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**Selective Exposure in the Age of Social Media:  
Endorsements Trump Partisan Source Affiliation when Selecting News Online**

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Abstract

Much of the literature on polarization and selective exposure presumes that the internet exacerbates the fragmentation of the media and the citizenry. Yet, this ignores how the widespread use of social media changes news consumption. Social media provide readers a choice of stories from different sources that come recommended from politically heterogeneous individuals, in a context that emphasizes social value over partisan affiliation. Building on existing models of news selectivity to emphasize information utility, we hypothesize that social media's distinctive feature, social endorsements, trigger several decision heuristics that suggest utility. In two experiments, we demonstrate that stronger social endorsements increase the probability that people select content, and that their presence reduces partisan selective exposure to levels indistinguishable from chance.

*Keywords:* polarization, selective exposure, social media, internet, cross-cutting

Both authors contributed equally and are listed in alphabetical order.

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Americans and the media they consume are generally moving toward divergent political orientations. Although contested by optimists (e.g., Fiorina, Abrams, & Pope, 2008), evidence suggests that Americans are increasingly polarized along partisan lines (Jacobson 2000, 2005; Abramowitz & Saunders 1998, 2002), particularly among elites (Hetherington, 2001), resulting in legislative gridlock, policy inaction, and a decline in civil public discourse (Layman, Carsey, & Horowitz, 2006; Sobieraj & Berry, 2011). Simultaneously, citizens increasingly ascribe partisan positions to media entities and filter content based on perceived ideological congruence (Bennett & Iyengar, 2008; Coe et al., 2008; Iyengar & Hahn, 2009; Stroud, 2008) or eliminate news consumption in an outright desire to avoid politics (Prior, 2007). Not only does the fragmentation of the media environment limit the diversity of information available to citizens, but it also polarizes individual-level attitudes (Stroud, 2010), increases ideological homogeneity among party members (or partisan sorting, see Levendusky, 2009), perpetuates the support of falsehoods (Kull, Ramsay, & Lewis, 2003), and alters the way consumers of partisan news sources react to threats (Baum, 2011).

In much of the literature cited above, the internet is presumed to exacerbate the fragmentation of the media and the citizenry. Yet this conception has ignored fundamental changes in the way that the public uses the internet, specifically with respect to social media and news consumption. We argue that the socialization of internet news fundamentally alters the context in which news reading occurs, providing a venue that promotes exposure to news from politically heterogeneous individuals, and which serves to emphasize social value rather than partisan affiliation. We build on existing models of news selectivity to emphasize information utility (as advocated by Sears & Freeman, 1967) and hypothesize that social media's distinctive feature, social endorsements, trigger several decision heuristics that suggest utility. Note that we

use the term utility to refer to the source of one's preferences—anticipated fulfillment of desires, usefulness, and/or benefits attained as a result of consuming (in this case) information. Below, we offer two experimental demonstrations that stronger social endorsements increase the probability that people select information, and that the mere presence of social endorsements serves to reduce political selectivity to levels indistinguishable from chance.

### **The Growing Importance of Social News**

We begin by outlining changes in news marketing strategies that media organizations have adopted in an attempt to attract a wider internet audience by leveraging social endorsements, which has direct implications for partisan selectivity. Historically, the selection of news content meant selecting a source: an individual tuned in to particular news program, bought a particular newspaper, or more recently, browsed a news website. With the exception of sharing paper article clippings, and more recently sharing articles by email, an individual's news environment depended on the sources they habitually consumed. Accordingly, news media organizations marketed their content by establishing a reputation or "brand," and social feedback was limited to interpersonal discussions with others, and later, comments on web pages.

Initial attempts by news media organizations to build compelling websites in the late 1990s were characterized by problems typical of the early web—the frustrating experience of browsing through hundreds of hyperlinks and poorly sorted keyword searches. Then in the early years of the new millennium, the "web 2.0" design paradigm emerged, which emphasized the importance of user-generated reviews, collaborative filtering (i.e., "people like you also like this"), and aggregated popularity ratings to effectively manage vast amounts of data (O'Reilly, 2007). Inspired by the successes of companies such as Google, Amazon, and YouTube in attracting traffic to their websites by providing a superior web 2.0 user experience, in 2005 the

New York Times and other news media companies began to emphasize their most popular and most emailed articles on their homepages.<sup>1</sup> These aggregated social endorsements mark the beginning of an expansive effort to socialize the online news reading experience.

