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Estimating Self-Reported News Exposure Across and Within Typical Days: Should Surveys Use More Refined Measures?

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Estimating Self-Reported News Exposure Across and Within Typical Days: Should Surveys Use More Refined Measures?

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Mass communication researchers have an interest in accurately measuring media exposure. Survey measures often ask respondents about the number of days in a week or the hours in a day that they use a medium. These two strategies (and their composite—hours per week) have yet to be directly compared to one another, so their relative usefulness for researchers is unknown. Analyses of data from the 2008 American National Election Studies Time Series Study suggest few benefits from measuring news exposure using both approaches. The measures of exposure as days per week, minutes per day, and minutes per week (the product of the first two) operate similarly as predictors of political knowledge, perceived issue distances between presidential candidates, days per week talking about politics, levels of community involvement, and voter turnout.

Although the state of the news audience is a topic immersed in much uncertainty, this much seems clear: Mass audiences for traditional news media have declined

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in size over the last several decades even as smaller segments of "news junkies" have increased their consumption of news content (e.g., Prior, 2007). One reason is the proliferation of media channels that have followed from the expansion of cable television since the 1970s and the growing use of the Internet starting in the middle 1990s. This expansion of programming options allows people to choose from a wider array of media content than before (thus explaining the decline of audiences for traditional news products) and to channel their media exposure into particular types of content (thus explaining the increasing volume of news consumption among the politically interested).

The apparently steady decline in news audiences increases the importance of proper measurement. Widespread exposure to news on television and in newspapers can no longer be taken for granted. Widening gaps between attentive and inattentive news audiences means that identifying who uses the news and with what frequency is becoming increasingly important. Given the typically small to moderate relationships that researchers expect between exposure and predicted outcomes, careful measurement is all the more crucial. Unfortunately, communication researchers have yet to pay adequate attention to this issue. Some recent reviews of exposure measurement highlight the need for further research in this area (e.g., Fishbein & Hornik, 2008; Slater, 2004; Southwell, 2005; Southwell, Barmada, Hornik, & Maklan, 2002). The general thrust of these reviews is that more work is needed to determine how best to measure exposure to the contemporary media. This is not merely an issue of exposure to news content, of course. Changes to the media landscape have increased the measurement hurdles that many researchers face.

This study takes an important step in the direction of identifying effective media measurement strategies by testing the usefulness of one method that some researchers have adopted to improve their measurement of exposure. It is a near truism in this area that increasing the specificity of measurement improves one's ability to predict the outcomes of exposure to the media. We test one aspect of that truism and find only limited support for it.

SPECIFICITY OF MEDIA EXPOSURE

The communication literature contains a number of ways to measure exposure. The usefulness of each depends, in part, on the goals of the research and the resources available for measurement. Researchers wish to measure a concept reliably and validly, but they are faced with survey costs and the limitations of human participants. The measurement choices that might be most important for researchers involve specificity. There are two types of exposure specificity particularly relevant for communication researchers: content and frequency. Two recent studies examined the validity of survey questions posed at different levels of content specificity. Romantan, Hornik, Price, Cappella, and Viswanath (2008) compared the performance of measures that asked respondents about general media exposure and health-related media exposure. They report that health media exposure measures outperformed the more general one in predicting respondent knowledge about cancer. Similarly, a review of sexual media effect studies examined how often researchers ask about media use in general as opposed to exposure to specific genres and programming (Annenberg Media Exposure Research Group, 2008). This analysis showed that the use of general measures decreased from 1976 through 2006 and that greater content specificity in measurement is associated with more frequent findings of statistically significant events.

The second dimension of specificity is frequency of exposure. If small differences in frequency of exposure are important for understanding variance in outcome measures, then the more specific the frequency measure, the more useful the measure will be for predicting effects. The traditional self-report survey questions measuring "days per week" of news exposure have been the most common in the field. With the complexity of the media environment increasing, continuing use of these traditional question formats could provide a progressively less accurate picture of news exposure. It used to be that a five-day-a-week national television news viewer could be predicted to have seen roughly two and a half hours of network news programming in a typical week. In the contemporary environment, the same amount of television news programming could easily be seen at a single sitting. At this rate, national television news exposure for "news junkies" could easily exceed a dozen or more hours per week compared to the two and a half hours per week for the "old-fashioned" network television news consumer. If such differences in exposure turn out to be consequential for understanding political beliefs, attitudes, and behaviors, then continued use of the traditional "days per week" format for self-reported news exposure could produce increasingly misleading research findings.

