

**Evolving Learning: The Changing Effect of Internet Access on  
Political Knowledge and Engagement (1998-2012)\***

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## **Evolving Learning: The Changing Effect of Internet Access on Political Knowledge and Engagement (1998-2012)**

### **Abstract**

This study examines the process of acquiring political information online *by accident*, and the subsequent effects. We analyze data from a cross-sectional time series conducted by Pew Research Centers that allows us to test whether or not accidental information acquisition closes the socioeconomic political knowledge and engagement gap, and if the effect has changed since the late 1990s. Ultimately, our analysis shows the knowledge gap between lower and higher SES Americans has grown over time, but accidental exposure does mitigate this gap. This effect of accidental exposure also holds when we look at actual political participation (vote frequency) as a dependent variable. In the case of knowledge, accidental exposure to information is not closing the gap over time. Accidental exposure does, however, seem to be increasingly closing the participation gap among lower and higher SES Americans since the 1990s.

An equitably informed citizenry is a critical element of an effective representative democracy (Dahl, 1989; Delli Carpini & Keeter, 1996). Although some have argued that democracy is sustainable even with only certain portions of the public possessing knowledge (Schumpeter, 1942; Schattschneider, 1960), there is wide agreement on the normative perspective that an informed mass public is an overall net positive in the context of sustainable self-government. An informed electorate can create ideologically-consistent belief systems, which ultimately will lead to wiser collective decisions compared to an uninformed electorate (Converse, 1964).

Of course, the American mass public is not an equitably informed citizenry. Certainly, there are “attentive publics” that possess high levels of knowledge of public affairs and attitude stability across issue areas, but such groups are outnumbered by the “inattentive public” (Converse, 1979; Campbell, Converse, Miller & Stokes, 1960; Baum, 2002, 2003). While estimations of the exact size of the inattentive public in America varies depending how it is defined, there is no disagreement that the inattentive public lacks a comprehension of basic political facts, as well as any desire to learn.

The major variable that tends to determine whether or not an individual is in the inattentive public or the much more exclusive attentive public is socioeconomic status (Delli Carpini & Keeter, 1996; McLeod & Perse, 1994). Within the context of the media environment, this difference in knowledge across socioeconomic status (SES) was termed the “knowledge gap” by Tichenor, Olien, and Donohue (1970). They were the first to show that information flow through the media regarding

public affairs and politics benefits higher SES individuals much more than those of lower SES.

The significance of the knowledge gap has been widely discussed among academic circles and beyond. Political knowledge is a necessary condition for the effective use of social action and the acquisition of political power (Vinswanath & Finnegan, 1996). The lack of knowledge among low SES groups limits the urge to engage in the political process. In this sense, less political knowledge is a direct cause of less influence on the outcome of the process. The effect, ultimately, is that elected officials in positions of power pay much more heed to the wishes of the wealthy and the educated than the rest of society (Bartels, 2010; Caliendo 2015; Clawson & Oxley, 2013; Gilens, 2012; Schlozman, Verba, & Brady, 2012).

The information environment has changed dramatically in the decades since Tichenor and his colleagues identified this knowledge gap based on SES. In terms of television, for example, the number of channel choices has increased from just a handful into the hundreds. This change has altered the television news landscape with significant implications for how viewers learn (Baum, 2003), what information viewers avoid (Prior, 2007), and what types of news people seek (Areceneux & Johnson, 2013; Levendusky; 2013; Stroud, 2011)

Beyond the propagation of television viewing options, the introduction and proliferation of the Internet during the last twenty years has been transformative. Just one click of a button puts an endless abyss of information at an individual's disposal in a matter of seconds. The abundance of information is so vast that it is now possible for people to come across political information even when they do not

specifically seek it out. This situation is very different from just a few decades ago, when the acquisition of political information necessitated more deliberate effort such as picking up a print newspaper or magazine, or turning on the television during the short time slots in which networks were airing public affairs programming.

