumbents receive no vote gains from their campaign activity. While incumbents in tight races may be reducing their losses with their campaign efforts, in general incumbents do not appear to be inducing a net vote gain with their hard work. There are at least two reasons to accept the premise that incumbents can reasonably expect to win fewer votes than challengers with an hour spent campaigning. First, by definition, incumbents have already convinced a plurality of voters to support their candidacy in the previous election, leaving fewer votes to be won (compared to challengers) barring a significant swing in voter preference during their term. Second, there is a higher likelihood that both non-voters and people who failed to support the incumbent the last time around will have been exposed to at least some information about the incumbent, increasing the chances that they hold a pre-existing opinion that even face-to-face canvassing may not change. By contrast, challengers are a blank slate, and all information they provide to voters–particularly in the early stages of the election–should be more likely to aid their cause as voters learn about them.

That said, I concede that the lack of a positive correlation between incumbents' campaigning and their vote share will be controversial in some circles, and therefore believe that the relationship between incumbents' time expenditures and their vote share merits further exploration. My analysis also suggests a number of other avenues for future research. For

one, it is not clear how the results in this article might apply to challengers in congressional elections. Certainly challengers' personal effort at voter contact should be expected to pay dividends in congressional races, but given the larger size of congressional districts relative to state legislative ones, a single candidate's capacity to personally contact a significant percentage of voters is much lower in the former. It therefore seems reasonable to expect that the effects of personal time expenditure on vote margin are lower for congressional candidates than those reported above, and whether congressional challenger's personal effort is an effective means to swing votes remains an open question. Future work should therefore seek to further study how the personal time expenditure of congressional candidates affects their vote margin. Future research might therefore further consider whether challengers receive a larger return from time expenditure occurring early in the election cycle. Finally, subsequent studies might also examine whether candidates are able to encourage higher levels of voter participation via the expenditure of their personal time.

It is also worth noting that the research design employed in this analysis is not without limitations. The most obvious of these is that the measure of campaign time employed throughout this article relies on candidates' accurate self-reporting of the number of hours they devoted to various activities. Hard work is a desirable trait, and it is possible that candidates over-reported their campaign time to a certain extent. That said, self-reporting of work time on survey instruments has proven to be fairly reliable when compared to time logs (Jacobs 1998), and the survey data provide little reason to believe either that candidates inflated their work time by a great deal or that self-reporting introduced non-random error into the analysis. Nonetheless, future research might also seek to independently verify candidate activities through a mix of time diaries, survey instruments, and/or observation methods.

Appendix: Response Rates and Sample Characteristics

State	Candidate Population	Response Rate
Rhode Island	114	23.7%
Michigan	207	24.6%
Ohio	175	26.9%
Iowa	170	28.2%
West Virginia	151	28.5%
Missouri	244	29.1%
Vermont	240	31.7%
Minnesota	266	35.3%
Hawaii	78	35.9%
New Mexico	101	36.6%
Connecticut	239	38.5%
Maine	288	38.9%
Montana	183	40.4%
Delaware	64	40.6%
Wisconsin	166	41.0%
Alaska	69	42.0%
Colorado	121	42.1%
Arizona	97	49.5%

Characteristics of Candidate Population and Sample

	Population	Sample
Total	2,971	1,022
Incumbents	46.7%	39.7%
Challengers	34.9%	37.8%
Dem	54.1%	61.3%
Women	28.2%	33.4%

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