Some survey organizations, most notably the Pew Center for the People and the Press, have been asking about minutes per day of news exposure for several years (Pew Research Center for the People and the Press, 2008). The European Social Survey has recently tested a set of media use measures that rely solely on recall of the minutes of media use on an average weekday (Coromina & Saris, 2009). To our knowledge, however, no head-to-head analysis of the validity of these measures compared to the standard "days per week" measures has ever been conducted. Recent studies have also assessed the reliability and stability of some media exposure measures. Lee, Hornik, and Hennessy (2008) report that media exposure measured in days per week and hours per day had moderate reliability. More importantly for the present context, they were comparably reliable and stable over time.

The question for the present study is whether the "minutes per day" format adds valuable information about the nature of news exposure that would otherwise be ignored by the traditional "days per week" format. We explore whether the "minutes per day" format, alone or in combination with a "days per week" question, provides a superior measure of self-reported news exposure in the contemporary media environment.

VALIDITY OF EXPOSURE MEASURES

There are at least two competing sources of validity concerns when it comes to self-reported measures of media exposure. First, such questions are associated with a wide array of measurement problems. They have less than impressive levels of reliability, so that substantial effects of media exposure only become apparent after correcting for measurement error in these questions (Bartels 1993; Henderson, 2006). They seem to overstate apparent media use far beyond levels obtained in behavioral measures such as Nielsen television ratings and newspaper circulation data (Price & Zaller, 1990, 1993; Prior, 2007, 2009a). Recent work suggests that these inflated estimates of audience size result from faulty memory searches and inferential strategies rather than from social desirability bias or survey satisficing—responding with little effort (Prior, 2009b). If so, then these questions could still be useful as covariates for explaining beliefs, attitudes, and behaviors even if they overstate the actual size of the news audience. However, as a means of estimating actual levels of news exposure, such questions leave much to be desired.

A second source of potential validity concerns is the traditional choice to measure self-reported exposure in entire days rather than shorter time intervals. This strategy may well capture habitual news exposure that occurs on a daily basis, but it completely ignores the variance in time spent using news media within a given day. For example, the Pew Center's 2008 media use survey found that among the 34% of respondents who read a newspaper "yesterday," 15% read newspapers for fewer than 15 minutes, 26% read newspapers for between 15 and 29 minutes, 38% read newspapers for between 30 minutes and an hour, and 21% read newspapers for an hour or more. There is clearly a large difference between less than 15 minutes of exposure and more than an hour of exposure, but this important source of daily variation is obscured in the standard "days per week" measures. In this way, we can see that the measures of days per week do a better job of assessing whether respondents are habitually exposed to news than how much news they are actually exposed to.

If survey respondents are simply unable to recall with much accuracy how much news to which they are typically exposed (Prior, 2009a, 2009b), asking more refined questions will only compound the conventional sources of error. At worst, more refined estimates of daily news exposure could be even noisier than the traditional measures and could therefore be even poorer predictors of beliefs, attitudes, and behaviors than traditional measures. At best, more refined measures could yield substantially improved estimates of the quantity rather than merely the frequency of news exposure, and could therefore provide much improved predictors of beliefs, attitudes, and behaviors that are affected by news exposure.

The goal of the analyses presented here is to determine whether news exposure is more effectively measured as days per week, minutes per day, or minutes per week. Effectiveness will be assessed by examining how these alternative measures of news exposure predict a number of consequential political variables measured before and after the 2008 presidential election. All of the criterion measures (e.g., political knowledge and participation) are expected to correlate with news exposure and all are central indicators of the political sophistication and activity of citizens in a democracy. If one measure of news exposure is clearly superior to the others in the tests that are presented here, that will provide a strong warrant for its inclusion in future research. Of course, media exposure does not stand alone as a predictor of media effects. Research has demonstrated that measuring attention to media messages is at least as important as measuring exposure (Drew & Weaver, 1990; Chaffee & Schleuder, 1986; Eveland, Hutchens, & Shen, 2009). Indeed, the measures nicely complement one another. With improvements in exposure measurement, the power of attention measures may be more fully applied in research designs.

The use of exposure, attention, and other ways to measure how audiences receive and process mediated messages has its basis in an underlying theoretical model. Most media impact models and traditions contain implicit or explicit assumptions about the concept of exposure. Those assumptions can provide guidance about measurement strategy. For example, working within a model of health campaigns research, Donohew, Lorch, and Palmgreen (1998) argue that attention to messages is a function of the joint characteristics of messages and individual members of the audience. As a result, measures of attention would be confounded with these and related factors.

Decisions about measurement are based only in part on the fit between concept and measure. The efficiency of measurement is an important second factor that will influence tactical decisions about which questions to ask. Therefore, this analysis will weigh any potential benefits in improved measurement accuracy against the practical costs in survey administration that may accompany those measurements. Because the best measures are those that provide a clear advantage in validity and come with acceptable practical costs, we examine both aspects to see the relative strengths provided by these conventional measurement strategies.