### **The Success of Socializing the News**

Recognizing the extent to which people enjoy sharing news content, social media services developed technology designed to make it as easy as possible to endorse news content. Today these sharing services are deeply integrated into most major news websites—endorsing a story on aggregators like Reddit, Tumblr, and Digg, or on social networking sites like Facebook, LinkedIn and/or Twitter is now as simple as clicking a prominently displayed icon accompanying a news story (see NYTimes.com, WashingtonPost.com, FoxNews.com, Google News, and nearly U.S. newspaper publisher website). Users of social media aggregation websites and mobile applications can see a list of items sorted by aggregated recommendations, while users of social networking sites see these stories as status updates from their contacts, all as part of the basic design of these platforms.

There is substantial evidence that this strategy of attracting users via social media is succeeding. A 2011 study analyzing Nielsen data found that Facebook was the fastest growing source of referrals to major news websites, while news aggregators account for an even larger share (Pew, 2011a). Furthermore, this trend seems likely to continue: television and print media's role in conveying news is declining in favor of online/mobile media, and the internet now constitutes the main source of news for a majority of Americans who are under 50 (Pew, 2011b). With more than 800 million active users, of whom 200 million are American (Facebook, 2011), sharing over 25 billion web articles each month (Facebook, 2010), the relationship

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<sup>1</sup> Data from the Internet Archive.

between social media and news consumption must now be considered to be a fundamental part of our media environment.

### **How Social Media Shape the Media Environment**

Social media shape the modern media landscape in two ways. First, because these websites and mobile applications display content from different news providers in a single location, users no longer need to select a news source; instead they select the story itself. This represents a fundamental break from past modes of news consumption wherein people habituated themselves to a trusted source—instead social media users can select news from a wide range of sources deemed by friends or fellow internet users to be interesting or important. This suggests that habitual de-facto selective exposure (Sears & Freeman 1967) will be substantially less common in the context of social media.

Second, these developments allow people to utilize endorsements to assist in their selection of content even when they visit a traditional news source website directly, because social recommendations also appear on the story’s originating website.<sup>2</sup> Nearly every news provider features a list of aggregated story popularity (the “Most Emailed” or “Most Read” lists) on its home page, and these lists are even more prominent in smartphone applications. Furthermore, these organizations now embed stories recommended by a user's Facebook friends directly in homepage of the originating website. This enhances the ability of individuals to select socially relevant content when presented with an overwhelming number of news stories from which to choose (there are usually over 200 links on the NYTimes.com homepage).

### **De-facto and Purposive Isolation in the Context of Online News**

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<sup>2</sup> Indeed we find evidence that this serves to habituate the use of endorsements: in Study 2 below, high social media users were more likely to utilize a social endorsement when selecting articles.

Having described recent structural changes in the online media environment that provide opportunities for exposure to stories from a variety of news sources and serve to socialize the media consumption process, we move to a discussion of the implications for exposure to attitude-challenging information. Past work on selective exposure suggests that people do not encounter attitude-challenging information in large part due to their social milieu, habits, and lack of perceived benefits for seeking out such information (e.g., Sears & Freeman 1967). Rarely do people discuss counter-attitudinal issues and attitude-challenging news (Mutz, 2004), and people are more likely to chance upon counter-attitudinal content in the mass media than in the context of interpersonal interactions (Mutz & Martin, 2001). These “de-facto” limits on exposure to counter-attitudinal information, along with constant reinforcement from a fragmented media, raise questions about citizens’ ability to engage in meaningful discourse (Sunstein, 2002) as highly partitioned media consumers grow unaccustomed to considering news and information supporting the opposing side (Taber & Lodge, 2006).