It is for these reasons that this study focuses on the evolution of the Internet's role in the context of the political knowledge and engagement gap in America. Generally, we seek to understand whether or not access to political information on the Internet has served to shrink the knowledge gap between disadvantaged and more affluent individuals. More specifically, however, we examine the process of accessing political information *by accident*, and test whether or not the accidental information acquisition among those of lower SES status helps to diminish key forms of political inequality.

The next section outlines the current state of the literature regarding the Internet and the knowledge and participation gap in America, and then discusses accidental information acquisition as a possible vehicle for closing this gap. We then analyze data from a cross-sectional time series that allows us to test whether or not accidental information acquisition among low SES individuals closes the knowledge gap, and if the effect has changed since the late 1990s. Ultimately, our analysis shows the knowledge gap between lower and higher SES Americans has grown over time, but accidental exposure has the ability to mitigate this gap. This effect of accidental exposure also holds when we look at actual political participation (vote frequency) as a dependent variable. In the case of knowledge, accidental exposure to information is not increasingly closing the gap over time. Accidental news

exposure does, however, seem to be increasingly closing the participation gap among the less advantaged and more affluent sectors of American society since the 1990s.

### **The Internet, the Knowledge and Participation Gap, and Accidental Information Acquisition**

As was the case with the advent of radio and television, the proliferation of Internet technology in the 1990s led to wide speculation that the World Wide Web could serve as a great equalizer between the haves and the have-nots when it came to political voice (Grossman, 1995; Kush, 2000; Rheingold, 1993; Schwartz, 1996). Certainly, there were several observers that were more skeptical (see Margolis & Resnick, 2000). It became clear that a lack of Internet access among lower SES individuals was contributing to a “digital divide,” in which the participation and knowledge gap was growing between those who could afford access and those who could not (Jones, Johnson-Yale, Millermaier, & Perez, 2009; Sylvester & McGlynn, 2010; Norris, 2001; Schlozman, Verba, & Brady, 2012). Furthermore, it was also argued that certain sections of the populous lacked the skills necessary to effectively locate and use political information even if they had Internet access (Hargittai, 2003, 2002, 2008; Hargittai & Hinnant, 2008; Min, 2010; Mossberger, Tolbert, & Stansbury, 2003). Thus, even if Internet access were to become ubiquitous in the United States effectively overcoming the “first level divide,” a “second level” digital divide would still persist between those with the motivation and skill to access knowledge and those without (Min, 2010).

For the most part, Internet access in America today is almost ubiquitous. Estimates based on user data and subscriptions suggest that penetration reaches 87 percent in 2014 (Internet Live Stats, 2014). Survey data, on the other hand, suggest the penetration rate exceeds 95 percent (Pew Research Center, 2012). This situation indicates that concerns over the first level digital divide are less important than the questions surrounding the second level divide.

We do not question the existence of a second level digital divide in the United States. Clearly, the motivation and skill to navigate the Internet to locate information varies across several groups, including those of low and high socioeconomic status (Hargittai, 2002). But what if Internet users still encounter information even when they are not pursuing it? Research has show that the inattentive public has a tendency to learn political facts from television even when they are seeking entertainment (Baum 2003; Popkin 1991). In high-information environments, those in the inattentive public have been found to acquire more information compared to inattentive publics in low-information environments (Zukin & Snyder, 1984). The Internet, of course is a high-information environment. If users are encountering political information *by accident* in this high-information environment, then perhaps the second level digital divide is not as critical of a barrier as initially thought.

Research has investigated accidental online exposure to political news. Tewksbury, Weaver, & Maddex (2001) found that about half of all Internet users reported that they were, “Exposed to news and information on current events, public issues, or politics when [they] had been going on-line for a purpose other

than to get news” (pp.548). They found that, overall, accidental online exposure was not associated with higher levels of learning in 1996, but was in 1998—the two years they sampled. A more recent examination of accidental news acquisition was associated with an increase in some forms of political engagement, but did not look at knowledge (Kim, Hsuan-Ting, & Gil de Zuniga, 2013). Also, in the context of the 2012 Republican presidential primary campaign, Morris and Morris (2013) found that Internet use did close the SES knowledge gap regarding the candidates and their issue positions.