METHOD

Data for this study were taken from the 2008 American National Election Studies (ANES) Times Series surveys. Both preelection (survey fielded September 2 through November 3, 2008) and postelection (survey fielded November 5 through December 30, 2008) responses are used. The ANES reports that the target population is English- or Spanish-speaking voting-age citizens in the

contiguous 48 states and the District of Columbia (ANES, 2009). The ANES uses a cluster sampling procedure to select respondents from a frame of residential addresses and has an AAPOR RR1 response rate of 59.5% for the preelection wave and 53.9% for the postelection wave. A list of variables and the ANES variable numbers is given in Appendix Table A1.

The 2008 ANES included two questions for each of four channels of news exposure (i.e., newspapers, television, Internet, and radio) in the preelection administration.¹ The first question asked respondents how many days in a typical week they obtain news, not including sports, from the medium. For those who reported at least one day of exposure, a subsequent question asked, "On a typical day when you [use the medium], about how much time do you spend [using the medium], not including sports?" Responses were recorded verbatim in hours or minutes, whichever was used by the respondent, and subsequently recoded into the number of minutes per day.²

Descriptive statistics for both sets of measures are reported in Appendix Table A2. Analysis of kurtosis and skewness statistics shows that whereas the days per week responses approximate a flattened normal distribution, the minutes per day responses are positively skewed and decidedly nonnormal. These tendencies cause overdispersion in minutes per day measures (i.e., where the standard deviations are larger than the means) that severely limit their usefulness in regression models. This overdispersion is caused by unrealistically high self-reports of media consumption: three respondents said they read printed newspapers for six or more hours on a typical day, four respondents said they followed news on the Internet for eight or more hours per day, two claimed to listen to radio news for 10 or more hours per day, and six respondents claimed to watch 10 or more hours of television news on an average day. To correct for this problem, the natural log of the minutes per day variables is used in the analysis that follows.³ As shown in

¹The 2008 ANES used a split sample ballot to test alternative wording of media use questions. Thus, we used half of the full sample for our analyses.

²Respondents who reported no days of exposure to a medium were scored as having zero minutes per day.

³Besides being overdispersed, a postestimation sensitivity analysis revealed that some of the untransformed reports of daily minutes of news exposure exerted undue influence on the regression results. Thus, transformation seemed warranted. One alternative to using a logarithmic transformation of the variables would have been to simply cap the upper bound above a certain level, as the Pew Center does for reporting findings from its minutes per day measures. One problem with that approach is the difficulty inherent in determining a precise criterion for cutting off or capping self-reported values. A second problem is that a capping strategy necessarily loses valuable information about individual-level variance when all respondents above a certain level are assigned the same value for news exposure. The logarithmic transformation retains the meaning behind relative differences in exposure time while eliminating some of the noise inherent in recall measures of this type. It also compensates for the probability that a period of time (say, 30 minutes) likely means more for political learning or participation at low levels of exposure than it does at very high levels of exposure.

Table A2, the logged minutes per day measures have an approximately normal distribution. A third set of variables was calculated by multiplying the unlogged minutes per day variable by the days per week measure. This new variable was then logged. A handful of respondents failed to provide estimates of minutes per day, so these few cases were excluded from all analyses.

Measures of days per week and minutes per day may have unique explanatory power across a range of dependent variables. Romantan et al. (2008) used domain specific (i.e., health information) knowledge as the criterion measure in a test of various measures of exposure. Eveland and colleagues (2009) took a similar approach with their test of measures of news exposure. Another recent test (Annenberg Media Exposure Research Group, 2008) added behavior measures as validity checks. Knowledge and behavior criterion measures are used in the present study.

First, we constructed an index of political knowledge. Following standard practice in the literature, we added several factual knowledge items scored 1 for a correct answer and 0 otherwise to a five-point interviewer assessment of respondents' political information that was recoded so that 4 indicated the highest knowledge level and 0 indicated the lowest (e.g., Althaus, 2003; Delli Carpini & Keeter, 1993; Zaller, 1992). In constructing this knowledge index, we used questions asking whether the unemployment rate had increased or declined in the past year (correct answer: increased), whether the disparity between rich and poor people had become larger or smaller than it was 20 years ago (correct answer: larger), which political party controlled the U.S. House of Representatives (the Democrats), which political party controlled the U.S. Senate (the Democrats), and which major party was more conservative (Republicans). The interviewer rating simply asked interviewers to assess respondents' level of information about politics and public affairs on a five point scale. The resulting index ranged from zero to nine (M = 5.32, SD = 1.98).⁴

