



## Connecting News Media Use with Gaps in Knowledge and Participation

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*This article examines the relative size of gaps in knowledge and participation between the more and less educated as they vary by the quantity and type of news media use. We predicted that the gap between high and low education groups would be smaller among heavy television news users than among light users, whereas the gap between high and low education groups would be larger among heavy newspaper users than among light users. We also predicted that the gap in general political participation—but not voting—would be greater among both heavy television news users and heavy newspaper users than among light news users. These predictions were based on logic derived from the communication effects gap hypothesis, the cognitive psychology of learning, and research on political behavior. Analyzing data collected as part of the American National Election Study during the 1996 U.S. presidential campaign, we found that gaps in knowledge between higher and lower education groups were greater among light than heavy users of television news. A similar pattern was found for knowledge gaps across levels of newspaper use, but this pattern was weaker and may possibly be attributed to ceilings imposed by the nature of the test or a natural ceiling in the information domain. By contrast, neither television news use nor newspaper use was related to gaps in voting; however, newspaper use, but not television news use, was related to gaps in general political participation.*

**Keywords** knowledge gap, newspapers, political learning, political participation, television news, voting

Having relatively equal amounts of information assures neither a consensual nor a particular outcome . . . but it does assure that whatever decisions are reached provide the most democratic approximation of the public will. (Delli Carpini & Keeter, 1996, p. 6)

Despite the importance of a high average level of political information and participation, we must distinguish between the absolute quantity of political information held (and participation engaged in) by the public and the relative differences in knowledge holding

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(and participation) among social groups. Increasing the level of these variables among some groups but not others—especially when the group increasing in knowledge or participation is already politically advantaged and has interests at odds with the disadvantaged group—could be worse for democracy than no overall increase at all. Specifically, when there are disparities across social groups in political knowledge and participation, democracy is at least a little less democratic, regardless of the underlying reason for these inequities.

Tichenor, Donohue, and Olien (1970) linked this issue to the study of mass communication campaigns in their initial “knowledge gap hypothesis”:

As the infusion of mass media information into a social system increases, segments of the population with higher socioeconomic status tend to acquire this information at a faster rate than the lower status segments, so that the gap in knowledge between these segments tends to increase rather than decrease. (pp. 159–160)

Despite this relatively straightforward hypothesis, there is some empirical evidence, plus some theoretical reason to expect, that a number of contextual factors may serve to eliminate or even reverse knowledge gaps, including whether the medium of communication is a newspaper or televised news. Following McLeod, Bybee, and Durall’s (1979) and Moore’s (1987) examinations of gaps in political contexts, we probe the knowledge gap—or, more generally, the “communication effects gap” (Shingi & Mody, 1976)—hypothesis in the context of the 1996 U.S. presidential election campaign. Our particular focus is the comparison of television news and newspaper use as they relate, potentially in different ways, to gaps in political knowledge and participation.

### **Macro and Micro Interpretations of the Knowledge Gap Hypothesis**

The formal statement of the knowledge gap hypothesis (Tichenor et al., 1970) above claims that as mediated information enters a social system, it leads to an increase in the existing knowledge gap between those of higher and lower socioeconomic status (SES; typically operationalized as formal education). Thus, the knowledge gap hypothesis presumes the initial existence of a gap in knowledge between society’s “haves” and “have nots” (i.e., a correlation between education and knowledge). The theory is concerned primarily with the role of media input in exacerbating a preexisting gap, either by changing the size of the gap (or correlation) over time or by creating differences in the size of the gap (or correlation) across issues that have received more or less coverage.

It is important to stress that, by itself, the finding of a bivariate relationship between education and knowledge is inadequate support for the knowledge gap hypothesis (Gaziano, 1983). In knowledge gap research, the important issue is not the existence of a gap. Instead, gaps should be tested as multivariate phenomena, that is, as differences in the relationship between variables *X* (e.g., education) and *Y* (e.g., knowledge) across levels of variable *Z* (e.g., time, news media publicity, or news media use). From this perspective, the existence of an initial bivariate “gap” in knowledge is not nearly as interesting as variation in the size or direction of this gap due to a third variable. Although some scholars do not make this distinction between the *existence of bivariate gaps* and *variation in the size of gaps*, we join a growing number of researchers (e.g., Eveland, 1997a; Gaziano, 1983; McLeod, Bybee, & Durall, 1979) who have stressed that the knowledge gap hypothesis requires the latter, multivariate examination of gaps.

### *Explanations for Increasing Knowledge Gaps*

The initial knowledge gap hypothesis was focused at the macro level with key independent variables such as socioeconomic status, time, and media publicity. Following its initial formulation, scholars have continued to examine other macro-level variables, including the level of community conflict and community size or pluralism (see Gaziano, 1997, and Viswanath & Finnegan, 1996, for excellent reviews), finding that in some cases gaps increase, but in others gaps are reduced or even reversed. Despite this generally macro-level focus of the initial hypothesis, in their seminal article Tichenor et al. (1970) worked to link levels of analysis by providing both macro- and micro-theoretical explanations for their observed gap-widening findings. They discussed five potential factors that could account for the increase in initial knowledge gaps with the input of media information, including differences between high and low SES groups in (a) relevant interpersonal contacts, (b) communication skills, (c) prior knowledge, and (d) selective exposure, acceptance, and retention. They also discussed the nature of the media system as a final potential factor contributing to increasing knowledge gaps between high and low SES segments of society.

The role of relevant interpersonal contacts in increasing gaps would be to allow those of higher SES to engage in conversations with others who are knowledgeable about important topics in the news. These conversations could provide additional opportunities—beyond media exposure—for learning through interpersonal exposure to the information. Also, high SES individuals could be more motivated to seek out information if they believed that it would be a topic of conversation among friends and neighbors. We believe that this interpersonal contact explanation may be important, but we will not examine it empirically in this study.

Differences in communication skills, and information processing ability more generally, between high and low education groups represent a key cognitive explanation for increasing knowledge gaps. Those who have attained a higher level of formal education have had more training and practice in learning and integrating information, not to mention more experience taking tests. They are likely to have better reading ability and be better at selecting and storing key points of information from a given news story. They are also more likely to engage in elaborative processing of mediated information, which is a key determinant of learning identified by psychologists and educational researchers (see Eveland, 1997b, 1998). Delli Carpini and Keeter (1996) make strong arguments and provide evidence that the skills imparted by higher education can substantially increase one's ability to learn political information.

Prior knowledge has also been shown to facilitate the processing and recall of information (e.g., Hsu & Price, 1993; Rhee & Cappella, 1997). Those with prior knowledge have probably developed more advanced schemas, which facilitate interpretation, storage, and recall of new information (Markus & Zajonc, 1985; Wicks, 1992). They are also better able to elaborate on information in the news because they have stored information with which to compare it and generate meaning (Höijer, 1989). In addition, those with well-developed schemas are better able to fill in the contextual blanks that sometimes exist in news information because they have this information stored in memory and can apply it to what are often sketchy news reports (Wicks, 1992).