Yet, de-facto limits to the political diversity of one’s social context are much less severe online. Most aggregation services do not consider political slant when collecting content, while social networking websites like Facebook encourage users to maintain a vast array of online relationships comprising of both strong and weak ties (Hampton, Goulet, Her, & Rainie, 2009), often including co-workers, with whom the potential for cross-cutting discourse that introduces counter-attitudinal information is substantially higher (Mutz & Mondak, 2006). Furthermore, despite what people say in self-reports about the political ideology of their friends in national surveys, people disagree with their online social network contacts on political issues to a greater extent than they believe (Goel, Mason, & Watts, 2010). Additionally, we expect people to be more willing to share news items that they believe will raise controversy or violate social norms

that discourage political discussion because of the lower levels of social presence in computer-mediated communication compared to in-person discussion (see Kiesler, Siegel, and McGuire, 1984; Sukumaran, Vezich, McHugh & Nass, 2011).

The causes of political selectivity today may run deeper than de-facto differences in social context, however. Recent work suggests that unlike the zenith of broadcast mass media, the political selectivity that is part of our current political landscape is not merely a byproduct of limited diversity in personal networks or social context, but is purposively undertaken as part of a tendency to select opinion-reinforcing news in a media environment that increasingly provides consumers with easy opportunities for doing so (Bennett & Manheim, 2006; Iyengar & Hahn, 2009). Furthermore, there is substantial experimental evidence of partisan selectivity when consuming content in an environment typical of pre-social media news aggregators (Iyengar & Hahn, 2009; Iyengar, Hahn, Krosnick, & Walker., 2008), though there is disagreement on the frequency of selective exposure on the internet (see Valentino, Banks, Hutchings, & Davis, 2009), and the question of whether people are actively avoiding attitude-challenging information or merely seeking attitude-reinforcement (see Garrett, 2009). In other words, it may not matter that social media platforms provide opportunities to select stories from diverse news sources—we need to know whether people actually do select more diverse content.

### **Social Endorsements as More Powerful Heuristic Cues than Source**

If the dominant factor impacting news selectivity in social media is source, then our expectations about the impact of social media on society should remain as pessimistic as previous accounts of partisan selectivity on the internet. On the other hand, if social endorsements affect selection to a greater extent than source labels, then there is some hope for cross-cutting exposure in the context of social media. We argue that source labels and social

endorsements constitute heuristic cues that people are likely to employ when deciding which stories to select. Below, we abstract the logic of the selection decision in the context of social media to illustrate why we expect that consumers will indeed need to employ heuristics in the first place; then discuss importance of the distinction between source cues that can convey trust and aggregated social endorsement cues that we argue suggest utility based on popularity; and finally discuss why a comparison of the relative impact of each type of cue is important to communication.

To understand why we expect consumers to employ heuristics, consider a fictional world in which media consist of a simple list of ten headlines (in random order). A perfectly rational news consumer might attempt to identify the optimal story by going down the list and keeping track of the story that provides the highest utility on a single dimension, say topical interest, which requires  $N - 1$ , or in this case 9, comparisons. Though this task appears relatively simple, the moment we introduce another dimension, say relevance to the one's profession, the task of comparing two articles can rapidly become more difficult in the absence of a clear winner—if two items are tied or if one item is higher on one dimension but lower on another, we must do the cognitive equivalent of assigning weights to each dimension and then tallying up a weighted sum utility assessment for each item. In reality, we expect such a full optimization task to be significantly more complex than our example above—the selection of content triggers assessments of potential credibility, raw utility in gaining new information (i.e., being informed about civic developments, the stock market/business climate, etc.) and potential social benefits (i.e., being able to talk with a friend or family member about the story).

Scholars of bounded rationality have amassed a great deal of evidence that the cognitive faculty of the human mind limits our ability to undertake tasks as complicated as full



optimization, especially when we lack unambiguous information about the costs and benefits of outcomes (Conlisk, 1996; Kahneman, 2003; Simon, 1972). Instead, people rely on heuristics that are relevant and applicable to the domain and/or environment in question to guide search efforts and to make computationally cheap decisions quickly (Gigerenzer & Selten, 2002), identifying an outcome that is at least “good enough” (see the literature on satisficing, e.g., Simon, 1947, 1972), in order to manage tasks such as the selection decision described above. While heuristic processing can lead to cognitive biases (e.g., Tversky & Kahneman, 1973), recent work conceptualizes such processing as an important tool in the context of evolutionary goals (e.g., reproducing, trading goods, making profits, negotiating status), that include learning mechanisms allowing for adjustments in response to changes in the environment. Thus, we have strong expectations that the cues that convey the most useful information will be those utilized by consumers.