To assess how different forms of news exposure might affect perceptions of the political world, we turned to a series of ANES questions in the preelection wave in which respondents place the major party presidential candidates on issue-position scales. These questions are commonly used to construct measures of issue polarization by measuring the perceived issue distance between major-party candidates for president or between the respondent's own position and that of the major party candidates (e.g., Abramowitz & Stone, 2006; Johnston & Feldman, 1989; Lavine & Gschwend, 2007). For each of five items we subtracted respondents' placement of Barack Obama from their assessment of John McCain and took the absolute value of the resulting difference. The perceptions concerned candidate issue

⁴Because the items in the political knowledge index varied in difficulty, the Cronbach's alpha for the index is a relatively low .51.

stances on government services, national defense, health care, granting citizenship to illegal immigrants, and power plant emissions. The mean of these five differences provides a second dependent variable (M = 1.81, SD = 1.27, Cronbach's alpha = .66).

We also look at a set of behavior measures from the postelection survey. Previous research has demonstrated positive relationships between news exposure and measures of political activity (e.g., Moy, McCluskey, McCoy, & Spratt, 2004). The first of these is political discussion. We use a question asking respondents how many days in the past week they discussed politics or public affairs (M = 2.08, SD = 2.13), which is conventionally employed by political scientists as a measure of political discussion frequency (e.g., Mutz, 2006; Walsh, 2004). Second, we look at self-reported vote turnout in the general election (76.3% of respondents reported voting). Finally, we take advantage of a battery of questions in the postelection survey that political scientists use to measure community-centered political activity (e.g., Verba & Nie, 1972; Verba, Schlozman, & Brady 1995). Six yes/no questions asked whether people worked on a community problem, contacted a public official, attended a meeting in their community or for their school board, volunteered for an organization, contributed to a charity, or were active in their church in the past year. Affirmative responses were summed into an index of community participation (M = 1.80, SD = 1.71).⁵ Descriptive statistics for the five criterion variables and six additional control variables are shown in Appendix Table A3.

RESULTS

To understand how these different measures of media exposure are related to one another, we first calculated Pearson correlations between days per week and logged minutes per day of exposure across all four media. The correlations between days per week and minutes per day within each medium tend to be quite strong: .68 for television news exposure, .70 for newspaper exposure, .80 for internet news exposure, and .83 for radio news exposure. These consistent within-medium correlations could mean that days per week and time per day of exposure are strongly related to one another. They could also mean that respondents are simply unable to differentiate their exposure at such fine gradations, and therefore provide generic answers ("a lot" or "a little") regardless of whether the questions ask for media exposure within or across days. In either case, these high within-medium correlations suggest that days per week and hours per day might be somewhat interchangeable as indicators of news exposure.

⁵The Cronbach's alpha for this index is a healthy .72, largely because so few respondents tend to engage in any of these activities.

To test this possibility, we used different specifications of the media exposure variables to predict levels of political knowledge, the size of perceived issue differences between presidential candidates, the frequency of political discussion, an index of community involvement, and voter turnout. In each case, we expected to find positive associations between media exposure and the criterion variables. Our main questions of interest were whether the apparent impact of self-reported news exposure varied when news exposure was measured within days instead of across days, and whether a combined measure of minutes per week that accounted for both types of exposure was superior to its component parts. The high within-medium correlations between these "days per week" and "minutes per day" measures meant that we could not interpret the coefficients were we to include both sets of questions in the same regression models. Instead, we present three models for each dependent variable: the first with news exposure modeled using the "days per week" measures, the second using the "minutes per day" measures, and the third using the combined "minutes per week" measures.

To test how well each alternative specification of news exposure predicted political knowledge levels, we regressed our scale of political knowledge on a set of standard control variables including gender, years of formal education, race, identification with either the Republican or Democratic party, and the extremity of party identification (strong, weak, or none), as well as measures of media use.⁶

Table 1 reports the findings for predicting political knowledge levels. The results suggest few important differences between the coefficients produced for exposure expressed as days per week and expressed as minutes per day or minutes per week. Minor differences in significance levels aside, standardized coefficients for a given type of media exposure all have the same signs and are roughly the same size across the three alternative specifications (Tables 3 and 4, discussed below, present analyses of the significance of differences in R-squared for the addition of alternate measures). Newspaper use has a slightly larger coefficient in days per week compared to either of the other measures, but the differences are minor. The same can be said for television and Internet news exposure. Overall, the R-squared values over the three models are nearly indistinguishable from one another.