The findings from the studies discussed above point in a similar direction: Accidental online exposure to political information is not a rare phenomenon, and it is likely linked to greater levels of political knowledge and engagement.

Unaddressed questions, however, still remain. What are the current rates of accidental news exposure, and have they changed as the Internet has evolved? Second, are the rates of accidental exposure different across SES? And third, does accidental exposure among those of lower SES work to close the knowledge and engagement gap? If so, has this effect changed over time?

Our intent is to address these questions using a cross-sectional time series created from the Pew Research Center’s Biennial Media Consumption Studies from 1998 through 2012. Based on the preceding discussion, we intend to test several expectations:

H1: Exposure to the Internet has risen for high and low SES groups.



H2: Accidental exposure to news about politics and government affairs has risen among high and low SES groups.

H3: Accidental exposure to news about politics among low SES groups will mitigate the political knowledge gap.

H4: Accidental exposure to news about politics among low SES groups will mitigate the political participation gap.

## **Data and Methods**

### *Data*

To complete our analysis we used longitudinal data from eight time points: 1998, 2000, 2002, 2004, 2006, 2008, 2010, and 2012. The data come from Pew Research Center for the People and the Press Biennial Media Consumption Surveys. The Biennial Media Consumption Survey is a nationally representative sample based on landline (and, when applicable, cell phone) interviews. Approximately 3,000 respondents are included in each survey, with no respondents included in previous or subsequent surveys. Some years used a split-form design, and not all respondents for those years received questions pertaining to our key measures (i.e., accidental online news exposure, Internet access), which further reduced our potential sample. The eight cross-sectional datasets were coded so that response scales matched across time-points and then merged to create a longitudinal dataset, and only measures that were included in the vast majority of surveys were kept for

the analysis. This resulted in an overall sample size of 18,914. However, due to missing data on the dependent variables, our regression analyses examining political knowledge and voting regularity use samples of 17,411 and 10,824, respectively. The sample size for voting regularity is considerably smaller since the question was not asked after 2006.

### *Dependent Variables*

Two dependent variables are analyzed: political knowledge and voting regularity. *Political knowledge* is a standardized variable measuring how much each respondent knows about the current political landscape. The amount and type of questions varied across years, necessitating standardization. In certain years as many as six questions were asked by Pew, while in others only two questions were asked. Examples of questions posed are: “Do you happen to know which political party has a majority in the U.S. House of Representatives?” (1) Democrat (2) Republican; “Do you happen to know if the national unemployment rate as reported by the government is currently closer to” (1) 5% (2) 8% (3) 15% (4) 21%.; “Is Angela Merkel the leader of” (1) Germany (2) France (3) the International Monetary Fund (4) NATO. For each year, the number of correct answers given by respondents were summed and then standardized so that there would be a consistent scale in the merged longitudinal dataset.

*Voting regularity* is a 5-point ordinal variable measuring how often people vote: (0) Never (1) Seldom (2) Part of the time (3) Almost always (4) Always. This

variable stayed consistent across years so was left in its original form on a 5-point ordinal scale. This question was not asked by Pew after 2006.

### Independent Variables

The three key independent variables in our analysis are accidental online news exposure, socioeconomic status (SES), and year. *Accidental online news exposure* measures whether respondents come across news even when they are online for purposes other than getting news (0) No (1) Yes. Experiencing accidental exposure was only asked of individuals with Internet access, however since it is impossible to be accidentally exposed to online news without Internet access, individuals who reported no Internet access were coded as (0) no accidental exposure. This allowed us to retain a large portion of respondents. Although Pew's survey question regarding accidental exposure was worded very similarly across waves, slight variations in the phrasing make presenting the exact question unfeasible here. This question was not asked in 2000 by Pew.