Differences in selective exposure, acceptance, and retention across education groups suggest that there is a gap in the use of news media information by those of low SES, and that when they do use news media, they often pay attention to different types of information than those of high SES. So, for instance, those of low SES are more likely

to focus on the sports section of the paper, while those of high SES are more likely to focus on the hard news sections or the opinion and analysis pages of the paper (Newspaper Association of America, 1998). As more media information about a given political topic enters a system, these exposure differences are compounded.

Finally, Tichenor et al. (1970) argue that the middle-class focus of newspapers can also contribute to increased knowledge gaps. Newspapers have a financial cost, and thus those of low SES backgrounds are less likely to subscribe to and read them, suggesting access as a relevant issue. Further, the content of the newspaper is generally aimed at the interests of those in the middle and upper classes because it is these groups that are most sought after by advertisers (Donohue, Tichenor, & Olien, 1986). This disconnect between the content of newspapers and the interests and reality of low SES audience members can also contribute to the differential in exposure described above.

These final two explanations are, at least in part, connected to the issue of potential inequities in exposure to relevant information. While this difference in exposure to information almost surely has something to do with the reason for increasing knowledge gaps, it is also the least interesting explanation from a theoretical perspective. Clearly, people who are not exposed to information will not be able to learn it. The question then becomes: Why are people not exposed to the information? The answer to this question, which is probably some combination of motivational factors (e.g., a lack of interest), economic factors (e.g., expense of newspapers or cable television), and time factors (e.g., work schedules that may preclude exposure), is beyond the scope of the present study.

More interesting, from our perspective, are other possible psychological explanations for knowledge gaps that increase with the influx of media information, such as (a) the form, structure, and content of particular media and (b) differences in processing ability and communication skills due to formal education and prior background knowledge that may facilitate the integration of new information. These explanations, for the most part, serve to direct this study of the knowledge gap hypothesis toward more micro concerns. Of course, this is not to imply that macro issues such as community conflict and structure are inherently unimportant. In the discussion, we will consider the potential impact of some macro contextual factors on our findings.

### ***Empirically Testing Gap Hypotheses***

Tichenor et al. (1970) described two different methods of testing the knowledge gap hypothesis. First, the hypothesis could be examined over time as the increase in the correlation between knowledge and education as media information enters the system. Alternatively, the hypothesis could be examined cross sectionally by comparing the correlation between education and knowledge for issues high in media coverage versus issues low in media coverage, with the expectation of higher correlations for issues high in publicity. Thus, both longitudinal and cross-sectional data are appropriate for testing gap hypotheses.

We argue that there is a third way to test the knowledge gap hypothesis, particularly when one is concerned with explanations beyond the impact of unequal exposure to information. When conducting a study at a single point in time and examining a single issue (or an index composed of many different issues), if the knowledge gap hypothesis holds true, then there should be a stronger correlation between education and knowledge for those high in media use than for those low in media use. This test (first used by McLeod et al., 1979, and recently applied by Kwak, 1999) should be consid-

ered just as valid as the initial cross-sectional test proposed by Tichenor et al. (1970). Using this method, the measure of media information is simply obtained at the individual level instead of the social level, thus moving the hypothesis toward our more micro theoretical focus.<sup>1</sup> However, we must acknowledge that only a longitudinal design can demonstrate actual *change* in gaps. In a cross-sectional design, whether of the traditional form (using the macro variable media publicity) or the form we describe here (using the micro variable media exposure), change must be inferred by differential patterns of correlations.

The initial cross-sectional hypothesis predicted that variations in media publicity would affect the correlation between education and knowledge. Media publicity is a macro-level variable describing the aggregate information environment. Presumably, issues high in publicity would lead to more exposure at the individual level than issues low in publicity. However, the exposure would probably vary between high and low SES groups such that the low SES groups would have relatively less exposure than the high SES groups, regardless of the degree of media publicity, owing to the motivational, time, and economic factors described above.

The application of an individual-level measure of news use in lieu of a measure of media publicity (a) provides a more precise estimate of actual exposure to information than does the more macro measure of media publicity and (b) therefore allows us to control for differences in news use across individuals, thus eliminating the theoretically less interesting exposure/attention explanation for knowledge gap increases. This leaves us with the ability to demonstrate more clearly the potential impact of the other explanatory factors initially suggested by Tichenor et al. (1970), such as micro-level differences in processing ability and communication skills, while holding news use constant.

Equally important, the move from a macro-level publicity measure to a micro-level news use measure allows us to examine potential differences in knowledge gaps across different media such as newspapers and television. These differences may be due to variations in media form, media content, or both (Neuman, Just, & Crigler, 1992). These media differences are another focus of the current study.

### ***The Role of Communication Medium***

The initial knowledge gap hypothesis focused on newspapers as the medium of communication for public affairs and scientific information (Tichenor et al., 1970). Indeed, it was the middle-class bias of newspapers that was one potential explanation for increasing knowledge gaps. As already noted, two implications of the middle-class bias are economic (cost) and motivational (interest) barriers to newspaper readership for lower status segments. However, another feature of the medium of newspapers that has stronger implications for the psychological explanations of the knowledge gap is the requirement of a certain level of literacy for meaningful knowledge gain from newspapers. This requirement means that, relative to other segments of the population, some segments of the population may have relatively more difficulty comprehending the information conveyed in newspapers, even if they have the income and interest to read them (Kleinnijhuis, 1991). Concerning this point, contradictory claims may be made about the unique inverted pyramid structure of many hard news stories. Graber (1994) argues that the inverted pyramid format helps readers learn by presenting the most important information first and thereby making it highly prominent. On the other hand, this style of writing might actually disadvantage those with less prior knowledge because the important contextual information comes at the end of the story, where it is least likely

to be useful or even read at all. However, despite the criticism of the location of the contextual information, one could argue that there is still more contextual information overall in newspapers than in television news, at least in part due to the larger news hole of newspapers.

Whereas newspapers have a middle-class bias, some have argued that television news is aimed at the lowest common denominator. If there is a bias to television news, it is a lower-class bias. Thus, the information in television news may be more accessible to those with weaker cognitive skills and less background knowledge and, hence, may be less likely to exacerbate knowledge gaps than newspaper news (Neuman et al., 1992). In addition, the hard news content of television is so limited that those with more skills and background information may reach a ceiling effect because television offers them little to learn beyond what they already know. Moreover, some have argued that when television visuals are consistent with or complementary to the verbal content, they can serve as a useful context and encourage learning (Graber, 1990; Neuman et al., 1992). The potential for television to serve a knowledge-leveling function has therefore been suggested since the early years of knowledge gap research (e.g., Donohue, Tichenor, & Olien, 1973; Tichenor et al., 1970). Indeed, some research focusing on the role of television news has produced data consistent with this claim (Kwak, 1999; McLeod et al., 1979; Miyo, 1983).