⁶The presence of many nonusers of some media (e.g., radio news) meant that a good number of respondents had identical values of zero for the respective exposure measures. This might artificially inflate the apparent level of association between some news exposures and the criterion variables. To evaluate this possibility, we examined the partial correlation coefficients for each combination of news exposure and criterion variable (controlling for gender, years of formal education, race, partisan identification, and strength of partisanship) for all respondents and then just those reporting some use of the respective news medium. A few of the 20 relationships (e.g., four media by five criterion measures) for each measurement level exhibited meaningful differences between these two approaches, but all of these were substantively small. The analytic leverage gained from the regression framework argued for including all respondents in all of the analyses, so that approach was taken.

	1	Political Knowle	edge	Candidate Issue Distances				
	Days/Wk	LnMins/Day	LnMins/Wk	Days/Wk	LnMins/Day	LnMins/Wk		
Newspaper Use	.101***	.053*	.075**	015	029	023		
TV News Use	.076**	.088**	.095***	.039	.063*	.064*		
Internet Use	.179***	.165***	.181***	.112***	.145***	.146***		
Radio Use	.036	.037	.040	.066*	.085**	.083**		
Adj. $R^2 =$.340	.332	.340	.118	.131	.130		
N=	1026	1026	1026	1114	1114	1114		

TABLE 1 Predicting Political Knowledge and Perceived Issue Distances Separating Presidential Candidates

 $^{\dagger}p < .10 \ ^{*}p < .05 \ ^{**}p < .01 \ ^{***}p < .001.$

Note. Column labels list the metric of the media use variables used to predict levels of the dependent variables. Cells contain standardized (beta) coefficients from a multiple OLS regression model. Models also control for gender, formal education, race, partisan identification, and strength of partisanship.

Source: 2008 ANES.

Table 1 also presents analyses of the impact of news exposure on perceptions of the issue distances separating presidential candidates. As with political knowledge, the size and significance of news exposure coefficients varied somewhat across models, but the three models yielded coefficients with similar directional tendencies and the same overall patterns. What differences that are apparent here suggest that measures of minutes per day and week accounted for slightly more variance than did the measure of days per week. Thus, it appears there might be a small advantage to be gained—on this dependent variable, in any event—from asking survey respondents for the amount of daily time they spent with the news media.

Table 2 presents parallel analyses predicting the frequency with which people talked about politics with others, engaged in community political activity, and voted in a recent presidential election. Much as with knowledge and perceptions of candidate issue distances, these measures of behavior reveal no strongly divergent pattern of differentiation across the three ways of operationalizing news exposure. In contrast to the analysis of the perception measure, though, the marginally notable pattern here lies in slightly higher R-squared values (Nagelkerke R-squared, in the case of voter turnout) with the days per week models than with the other two.

Looking across all five analyses, the aggregate results suggest no clear pattern of difference between the measures of days per week, minutes per day, and minutes per week. Improvements in model specification can also be assessed through analyses that specify the gains in variance explained by the addition of measures to models that contain only one or two of the three sets of measures. For example, one could start with analyses in which the controls and exposure measured in days

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	Days/Wk	LnMins/Day	LnMins/Wk	Days/Wk	LnMins/Day	LnMins/Wk	Days/Wk	LnMins/Day	LnMins/Wk
Newspaper Use	.110***	.077**	.096**	.140***	.055 [†]	.089**	.103***	.078 [†]	.081*
TV News Use	$.116^{***}$.084**	$.105^{***}$	900.	032	018	$.066^{\dagger}$.060	.063
Internet Use	.215***	.174***	$.196^{***}$.116***	.071*	$.086^{**}$	$.120^{**}$.147**	$.126^{**}$
Radio Use	$.119^{***}$.141***	.139***	$.118^{***}$	$.114^{***}$.119***	.043	.055	.047
Adj. $R^2 =$.125	.105	.117	.158	.135	.142	.297	.280	.289
N = N	1114	1114	1114	1114	1114	1114	1026	1026	1026
$^{\dagger}p < .10 \ ^{*}p < .05$	5*p < .01**p	0 < .001.							

Note. Column labels list the metric of the media use variables used to predict levels of the dependent variables. Cells contain standardized (beta) coefficients from a multiple OLS regression model. Models control for gender, formal education, race, partisan identification, and strength of partisanship. In the case of turnout, cells contain logistic regression coefficients and Nagelkerke r-squared. Source: 2008 ANES. per week are the variables in an initial model. Exposure measured in minutes per day followed by minutes per week is added to the model. There are six possible combinations of entry for the three measures of exposure. Examining all six combinations would show the advantages of using any one of the three and the gain one obtains from including the other two.

