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# The Effects of Campaign Spending in Congressional Elections \*

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*Incomplete understanding of the connection between campaign spending and election outcomes has hindered evaluation of enacted and proposed congressional campaign finance reforms. Reanalysis of the 1972 and 1974 House and Senate campaign spending data using both OLS and 2SLS regression models shows that spending by challengers has a much greater impact on the outcome than does spending by incumbents. A similar analysis of the effects of spending on voters' recall of candidates in the 1972 and 1974 SRC surveys supports the explanation that campaign expenditures buy nonincumbents the necessary voter recognition already enjoyed by incumbents prior to the campaign. The 1974 survey questions on Senate candidates indicate that, although the inability to remember candidates' names does not preclude having opinions about them, voters recalling candidates are much more likely to offer evaluative comments, and these more frequently refer to candidates personally. Aware voters offer more negative as well as positive evaluations (though positive outnumber negative); familiarity is not automatically advantageous. And voters' evaluations of candidates strongly influence how they vote. The implications of these findings for congressional campaign finance policy are readily apparent.*

Legislation extending public funding to congressional campaigns was on the agendas of both the House and Senate during the first session of the 95th Congress. The Senate bill, S 926, won majority support but was killed by filibuster; it is not likely that this setback has settled the issue. As with other recent laws intended to alter the way in which congressional campaigns are financed—the Federal Elections Campaign Act of 1971 (PL 92–225) and the Federal Election Campaign Act Amendments of 1974 (PS 93–443)—consideration of this legislation was not informed by any clear understanding of its likely consequences. Nor will be future debates, as long as the crucial question of how campaign expenditures affect

the outcomes of congressional elections remains unanswered.

The work reported in this article is intended to clarify the structure of the aggregate relationship between spending and congressional election results and to indicate how campaign spending is linked to the behavior of voters. Specifically, it will show that spending by *challengers* has a substantial impact on election outcomes, whereas spending by *incumbents* has relatively little effect; the evidence is particularly strong for House elections. The much greater impact of the challenger's spending remains when simultaneity bias is eliminated by means of two-stage least squares regression analysis. In simple terms, the more incumbents spend, the worse they do; the reason is that they raise and spend money in direct proportion to the magnitude of the electoral threat posed by the challenger, but this reactive spending fails to offset the progress made by the challenger that inspires it in the first place.

An explanation for these findings is developed from an analysis of the effects of campaign spending on voter recall of incumbent and nonincumbent congressional candidates: campaign expenditures buy nonincumbents the necessary voter recognition already enjoyed by incumbents prior to the campaign. The analysis shows that awareness has an important effect on voter evaluation of candidates and, consequently, on voting behavior in congressional elections. The article concludes with consideration of some salient implications of these findings for enacted or proposed changes in campaign finance policy.

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### Aggregate Effects of Campaign Spending

A number of recent studies have found that what candidates spend in legislative contests is indeed related to how well they do on election day (Palda, 1973, 1975; Welch, 1974, 1976; Dawson and Zinser, 1976). However, with few exceptions (Glantz, et al., 1977; Jacobson, 1976), these studies have assumed that campaign spending has the same consequences for incumbents and challengers alike. In particular, economic models investigating the "productivity" of campaign spending in terms of winning votes or elections have been grounded on the implicit premise that the marginal productivity of campaign expenditures is the same for all candidates (Lott and Warner, 1974; Welch, 1974; Silberman, 1976). For congressional candidates, a contrary assumption is much more defensible. The advantages of incumbency are well known. The list of perquisites and allowances senators and representatives have granted themselves is too familiar to require reiteration. Incumbents control resources easily worth several hundred thousand dollars annually (Cover, 1977; Perdue, 1977); these resources are unquestionably used to pursue reelection, if only because, for most members of Congress, the campaign never ends (Mayhew, 1974b). In light of the enormous head start therefore enjoyed by incumbents, it would be surprising indeed if campaign spending were not more important to challengers—and to other non-incumbents—than to incumbent candidates.

Evidence from the 1972 and 1974 congressional elections, to be presented in this section, holds no such surprises; it strongly supports the conclusion that what the challenger spends is an important determinant of the outcome, while spending by incumbents makes relatively little difference. Incumbents are apparently able to adjust their level of spending to the gravity of a specific challenge; they spend more when challengers spend more, less when challengers spend less. But the marginal gain in support derived from additional spending does not approach that of the challenger from an equal spending increment: the more *both* candidates spend, the better the challenger does.

The evidence for this interpretation is derived from multiple regression equations in which challenger and incumbent spending are entered, along with appropriate controls, as separate variables, so that their differing impacts are clearly displayed. An important complication is involved, however. Ordinary least squares (OLS) regression models presuppose unidirectional causality—in this case, that spending produces votes. But reciprocal causal-

ity is an equally plausible premise—and failure to take this into account is another common deficiency in the literature on campaign spending effects (Palda, 1975, being an exception). The *expectation* that a candidate will do well may bring campaign contributions. Suppose it is possible to make a rough prediction of the outcome prior to the election; if campaign contributors as "rational investors" who, other things equal, invest more in a campaign they expect to be successful (since one element of risk is smaller), contributions to candidates should increase with their probability of election (Ban-Zion and Eytan, 1974; Welch, 1974, 1977; Dawson and Zinser, 1976).

Or, from a slightly different perspective, campaign spending may help win popular support, and thus votes, but characteristics that also help to attract votes—personal charm or "charisma," political skill and experience—should also ease the job of fundraising. Candidates who are well known and who have political experience (and thus a greater likelihood of success) raise money more easily, spend it, thereby further increasing their popularity (and chances for victory), acquiring in consequence even more money, and so on—the ultimate payoff coming in the form of additional votes on election day.

The ordinary least squares regressions reported in most studies are inappropriate for estimating reciprocal relationships; a simultaneous equation system is required. OLS estimates of parameters when the true relationship is reciprocal are biased and inconsistent because endogenous variables (those which have a reciprocal effect on one another), when treated as explanatory variables, are correlated with the error term (Johnston, 1972, p. 343). The two-stage least squares (2SLS) regression procedure, a standard solution to this problem, is therefore used later in this section to estimate the effects of campaign expenditures by challengers and incumbents within a system of simultaneous relationships.

Despite its potential inadequacies, however, a straightforward OLS regression equation provides a useful starting point for determining the aggregate effects of campaign spending in congressional elections. The equation estimated for the 1972 and 1974 House elections was

$$CV = a + b_1 CE + b_2 IE + b_3 P + b_4 CPS + e \quad (1.1)$$

where

$CV$  is the challenger's percentage of the

two-party vote<sup>1</sup>

*CE* is the challenger's campaign expenditures in thousands of dollars<sup>2</sup>

*IE* is the incumbent's campaign expenditures in thousands of dollars

*P* is the challenger's party (1 if Democrat, 0 if Republican)

*CPS* is the strength of the challenger's party in the district (approximated here by the percentage of the vote won by the challenger's party's candidate in the last election for this seat)<sup>3</sup>

*a* is the intercept, the *b*'s regression coefficients, and *e* the error or disturbance term. The challenger's share of the vote is hypothesized to be a function of what the challenger and incumbent spend, the challenger's party, and the strength of that party in the district. Notice that an equivalent equation with observations on incumbents would produce estimates of the coefficients which mirror those derived from this model; either one would support the same substantive conclusions.

Since our interest is in the effects of campaign spending, variables *P* and *CPS* serve primarily as controls in this equation. The party variable accounts for national short-term forces favoring one party or another in a particular election year. District party strength is measured by the vote for the challenger's party in the most recent prior election for that seat; though far from ideal as an approximation of the expected or "normal" vote, it has the advantage over the other possible index (percentage of registrants with the challenger's party in the district) of being available for a much larger proportion of the districts. At one stage of this research I used registration percentages in place of *CPS*, and the results were essentially the same as those reported in this article, though the number of cases was halved. Both the party and party strength variables are expected to affect a candidate's ability to raise money as well as to win votes and so must be taken into account in this preliminary model.

Challenger and incumbent spending are entered as separate variables rather than as some composite (for example, the challenger's per-

centage of expenditures by both candidates) because their coefficients are not expected to be the same. The functional relationship between spending and votes is assumed to be linear. This has the advantage of simplicity but the drawback that it fails to allow for the diminishing returns that must apply to campaign spending; no candidate can get more than 100 percent of the vote, no matter how much is spent. An attractive alternative is the semilog form in which spending is entered as the natural logarithm of actual expenditures (Welch, 1976); it permits diminishing returns but does not allow them to become negative as would, for instance, a quadratic model (Silberman and Yochum, 1977).

Both the linear and semilog forms fit the data equally well; the  $R^2$ 's are identical. But the semilog model has the defect of seriously underestimating the challenger's vote at higher levels of spending; that is, it provides estimates which exaggerate the extent to which returns diminish as spending increases. Examination of the residuals (a residual is, in this case, the difference between the percent of votes actually won by the challenger and that predicted by the regression equation) showed this to be the case. The problem is illustrated by comparing the actual number of winning challengers in both election years with the number predicted by the linear and semilog equations:

Winning Challengers	1972	1974
Actual number <sup>4</sup>	9	39
Number predicted by:		
Linear equation	5	29
Semilog equation	1	2

The linear equation exaggerates the expected vote of challengers at higher levels of spending, but inspection of the residuals indicates that this is not a significant problem until the challenger's spending exceeds \$160,000, which occurs in less than 2 percent of the cases in either election year; at this level of spending the equations are less likely to overpredict the number of winning challengers than they are to overstate the size of the challenger's victory. I

<sup>1</sup>The election results are from Scammon (1975).

<sup>2</sup>The 1972 data are from Common Cause (1972); the 1974 data are from *Congressional Quarterly* (1975, pp. 789-96).

<sup>3</sup>The data source is *Congressional Quarterly* (1974b). Previous vote percentages have been adjusted in these data for changes in district boundaries where redistricting has occurred.