### **The Role of Media in Participation Gaps**

The role of mass media in democratic societies encompasses far more than conveying factual information to citizens. Specifically, media play an important role in providing what has been labeled “mobilizing information” (Lemert, 1984, 1992). Mobilizing information is content that goes beyond information about the political system or political actors to enable citizens to understand problems related to their communities and to engage in various forms of participatory activities. In other words, mobilizing information integrates political issues and conflicts into the context of the larger community and provides information on whom to contact, how to donate money, or where to voice one’s opinion.

As part of the civic journalism movement, newspapers have more recently claimed an important role for themselves as providers of mobilizing information. Merritt and Rosen (1995), for example, argue that news media in general and newspapers in particular can serve as important agents of conveying information necessary for individuals to participate in politics. This type of coverage not only includes descriptions of a given issue (e.g., a community conflict) but also contains information that makes the conflict comprehensible (Lemert, 1984, 1992).

Unfortunately, Schudson (1995) argues, empirical realities deviate substantially from that normative claim. There is less and less mobilizing information in today’s newspapers, he contends. Even when mobilizing information is reported, it is not prominently placed.

In response to television’s ability to report current events faster than print media, newspapers have shifted their coverage from event-centered reporting toward stories with greater depth, analysis, and complexity (Barnhurst & Mutz, 1997). As a result, audiences “use the paper not by reading . . . but by scanning and collecting bits of information” (Barnhurst & Mutz, 1997, p. 48). These patterns of coverage should favor citizens with greater information processing abilities and more complex preexisting knowledge structures that allow them to process information more quickly and efficiently. They possess the information processing strategies and cognitive skills necessary to identify

mobilizing information, even if it is less prominently placed or mentioned only implicitly. As a result, the relationship between media use and participatory behavior can be expected to be higher for individuals with higher levels of education than for individuals with lower levels of education. Consistent with past research (McLeod et al., 1979), we would expect this pattern to be more prevalent among heavy news users than light news users, and the difference across levels of news use should be more pronounced for newspaper use than television news use.

It is unclear, however, whether or not these relationships should hold true for all types of participatory activity. Previous research on political participation has consistently supported the notion of participation as a multidimensional construct. While there is considerable disagreement over the number of dimensions that can be distinguished, most researchers have differentiated voting from other forms of participatory behavior (e.g., Milbrath & Goel, 1977; Rosenstone & Hansen, 1993; Verba, Brady, & Scholzman, 1995; Verba & Nie, 1972). Voting is based on social norms (Milbrath & Goel, 1977) and long-term gratifications such as “the desire to do one’s duty as a citizen or . . . to influence government policy” (Verba et al., 1995, p. 360). More important, however, “the act of voting does not require as much information and motivation as do most other political activities” (Milbrath & Goel, 1977, p. 12). Most important, even if media coverage does have a direct impact on turnout, there is little evidence to support the notion that this impact should be stronger for more educated citizens than for their counterparts with lower levels of education. As a result, the greater gaps between education segments by media use should be more likely for general participatory activities than voting.

## Methods

Data for this study came from the 1996 American National Election Study (ANES) preelection and post-election surveys ( $N = 1,714$ ).<sup>2</sup> The fieldwork for the preelection survey took place between September 3 and November 4, 1996. The postelection survey was conducted between November 6 and December 31, 1996. The study population included all United States citizens of voting age on or before Election Day 1996. The sample was based on a multistage area probability sampling technique, with respondents being randomly selected within households in the final stage.<sup>3</sup> Interviews were primarily conducted face to face, although some telephone interviews were also conducted.<sup>4</sup>

## Measures

Three groups of variables were used in this study: criterion variables, control variables, and media use variables. The specific ANES labels for the items used in variable construction are listed in the Appendix.

*Criterion Variables.* There are many items traditionally available in the ANES that have been demonstrated by prior researchers to be reliable and valid indicators of political knowledge (see Brians & Wattenberg, 1996; Clarke & Fredin, 1978; Delli Carpini & Keeter, 1996; Luskin, 1987). Since these items use different methods of measurement (e.g., open- versus closed-ended questions), and there is some indication that method of measurement may influence knowledge gaps on a given topic (see Viswanath & Finnegan, 1996), we analyzed several groups of knowledge indicators separately. Specifically, we used (a) summed number of likes and dislikes mentioned regarding the three major presidential candidates ( $\alpha = .70$ ), (b) relatively correct placement of Clinton and Dole

on issue position items ( $\alpha = .84$ ), (c) relatively correct placement of the parties on issue position items ( $\alpha = .77$ ), and (d) relatively correct placement of Clinton versus Dole and the Democratic versus Republican parties on a liberal-conservative scale ( $\alpha = .83$ ). Despite our desire to test for possible measurement and domain effects, most citizens are generalists when it comes to political knowledge (Delli Carpini & Keeter, 1996). Because of this, knowledge is highly correlated across political domains. Therefore, we also combined these subscales—weighting them equally despite varying numbers of items in each subscale—into an overarching political knowledge measure and analyzed it as a whole ( $\alpha = .82$ ).

Two types of participatory activities were differentiated. Voting was measured as a single item self-report of having voted in the election. General participation was measured by combining five dichotomous measures of campaign activities into an additive index ( $\alpha = .67$ ): displaying a campaign button/sign/sticker, attending a meeting/speech/rally for a candidate, working for a party or candidate, donating money to a candidate, and donating money to a political party.<sup>5</sup>

*Control Variables.* Several demographic variables, plus campaign interest, play a key role in predicting news media use, political knowledge, and political participation (see Delli Carpini & Keeter, 1996; McLeod, Scheufele, & Moy, 1999; Verba et al., 1995). Therefore, we used the following variables as controls in our analyses: gender, income (recoded to more closely approximate interval measurement), education, age,<sup>6</sup> and campaign interest.

*Media Use Variables.* Political communication researchers have not converged upon a standard measure for news media use. However, we do know that, in addition to exposure, attention to news media is an important component of overall media use because newspapers essentially compel attention, whereas television news does not (e.g., Chaffee & Schleuder, 1986). But it is unclear whether measures of exposure and attention are best combined to create general “news media use” measures (e.g., Brians & Wattenberg, 1996; McLeod et al., 1996; Price & Czilli, 1996) or whether attention and exposure to a given medium should be examined separately in the same regression equation (e.g., Chaffee, Zhao, & Leshner, 1994; Drew & Weaver, 1998). In this study, given (a) the relatively high correlations between measures of exposure and attention within each medium, (b) the relatively low correlations across media for attention and exposure, and (c) the analytical simplicity of using combined measures rather than analyzing each item separately, we chose to combine measures of attention and exposure within medium. Thus, television news use was a four-item index ( $\alpha = .81$ ) of two exposure items (local and national television news) and two attention items (attention to the campaign in local and national television news). Newspaper use was a two-item index ( $\alpha = .71$ ) of days reading the newspaper and attention to the campaign in the newspaper.