*Socioeconomic status (SES)* is a composite measure of income and education. Both income and education were standardized in each cross-sectional dataset (i.e., at each time-point). The two variables were then summed and standardized again to create a composite measure of SES with a mean of 0 and standard deviation of 1 for each year so that there would be a consistent scale in the merged longitudinal dataset.

*Year* is a continuous variable which indicates the year that the cross-sectional Pew data were collected. Year is coded with the base year (1998) as the origin or zero-point (1998=0, 2000=2, 2002=4, 2004=6, 2006=8, 2008=10,

2010=12, 2012=14). This facilitates measuring change from the onset of Pew data collection on accidental online news exposure, political knowledge, and voting regularity.

Five control variables are included in our analysis. *Age* is a continuous measure indicating respondent age. *Female* and *respondent is white* are dummy variables. *Conservative political ideology* is a 5-point scale (1) Very liberal (2) Liberal (3) Moderate (4) Conservative (5) Very conservative. *Follows news* is a composite variable that measures how closely respondents follow different news stories. The amount and types of questions vary across cross-sectional Pew surveys, so the number of news stories was summed and standardized at each time-point so that there would be a consistent scale in the merged longitudinal dataset.

### *Analytic Technique*

OLS regression is used to examine the relationship between accidental online news exposure and political knowledge. Ordered logistic regression is used to examine the relationship between accidental online news exposure and voting regularity. Three models are run for the analysis of each outcome variable. The first model is a main effects model. The second model is a two-way interaction model that allows us to examine the moderating effect of accidental exposure on the link between socioeconomic status (SES) and the outcome variables. The third model is a three-way interaction model that allows us to analyze how the interaction between accidental exposure and SES changes over time. The third model also allows us to examine whether the SES gap in political knowledge and participation

is increasing over time, and whether the effect of accidental exposure on the outcome variable is changing over time by including these higher order interactions in our three-way interaction model.

### *Missing Data*

Multiple imputation using the MI command in Stata (Royston 2005) was used to impute missing values for independent variables in order to retain more information. Four variables contained missing data: accidental online news exposure, socioeconomic status (SES), age, and follow news. Only accidental exposure and SES had more than three percent missingness. Thirteen percent of respondents were missing data on accidental online news exposure, while 16 percent of respondents were missing data on SES, due primarily to individuals choosing not to report their income on the Pew surveys. Following recommendations from past research, all variables in our analysis were used to create an imputation model (Royston 2005; von Hippel 2007). Five imputations and corresponding datasets were created. Results were averaged across the five datasets to produce more precise coefficients and standard errors than those provided from single imputation or listwise deletion (Royston 2005).

## **Results**

Table 1 presents descriptive statistics for all dependent and independent variables. Several values are worth discussing further. On average, people report that they almost always vote (mean of 2.9), and nearly 50 percent of respondents

report accidental online news exposure, suggesting that it is neither a rare or ubiquitous occurrence between 1998 and 2012. As far as demographics, our sample tends to be slightly more female, older, and contains more white individuals than the overall national percentages.

#### *Trends in Internet Use and Accidental Online News Exposure (1998-2012)*

Figure 1 shows the trend in Internet use and accidental exposure between 1998 and 2012. Unsurprisingly, the overall trend for both phenomena is an upward trajectory. In finer detail, though, we see a large jump in Internet use (from 40% to 64%) and accidental exposure (from 22% to 41%) from 1998 to 2002, and then somewhat of a leveling off between 2002 and 2006. In 2008 there is a slight dip in Internet use and a larger dip in accidental exposure, but this is likely due to sampling procedures by Pew and survey question design rather than an actual dip in the population. Between 2008 and 2012, however, Internet use dramatically increases to near ubiquity (65% to 98%), and accidental exposure increases substantially as well (from 50% to 75%).