The best way to present these models is to start with analyses that show the incremental gains of adding specific exposure measures. Given that six combinations yield quite a bit of data, only two full sets of results are presented in Table 3. The top panel of the table shows the incremental R-squared (Nagelkerke R-squared for voter turnout) values for the addition of exposure measured in minutes per day and minutes per week to models that contain controls and exposure measured in days per week. The bottom panel features the addition of news exposure measured in days per week and minutes per week to models that contain the controls and minutes per day (because minutes per week is the product of the other two variables, it is entered last in both of these examples). These results show a number of things. First, the initial entry is the most substantial in almost every case. At the very least, it is always statistically significant. Second, adding minutes per day as the second set of news exposure measures is statistically significant in three models and marginally significant in a fourth, and adding days

$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			•			
Days/Week Entered First Controls Only $.301^{***}$ $.109^{***}$ $.050^{***}$ $.122^{***}$ $.261^{***}$ + Days/Week $.046^{***}$ $.017^{***}$ $.082^{***}$ $.043^{***}$ $.036^{***}$ + LnMinutes/Day $.009^{**}$ $.014^{**}$ $.011^{**}$ $.007^{\dagger}$ $.005$ + LnMinutes/Week $.000$ $.001$ $.005$ $.003$ $.007$ Final R ² $.356$ $.140$ $.149$ $.175$ $.309$ LnMins/Day Entered First Controls Only $.301^{***}$ $.003^{***}$ $.022^{***}$ $.261^{***}$ + LnMinutes/Day $.037^{***}$ $.031^{***}$ $.063^{***}$ $.021^{***}$ $.019^{**}$ + Days/Week $.017^{***}$ $.001$ $.031^{***}$ $.030^{***}$ $.022^{**}$ + LnMinutes/Week $.000$ $.001$ $.005$ $.002$ $.007$ Final R ² $.356$ $.140$ $.149$ $.175$ $.309$		Political Knowledge	Candidate Issue Distance	Political Discussion	Community Political Activity	Voter Turnout
$\begin{array}{llllllllllllllllllllllllllllllllllll$	Days/Week Entered First					
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Controls Only	.301***	.109***	.050***	.122***	.261***
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	+ Days/Week	.046***	.017***	.082***	.043***	.036***
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	+ LnMinutes/Day	.009**	.014**	.011**	.007†	.005
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	+ LnMinutes/Week	.000	.001	.005	.003	.007
$ \begin{array}{l lllllllllllllllllllllllllllllllllll$	Final R ²	.356	.140	.149	.175	.309
$ \begin{array}{llllllllllllllllllllllllllllllllllll$	LnMins/Day Entered First					
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Controls Only	.301***	.109***	.050***	.122***	.261***
$\begin{array}{cccccccc} + \text{ Days/Week} & .017^{***} & .001 & .031^{***} & .030^{***} & .022^{**} \\ + \text{ LnMinutes/Week} & .000 & .001 & .005 & .002 & .007 \\ \text{Final } \text{R}^2 & .356 & .140 & .149 & .175 & .309 \end{array}$	+ LnMinutes/Day	.037***	.031***	.063***	.021***	.019**
+ LnMinutes/Week .000 .001 .005 .002 .007 Final R^2 .356 .140 .149 .175 .309	+ Days/Week	.017***	.001	.031***	.030***	.022**
Final R ² .356 .140 .149 .175 .309	+ LnMinutes/Week	.000	.001	.005	.002	.007
	Final R ²	.356	.140	.149	.175	.309

TABLE 3 Changes in Variance Accounted for by the Addition of Minutes of News Exposure

 $^{\dagger}p < .10 * p < .05 * p < .01 * p < .001.$

Note. Cell entries for the first four data columns are increments of \mathbb{R}^2 from OLS regression models as each block of variables is added. Cell entries in the final column on the right are increments of Nagelkerke \mathbb{R}^2 from logit regression models as each block is added. Control variables are respondent sex (male), education, race (black) party identification (Democrat or Republican), and partisan extremity.

Source: 2008 ANES.

Moulti										
	Political Knowledge	Candidate Issue Distance	Political Discussion	Community Political Activity	Voter Turnout					
Days/Week	.020	.007	.039	.025	.020					
LnMinutes/Day	.015	.013	.027	.012	.012					
LnMinutes/Week	.019	.013	.032	.015	.017					

TABLE 4 Mean Incremental Variance Accounted for across Six Orders of Entry

Note. Cell entries for the first four data columns are mean increments of \mathbb{R}^2 from OLS regression models as each block of variables is added across all six possible orderings. Cell entries in the final column on the right are mean increments of Nagelkerke \mathbb{R}^2 from logit regression models. Control variables are respondent sex (male), education, race (black) party identification (Democrat or Republican), and partisan extremity.

Source: 2008 ANES.

per week as the second set of exposure measures is significant in four models. Thus, adding a second set of exposure measures sometimes adds a small amount of explained variance to the models, but there are few differences between the two measurement approaches. Finally, the addition of minutes per week as a third set of exposure measures makes no significant contribution to any of the models.