Models of news consumption generally posit that people utilize heuristics based on source (Althaus & Tewksbury, 2002; Iyengar & Hahn, 2009; Sundar, Knobloch-Westerwick, & Hastall, 2007), story placement, the presence of a photograph, and other editorial cues (Graber, 1988) to help them judge the relevance, credibility and importance of a news story. In the context of an aggregated social media environment, editorial cues are completely absent, which leaves source as the only applicable decision criteria from past models. Of course, source cues only convey information about the reputation and possibly the ideology of the organization that produced the story in question.

Nonetheless, in the absence of any other meaningful selection criteria (besides a story’s title), we expect people to factor the attributes of the source into their decision, including the

extent to which that source is likely to provide content that is ideologically consistent with their prior attitudes.

**H1:** Partisan consumers of news content will select content based on anticipated agreement (as indicated by source cues).

However, there are a variety of reasons to expect that the social endorsement cues present in social media will dominate partisan cues as a heuristic criterion when selecting news stories. We hypothesize that well-documented social heuristics yield more pertinent information as decision-relevant cues. When dealing with aggregated recommendations or popularity cues, the bandwagon heuristic predicts a tendency for individuals to (a) assume that the support of others is likely to predict personal relevance and utility (Sundar & Nass, 2001), to (b) believe that the attitudes of others are useful in forming an opinion (Axsom, Yates, & Chaiken, 1987), and to (c) believe that once a large number of similar individuals support or endorse an object or attitude it is necessary to follow the crowd (see Lee & Lee, 1939; Sunstein, 2006). There is evidence that people utilize these heuristics in the context of browsing the internet with respect to determining information credibility (Fogg, 2003; Metzger et al., 2010), selecting digital media (in the case music, Salganik, Dodds, & Watts, 2006), selecting courses (Steffes & Burgee 2009), selecting and endorsing articles that friends endorse in the context of a news aggregation service (Lerman 2007), and selecting traditional news media articles (Silvia Knobloch-Westerwick, Sharma, Hansen, & Alter, 2005).

**H2:** Consumers of news content will use social endorsements to make content selections.

Because social endorsements contain so much more decision-relevant information than do source cues, we expect that people will not only utilize social endorsements, but that the presence of social endorsements should shift attention away from source cues as a decision

criterion. A person selects information largely because he or she seeks information that is interesting, valuable, and socially significant (Sears and Freeman, 1967, pp. 209-212), though we should not discount the impact of perceived source credibility. Nonetheless, social endorsement cues convey explicit assertions of social relevance and interest; sources necessarily must host a wide variety of content, and thus cannot convey as much discriminating information. In the context of being overwhelmed with choices, we expect that people will favor social endorsements to the extent that many will simply disregard source cues, choosing stories based on the two dimensions that convey the most information about the potential value of the story's content: social endorsement and story title.

**H3:** News consumers are more likely to utilize social endorsements than perceived partisan alignment of a news source (selective exposure).

**H4:** The presence of social endorsements will negate the effect of source cues.

The comparison of the relative effect of social endorsements and source cues has more general theoretical implications beyond news consumption. Though the literature shows that both social cues and source cues can affect our behavior, we were unable to find a single study comparing these variables. Yet a confirmation of H4 would have critical implications for our theoretical understanding of evaluation processes—if people generally disregard source cues in the presence of social cues, scholars need to re-examine the importance of source cues in decision-making and persuasion in light of this mediating relationship.