### *Analytical Techniques*

Our analyses follow the lead of McLeod et al. (1979; see also Eveland, 1997a, and Kwak, 1999) in using a statistical interaction between education and a news media use variable<sup>7</sup> as an alternative to comparisons of education-knowledge correlations across issues of differing media publicity. This statistical interaction between news media use and education tests the equality of relationship between education and the criterion measure (i.e., knowledge, participation) at different levels of media use. If the relationships



between education and our dependent variables, and between media use and our dependent variables, are positive as we expect them to be, then (a) a negative sign for the interaction term indicates a weaker relationship between education and the dependent variable at high levels of media use, and (b) a positive sign for the interaction term indicates a stronger relationship between education and the dependent variable at high levels of media use.

In predicting voting—which was measured as a dichotomous variable—we employed hierarchical logistic regression models equivalent to the other ordinary least squares (OLS) regression models. In other words, we entered three blocks of predictors, beginning with demographic variables and interest, then media use variables, and finally product terms. For the first block entered, the resulting model was compared with the baseline model, that is, the model with only the constant included in the equation. In order to compare coefficients across models, we calculated standardized logistic regression coefficients (Menard, 1995), similar to the beta weights used in our OLS regression analyses.<sup>8</sup>

## Results

Table 1 presents the results of our OLS regression models predicting the four different types of political knowledge and the overall political knowledge index. First, it is clear that across the four different types of knowledge, patterns are quite consistent, although minor deviations do exist. Formal education is clearly the strongest predictor of political knowledge holding, which is entirely consistent with past research (e.g., Delli Carpini & Keeter, 1996). Likewise, campaign interest is a strong predictor of each measure of knowledge, although less so for ideological knowledge than other types. The relationship between family income and knowledge is very consistent across the different dimensions of knowledge. The relationship between gender and knowledge is significant for issue knowledge (both candidate and party), but not for candidate likes/dislikes or ideological knowledge. Finally, the relationship between age and knowledge varies in both form (sometimes linear and sometimes not) and direction depending on the type of knowledge being examined.

The role of news media use in predicting political knowledge is generally consistent with past research. Television news use is only weakly related to political knowledge at best, and often is unrelated. Newspaper use is somewhat more strongly related to political knowledge—at about the level of gender and household income—but as with gender, it is not a significant predictor of either candidate likes/dislikes or ideological knowledge. However, these findings are qualified by generally significant and meaningful interactions.

In each test, television news use interacts with education in predicting political knowledge, and the pattern is the same in every case. Specifically, the interactions indicate that the relationship between education and knowledge is weaker among heavy television news viewers than among light television news users. This implies, but does not absolutely demonstrate, that television news use may be able to reduce knowledge gaps, as first suggested by Tichenor et al. (1970) 30 years ago.

To our surprise, a similar (although generally weaker and less frequently significant) pattern was found for newspaper use. For candidate issue stance knowledge and for ideological knowledge, the relationship between education and knowledge was weaker among heavy newspaper users than among light newspaper users. This pattern is opposite that predicted by the initial knowledge gap hypothesis.

**Table 1**  
Knowledge gap tests across types of knowledge

	Candidate likes/ dislikes	Candidate issue stance knowledge	Party issue stance knowledge	Ideological knowledge	Overall political knowledge
Control variables					
Formal education	.32**	.33**	.36**	.37**	.43**
Campaign interest	.23**	.25**	.23**	.14**	.26**
Family income	.07**	.10**	.10**	.10**	.11**
Gender (female)	-.03	-.08**	-.09**	.00	-.07**
Age	.23	-.05	.00	-.26	.03
Age <sup>2</sup>	-.12	-.05	-.08	.31*	.02
Adj. incr. $R^2$ %	<b>22.0**</b>	<b>27.8**</b>	<b>28.9**</b>	<b>20.2**</b>	<b>36.8**</b>
Media variables					
TV news use	.05	.06*	.01	.02	.05
Newspaper use	.03	.09**	.10**	.05	.08**
Adj. incr. $R^2$ %	<b>0.1</b>	<b>0.7**</b>	<b>0.6**</b>	<b>0.1</b>	<b>0.6**</b>
Interaction terms					
Education × TV	-.07**	-.09**	-.09**	-.05*	-.09**
Education × NP	.00	-.05*	-.03	-.06**	-.04
Adj. incr. $R^2$ %	<b>0.5**</b>	<b>0.7**</b>	<b>0.6**</b>	<b>0.4**</b>	<b>0.8**</b>
Adj. final $R^2$ %	<b>22.6**</b>	<b>29.2**</b>	<b>30.1**</b>	<b>20.7**</b>	<b>38.2**</b>

*Note.* Coefficients are standardized regression coefficients (betas). For the media and interaction term blocks, only variables in previous blocks are controlled to reduce multicollinearity.

\* $p < .05$ . \*\* $p < .01$ .

Table 2 presents one alternative—and potentially more intuitive—method of examining the relationships among news media use, education, and overall political knowledge.<sup>9</sup> As indicated in Table 2 (and consistent with the findings in Table 1), the correlation between education and overall political knowledge is larger among those who are low in television news use than among those who are moderate or high in television news use. However, this pattern is not replicated for newspaper use; correlations between education and political knowledge are similar among both heavy and light newspaper users. The apparent curvilinear relationship is not significant.

Another means of demonstrating our findings is to plot the overall political knowledge means across levels of education and media use. Figure 1 reveals that the difference in knowledge means between high and low education groups is greater among those who watch little television news than among those who watch a lot of television news. The difference between low and high education groups among heavy television news users is only 3.14, but among light television news users the value is 4.67. However, this apparent gap-reducing tendency for television news is not replicated in the plot of newspaper use.

**Table 2**  
Correlations between education and knowledge  
by levels of news media use

	Newspaper use	Television news use
Low	.47	.58
Medium	.55	.54
High	.50	.48

*Note.* Cell entries are correlations between education and overall political knowledge.

To more accurately interpret our findings we must eliminate at least two alternative explanations, both of which are based on the notion of ceiling effects (see Ettema & Kline, 1977). These alternative explanations suggest that those with high levels of education were unable to gain any more political information from news media exposure because (a) they are fully informed or at least have hit the fully informed limit of our measurement or (b) the news media do not allow any further gain in information owing to content limitations in the depth or breadth of their content.