Table 3 features only two of the possible entry combinations, so it presents only a partial picture. Table 4 presents the mean R-squared values across all six orders of entry. The data in this table show that the three measures of exposure have similar relationships with the dependent variables. The days per week approach accounts for more average variance in knowledge, political talk, community political activity, and voter turnout, whereas the minutes per day and minutes per week approaches account for more average variance in candidate issue distance. However, all of these differences are substantively small. When only considering explained variance, none of the three measurement approaches offers an obvious advantage over the others. Of particular importance, the combined measure of minutes per week is not clearly superior to either of the other two measurement strategies.

DISCUSSION

The analyses presented here tested the relative advantages of asking respondents to report days per week or minutes per day using specific media. Analyses that compared the number of days of exposure in a typical week with those that asked about length of exposure in a typical day failed to suggest any consistent advantage of the within-day time measures relative to the across-day measures. This is because respondents who report higher (lower) levels of weekly exposure to a news medium also tend to report higher (lower) levels of daily time spent with that medium. As a result of this tendency, there seems to be no clear explanatory advantage in asking respondents to report both days per week and minutes per day. Table 3 showed that the addition of one set of these measures to models containing the other explains a modest amount of additional variance in most cases. The addition of measures of days per week (top panel of Table 3) often accounted for more variance than did the addition of measures of minutes per day (bottom panel of Table 3), but the difference was not large. Combining these measures into a single estimate of minutes per week of cumulative news exposure added little new information when that measure was added to models that contained its components.

The findings reported in Table 4 suggest that news exposure measured in days per week explained slightly more variance than did measures of minutes per day. The advantage, however, is not substantial. Indeed, in many ways, days per week and minutes per day performed similarly to one another. If measuring news exposure as days per week or minutes per day yields similar information, as seems to be the indicated in the findings reported here, this raises an important question: Are these different measurement strategies equally useful for survey researchers? We suggest they are not.

If the primary goal is to estimate the relative amount of exposure in a sampled population across a wide range of media, then Pew's strategy of asking first about whether a respondent used a particular medium "yesterday" and then asking how many minutes per day the medium was used might hold an advantage over the days per week format alone. The contemporary media system is so diverse in form and content that the relative audiences for various outlets become difficult to compare across media using behavioral measures such as page hits or Nielsen ratings data that are highly valid but useful only for within-medium comparisons (for a discussion of this problem, see Althaus, 2007). Having a comparable measure of minutes per day spent with each medium, even if this exposure is overreported, allows for a precise comparison of audience activity across the wide range of diverse content platforms that make up the contemporary media environment.

However, if the primary goal is to use media exposure as dependent or independent variables within individual-level research designs, then the conventional "days per week" strategy offers two clear advantages even in today's complex media system. First, although measuring minutes of news exposure per day appears to offer little predictive power over measuring days per week of news exposure, the days per week approach has a clear advantage for use in multiple regression frameworks. The number of days in a typical week has a natural boundary, as there are only seven possible days for exposing oneself to the news. The response scale is also simple enough to be self-administered—respondents simply select a number from zero to seven. In contrast, the number of available minutes in a typical day is quite large, and the potential for overestimating daily exposure becomes potentially more serious. Indeed, Appendix Table A2 shows that all of the minutes per day responses were overdispersed and skewed by outliers that almost certainly exaggerated actual levels of media exposure. Using such measures in regression models requires transforming them in some way to reduce the impact of outliers that are of questionable validity and that substantially skew item distributions. In contrast, the data in Table A2 show that the measures of exposure in days per week were much more normally distributed.

Second, the simpler response structure of days per week offers at least two advantages from the standpoint of survey costs and errors (Groves, 1989). First, between two and five respondents per medium were unable or unwilling to estimate their minutes per day with a medium, even though they were able to estimate the number of days per week they used it. We suspect that the cognitive complexity of the minutes per day task might have been a factor in producing this additional item nonresponse. Although this involves only a small number of respondents, item nonresponse appears to be a somewhat greater concern for the minutes per day approach than for the days per week approach. A second concern with the minutes per day approach is how to record respondents' estimates of minutes per day with each medium. Because respondents may not naturally think in terms of minutes but rather in hours, the survey instrument needs to be flexible enough to record estimates in both metrics. At some point these responses need to be converted to a common metric, thereby lengthening the amount of administrative time devoted to preparing these data for analysis.

Seen in this way, not only does the days-per-week strategy guard against extreme outliers, it also allows for a more straightforward reporting and recording of survey responses. This does not mean that the days per week approach provides a more valid estimate than the minutes per day approach. Recent research suggests that both traditional approaches tend to encourage overestimation of actual media exposure (Prior, 2009b).