<sup>4</sup>Actually 13 incumbents lost in 1972, but three of them were defeated by other incumbents they were forced to run against because of reapportionment and a fourth lost a three-way race running as an independent. Forty incumbents lost in 1974, but one of these had just been elected in a special election and no separate spending figures were available for the second contest.

therefore chose to present the linear equations, but the reader should be aware that a comparable analysis with semilog equations would uphold the substantive conclusions defended below. The regression estimates of equation 1.1 are reported in Table 1.<sup>5</sup>

According to the equations in Table 1, it is clearly the challenger's level of spending that has the greatest impact on the outcome of these elections; challengers are expected to gain a little over 1 percent of the vote for every \$10,000 they spend. Incumbent spending apparently makes much less difference. The simple correlation between incumbent expenditures and the challenger's vote is in fact positive (.39 for 1972, .46 for 1974); ignoring other factors, *the more incumbents spend, the worse they do*. With the challenger's spending controlled, the incumbent's spending has a weak negative effect on the challenger's vote; its coefficient is not statistically significant in the 1972 equation. This implies that incumbents are able to expand their financial resources in response to a serious challenge (represented by the challenger's level of spending), but that this additional spending either does them little good or at best does not begin to match the much greater benefit challengers derive from an equivalent increase.

The evidence that incumbents are able to adjust their spending to the gravity of the challenge is convincing. Regression of incum-

bent expenditures on a variety of explanatory variables shows that the challenger's level of spending has by far the greatest explanatory power. The equation estimated was:

$$IE = a + b_1CE + b_2P + b_3CPS + b_4IP + b_5YRS + b_6PO + b_7L + e \quad (2.1)$$

where

*IP* is 1 if the incumbent ran in a primary election, 0 otherwise

*YRS* is the number of consecutive years the incumbent has been in the House

*PO* is 1 if the challenger has previously held elective office, 0 otherwise<sup>6</sup>

*L* is 1 if the incumbent is chair or ranking member of a subcommittee or holds a higher leadership position, 0 otherwise

and *IE*, *CE*, *P*, *CPS*, and the coefficients are as defined for equation 1.1. The results appear in Table 2. Obviously, the challenger's spending is the most important explanatory variable in these equations. And the other variables work as expected on the assumption that incumbents spend in response to the gravity of the electoral challenge. For example, incumbents spend more if the challenger has held elective office, or—in 1974—if the challenger was a Democrat; they spend less, other things being equal, the longer they have been in office. But all of these variables would be expected to show *opposite* signs if the equations estimated the incumbent's capacity to *raise* money according to political assets and likelihood of reelection.

<sup>6</sup>From information in *Congressional Quarterly* (1972 and 1974a).

Table 1. The Effects of Campaign Spending in the 1972 and 1974 House Elections (OLS): Equation 1.1

		Regression Coefficient	<i>t</i> -ratio <sup>a</sup>	Standardized Regression Coefficient	
1972 (N=296)	<i>CV</i> = <i>a</i>	20.7			
	<i>b</i> <sub>1</sub> <i>CE</i>	.112	9.42	.51	
	<i>b</i> <sub>2</sub> <i>IE</i>	-.002	-.14	-.01	<i>R</i> <sup>2</sup> = .49
	<i>b</i> <sub>3</sub> <i>P</i>	-.47	-.61	-.03	
	<i>b</i> <sub>4</sub> <i>CPS</i>	.299	6.94	.33	
1974 (N=319)	<i>CV</i> = <i>a</i>	15.6			
	<i>b</i> <sub>1</sub> <i>CE</i>	.121	10.45	.48	
	<i>b</i> <sub>2</sub> <i>IE</i>	-.028	-2.34	-.11	<i>R</i> <sup>2</sup> = .65
	<i>b</i> <sub>3</sub> <i>P</i>	9.78	11.19	.42	
	<i>b</i> <sub>4</sub> <i>CPS</i>	.351	7.75	.28	

<sup>a</sup>Given the degrees of freedom in these equations, a *t*-ratio of at least 1.98 is necessary for a .05 level of significance, 2.58 for .01, and 3.35 for .001.

Even more to the point, the *difference* in spending between 1972 and 1974 by incumbents who ran and were opposed in both campaigns is an almost identical function of the difference in spending by their opponents in the two elections. This is apparent from an estimate of

$$(IE_{74} - IE_{72}) = a + b_1(CE_{74} - CE_{72}) + b_2IE_{72} + b_3CE_{72} + b_4IP_{72} + b_5IP_{74} + b_6P + e \quad (3.1)$$

where the variables and coefficients are as defined for equations 1.1 and 2.1 and the subscripts on the variables indicate the election year. The results are shown in Table 3. If the controls for primary elections, party, and 1972 spending by both candidates are omitted, the

relationship between the change in challenger spending and the change in incumbent spending scarcely varies. The regression coefficient becomes .505, its *t*-ratio 13.23, and its standardized regression coefficient .61.

Incumbents apparently increase or decrease their spending in reaction to changes in the amount spent by opponents. Any increase, however, does not counterbalance benefits to the challenger from the spending that inspired it in the first place. The difference in spending levels by incumbents between 1972 and 1974 is negatively correlated (-.58) with the differences in the proportion of votes won by the incumbent in the two elections. A significant negative relationship remains even when changes in the challenger's spending are taken into account.

Table 2. Determinants of Spending by Incumbents in the 1972 and 1974 House Elections: Equation 2.1

		Regression Coefficient	<i>t</i> -ratio <sup>a</sup>	Standardized Regression Coefficient	
1972 (N=296)	<i>IE</i> = <i>a</i>	28.08			
	<i>b</i> <sub>1</sub> <i>CE</i>	.522	10.33	.54	<i>R</i> <sup>2</sup> = .39
	<i>b</i> <sub>2</sub> <sup>2</sup> <i>P</i>	3.31	.87	.04	
	<i>b</i> <sub>3</sub> <sup>2</sup> <i>CPS</i>	.224	1.05	.06	
	<i>b</i> <sub>4</sub> <sup>2</sup> <i>IP</i>	10.50	2.69	.13	
	<i>b</i> <sub>5</sub> <sup>4</sup> <i>YRS</i>	-.789	-2.69	-.15	
	<i>b</i> <sub>6</sub> <sup>2</sup> <i>PO</i>	3.10	.69	.03	
	<i>b</i> <sub>7</sub> <sup>6</sup> <i>L</i>	.89	.14	.01	
1974 (N=319)	<i>IE</i> = <i>a</i>	14.11			
	<i>b</i> <sub>1</sub> <i>CE</i>	.495	10.30	.51	<i>R</i> <sup>2</sup> = .47
	<i>b</i> <sub>2</sub> <sup>2</sup> <i>P</i>	12.69	2.88	.14	
	<i>b</i> <sub>3</sub> <sup>2</sup> <i>CPS</i>	.673	3.05	.14	
	<i>b</i> <sub>4</sub> <sup>2</sup> <i>IP</i>	.10	.02	.00	
	<i>b</i> <sub>5</sub> <sup>2</sup> <i>YRS</i>	-.035	-.11	-.01	
	<i>b</i> <sub>6</sub> <sup>2</sup> <i>PO</i>	6.79	1.45	.07	
	<i>b</i> <sub>7</sub> <sup>2</sup> <i>L</i>	-12.50	-2.00	-.10	

<sup>a</sup>See Table 1.

Table 3. Determinants of Changes in Spending by House Incumbents Between 1972 and 1974: Equation 3.1

		Regression Coefficient	<i>t</i> -ratio <sup>a</sup>	Standardized Regression Coefficient	
(N=295) ( <i>IE</i> <sub>74</sub> - <i>IE</i> <sub>72</sub> ) = <i>a</i>	<i>a</i>	28.92			
	<i>b</i> <sub>1</sub> ( <i>CE</i> <sub>74</sub> - <i>CE</i> <sub>72</sub> )	.491	11.73	.60	<i>R</i> <sup>2</sup> = .63
	<i>b</i> <sub>2</sub> <i>IE</i> <sub>72</sub>	-.454	-11.96	-.58	
	<i>b</i> <sub>3</sub> <i>CE</i> <sub>72</sub>	.398	7.73	.43	
	<i>b</i> <sub>4</sub> <i>IP</i> <sub>72</sub>	-8.24	-2.35	-.09	
	<i>b</i> <sub>5</sub> <i>IP</i> <sub>74</sub>	-1.35	-.39	-.01	
	<i>b</i> <sub>6</sub> <sup>2</sup> <i>P</i>	-13.14	-3.54	-.15	

<sup>a</sup>See Table 1.

Of the 39 incumbents who lost in 1974, 34 (87 percent) spent more in losing than they did in winning in 1972. The mean expenditure for all incumbents who ran and were opposed in both elections was \$61,799 in 1972 and \$63,609 in 1974, an increase of 3 percent. The mean expenditure of the 1974 losers was \$69,218 in 1972 and \$101,645 in 1974, a 47 percent increase. Most were of course Republicans. But in a year electorally disastrous for Republicans and financially hopeless for Republican *challengers* (1974 Democratic challengers spent an average of \$59,352, Republican challengers \$21,463), Republican *incumbents* actually outspent Democratic incumbents by, on the average, about \$35,000 (\$81,437 to \$46,261). Despite the extraordinarily hostile political environment, Republican incumbents were able to increase their spending by almost 55 percent over the previous election; spending by Democrats actually decreased.

Since the circumstances of the 1974 election were rather unusual, evidence from other elections would be pertinent. Unfortunately, 1972 is the first election for which reasonably complete data on spending in House election are available. However, for both 1970 and 1972 data have been published on spending for radio and television time by House candidates in the general election campaign, so some comparisons are possible. In 1970 the losing incumbents spent an average of \$9,628 on radio and television; winning incumbents spent an average of \$4,572. The comparable figures for 1972 are \$16,220 and \$5,727, respectively. Mean expenditures for broadcast time grew from \$4,738 to \$6,097 for all incumbents between 1970 and 1972, an increase of 27 percent; the same expenditures for incumbents who ran and were opposed in both years and who lost in 1972 went from \$8,696 to \$16,220, an increase of 87 percent.<sup>7</sup>

The point is clear—and fundamental to comprehending the role of money in congressional elections. Incumbents are evidently able to raise and spend money in direct proportion to the perceived necessity to do so, this being a function of the gravity of the electoral threat posed by the opposition. None of the contribution or demand functions previously estimated for models of campaign finance processes have taken this into account (Bental, Ben-Zion, and Moshel, 1976, 1977; Dawson and Zinser, 1976; Silberman and Yochum, 1977; Welch, 1977);

they therefore require respecification.