The first explanation can be discounted by demonstrating that among those high in education, the variance in political knowledge is not restricted, and the mean is not extremely close to the theoretical maximum for any of the knowledge measures. Analysis of those with the highest levels of education (those with bachelor-level degrees or more) indicates that while there is some potential of true ceilings for some measures, other measures are clearly normally distributed below the theoretical maximum. Specifically, there is a clear tendency for a ceiling effect for the ideological knowledge scale. A weak ceiling effect might be argued for the two issue stance measures, although there is still substantial variance even among the most highly educated group. By contrast, candidate likes/dislikes and the overall knowledge scale are normally distributed and do not approach the theoretical maximum. Thus, while one might discount the significant interaction between newspaper use and education for the candidate issue stance and ideological knowledge scales as the result of a ceiling effect, the same argument cannot be made for television news use because it demonstrates the same pattern across all knowledge measures.

The second ceiling explanation—a ceiling effect due to limitations in the source of information—cannot be resolved by our survey data. This explanation resonates with arguments that the content of television news (but not newspapers) could engender this type of ceiling effect as a result of the limited amount of hard information available in a 22-minute television newscast. While we cannot settle this debate without a formal content analysis of national and local television news programs during the 1996 campaign, we would argue from our qualitative impression that all of the information probed in these knowledge questions *could* have been culled by the astute viewer of television news during the 1996 presidential campaign.

Table 3 displays the results for voting and general participation as the respective dependent variables. Consistent with previous research (e.g., Verba & Nie, 1972), socio-economic variables such as education and income showed significant positive relation-

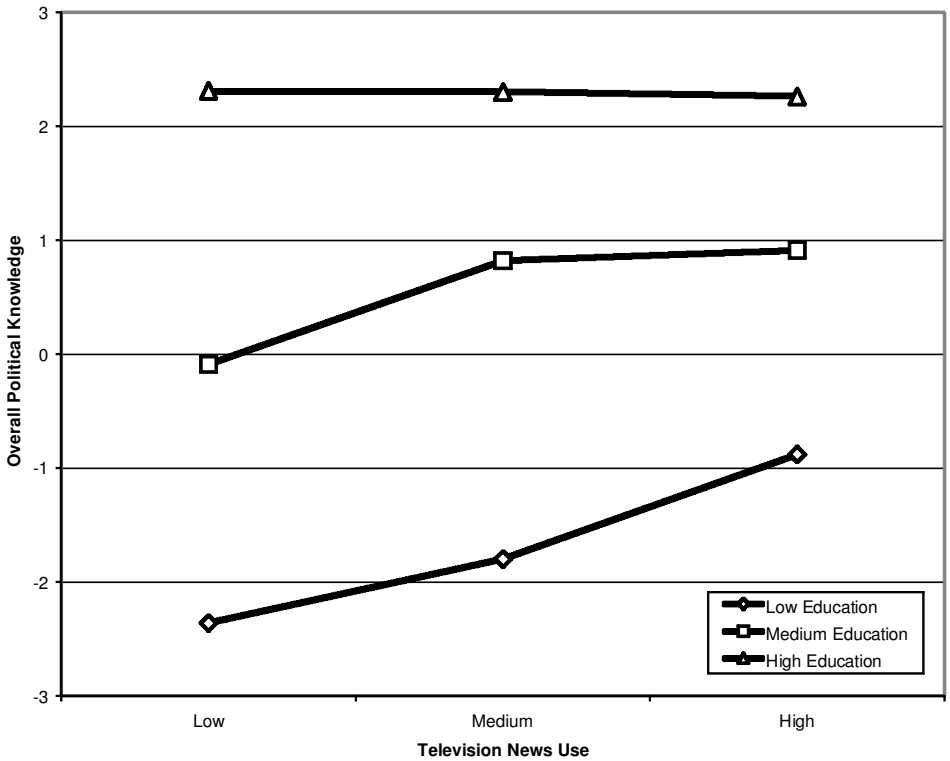
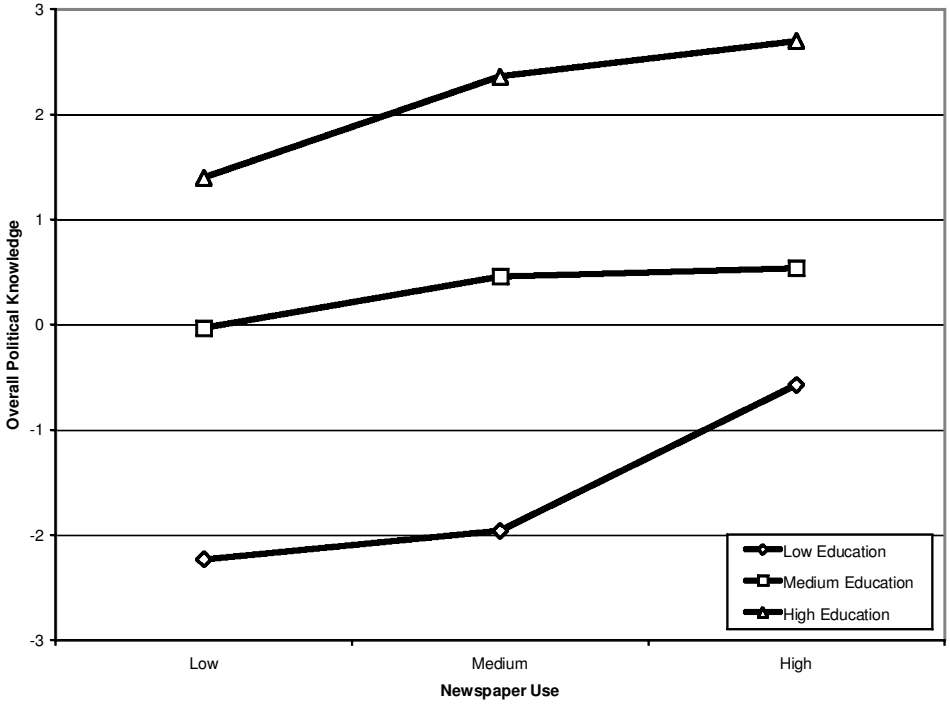


Figure 1. Plots of knowledge means by education and news media use.

ships with both forms of participation. In addition, older respondents were more likely to engage in both types of participatory behavior. Gender was not significantly related to voting or participation. Also consistent with previous research (McLeod et al., 1999; Verba et al., 1995), higher levels of campaign interest were positively related to reports of having voted or participated in other activities. Without providing formal tests, the impact of demographic controls and campaign interest seems weaker for general participation than for voting, accounting for about 23% of the variance in voting and about 10% in general participation.<sup>10</sup>

After controlling for demographic variables and campaign interest, the patterns of relationships between campaign media use and forms of political participation were contrary to our expectations. For both voting and general participation, newspaper use, but not television news use, was a significant predictor. Using the increment to  $R^2$  as the measure of strength, media use also played a stronger role in predicting voting than general participation.