#### *Discrepancies in Internet Use and Accidental Online News Exposure by Socioeconomic Status (1998-2012)*

Figures 2 and 3 show the trend in Internet use and accidental exposure broken down by socioeconomic status (SES). What is most noticeable is that between 1998 and 2010 each group's Internet use and accidental exposure has gone up over time, but generally at the same rate. This appears to be a case of a rising tide lifting all boats—although lower SES individuals have increased their Internet

use and accidental exposure, so have middle and higher SES individuals. It is not until 2012 that the SES gap in Internet use nearly disappears (although in 2010 the gap between middle and high SES individuals became noticeably smaller). Similarly, the SES gap in accidental online news exposure does not noticeably shrink until 2012.

### *Trends in the Link between Accidental Online News Exposure and Political Knowledge*

After examining descriptive trends in accidental online news exposure over time, our analysis looks at the link between accidental exposure and political knowledge over time in Table 2. Model 1 is a main effects model and exhibits three noteworthy findings. Accidental exposure is positively associated with political knowledge (.211) even after controlling for time and other factors, and socioeconomic status (SES) is positively linked with political knowledge (.288). Interestingly, the coefficient for year is negative and statistically significant (-.009) indicating that individuals have become less politically knowledgeable over time (i.e., since 1998). Although, this apparent reduction in knowledge in the American populace over time may be due to differences in the level of difficulty of questions as the years increased. It is unclear, however, whether accidental exposure helps to reduce the SES gap in political knowledge evident in Model 1.

Model 2 is the two-way interaction model that includes the moderating effect of accidental exposure on the relationship between SES and political knowledge. The interaction between accidental exposure and political knowledge is negative and statistically significant (-.030). This indicates that for respondents who report

accidental exposure the slope for SES is less steep and the SES knowledge gap is reduced by accidental exposure. It is uncertain, though, whether the moderating effect of accidental exposure is increasingly reducing the SES knowledge gap over time.

Model 3 is the three-way interaction model that includes the moderating effect of time on the interaction between accidental exposure and SES. The three-way interaction among accidental exposure, SES, and year is statistically insignificant suggesting that, although accidental exposure reduces the SES knowledge gap, it is not doing so at an increasing rate over time. Two additional findings merit further discussion. The interaction between SES and year is statistically significant and positive, suggesting that the SES political knowledge gap has increased since 1998, which makes locating factors that can reduce this gap important. Also, the interaction between accidental exposure and year is not statistically significant, suggesting that the relationship between accidental exposure and political knowledge is not changing over time.

These results suggest that accidental exposure and SES are positively related to political knowledge, and that accidental exposure reduces the SES knowledge gap—an important development since our results also indicate that the SES political knowledge gap has increased over the time period under examination. However, accidental exposure is not mitigating the SES gap at an increasing rate since 1998. This may be due to the fact that, although accidental exposure has increased over time (see Figure 1), the rates of accidental exposure have increased at a steady rate for everyone—lower, middle, and higher SES individuals.



### *Trends in the Link between Accidental Online News Exposure and Voting Regularity*

In addition to investigating political knowledge, we looked at the relationship between accidental exposure and voting regularity between 1998 and 2012. The results of this analysis are presented in Table 3. The main effects model, Model 1, indicates that accidental exposure (.189) and SES (.397) are positively related to the increased log-odds of voting more often, holding constant other factors in the model. Year is also positively related to voting regularity (.019), suggesting that people report increased voting regularity since 1998—although our earlier results suggest that they are less knowledgeable on political issues over that same time period.

Model 2 investigates the moderating effect of accidental exposure on the SES voting gap by introducing the interaction term between the two variables. As with political knowledge, the interaction term is statistically significant and negative (-.083), indicating that accidental exposure helps to reduce the SES voting gap. Model 3 adds the three-way interaction term that allows us to examine the moderating effect of time on the interaction between accidental exposure and SES. Unlike our analysis of political knowledge, the three-way interaction among accidental exposure, SES, and year is statistically significant and negative in Model 3 examining voting regularity (-.027). This indicates that as time increases, the interaction between accidental exposure and SES becomes increasingly negative. In other words, since 1998 the moderating effect of accidental exposure has increasingly reduced the SES voting gap (the SES slope is increasingly flattening).