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The argument that reactive spending by incumbents does not offset the gains accruing to challengers from the spending that inspired the reaction is based, in part, on possibly unreliable OLS estimates. A more complete model of the money-vote relationship postulates a reciprocal connection between these variables:

$$CE = f(P, CPS, PO, YRS, CP, EV) \quad (4.1)$$

$$IE = f(P, CPS, PO, YRS, IP, EV, CE) \quad (4.2)$$

$$CV = f(CE, IE, PO, CPS) \quad (4.3)$$

$$EV \cong CV \quad (4.4)$$

The variables are as defined for the previous equations, with the addition of *CP* (1 if the challenger ran in a primary election, 0 if not) and *EV*, the challenger's expected vote.

Equation 4.1 hypothesizes that the challenger's ability to attract contributions is, to begin with, a function of the challenger's party (consider 1974) and district party strength (measured, remember, as the proportion of votes won by the party's candidate for the seat the last time around; it may also be interpreted here as an indicator of the vulnerability of the incumbent). The variable *PO* measures the effects of prior electoral success, and the exposure, experience, and contacts that come with holding elective office, on the ability to raise campaign funds. The number of years the incumbents has held office is another indicator of vulnerability, this affecting the attractiveness of the challenger as an "investment."

Since the data do not include separate figures for primary and general elections, *CP* (and *IP* in the second equation) is included to pick up the differences in spending brought about by the demands of a primary contest. There is no way to determine accurately how much of a candidate's money was spent in the primary. This is not so troublesome as it may seem. Challengers spend as much as they can raise anyway. Their principal problem is to make themselves known to voters, and this can be done as effectively in a primary as in a general election campaign (Jacobson, 1976); primary election spending should therefore have general election payoffs. And incumbents spend according to what the challenger does. We do not, therefore, expect particularly dramatic changes in spending levels if a candidate does or does not contest a primary. But

<sup>7</sup>Data upon which these figures are based are from United States Congress (1971 and 1973).

coefficients on these variables will give some indication of the degree to which primaries do affect spending.

Finally, challengers are expected to attract contributions in proportion to their probability of being elected, which is here approximated by their expected vote, itself of course related to the actual vote.

Interpretation of the equation for incumbent spending is quite different. Incumbent spending is *not* a positive function of the likelihood of victory at all; rather, the more certain they are of election, the less incumbents spend. This does not mean that rational investors deliberately ignore them—who would not want to invest in a sure thing?—or that they could not raise a great deal more money if they wished. The explanation is simply that incumbents sure of victory feel no need for the money that is available. Soliciting and accepting contributions is hardly something politicians enjoy. Hubert Humphrey called it “a disgusting, degrading, demeaning experience,” and others have echoed his sentiments (Adamany and Agree, 1975, p. 8). Indeed, this may be the major reason many members of Congress currently favor public funding of congressional campaigns.

Incumbents, then, acquire funds only in proportion to the felt necessity to do so. And they can usually get all they need. The variables that determine incumbent spending, therefore, indicate how much the candidate is likely to need. And this, in turn, is primarily a function of the strength of the challenger. Since the challenger’s strength is indicated in good measure by financial resources, *CE* belongs in equation 4.2 as an explanatory variable. The measure of incumbent expenditures, *IE*, does not similarly belong in the challenger’s expenditure equation; challengers are not able to raise money at will to contest an incumbent who may be spending a great deal. Rather, they spend all they can (at least up to very large amounts) independently of what the incumbent is spending.

The other variables in the incumbent’s spending equation can be interpreted in the same way; they determine how threatened incumbents are likely to feel and therefore how much they find it prudent to raise and spend.

The third equation is of course the one originally estimated by OLS. The other exogenous variables (those determined *outside* the equation system) are left out on the theoretical premise that they affect *CV* only indirectly (through their effect on spending); empirically, these variables had no statistically significant connection with the election outcomes with the

other variables controlled. Since *CV* is approximated with some significant degree of accuracy by *EV* (equation 4.4), the OLS estimates are liable to bias and inconsistency and thus are unreliable estimates of the structural parameters (those of the true causal relationships in equation 4.3). A standard solution to this difficulty is the two-stage least squares procedure. The first step is to regress challenger and incumbent spending on all of the exogenous variables in the system. The equations to be estimated are:

$$CE^* = a + b_1P + b_2CPS + b_3PO + b_4YRS + b_5CP + b_6IP + e \quad (5.1)$$

$$IE^* = a + b_1P + b_2CPS + b_3PO + b_4YRS + b_5CP + b_6IP + e. \quad (5.2)$$

The estimated parameters are then used to compute *CE\** and *IE\** for each observation, and these variables replace *CE* and *IE* in the second stage equation,

$$CV = a + b_1CE^* + b_2IE^* + b_3P + b_4CPS + e. \quad (5.3)$$

The 2SLS procedure “purges” the explanatory variables *CE\** and *IE\** of the component associated with the error term. The resulting estimates are still biased estimates of the true structural parameters but are now consistent; the bias decreases as the sample size increases, approaching zero in the limit (Rao and Miller, 1971, p. 214; Johnston, 1972, pp. 380–84). The estimates of equations 5.1, 5.2, and 5.3 appear in Table 4.

The 2SLS results recapitulate the OLS findings in one very important respect: a given amount of campaign spending does not have the same consequence for challengers and incumbents. Spending by challengers has a much more substantial effect on the outcome of the election even with simultaneity bias purged from the equation. Indeed, the regression coefficients on *CE\** are larger than those for *CE*. However, the *standardized* regression coefficients for *CE\** are smaller than those for *CE* (.36 compared to .51 for 1972, .38 compared to .48 for 1974); the steeper slopes are evidently an artifact of the much smaller range of the instrumental variable *CE\**, less than half that of *CE* in both election sets. Even so, OLS does not appear to greatly exaggerate the effects of the challenger’s spending, nor does it substantially underestimate the effects of incumbent spending.



Table 4. The Effects of Campaign Spending in the 1972 and 1974 House Elections (2SLS):  
Equations 5.1, 5.2, and 5.3

		Regression Coefficient	<i>t</i> -ratio <sup>a</sup>	Standardized Regression Coefficient	
1972 (N=296)					
First-Stage Equations	<i>CE*</i> = <i>a</i>	-17.56			
	<i>b</i> <sub>1</sub> <i>P</i>	-11.34	-2.60	-.14	
	<i>b</i> <sub>2</sub> <i>CPS</i>	1.39	5.92	.34	
	<i>b</i> <sub>3</sub> <i>PO</i>	21.20	4.18	.23	<i>R</i> <sup>2</sup> = .23
	<i>b</i> <sub>4</sub> <i>YRS</i>	-.40	-1.36	-.07	
	<i>b</i> <sub>5</sub> <i>CP</i>	8.28	1.96	.10	
	<i>b</i> <sub>6</sub> <i>IP</i>	1.92	.42	.02	
	<i>IE*</i> = <i>a</i>	18.23			
	<i>b</i> <sub>1</sub> <i>P</i>	-2.86	-.66	-.04	
	<i>b</i> <sub>2</sub> <i>CPS</i>	.93	3.95	.23	
	<i>b</i> <sub>3</sub> <i>PO</i>	13.40	2.64	.15	<i>R</i> <sup>2</sup> = .18
	<i>b</i> <sub>4</sub> <i>YRS</i>	-.99	-3.36	-.19	
	<i>b</i> <sub>5</sub> <i>CP</i>	8.85	2.10	.12	
	<i>b</i> <sub>6</sub> <i>IP</i>	10.73	2.34	.13	
Second-Stage Equations	<i>CV</i> = <i>a</i>	22.3			
	<i>b</i> <sub>1</sub> <i>CE*</i>	.163	2.59 <sup>b</sup>	.36	
	<i>b</i> <sub>2</sub> <i>IE*</i>	-.051	-.89	-.10	<i>R</i> <sup>2</sup> = .46 <sup>b</sup>
	<i>b</i> <sub>3</sub> <i>P</i>	-.01	-.01	-.00	
	<i>b</i> <sub>4</sub> <i>CPS</i>	.269	3.55	.30	
1974 (N=319)					
First-Stage Equations	<i>CE*</i> = <i>a</i>	-16.03			
	<i>b</i> <sub>1</sub> <i>P</i>	28.15	5.40	.31	
	<i>b</i> <sub>2</sub> <i>CPS</i>	1.07	4.25	.22	
	<i>b</i> <sub>3</sub> <i>PO</i>	21.00	3.89	.20	<i>R</i> <sup>2</sup> = .29
	<i>b</i> <sub>4</sub> <i>YRS</i>	-.19	-.58	-.03	
	<i>b</i> <sub>5</sub> <i>CP</i>	3.77	.77	.04	
	<i>b</i> <sub>6</sub> <i>IP</i>	-3.16	-.66	-.03	
	<i>IE*</i> = <i>a</i>	6.15			
	<i>b</i> <sub>1</sub> <i>P</i>	22.55	4.40	.25	
	<i>b</i> <sub>2</sub> <i>CPS</i>	1.23	4.94	.26	
	<i>b</i> <sub>3</sub> <i>PO</i>	17.00	3.19	.17	<i>R</i> <sup>2</sup> = .28
	<i>b</i> <sub>4</sub> <i>YRS</i>	-.42	-1.31	-.07	
	<i>b</i> <sub>5</sub> <i>CP</i>	7.37	1.53	.08	
	<i>b</i> <sub>6</sub> <i>IP</i>	-2.30	-.49	-.02	
Second-Stage Equation	<i>CV</i> = <i>a</i>	17.1			
	<i>b</i> <sub>1</sub> <i>CE*</i>	.179	1.21 <sup>b</sup>	.38	
	<i>b</i> <sub>2</sub> <i>IE*</i>	-.022	-.14	-.05	<i>R</i> <sup>2</sup> = .63 <sup>b</sup>
	<i>b</i> <sub>3</sub> <i>P</i>	7.51	4.20	.32	
	<i>b</i> <sub>4</sub> <i>CPS</i>	.264	2.94	.21	

<sup>a</sup>See Table 1.