Consistent with our expectations, however, we found a significant interaction between education and newspaper use when predicting general political participation. The relationship between education and political participation was stronger for respondents with higher levels of newspaper use than for respondents with lower levels of newspaper use.

**Table 3**  
Knowledge gap tests across types of participatory behavior

	Voting	Participation
<b>Control Variables</b>		
Formal education	.37**	.11**
Campaign interest	.46**	.22**
Family income	.28**	.10**
Gender (female)	-.05	-.03
Age	.38	-.05
Age <sup>2</sup>	-.04	.11
Adj. incr. $R^2$ %	<b>22.5**</b>	<b>9.6**</b>
<b>Media variables</b>		
TV news use	.08	-.01
Newspaper use	.17**	.08**
Adj. incr. $R^2$ %	<b>0.7**</b>	<b>0.6*</b>
<b>Interaction terms</b>		
Education × TV	.02	.02
Education × NP	-.02	.05*
Adj. incr. $R^2$ %	<b>0.0</b>	<b>0.3</b>
Adj. final $R^2$ %	<b>23.2**</b>	<b>10.2**</b>

*Note.* Coefficients for voting are standardized logistic regression coefficients. Coefficients for participation are standardized regression coefficients (betas). For the media and interaction term blocks, only variables in previous blocks are controlled to reduce multicollinearity. All  $R^2$  values are calculated based on Nagelkerke (1991).

\* $p < .05$ . \*\* $p < .01$ .

## Discussion

The purpose of this study was to examine the relative size of gaps between the more and less educated as they vary by the quantity and type of news media use. We predicted that the relationship between education and knowledge would be weaker among heavy television news users (controlling newspaper use) than among light television news users, whereas the opposite pattern (traditional knowledge gap) would hold when comparing education-knowledge relationships across levels of newspaper use (controlling television news use). We also predicted that the relationship between education and political participation would be stronger among heavy news users than among light news users, and we expected the pattern to be more clear for newspaper use than television news use. These predictions were based on reasoning derived from the integration of theory and research on the communication effects gap, the cognitive psychology of learning, and political behavior. Our expectations received only limited support, but the findings were clearly interpretable in light of existing theory and research and have important implications for empirical and normative theories.

### *Gaps in Knowledge*

Gaps in knowledge between higher and lower education groups were greater among light users of television news than among heavy users of television news, controlling for use of newspapers and a number of demographic variables, plus campaign interest.<sup>11</sup> A similar pattern was found for newspaper use, but this pattern was weaker and may possibly be attributed to ceilings imposed by the nature of the test or a natural ceiling in the information domain. The implications of these findings are that television use could decrease preexisting gaps in knowledge between those with more and less education, while newspaper use can either decrease the gap or at least not increase it. The results of this study add to a slowly growing literature that suggests that television news use may help to reduce political knowledge disparities across education levels (e.g., Kwak, 1999; Miyo, 1983; Neuman et al., 1992). However, the literature is still unclear about the impact of newspaper use on gaps in political knowledge between higher and lower education groups (e.g., Horstmann, 1991; Kwak, 1999; McLeod et al., 1979).

These are inferences based on cross-sectional data and individual-level measures of media use. Given this, we must rely on some assumptions, particularly the assumption of causality. The logic of this inference can be laid out in the following steps. First, a correlation between news media use and knowledge demonstrates that those who use news media more know more about politics. This correlation is often inferred to imply a causal relationship such that people learn from media use, though clearly a simple correlation cannot ensure causality, particularly unidirectional causality. However, there is abundant experimental evidence demonstrating that exposure to information in the media *can* cause information gain (e.g., Drew & Reeves, 1980; Just & Crigler, 1989). There is also longitudinal survey research that indicates that the stronger causal path is from news use to knowledge, not the other way around (Chaffee, Ward, & Tipton, 1970; Conway, Wyckoff, Feldbaum, & Ahern, 1981). Second, if this media use-knowledge relationship is stronger among those who are less educated (or there is a significant interaction between news media use and education, as in the case of television news in this study), it implies that the less educated learn more from television news than do those with greater education. Third, over time, as learning takes place, the less educated segments learn more from a given unit of news use than the more educated segments. Finally, if news use is equal across groups (and this is more likely with television news than newspapers),

television can reduce the size of—or potentially even eliminate—the knowledge gap between high and low education groups. The issue of equality in news use, as we have already noted, may be influenced by economic, motivational, and time factors.

If television news use does have the potential to reduce knowledge gaps, why might this be? A related question is, Why is newspaper use apparently not as successful in reducing knowledge gaps? Our data do not speak directly to these questions, but theory and past research provide some clues to help us understand these findings. The first two explanations describe how television news might facilitate learning among the lower education segments of society, while the second two explanations discuss how television news may be inhibiting learning among the more highly educated segments of society. These explanations are not mutually exclusive and, in fact, are likely to work in conjunction with one another.

First, news generally has been criticized for being “personalized” or focused on personalities instead of social institutions (W. Bennett, 1988). Some have argued that television news is more likely to frame stories in a personal or episodic manner than newspapers (Iyengar, 1991). While it has been claimed that the episodic nature of news discourages learning (e.g., Graber, 1994), personalized information may more easily fit into the existing schemas of less educated population segments, making it easier for them to engage in the elaborative processes (connecting new information to information stored in memory) that facilitate comprehension and recall. In addition, learning about the presidential candidates may be facilitated by the personalized focus of television news relative to newspaper news. This is consistent with our finding that the biggest difference between newspaper news and television news in terms of gap-closing ability was for the measure of candidate likes and dislikes.

Another benefit that may increase learning from television news among those with less education is its ability to use visuals as contextual information. In addition to verbal information describing, for instance, a candidate’s stance on racial or economic issues, television news provides images of candidates worshipping in Southern Baptist churches or making speeches at military bases. This visual information often reinforces the verbal content of the television story in a way that black and white text in a newspaper cannot. For voters who are less sophisticated owing to less formal education, this verbal-visual redundancy can simplify what are (sometimes) complex candidate issue stances into clear distinctions, for instance, between the candidate *for* military spending versus the candidate *against* it. The ability to make these types of distinctions, gross though they may be, is an important ability for those who base their allegiances on the stances of political candidates and parties on issues.

As we noted earlier, television may appear to be closing gaps between high education and low education groups not so much because it facilitates learning among the low education groups, but because television news’ meager content inhibits learning by higher education groups. That is, those who are high in education have little to gain from the paltry content of television news, and thus there is no benefit to television news use among this segment of society. On the other hand, the minimal information held by low education citizens can still be improved upon by the content of television news, and so the gap appears to close.