There are some limitations to our analyses, of course. We looked at a finite set of criterion measures. They included recall of facts, perceptions of candidates, and reports of political behavior. This represents a range of possible outcomes correlated with exposure to the news, but it might be that there are important variables that were not assessed here. It might be that some beliefs and behaviors are particularly sensitive to small variations in news exposure. If so, more precise measures of exposure might be warranted.

We conclude with a final reminder that the data presented here have little bearing on the question of the accuracy with which people can recall their actual media use (see Prior, 2009b, for a recent discussion of this issue). There is no telling from these data whether people are over or under reporting their media use. The correlation data do suggest, however, that reported frequency of use is relatively constant across the time frames studied here. People who perceived themselves as frequent news viewers may apply that perception to both measures of daily use and minutes per day. This latter explanation calls into question the utility of measuring more than once something that may be as much perception as reality.

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APPENDIX

items c	ised from 2008 AINES Time Series Data Set
Dependent Variables	
Political Knowledge	083087, 085066, 085067, 085080, 085119a, 083303
Political Discussion	085109
Community Political Activity	085124, 085125, 085126, 085128, 085129, 085130
Voter Turnout	085036x
Candidate Issue Distances	083110x, 083111x, 083117x, 083118x, 083126x, 083127x, 083135x, 083136x, 083159x, 083160x
Media Exposure Variables	
Days per Week	083023, 083024, 083025, 083026
Minutes per Day	083023a, 083024a, 083025a, 083026a
Control Variables	
Male	083311
Education (Years)	083217
Black	083251a
Democrat	dummy coded from 083097
Republican	dummy coded from 083097
Partisan Extremity	083098a, 083098b

APPENDIX TABLE A1 Items Used from 2008 ANES Time Series Data Set

Note. SPSS syntax providing definitions for all variables used in this article is available from the authors upon request.

	Min	Max	Mean	S.D.	Kurtosis	Skewness	N =
Days Per Week							
Newspaper Use	0	7	2.48	2.73	-1.15	.69	1160
TV News Use	0	7	5.06	2.41	58	91	1160
Internet Use	0	7	2.25	2.80	-1.11	.76	1160
Radio Use	0	7	2.31	2.76	-1.24	.66	1160
Minutes Per Day							
Newspaper Use	0	900	28.31	47.33	120.21	8.04	1160
TV News Use	0	1,200	73.21	91.70	52.80	5.68	1160
Internet Use	0	543	27.30	53.66	31.09	4.58	1160
Radio Use	0	960	31.85	70.70	38.79	4.99	1160
Ln Newspaper Use	0	6.80	2.16	1.82	-1.59	14	1160
Ln TV News Use	0	7.09	3.68	1.38	2.00	-1.38	1160
Ln Internet Use	0	6.30	1.73	1.92	-1.48	.41	1160
Ln Radio Use	0	6.87	1.76	1.94	-1.30	.46	1160
Minutes Per Week							
Newspaper Use	0	2,700	116.41	213.44	42.39	5.04	1160
TV News Use	0	8,400	441.11	600.63	45.99	5.14	1160
Internet Use	0	3,780	136.14	306.40	38.84	5.10	1160
Radio Use	0	6,720	172.36	455.81	54.01	5.96	1160
Ln Newspaper Use	0	7.90	2.86	2.44	-1.61	10	1160
Ln TV News Use	0	9.04	5.15	1.91	1.99	-1.53	1160
Ln Internet Use	0	8.24	2.37	2.63	-1.56	.38	1160
Ln Radio Use	0	8.81	2.44	2.66	-1.44	.40	1160

APPENDIX TABLE A2 Descriptive Statistics for Media Exposure Variables

Note. Table contains data only for respondents with valid responses on both "days per week" and "minutes per day" questions for all four media channels.

	Min	Max	Mean	S.D.	Kurtosis	Skewness	N =
Dependent Variables							
Political Knowledge	0	9	5.32	1.98	55	13	1048
Candidate Issue Distances	0	6	1.81	1.27	50	.41	1160
Political Discussion	0	7	2.08	2.13	.08	1.01	1160
Community Political Activity	0	6	1.80	1.71	47	.75	1160
Voter Turnout	0	1	.76	.43	47	-1.24	1054
Control Variables							
Male	0	1	.44	.50	-1.94	.26	1154
Education (Years)	0	17	13.08	2.66	2.02	84	1154
Black	0	1	.23	.42	42	1.26	1153
Democrat	0	1	.43	.50	-1.93	.27	1144
Republican	0	1	.20	.40	.34	1.53	1144
Partisan Extremity	0	3	1.87	1.03	-1.10	38	1143

APPENDIX TABLE A3 Descriptive Statistics for Dependent and Control Variables