<sup>b</sup>The *R*<sup>2</sup>s and *t*-ratios for the second-stage equations are adjusted figures; they cannot be computed directly from the second stage regression runs.<sup>8</sup>

The parameters estimated in the second-stage equations indicate that challengers receive 1.63 percent to 1.79 percent of the vote for

each \$10,000 they spend; they are expected to lose between 0.51 percent and 0.22 percent for each \$10,000 the incumbent spends; therefore,

<sup>8</sup>The *R*<sup>2</sup>'s and the *t*-ratios for the second stage equations are not taken directly from the statistics produced by estimating these equations. Rather, they are found by replacing the standard error of the estimate from the equation as computed by a standard

error computed from a combination of the 2SLS parameters with the actual spending variables *CE* and *IE* replacing *CE\** and *IE\**. I am obliged to John Ferejohn for explaining this procedure to me.

if spending by *both* candidates increases by this amount, the net gain for challengers should approximate at least 1 percent of the vote. These equations also show (as did the OLS equations) that it was very advantageous to be a Democrat in 1974 (it was worth an additional 7.5 percent of the vote), whereas in 1972 the candidate's party made no difference. And they indicate that the challenger's district party strength also contributes significantly to the share of the vote won.

One troubling aspect of these equations is that in both election sets  $CE^*$  and  $IE^*$  are very highly correlated. The reason for this is clear from the first-stage equations; the variables seem to have similar effects on the spending levels of both candidates. This is of course as it should be, if incumbent spending is basically a reflection of challenger spending, as I have been arguing. But it raises the problem of multicollinearity. Multicollinearity destroys the precision of the estimates; notice that the coefficient for  $CE$  in the 1974 equation is not statistically significant by the usual criterion (a  $t$ -ratio of 1.98 or larger). According to Johnston (1972, p. 163), a very large positive correlation between two explanatory variables is likely to produce large and opposite errors in the estimates of regression coefficients.

Under these circumstances it is useful to run the second-stage equations excluding one of the correlated variables. Estimates of the equations omitting  $IE^*$  are found in Table 5. The coefficients for  $CE^*$  decrease somewhat, as anticipated. But the precision of the estimates increases, especially in the 1974 equation. If  $IE^*$  were left in the equations instead, this variable would also show a strong positive relationship to the challenger's share of the

vote;  $IE^*$ , like  $IE$ , has a significantly positive simple correlation with  $CV$  (the adjusted figures are .51 for 1972 and .78 for 1974).

Some further comments on the first-stage equations are in order. Spending by both challengers and incumbents changes by approximately \$1,000 for a change of 1 percent in the vote won by the challenger's party in the last election. Challengers who have won political office before spend an average of about \$21,000 more than those who have not; incumbents also spend more against these candidates. These two variables make the most difference. The advantages of being the incumbent are clear; notice the intercepts. So are the advantages of being a Democrat in 1974. The  $R^2$ 's for these equations are not as large as would be desirable; a number of other explanatory variables were tested in earlier stages of the research, but none of them improved any of the equations significantly. The criterion for inclusion, other than theoretical plausibility, was that a variable had to have a regression coefficient at least twice its standard error in at least one of the equations.

Before proceeding to develop an explanation of these results, it will be instructive to consider the effects of campaign spending on the electoral fortunes of candidates running in contests in which neither is an incumbent. The OLS regression estimates of the relationship for Democratic candidates (had Republican candidates been chosen instead, the results would have formed a mirror image of those reported) appear in Table 6; the party variable has of course been omitted, the  $CE$ ,  $IE$ , and  $CPS$  are replaced by  $DE$  (the Democrat's spending in thousands of dollars),  $RE$  (the Republican's

Table 5. The Effects of Challengers' Campaign Spending in the 1972 and 1974 House Elections (2SLS): Equation 5.3 Omitting  $IE^*$

		Regression Coefficient	$t$ -ratio <sup>a</sup>	Standardized Regression Coefficient	
1972 (N=296)	$CV = a$	20.8			$R^2 = .49^b$
	$b_1CE^*$	.117	3.42 <sup>b</sup>	.26	
	$b_3P$	-.41	-.48	-.02	
	$b_4CPS$	.289	4.07	.32	
1974 (N=319)	$CV = a$	16.7			$R^2 = .62^b$
	$b_1CE^*$	.160	3.60 <sup>b</sup>	.34	
	$b_3P$	7.53	4.21	.32	
	$b_4CPS$	.257	3.49	.21	

<sup>a</sup>See table 1.

<sup>b</sup>See table 4.

spending), and *DPS* (Democratic party strength—measured like *CPS*) in these equations.

The results for 1972 are as we should anticipate. The marginal effects of spending are similar for both candidates; the Democrat's own spending helps, that of the Republican does the opposite. For 1974, however, notice that the Republican candidate's spending makes a much greater difference in the outcome than does that of the Democrat, which is perversely signed and is not significantly related to the outcome at all. In other words, Republican candidates in 1974 were affected by spending in a way we would expect if they were, instead, challenging incumbents. But this is not so surprising. Given the post-Watergate political atmosphere, poisonous for Republicans, Republican candidates found themselves in the heavily disadvantaged position usually reserved for challengers regardless of whether or not the Democrat was really an incumbent. Campaign spending is evidently most useful to candidates suffering severe electoral handicaps, no matter what the source.

All of the foregoing refers to House contests. Analysis of Senate elections will be much briefer. The regression model which clearly fits the data best is the semilog form:

$$CV = a + b_1 \ln CEPC + b_2 \ln IEPC + b_3 P + e \quad (6.1)$$

where

*lnCEPC* is the natural log of the challenger's expenditures in cents per voting-age individual<sup>9</sup>

<sup>9</sup>The voting age populations of the states are from United States Congress (1974, p. 18542 and 1977, p. 835).

*lnIEPC* is the natural log of the incumbent's expenditures in cents per voting-age individual

and the other variables and coefficients are as defined for equation 1.1. Actual spending was divided by the voting-age population of the state in recognition of the widely varying state populations. No measure of party strength was included in the equation because in no model tested did this variable (measured by an index similar to Kostroski's base party vote<sup>10</sup>) show any significant connection with Senate election outcomes. The results of this analysis are found in Table 7. They are somewhat more ambiguous than the results for House elections. The challenger's spending does appear to have a greater impact, but for 1972 the difference is not large, and in both years the incumbent's spending was negatively related to the challenger's share of the vote. The simple correlation between incumbent spending and the challenger's vote was  $-.17$  for 1972 and  $.48$  for 1974, again a mixed outcome.

The 2SLS technique was also attempted with Senate data; for 1972 the first-stage equations explained so little of the variance that even remotely trustworthy 2SLS estimates were out of the question. Estimates were obtained for 1974; they were almost identical to the OLS estimates. The tentative conclusion suggested by these findings is that the challenger's expenditures are more effective in Senate elections, too, but incumbent senators benefit from their own spending to a greater degree than do their counterparts in the House.

<sup>10</sup>The index of state party strength was computed as the smallest proportion of the total statewide House vote won in aggregate by House candidates of the Senate candidate's party in any election year from 1968 to 1974. See Kostroski (1973).

Table 6. The Effects of Campaign Spending in the 1972 and 1974 House Elections for Open Seats (OLS)

		Regression Coefficient	t-ratio <sup>a</sup>	Standardized Regression Coefficient	
1972 (N=52)	<i>DV = a</i>	34.7			
	<i>b</i> <sub>1</sub> <i>DE</i>	.045	2.56	.31	<i>R</i> <sup>2</sup> = .46
	<i>b</i> <sub>2</sub> <i>RE</i>	-.077	-2.84	-.34	
	<i>b</i> <sub>4</sub> <i>DPS</i>	.308	4.15	.47	
1974 (N=53)	<i>DV = a</i>	51.4			
	<i>b</i> <sub>1</sub> <i>DE</i>	-.002	-.10	-.01	<i>R</i> <sup>2</sup> = .59
	<i>b</i> <sub>2</sub> <i>RE</i>	-.130	-5.07	-.54	
	<i>b</i> <sub>4</sub> <i>DPS</i>	.328	3.95	.41	

<sup>a</sup>Given the degrees of freedom in these equations, a t-ratio of at least 2.01 is necessary for a .05 level of significance, 2.68 for .01, and 3.50 for .001.

**Campaign Spending and Candidate Familiarity**

An attractive theoretical explanation for the findings reported in the first section begins with the observation that incumbents are already familiar to voters at the outset of the campaign, whereas nonincumbents probably are not. The resources of office provide ample means for acquiring voter recognition and, beyond that, building a favorable reputation (Cover, 1977; Abramowitz, 1975). Additional information on incumbents disseminated during the campaign should have less impact on an electorate which has already been subjected to a barrage of messages from the candidate. Nonincumbents normally have much more to gain in the way of voter awareness in the course of the campaign, implying that the more extensive—and therefore expensive—the campaign, the better known they will become.

Voter recognition appears to be an important component of electoral success. The

pioneering work of Stokes and Miller (1962) showing the connection between voter awareness of House candidates and the frequency of partisan defection in 1958 has been reinforced by studies of more recent House elections (Arsenau and Wolfinger, 1973). The effects of differential awareness of candidates on partisan voting patterns in the 1972 and 1974 House elections and the 1974 Senate elections (which will provide the data base for this section) are shown in Table 8. The candidate familiarity question was asked about Senate candidates for the first time in 1974; notice that partisan voters respond to differential awareness of Senate candidates in essentially the same way as to differential awareness of House candidates.<sup>11</sup>

<sup>11</sup>The candidate-recognition questions, coded as variables 2174, 2175, and 2176 of the 1974 SRC Survey, were "Now let's talk about the campaign for Senator. Do you remember what the candidates' names were? What were they?" (Miller, Miller, and Kline, 1975, pp. 103-05).