Finally, it may be that television news does have sufficient content to increase learning among those who are highly educated but that this group does not make the appropriate effort to learn from television. Research among children (Salomon, 1983) has demonstrated that television is perceived to be easier to learn from than print sources. Salomon (1984) has also shown that the effort one devotes to learning from a particular

medium is dependent on perceptions of the medium (how much effort will it take to learn from this medium?) and perceptions of self-efficacy (am I able to learn this information if I put forth the appropriate effort?). If I believe that newspapers take a lot of effort but I do not believe I can learn from them even if I make the effort, then I will not put forth the effort. Similarly, if I think that learning requires very little effort and I have high self-efficacy, I will put forth little effort. It is important to note that cognitive effort—as long as it is the right *kind* of cognitive effort—should increase learning from a given unit of exposure.

It may be, then, that highly educated respondents look down upon television news and perceive that it would take little of their effort to glean information from it. Therefore, they put little effort into learning from television but more into learning from the newspaper. By contrast, the less educated segments of society believe that print media are potentially beyond their skill level but that if they work at it, they can learn from television news. This is very similar to what happened in a comparison of high ability and low ability Israeli children (Salomon & Leigh, 1984). Thus, the greater effort in processing television news by low education groups is rewarded with greater learning from a unit of television news than the learning of higher education groups from that same unit of viewing, since the higher education groups are not putting forth sufficient cognitive effort to learn from television like they do with newspapers.

In addition to these micro-level explanations for our findings, we must also consider how unmeasured macro-level variables may have also influenced our findings. Probably the most important macro variable to consider is the time of the campaign. Moore (1987; see also Genova & Greenberg, 1979) has noted that the time of measurement during a political campaign may influence findings, such that early and late in the campaign small gaps are likely, whereas during the middle of the campaign gaps may be particularly large. This is because by the end of an extensive campaign with heavy media attention and high levels of salience to the public (i.e., a presidential campaign), low education individuals are able to “catch up” to high education individuals. However, one strength of our operationalization of the role of media in knowledge gaps is that absolute size of gaps and change in gaps over time are not measured. Instead, we infer the role of the media through differential patterns of correlations between education and knowledge across levels of media exposure. Thus, it is unclear whether or not time of campaign would influence these correlations. Further research will be required before this issue can be sufficiently addressed.

The other key macro-level variable that must be considered is the level of importance of the topic of politics. That is, while in this study both television and to a lesser extent newspaper use appeared to reduce knowledge gaps, this may not be true when a less intensive campaign is taking place. During a presidential election campaign, political conflict is much more prominent in the media than during an off-year election. Indeed, even presidential election years vary in their level of public interest and political conflict. Specifically, it is unclear whether we would have come to the same conclusion had we studied this topic in an off-year election such as 1994 or 1998 when news coverage and interest were probably lower. We may also have come to a different conclusion had we studied the presidential election of 1992, which on the surface seems to have generated much more interest among both the media and the public. Additional research, preferably comparing presidential elections with off-year elections following the work of S. Bennett (1994), and also comparing across presidential election years and across elections with incumbents versus two relatively unknown challengers, is needed to address this issue more thoroughly.



### **Gaps in Participation**

As expected, we did not find the difference in the size of the voting gap across education groups to be larger among heavy newspaper users than light newspaper users. This is consistent with the long-standing argument that voting is mostly a function of social norms, feelings of citizen duty, and long-term socialization processes (e.g., Milbrath & Goel, 1977; Verba et al., 1995). As argued earlier, even if media coverage does have a direct impact on turnout, there is little evidence to support the notion that this impact on voting should be stronger for more educated citizens than for their counterparts with lower levels of education.

As far as general participation is concerned, however, we found a significant interaction between newspaper use and education that is consistent with the limited past research (McLeod et al., 1979). As argued earlier, these differences between individuals with high and low levels of education are probably due to differences in preexisting knowledge structures about political issues and processes as well as differences in information processing strategies that enable highly educated respondents to benefit more from newspaper use than their less educated counterparts.

In contrast to the education-newspaper interaction, however, the interaction of television news use and education did not have a significant impact on general participation. Since we controlled for a main effect of television news, this lack of difference between high and low education groups cannot be merely a function of lower levels of mobilizing content in this medium. Rather, it is reasonable to assume that the linear presentation of news on television makes political content more easily accessible for audience members with varying levels of educational attainment.

These findings, of course, have important normative implications for democratic systems, in general, and mass media, in particular. While newspapers have consistently been found to increase *overall* levels of participation (for an overview, see McLeod et al., 1999), our findings suggest that this positive influence of newspaper use is significantly stronger among more educated respondents than among less educated respondents. Rather than providing information that is potentially useful in mobilizing a broad cross section of citizens during campaigns, newspapers seem to provide information that disproportionately benefits individuals who are already more likely to engage in participatory activities, that is, the more educated strata of society.

### **Conclusion**

Generally speaking, it is assumed that the preferred method for testing the communication effects gap hypothesis is to use longitudinal data to examine actual changes in the size of gaps between more and less educated segments of society over time. However, there are several problems with using this method, particularly given the aims of the present study. First, information in political campaigns does not remain static, and so over time the information conveyed by the news media changes based on candidate strategies, unexpected events, and so forth. It is very difficult in political campaigns to be able to know what topics will be covered in the future and therefore to ask knowledge questions on this topic in the first, pre-media coverage wave of a panel study. This is particularly true by comparison to research on topics such as health campaigns (e.g., Chew & Palmer, 1994; Viswanath, Kahn, Finnegan, Hertog, & Potter, 1993). Even if prior knowledge of an upcoming topic of media focus during a presidential campaign were possible, reactivity biases (from being asked identical knowledge questions repeat-

edly) can provide an alternative, methodological explanation for findings. If different measures of knowledge are used during different waves to avoid reactivity biases, questions arise about the comparability of the different knowledge measures.

Second, examining variables like voting and political participation over a political campaign makes little sense because the timing of participation in election campaigns is in many ways predetermined and takes place toward the end of the campaign. That is, how meaningful would it be to take a measure of voting or other forms of campaign participation before the campaign had begun?

Third, in order to examine differences across media as we have done here, individual measures of news media use would need to be included in any analysis, moving the analytical focus once again to micro-level measures of information exposure and away from macro-level measures of the information environment or time.

Clearly, any test of the communication effects gap hypothesis will suffer from limitations on the inferences that may be made. Such is the nature of a complex hypothesis. Thus, while the present study is admittedly limited in its ability to demonstrate causality or actual change in levels of knowledge and participation over time, the alternative choice of using panel data suffers from its own limitations. Therefore, research on gap phenomena should make use of multiple sources of data and various research designs (cross-sectional and panel surveys, repeated cross-sectional surveys, quasi-experiments, and laboratory experiments) to better understand both the micro- and macro-level underpinnings of the communication effects gap hypothesis. We are glad to report that, to a large extent, communication effects gap researchers have been methodological pluralists in this respect over the past 30 years.