It is also interesting to note that in Model 3 the interaction between SES and year is statistically significant and positive (.024) indicating that the SES voting gap

is increasing over time—just as we found with the SES political knowledge gap. Additionally, the interaction between accidental exposure and year is statistically significant and positive (.047), suggesting that the link between accidental exposure and voting regularity is strengthening over time.

The results from Table 3 indicate that accidental exposure and SES are positively related to voting regularity, and accidental exposure helps to diminish the SES voting gap. Furthermore, accidental exposure appears to be mitigating the SES voting gap at an increasing rate. This would seem to be a key finding since our results also suggest that the SES voting gap is increasing over time. It is unclear, however, why accidental online news exposure has the capacity to increasingly diminish the SES voting gap over time, but does not have the same capacity when it comes to the SES knowledge gap.

## **Discussion**

We set out to examine the impact of accidental online information exposure on both political knowledge and participation (via voting regularity) between 1998 and 2012, a time when Internet use, and subsequently accidental exposure, went from minority phenomena to very frequent occurrences. We examined trends in Internet use and accidental exposure between 1998 and 2012 for all individuals and by socioeconomic status. We then examined whether accidental exposure has the ability to mitigate the socioeconomic (SES) political knowledge and voting regularity gap between 1998 and 2012, and, if so, whether that mitigating ability is increasing over time.

Our results indicate that accidental online news exposure has increased from 22 percent to 75 percent between 1998 and 2012, and in that same time span Internet use has reached near ubiquity. Broken down by SES, higher SES individuals are more likely to experience accidental exposure than middle or lower SES individuals, and middle SES individuals are more likely than lower SES individuals to experience accidental exposure. Accidental exposure has increased for lower, middle, and high SES individuals between 1998 and 2012, however the increase for each group has been at a similar rate for most of that time span. It is not until 2012 that the SES gap in Internet use and accidental exposure noticeably closes.

Our investigation of the link between accidental online news exposure and political knowledge between 1998 and 2012 found that accidental exposure and SES are positively related to political knowledge. Our findings also suggest that, holding year constant, accidental exposure reduces the SES knowledge gap—a key finding since our results also indicate that the SES political knowledge gap is increasing over time. However, our results suggest that accidental exposure is not mitigating the SES gap at an increasing rate over the time span of our study.

Our examination of the link between accidental online news exposure and voting regularity between 1998 and 2012 found that accidental exposure and SES are positively related to voting regularity and helps to diminish the SES voting gap. Moreover, accidental exposure appears to be mitigating the SES voting gap at an increasing rate. Again, this would seem to be an important development since our results also suggest that the SES voting gap is increasing over time.

Our study indicates that accidental online news exposure can help to mitigate the growing socioeconomic status gap in political knowledge and participation. Moreover, for voting regularity this process appears to be growing over time. Our study appears to have located a manner in which Internet use can help to close the advantages that well-off people have in the political realm. Prior research speculated that the Internet stands to exacerbate various forms of inequality—including political inequality—due to differences in computer skills, equipment, regular access, and website choices (Hargittai, 2008; Hargittai & Hinnant, 2008). However, recent research indicates that in practice the Internet can reduce political inequality (Morris & Morris, 2013). We believe our analysis has located a way that the Internet can diminish political inequality, even though higher SES individuals tend to have more and better access to the Internet, have newer equipment, visit more informative sites regarding current events, and are more educated in computer technology and skills. By accidentally coming across information and activity that they may not otherwise come across in their everyday lives, less well off individuals gain political information and may be more likely to become engaged in and knowledgeable about the political realm.

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