**Table 7. The Effects of Campaign Spending in the 1972 and 1974 Senate Elections (OLS): Equation 6.1**

		Regression Coefficient	t-ratio <sup>a</sup>	Standardized Regression Coefficient	
1972 (N=25)	CV = a	41.8			R <sup>2</sup> = .47
	b <sub>1</sub> lnCEPC	5.55	4.15	.78	
	b <sub>2</sub> lnIEPC	-4.81	-2.77	-.49	
	b <sub>3</sub> P	2.49	.81	.14	
1974 (N=22)	CV = a	35.4			R <sup>2</sup> = .81
	b <sub>1</sub> lnCEPC	3.77	3.69	.78	
	b <sub>2</sub> lnIEPC	-1.39	-.98	-.20	
	b <sub>3</sub> P	8.26	5.18	.55	

<sup>a</sup>Given the degrees of freedom in these equations, a t-ratio of at least 2.08 is necessary for a .05 level of significance, 2.85 for .01, and 3.85 for .001.

**Table 8. The Effects of Awareness of the Candidates on Partisan Defection in House and Senate Elections**

Percent Who Defected in:	Voter Was Aware of:			
	Both Candidates	Own Candidate	Other Candidate	Neither Candidate
<b>House Elections</b>				
1972	23 (151) <sup>a</sup>	7 (100)	62 (26)	21 (242)
1974	29 (281)	1 (154)	58 (79)	15 (374)
<b>Senate Elections</b>				
1974	25 (317)	2 (138)	62 (87)	10 (205)

<sup>a</sup>Number of cases from which percentages were computed. The 1974 sample is weighted.

Source: The 1972 and 1974 SRC surveys.

The same data provide information on the advantage in voter recognition typically enjoyed by incumbents over their challengers. Table 9 lists the proportion of voters in the sample able to remember a candidate's name according to the candidate's incumbency status. The incumbent's advantage here is clear. And Senate candidates are better known, in general, than House candidates, hardly a counterintuitive discovery. A much more telling point can be made if information from both tables is combined: in those instances in which the contest is between an incumbent and a challenger and only one of the candidates is known, that candidate is the incumbent 96 percent of the time in all three election sets. When the effects of awareness are most pronounced, the advantage is almost entirely to the incumbent.

Challengers and other nonincumbents clearly have more to gain by vigorous campaigning. In general, then, the more nonincumbents spend, the greater should be their saliency. Spending by incumbents should, by comparison, have a weaker effect on how well they are known. This, if true, would provide an explanatory link between the observed aggregate effects of campaign spending by incumbents and challengers and the survey findings on voting behavior in congressional elections.

The relationship between campaign spending and candidate saliency may, of course, also involve reciprocal causation. Candidates who are well known are able to raise more money, which, spent judiciously, increases their renown even further. If this is the case, a model of these relationships should consist of two simultaneous equations with two endogenous variables. Theoretically, candidate saliency is expected to be a function of campaign spending

plus some exogenous variables, while campaign spending is, in turn, a function of candidate saliency and some exogenous variables. Identification of the equations (and thus the possibility of estimating their parameters) depends on the available exogenous variables and the assumptions that can be made about them. Consider a preliminary specification:

$$CR = a + b_1E + b_2PO + c_1 \dots s X_1 \dots s + e \tag{7.1}$$

$$E = a + b_1CR + b_2PO + b_3NPS + b_4NI + e \tag{7.2}$$

where

*CR* is candidate recall, measured as 1 if the respondent remembers the candidate's name, 0 otherwise<sup>12</sup>

*E* is the nonincumbent candidate's campaign expenditures (in thousands of dollars)

*PO* is 1 if the candidate has previously held elective office, 0 otherwise

*NPS* is the strength of the nonincumbent candidate's party in the constituency (measured as was *CPS* in the first section)

*NI* is 1 if the nonincumbent is running against another nonincumbent, 0 if opposing an incumbent

*X*<sub>1 . . . 5</sub> are respondent variables: social class, education, attentiveness to the mass media, political interest, and whether or not the respondent shares the candidate's partisan affiliation.<sup>13</sup>

<sup>12</sup>The data are from the SRC surveys for 1972 and 1974; the 1974 sample is weighted.

<sup>13</sup>The construction of these variables is reported in Jacobson (1976).

Table 9. Percent of Voters Aware of Candidates by Incumbency Status

	Percent of Voters Recalling Name of Candidates Who Were:		
	Incumbents	Challengers	Neither (Open Seat)
House Elections			
1972	50 (498) <sup>a</sup>	27 (498)	41 (220)
1974	57 (856)	31 (856)	35 (374)
Senate Elections			
1974	73 (595)	44 (595)	54 (428)

<sup>a</sup>Number of cases from which percentages were computed. The 1974 sample is weighted.

Source: The 1972 and 1974 SRC surveys.

The  $a$ 's are intercepts, the  $b$ 's and  $c$ 's regression coefficients, and the  $e$ 's the error terms.

The reasoning underlying this specification should be apparent. Observations on all nonincumbents, not merely challengers, can be included because, theoretically, spending should affect popular awareness of all nonincumbent candidates in about the same way. The small quantity of empirical evidence available suggests that it does (Jacobson, 1976). This also augments the number of observations, particularly at the upper end of the expenditure scale. Whether or not respondents remember names of candidates depends on how much candidates spend, their prior political exposure, and characteristics of the respondents themselves.

Candidates' spending levels depend on how well they are known, their prior political experience, which party they belong to (especially important in a year like 1974), the strength of that party in their districts, and whether or not they are running against incumbents. The variables  $P$ ,  $NPS$ , and  $NI$  are expected to affect the ability to raise money—primarily because they are closely related to presumed chances of victory—but should not, in theory, affect the likelihood that a voter will recognize a candidate independently of the voter's individual partisan orientation. Equation 7.2 is similar to equation 5.1 in the first section;  $NI$  replaces  $YRS$  as one measure of the effects of incumbency (necessarily because not all nonincumbents are challengers), and the primary election variables are dropped because they had no statistically significant effect in any of the regressions examined.

Both equations are identified (overidentified, in fact), but this specification is unsatisfactory. The first equation involves a categorical dependent variable and therefore raises some difficulties to be addressed shortly. Before we proceed to that, we will find it helpful to simplify the equation. The first simplification is to ignore the respondent variables  $X_1 \dots 5$ . Although some of these variables are indeed related to the likelihood that the respondent will remember a candidate's name,<sup>14</sup> none is correlated with the other independent variables as high as .1, so their omission should not affect the regression coefficients of those vari-

ables (Kmenta, 1971, pp. 392–95). Furthermore, we can assume that  $b_2 = 0$  in equation 7.1. Although on theoretical grounds we might expect that candidates who have held prior political office would have a greater probability of being known by voters, empirically this does not seem to be true. If spending is taken into account, the relationship between this variable and candidate recognition, weak to begin with, disappears.<sup>15</sup>

Even though the dependent variable in equation 7.1 actually takes only two values, 1 and 0, the equation can be interpreted as estimating the conditional probability that a respondent remembers a candidate's name. A problem is that least squares estimates of the parameters may predict values of more than 1.0 or less than 0.0 for this probability for some observations. In addition, the error term cannot have a zero expectation, invalidating one of the assumptions required for unbiased least squares estimation (Theil, 1971, pp. 632–33). Logit analysis avoids these difficulties. The odds on a voter's knowing a candidate are defined as  $P_{cr}/(1-P_{cr})$ , where  $P_{cr}$  is the probability that a voter knows the candidate. This term can take any value from zero to infinity; a logarithmic transformation of the term,  $\ln(P_{cr}/(1-P_{cr}))$ , restricts the possible values of  $P_{cr}$  to a range of from 0 to 1 as the transformed term varies from minus infinity to plus infinity (Theil, 1971, p. 632). The transformed term, designated  $L_{cr}$ , replaces  $CR$  in equation 7.1.

In order to get observations for  $P_{cr}$  it is necessary to group the survey observations and estimate  $P_{cr}$  as  $F_{cr}$ , the proportionate frequency with which respondents in each group remember the candidate's name. The standard procedure, followed in this instance, is to group observations on intervals of the independent variables. For each group the average expenditure (in thousands of dollars) is calculated along with the recognition frequency. The equation is now

$$L_{cr} = a + b_1 \bar{E} + e. \quad (8.1)$$

Since the groups providing observations for this equation are of different sizes, the errors are heteroscedastic, and so weighted least squares

<sup>14</sup>The only respondent variable that has a consistent and significant impact on candidate recall is attentiveness to the mass media; voters who follow the election regularly in at least one mass medium are significantly more likely to remember the candidates' names. See Jacobson (1976).

<sup>15</sup>The simple correlations between the previous office variable ( $PO$ ) and the candidate recall variable ( $CR$ ) for 1974 Senate and 1972 and 1974 House voters are, respectively, .11, .09, and .13; with campaign spending controlled, the corresponding partial correlations are .01, .03, and  $-.01$ .

are used to compute the estimates.<sup>16</sup>

Ordinary (weighted) least squares estimates of equation 8.1 would still be biased and inconsistent because it is part of a simultaneous equation system in which  $\bar{E}$  is assumed to be endogenous and therefore not independent of the error term. The 2SLS procedure is again in order. First  $E$  is regressed on the exogenous variables,

$$E^* = a + b_2PO + b_3P + b_4NPS + b_5NI + e \quad (9.1a)$$

and the results are used to compute expected values,  $E^*$ , for each observation. Grouping these observations on intervals of values of  $E^*$  and taking the recognition frequency and mean value of  $E^*$  ( $\bar{E}^*$ ) for each group, the second stage equation,

$$L_{cr} = a + b_1\bar{E}^* + e \quad (9.2)$$

may be estimated using OLS.