In closing, our findings, along with those reported in other studies using a similar methodology, suggest that future research on communication effects gaps should (a) continue to consider the context of political communication campaigns, both during elections and otherwise; (b) pay closer attention to medium-related differences in the production or reduction of knowledge gaps, particularly the role of television as a gap reducer; (c) continue to explore the possibility that newspaper use may exacerbate gaps in participation; and (d) use the interaction between media use and education as the statistical test when examining cross-sectional data.

## Notes

1. Indeed, this approach was acknowledged in the seminal article by Tichenor et al. (1970, p. 164) when they described past research, stating, “None of these studies measured mass media coverage *or exposure* [italics added] directly.” This suggests that they acknowledged that either media coverage or media exposure could be used to test the knowledge gap hypothesis. This has also been pointed out over the years by Gaziano (1988; Gaziano & Gaziano, 1996).

2. Although the full sample size is 1,714, the sample size for our analyses varied owing to factors including but not limited to item nonresponse.

3. About three fourths of the sample had been previously interviewed in 1994, while the remainder were first interviewed in the 1996 survey. For the preelection component of the survey, the response rate was 71%. As would be expected, the response rate was higher among panel respondents (76%) than among respondents who were interviewed for the first time (60%). Attrition from preelection to postelection interviewing was about 10%. Again, retention rates were higher for panel respondents (91%) than for cross-section respondents (85%).

4. It should be noted that while the 1996 National Election Study made use of a panel design, most of the measures of interest to us in this study—specifically the knowledge and media questions—were not repeated across waves in 1996. Therefore, we are forced to treat these data as cross

sectional since, while we used measures gathered in both the preelection and postelection waves of 1996, they were generally not well designed for a panel analysis of the issues relevant to this study.

5. It can be argued that as a result of the relatively small proportion of respondents who engaged in each of these activities, this measure should be constructed as a dichotomy similar to voting. In other words, respondents who reported having participated in any of these activities would be coded as one and all other respondents would be coded as zero. We chose to use a continuous measure of participation, however, for two reasons. First, using Monte Carlo simulations, King and Zeng (1999) recently demonstrated that predicting dichotomous variables with relatively small proportions of ones and large proportions of zeros can lead to a substantial underestimation of relationships. Second, we are not very concerned about the somewhat non-normal distribution we observed for the continuous measure of political participation given that measures of political participation, constructed as additive indices of multiple dichotomous items, have repeatedly been found to be positively skewed (e.g., Verba et al., 1995). In addition, Levine and Dunlap (1982, p. 272) argue that "the F test tends to be conservative under skewed and leptokurtic distributions." Transformations, therefore, are necessary only if a researcher is concerned about statistical power. Given our sample size, we chose not to transform this variable.

6. A measure of chronological age taps many different constructs at different stages of its distribution, including health and eyesight, free time, and so on. For this reason, researchers have suggested checking for the presence of nonlinear relationships between age and various criterion measures (e.g., Eveland, 1997a). S. Bennett (1989) specifically found a nonlinear relationship between age and political knowledge. Therefore, we have included both linear and quadratic versions of the age variable in our analyses to account for this potentially nonlinear relationship.

7. Following traditional OLS methods for testing interaction effects (Cohen & Cohen, 1983; Jaccard, Turrisi, & Wan, 1990), all of the variables measuring the "main effects" (i.e., the component terms of the interaction) were first standardized before the computation of the product term, which is created by multiplying education by either newspaper use or television news use. In subsequent analyses, the standardized versions of the education and media use variables were then entered into the regression before the product term; that is, the test of the interaction required first controlling the component terms. The use of standardized component terms allowed for a valid interpretation of the beta coefficient for the product term because it reduces multicollinearity between the product term and its components while leaving the relationship between the components unchanged (Dunlap & Kemery, 1987).

8. As suggested by Menard (1995), we calculated standardized logistic regression coefficients that allow us, at least within a single sample, to compare coefficients across various OLS and logistic regression models (Kaufman, 1996). The calculation follows the formula reported by Menard (1995):  $b_{i, \text{stand.}} = b_i \cdot SD_y / (\sigma^2_{\text{logit}(\hat{Y})} / R^2)^{1/2}$ , where  $b_i$  is the unstandardized coefficient,  $SD_y$  is the standard deviation of the independent variable,  $R^2$  is the coefficient of determination, and  $\sigma^2_{\text{logit}(\hat{Y})}$  is the variance of the estimated values of  $\text{logit}(Y)$ .

9. While this "subgroup correlation comparison" method, and the mean score-based method described in the subsequent paragraph, may be easier to grasp conceptually than the results of the interaction tests in Table 1 and Table 3, the results of Tables 1 and 3 are more precise and appropriate because they include controls for additional variables and do not suffer from potential bias in the selection of cut points (see Eveland, 1997a).

10. It would be reasonable to assume that the small proportion of the variance accounted for in political participation in this model is due to the relative skewness of the dependent variable. A comparison with other data sets, however, shows that this interpretation is not correct. Specifically, McLeod et al. (1999) and Verba et al. (1995) both accounted for more than a quarter of the variance in participation using indices that showed frequency distributions very similar to ours.

11. One anonymous reviewer noted that it is possible that the two-way interaction between television news use and education may have varied by degree of newspaper use. That is, the interaction may have been stronger (or weaker) among nonreaders than among readers. In order to test this possibility statistically, we examined the three-way interaction among education, television news use, and newspaper use. If the interaction between education and television news use was different based on level of newspaper use, the three-way interaction would be statistically

significant. In fact, in none of the five tests did the three-way interaction come close to statistical significance, suggesting the television by education interaction was consistent regardless of the level of newspaper use.

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**Appendix: Items Used from 1996 ANES Data Set**

*Education:* 960610

*Campaign Interest:* 960201

*Income:* 960701 (the categories of this variable were reconstructed to produce a more linear measure)

*Gender:* 960066

*Age:* 960605

*Television News Use:* 960242, 960243, 960244, 960245

*Newspaper Use:* 960246, 960248

*Political Knowledge:*

*Presidential Candidate Likes/Dislikes:* 960206, 960207, 960208, 960209, 960210, 960212, 960213, 960214, 960215, 960216, 960218, 960219, 960220, 960221, 960222, 960224, 960225, 960226, 960227, 960228, 960230, 960231, 960232, 960233, 960234, 960236, 960237, 960238, 960239, 960240

*Candidate Issue Stance Knowledge:* 960453, 960455, 960466, 960469, 960480, 960481, 960484, 960485, 960490, 960492, 960506, 960509, 960520, 960521, 960526, 960529, 960538, 960539, 960544, 960545, 961211, 961212, 961284, 961285

*Party Issue Stance Knowledge:* 960461, 960462, 960477, 960478, 960517, 960518, 960535, 960536, 960541, 960542

*Ideological Knowledge:* 960369, 960371, 960379, 960380

*Political Participation:* 961166, 961167, 961168, 961169, 961171

*Voting:* 961074