This was the procedure followed for the two House election sets. For the Senate elections, the grouping was done by states, and the observations on expenditures and the 2SLS instruments for spending are therefore not averages but rather figures for the separate contests in each individual state. Because the states vary widely in population and hence presumably in the cost of conducting an equivalent campaign, expenditures were divided by the voting-age population in each state and were entered as cents per voting-age individual ( $EPV$ ). But per-voter spending declines as the size of the population increases (campaign spending enjoys economies to scale); therefore, the equation estimating Senate campaign spending includes as a conditioning variable the natural logarithm of the voting-age population (in thousands). It replaces  $NPS$ , which was dropped because it had no effect whatever on spending when the other variables were con-

trolled.<sup>17</sup> The first-stage equation for Senate elections is thus

$$EPV^* = a + b_2PO + b_3P + b_4\ln VAP + b_5NI + e \quad (9.1b)$$

where  $EPV$  is spending in cents per voting-age individual,  $\ln VAP$  is the natural log of the voting-age population (in thousands), and the other variables and coefficients are as defined previously.

The regression estimates for equations 9.1a, 9.1b, 9.2, and, for comparison, 8.1 are listed in Table 10. Equation 8.1 was also used to estimate the equivalent parameters for incumbents in the three election sets and these also appear in the table. Results in this form are not easy to interpret, so they are displayed graphically in the three figures. The estimated curve for 1972 House candidates is shown for spending up to \$160,000, that for 1974 up to \$200,000, and the scales are adjusted to assure comparability; inflation must be acknowledged.

The coefficients of determination ( $R^2$ 's) and the standard errors are not listed for the logit equations because they are rendered meaningless by the grouping. Estimates based on individual rather than grouped data (from OLS and reduced form versions of equation 7.1 indicate that the relationship between spending and candidate saliency is significant at .001 for nonincumbents in all election sets and for incumbents in the 1974 elections. The relationship for 1972 House incumbents is not statistically significant even when the data are grouped for the logit analysis.

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The hypothesis that campaign spending is more useful to nonincumbents than to incumbents because of its greater effect on how frequently they are remembered by voters is, in general, well supported by these data. The evidence is strongest for the 1972 House elections; the amount spent by incumbents had

<sup>16</sup>Grouping the observations on interval values of the independent variable minimizes the loss of efficiency engendered by grouping. The groups are of different sizes because fixed intervals of the explanatory variable were employed in their formulation. For this reason, equations using the grouped observations were estimated by weighted least squares, the weights being proportional to the reciprocal of the approximate standard deviation of the error term,  $e$ , where the variance of  $e$  is estimated as  $1/(NF_{cr}(1-F_{cr}))$ ,  $N$  being the number of observations in a group and  $F_{cr}$  the proportionate frequency a candidate is known for that group. The procedure is from Theil (1971, p. 635). The number of observations (groups) in the several logit equations varies from 13 to 29. The mean number of cases in the Senate groups is 34; that in the House groups, 61.

<sup>17</sup> $NPS$ -for Senate elections was measured as explained in footnote 10. This variable, when included, was not a statistically significant determinant of spending and had a perverse sign. One extreme case had to be dropped from both the incumbent and nonincumbent Senate groups. This was South Dakota, where the challenger spent twice as much per eligible voter as any other nonincumbent and the incumbent more than four times as much as any other incumbent in the states covered by the survey ( $N=24$ ). Both candidates were known by all the voters surveyed in the state ( $N=26$ ).

little apparent effect on the probability they would be remembered; the expected gain is only .02 as spending increases from \$0 to \$160,000 whereas awareness of nonincumbents more than doubles over the same range of expenditures. Those few nonincumbents fortunate enough to spend over \$150,000 were as likely to be remembered as incumbents.

In 1974, spending by both incumbents and nonincumbents had a positive effect on the probability that voters would remember them. Nonincumbents did benefit more than incumbents from the same amount of spending, but the difference is not so great as it was in 1972; they gain about .13 more than incumbents as spending increases from \$0 to \$200,000. We are reminded that 1974 was an unusual year for Republican incumbents. Four whose districts were covered in the survey spent over \$200,000; three of them had also spent over

\$100,000 in 1972; their collective frequency of recall by voters was .93 (N=29). Very high levels of spending evidently do make a difference, even for incumbents. Parenthetically, three of them lost and the fourth squeaked by with 51.1 percent of the vote.<sup>18</sup> Saliency is obviously not the only important factor determining candidate success (a point ably argued by Abramowitz, 1975).

<sup>18</sup>The candidates were Samuel Young, Illinois 10th, spending \$251,200 in 1974 and \$206,166 in 1972; William Hudnut III, Indiana 11th, with \$201,700 in 1974 and \$163,442 in 1972; Joel T. Broyhill, Virginia 10th, with \$248,700 in 1974 and \$141,290 in 1972; and Sam Steiger, Arizona 3rd, who spent \$203,900 in 1974, but only \$37,691 in 1972. Steiger was the only winner.

Table 10. OLS and 2SLS Logit Regression Equations Estimating the Effects of Campaign Spending on Voter Awareness of House and Senate Candidates

Equation 9.1a: House Elections

$$1972 \quad E^* = 2.28 + 17.11 PO + 5.19 P + .682 NPS + 60.97 NI$$

(4.17)<sup>a</sup>    (3.58)    (.128)    (4.14)

N = 718                      R<sup>2</sup> = .36

$$1974 \quad E^* = -46.34 + 26.37 PO + 33.27 P + 1.77 NPS + 21.62 NI$$

(3.22)    (2.74)    (.139)    (3.72)

N = 976                      R<sup>2</sup> = .47

Equation 9.1b: Senate Elections

$$1974 \quad EPV^* = 205 + 41.8 PO + 12.6 P + .04 NI + 24.8 InVAP$$

(2.89)    (2.51)    (2.27)    (1.15)

N = 997                      R<sup>2</sup> = .46

Equation 9.2: 2SLS

House Elections    1972     $L_{Cr} = -1.25 + .0087 \bar{E}^*$

1974     $L_{Cr} = -1.20 + .0104 \bar{E}^*$

Senate Elections    1974     $L_{Cr} = -.615 + .0178 \bar{EPV}^*$

Equation 8.1: OLS

Nonincumbents

House Elections    1972     $L_{Cr} = -1.22 + .0076 \bar{E}$

1974     $L_{Cr} = -1.10 + .0094 \bar{E}$

Senate Elections    1974     $L_{Cr} = -.750 + .0444 \bar{EPV}$

Incumbents

House Elections    1972     $L_{Cr} = -.036 + .0005 \bar{E}$

1974     $L_{Cr} = -.129 + .0078 \bar{E}$

Senate Elections    1974     $L_{Cr} = .521 + .0209 \bar{EPV}$

<sup>a</sup>Standard error of regression coefficient.



Spending was notably more effective in increasing the awareness of House candidates of all kinds in 1974 as compared to 1972. An inescapable inference is that in presidential election years, messages from congressional candidates are crowded out by those coming from the presidential campaigns; at midterm, with less competition, congressional campaigns reach the intended audience more consistently. Information on future elections will be necessary to test this interpretation.

For both the 1972 and 1974 House elections, the 2SLS and OLS estimates are almost identical; by this evidence, simultaneity bias was not a problem in the OLS estimates of the relationship. These findings suggest that the structure here is actually recursive; spending affects saliency, but saliency has little effect on spending.

The results for Senate elections, however, indicate that simultaneity bias was present in the OLS estimate. The slope of the 2SLS regression coefficient for nonincumbents is

much less steep than the OLS slope; comparing the 2SLS estimate to the OLS estimate for incumbents, the conclusion must be that spending affects both groups similarly. This corresponds to the finding reported in the first section that Senate incumbents benefit from their own campaign spending more than do House incumbents. No easy explanation for this difference comes to mind; it may have to do with the greater prominence, intensity, or technological sophistication of Senate campaigns; an answer awaits further research.

A few points dealing specifically with incumbents and their challengers are in order. It should be emphasized that even if spending has the same marginal effect on the ability to recall names of challengers and incumbents, incumbents begin with such a great advantage in saliency that an equal increase in spending may still benefit the challenger. For one thing, it will decrease the *proportionate* advantage in awareness enjoyed by the incumbent. For example, incumbent senators are remembered 1.8 times

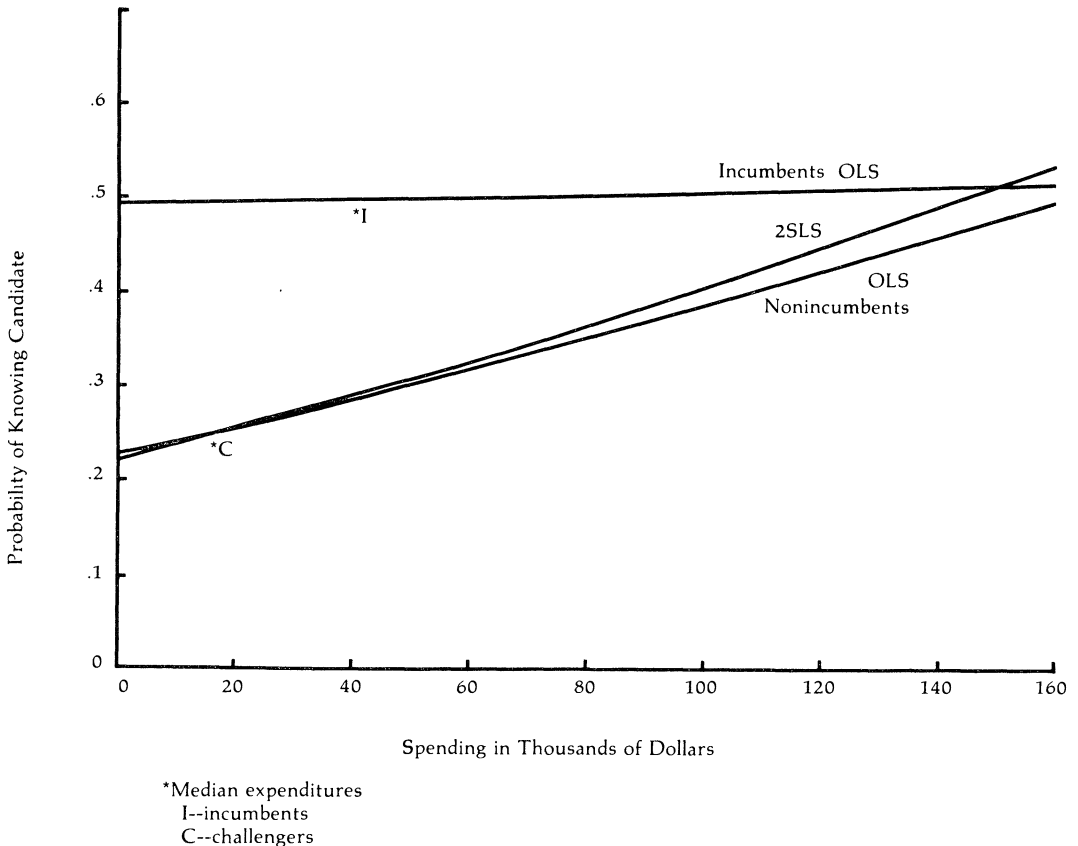


Figure 1. U.S. House of Representatives 1972 Elections

as frequently as nonincumbents (by the 2SLS estimates) if no money is spent; the figure drops to 1.4 at 70 cents per eligible voter even though the absolute gain in saliency is about the same for both groups. In addition, very few voters know a challenger without also knowing the opposing incumbent (about 1 percent in these surveys), while over a quarter of the respondents typically know the incumbent without knowing the challenger. Greater spending might therefore help challengers more than incumbents by increasing the number of instances in which *both* candidates are known.

The points at which the estimated curves intersect the mean expenditure level for challengers and incumbents are indicated on the figures. This information reiterates what is already known about the incumbent's spending advantage and displays its connection with the saliency advantage. Clearly, challengers must spend much more than they typically do—and much more than incumbents—if they hope to match the incumbent's saliency.

### What's in a Name?

Campaign spending is important to candidates who need to make themselves known to voters; voters are more likely to vote for candidates whose names they recall. Since remembering a candidate's name has itself been given no weighty theoretical significance, it must be interpreted as an indicator of some sort. In earlier work I have argued, without supporting evidence, that candidate recognition should be considered a threshold indicator. That is, we should not assume that respondents who answer positively and correctly know nothing but the name of the candidate (although for some this may be true), but rather the ability to remember a candidate's name is best understood as a sign that the respondent "has crossed a minimal threshold essential to the acquisition of further information and to the elaboration of opinions about the candidate" (Jacobson, 1976, p. 17).

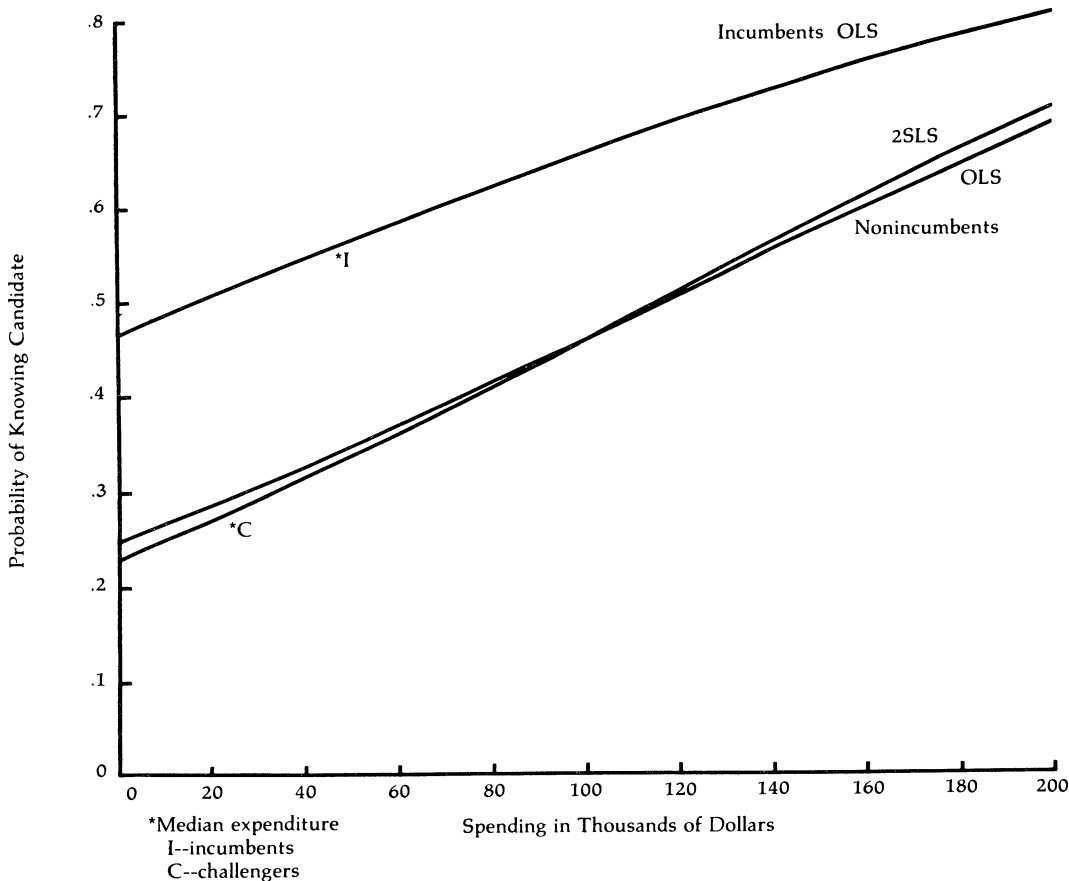


Figure 2. U.S. House of Representatives 1974 Elections

More recent studies suggest that the issue is more complicated. Abramowitz (1975) found that many of his respondents were quite ready to offer and amplify opinions on how incumbent members of Congress had performed their jobs without being able to recall their names. Ferejohn's investigation (1977) led him to conclude that incumbents are now enjoying an electoral advantage extending beyond what can be explained by greater familiarity to voters, since incumbents are favored even by voters who remember neither candidate's name.<sup>19</sup> Evidently it is not necessary to remember politicians' names in order to have an opinion about them. What does name recall indicate, then? The 1974 survey contains some items

through which the question can be explored. Regarding the Senate races, respondents were asked, in addition to the name-recall question, a series of questions that can be summarized as "Was there anything in particular about the Democratic (Republican) candidate that made you want to vote for (against) him (her)? What was that?"<sup>20</sup> Responses to these questions were first recorded simply as positive (if anything made the respondent want to vote for the candidate), negative (if anything made the respondent want to vote against the candidate), or no response (the respondent mentioned nothing for or against the candidate) and were crosstabulated with responses to the recognition question. The results, broken down by partisanship, appear in Table 11.

<sup>19</sup>This finding may be an artifact of the way "candidate familiarity" is measured. Surely voters may recognize the incumbent's name when they see it on the ballot without necessarily being able to recall it when asked by an interviewer.

<sup>20</sup>See variables 2177 to 2192 in the 1974 SRC survey codebook (Miller, Miller, and Kline, 1975, pp. 105-12).

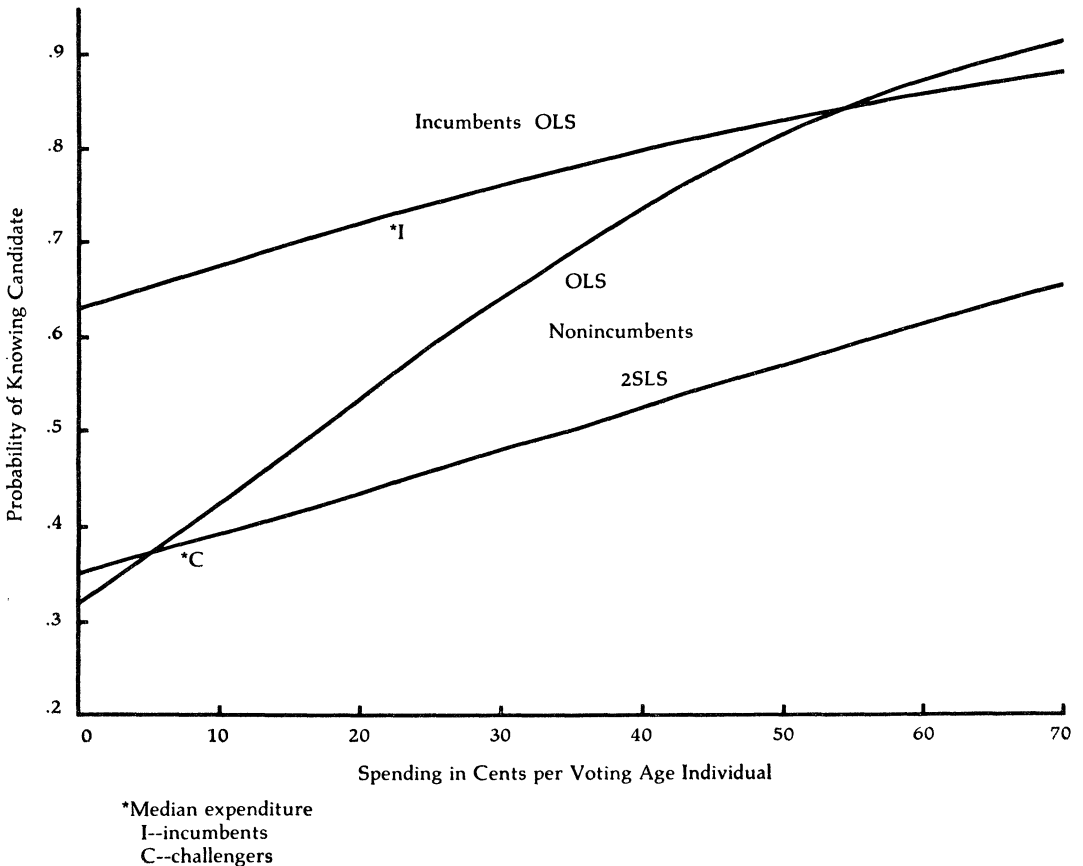


Figure 3. U.S. Senate 1974 Elections

Respondents (and only those who reported voting are included in the sample) who know the names of candidates are also much more likely to have something to say about them. Nearly two-thirds of the voters who could not recall the candidates' names had nothing to say about them either. Less than one-fifth of those accurately naming a candidate had no further comment. Although the effects of partisanship are quite apparent, aware voters more frequently find something good *and* bad about both their own and the other party's candidate. Familiarity does not invariably produce a favorable evaluation by any means. The relative gain in positive evaluations associated with recognition occurs primarily among a candidate's fellow partisans and, to a lesser extent, independent voters; among the other party's supporters the greater proportion of positive responses arising from awareness is more nearly matched by the increase in proportion of negative responses.

From another perspective, Table 11 makes it clear that ignorance of a candidate's name does not preclude expressing an opinion about that candidate; a third of the voters in this category were willing to do so. Do respondents who do not remember the candidate's name use different evaluative criteria than do respondents who are aware of the candidate? A more detailed recoding of the answers reported in the survey provides a way of finding out. All positive and negative responses (and up to three of each were recorded by the interviewers) were classified as *personal* (those referring specifically to characteristics of the candidates them-

selves), *party* (references to one of the parties or to the candidates themselves exclusively as partisans), or *mixed*.<sup>21</sup> These were cross-tabulated with responses to the recognition question; the results are found in Table 12. Not surprisingly, voters who do not remember candidates' names more readily resort to partisan criteria to evaluate them; personal comments are much more frequent among voters knowing candidates. Still, nearly a third of the unaware group employ purely personal criteria without remembering who the person is. Notice, incidentally, that aware voters are more likely to have multiple comments about the candidate; they average 1.7 responses, the unaware group 1.2.

Two tentative conclusions are warranted. Although the ability to remember a candidate's name is not a precise threshold—voters are often able to evaluate candidates without this piece of information—there is a substantial difference in both the frequency and character of evaluative comments between voters who do and do not recall the candidate. And the gains to be made from campaigning—and thereby making oneself known to voters—derive from gathering support among one's own partisans and independent voters rather than from con-

<sup>21</sup>Responses coded 00, 01, and 05 in the hundred series for these questions were considered party references; those coded 02, 03, and 04 were classified as personal references; and those coded 06 through 12 were considered mixed. See Miller, Miller, and Kline (1975, pp. 400–15) for the complete coding categories.

Table 11. Voter Awareness and Evaluation of 1974 Senate Candidates

Percent Evaluating:	Evaluation				
	Positive	Negative	Positive and Negative	None	
<b>Own Party's Candidate</b>					
Known	56.4	12.5	15.4	15.7	(479) <sup>a</sup>
Not Known	38.1	4.6	1.5	55.8	(260)
Difference	18.3	7.9	13.9	-40.1	
<b>Other Party's Candidate</b>					
Known	21.9	40.0	15.7	22.4	(402)
Not Known	5.7	27.3	1.0	67.7	(300)
Difference	16.2	12.7	14.7	-45.3	
<b>Independent Voters, Candidate is</b>					
Known	36.4	27.3	18.2	18.2	( 77)
Not Known	10.0	8.3	1.7	80.0	( 66)
Difference	26.4	19.0	16.5	-61.8	

<sup>a</sup>Number of cases from which percentages were computed. The sample is weighted.

Source: The 1974 SRC survey.

verting the opposition. This, of course, is part of conventional wisdom.

An overview of the connection between the simplified candidate evaluation index and the reported vote for senator in 1974 will complete this part of the analysis. Table 13 displays this relationship. Evaluation of both candidates has a noticeable impact on voting behavior. And the effects are as we would anticipate: positive evaluations increase the likelihood of voting for a candidate, negative evaluations decrease that

likelihood, and the effect in either case depends also on the evaluation of the other candidate. Defections are therefore concentrated in the upper right-hand corner of the partisan table, party loyalty is predominant in the lower left-hand corner. A comparable pattern occurs among independent voters.

To sum up briefly, then: our evidence is that campaign spending helps candidates, most particularly nonincumbents, by bringing them to the attention of voters. It is *not* the case that

Table 12. Voter Awareness and Criteria for Evaluation of 1974 Senate Candidates

Percent of Evaluations	Evaluative Criteria			Number of Comments	Number of Respondents
	Personal	Party	Mixed		
Positive					
Knowing Candidate	60.7	8.9	30.4	957	538
Not Knowing Candidate	37.1	31.1	31.7	167	134
Negative					
Knowing Candidate	44.4	14.5	41.1	601	393
Not Knowing Candidate	24.6	43.0	32.5	114	108

Source: The 1974 SRC survey. The sample is weighted.

Table 13. Evaluation of Senate Candidates and Voting Behavior in 1974

Percent of Partisan Voters Defecting				
Evaluation of Other Party's Candidate	Evaluation of Own Party's Candidate			Marginal Totals
	Positive	Positive and Negative	Negative	
Positive	28.6 (21) <sup>a</sup>	77.1 (35)	77.1 (35)	65.9 (91)
Positive and Negative	4.5 (139)	31.1 (45)	56.0 (25)	16.3 (209)
Negative	4.2 (167)	3.4 (59)	40.0 ( 5)	4.8 (231)
Marginal Totals	5.8 (327)	30.9 (139)	66.2 (65)	19.8 (531)
No Evaluation: 16.5 (115)				

Independent Voters: Percent Voting for Democrat

Evaluation of Republican	Evaluation of Democrat			Marginal Totals
	Positive	Positive and Negative	Negative	
Positive		0.0 (11)	20.0 ( 5)	6.3 (16)
Positive and Negative	88.9 ( 9)	66.7 ( 3)	0.0 ( 5)	58.8 (17)
Negative	100.0 ( 2)	83.3 ( 6)	100.0 ( 1)	88.9 ( 9)
Marginal Totals	90.0 (11)	35.0 (20)	18.2 (11)	45.2 (42)
No Evaluation: 40.0 (15)				

<sup>a</sup>Number of cases from which percentages were computed. The sample is weighted.

Source: The 1974 SRC survey.

well-known candidates simply attract more money; rather, money buys attention. Voters who are aware of candidates are also more likely to have opinions about them, both positive and negative, and the net gain in positive evaluations for candidates who do succeed in getting the attention of voters comes primarily from adherents of their own party and from independents. And voters' evaluations of the candidates strongly influence how they cast their votes. Since nonincumbents have the most to gain from campaigning, it is not surprising that their level of spending has a greater impact on the outcomes of elections than does that of incumbents.

### Implications for Campaign Finance Policy

The findings reported here have important implications for campaign finance policy reform. For House elections, both the OLS and the 2SLS models indicate that the marginal gains from a given increase in campaign spending are much greater for challengers than for incumbents. The unmistakable conclusion to be drawn from this is that, in general, any increase in spending by both candidates will help the challenger. Public subsidies—or any other policy which gets more money into the hands of challengers—should therefore make House elections more competitive. Incumbents will also get more money under such circumstances, but since for them raising money is not the problem it is for challengers and because their additional spending does not counterbalance the effects of greater spending by challengers, this will not work to their benefit.

On the other hand, any reform measure which decreases spending by the candidates will favor incumbents. This includes limits on campaign contributions from individuals and groups as well as ceilings on total spending by the candidates. Even though incumbents raise money more easily from all sources, limits on contributions will not help challengers because the problem is *not* equalizing spending between candidates but rather simply getting more money to challengers so that they can mount competitive races. Anything that makes it harder to raise campaign funds is to their detriment.

Ceilings on permissible spending, if they have any effect on it at all, can only lessen competition. The consequences of subsidies combined with limits—constitutional by the decision in *Buckley v. Valeo* (1976)—depend on the size of the subsidy provided and the limit

imposed. For example, the major public financing bill before the House in the 95th Congress, HR 5157, would provide partial public funding on a matching basis and impose a ceiling of \$150,000 on general election expenditures in House contests. Ignoring the problem that the data include primary election spending, and adjusting for inflation, the equations can be used to estimate the hypothetical effects of equivalent subsidies and limits in 1972 and 1974. The results of this exercise have been reported in detail elsewhere (Jacobson, 1977). They suggest that the legislation would have had very different consequences in the two election years. It would have diminished the expected number of successful challenges in 1972 because the limit would have been too low; but in 1974 the same financing system would have increased the number of predicted challenger victories substantially, with an even greater increase had the ceiling not been in force.

The subsidies and spending limits proposed for Senate elections under S 926, the Senate public funding bill, would have had slightly different consequences. They would have made no difference at all in 1972, but might have increased the number of successful challenges in 1974. The limits are evidently set high enough to avoid harming challengers. In 1974, the law would have reduced incumbent spending and increased challenger spending, to the definite benefit of the latter (Jacobson, 1977).

An explanation of the divergent effects of these laws in 1972 and 1974 doubtless lies in the different political circumstances of the two election years. In 1972, despite the decisive Nixon victory, national short-term forces do not seem to have been important in House elections; note the coefficients on *P* for 1972. Quite the opposite is true of 1974. Republicans were at a serious disadvantage because of Watergate, the collapse of the Nixon administration, and Ford's unpopular pardon of the former president. Democrats could therefore unseat incumbent Republicans with much greater ease (and with a good deal less money) than would have been the case in 1972. Almost all of the predicted 1974 winners are Democrats under any financing system; the partisan balance is nearly even for 1972.

Thus public funding and spending limits of the kind proposed in HR 5157 and S 926 would have different consequences according to varying political circumstances. If strong short-term forces favor the candidates of one party or another (or of different parties in different localities), less money will be needed by challengers of the advantaged party for them to

win; subsidies will be more effective, even in relatively small amounts, and ceilings on spending will not be particularly damaging to their chances. In the absence of strong short-term forces, however, the subsidies may not be high enough to help significantly, and the ceilings may actually diminish the possibility of unseating an incumbent. Legislation of this kind has the potential to exaggerate whatever trends exist at the time of the election. Incumbents may be given an added margin of safety in election years when short-term forces are weak, but when these forces are strong, the turnover in congressional seats should be greater.

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