### **Study 1: The impact of social endorsement on partisan selective exposure**

We developed a web application to study the effects of social and political cues on news content selection, designed to replicate and extend Iyengar and Hahn (2009). Within the confines of a web interface similar to Facebook and Twitter, participants browsed a series of

articles from two “hard” categories (World News and Business) and two “soft” categories (Sports and Entertainment), selecting one from each category by clicking on the title of an article. Participants were randomly assigned to one of three conditions shown in Figure 1 A, B, and C: a “partisan label” condition (A), which displayed only the source label, a “social endorsement” condition (B), which displayed the social endorsement cue but not the source label, and a “partisan and social” condition (C), which displayed both source labels and social endorsements. All participants saw the headline for each news story (pulled in real time from RSS feeds, as in Iyengar and Hahn, 2009), a logo for a news source if they were assigned to a cell with partisan cues, and the Facebook icon with the text “*N* number of people recommend this story” if assigned to a cell with social endorsement cues. In each subset of 4 news reports, 3 were assigned to a “low” level of endorsement, with a randomly generated range between 0 and 1,000 recommendations, while one article was randomly assigned to a “high” level of endorsement, with over 10,000 recommendations. These ranges were determined by monitoring the typical number of “recommends” by Facebook users for the top rated story from CNN and Fox News and the typical number of “recommends” for ordinary stories over a three-day period. Half of the stories were randomly assigned partisan source labels: Fox for the right (see Jamieson and Cappella 2008), and MSNBC for the left (see Steinberg 2007; Project for Excellence in Journalism 2009); the remaining stories were assigned to USA Today and Reuters—sources without obvious partisan affiliation (the assignments are based on Iyengar and Hahn, 2009). After completing the experiment, participants completed a brief questionnaire that collected data on partisan identification, online news reading habits, and relevant socio-demographics.

[Figure 1 about here.]

**A national sample from an online crowd-sourcing service**

Participants ( $N = 739$ ) were recruited from Mechanical Turk, a “crowd-sourcing” service run by Amazon.com wherein participants receive money for completing discrete tasks. Validation studies using Mechanical Turk subjects and traditional laboratory subjects show that the two groups are nearly indistinguishable in computing reliability measures of personality scales (Buhrmester, Kwang, & Gosling, 2011) and in replications of classical experiments (Sprouse, 2011). Furthermore, Mechanical Turk subjects are significantly more diverse than most college student subject pools (Buhrmester et al., 2011).<sup>3</sup>

Demographic data confirm that the sample is far more representative of national demographics than a traditional undergraduate sample. There was at least one participant from every state in the country except Alaska and Maine, and the number of participants per state is correlated at .94 with the 2010 U.S. Census estimates of state resident population. With respect to race, Asian (5%) and White respondents (80%) were slightly over-represented, while African American (6%) and Hispanic respondents (2%) were slightly under-represented. Females were also slightly over-represented (58%). The sample leaned slightly left, with 42% of respondents identifying as Democrats, 14% leaning Democrat, 19% identifying as Independents or “other party,” 8% leaning Republican, and 17% identifying as Republicans. The 18-34 demographic was slightly over-represented: with 25% of respondents in the 18-24 age group, 35% in the 25-34 group, 31% in the 35-54 group, and 9% in the 55 and older group.

## **Analysis**

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<sup>3</sup> Participants were also required to answer 5 validation questions that assessed compliance with instructions; we include only those who answered correctly.

Our dependent measure comprised the selection of one of four stories, which constitutes a choice between multiple “unordered” alternatives.<sup>4</sup> We need to include both alternative-specific and individual-level predictors to capture the impact of an individual’s partisan identity on their choice of news source and utilization of a social endorsement cue. Accordingly, we model this unordered choice with what is often referred to as a “conditional logit” or “mixed multinomial logit” regression model (McFadden, 1974).<sup>5</sup> Consider participant  $i$  with  $j$  choices: this model estimates the latent utility of the  $j$ th choice by  $U_{ij} = \alpha_j + \beta x_{ij} + \gamma_j z_i$ , where the  $x_{ij}$  are alternative-specific variables, and the  $z_i$  are individual-specific variables. When an individual makes the choice among alternatives, we can model this choice as the latent utility for  $j$  over all other alternatives (see for example, Croissant, 2011).<sup>6</sup> Thus, we are interested in the difference between the utility of one alternative over another:  $U_{ij} - U_{ik} = (\alpha_j - \alpha_k) + \beta(x_{ij} - x_{ik}) + (\gamma_j - \gamma_k)z_i$ . Given the respondent’s utility function, the probability of selecting alternative  $q$  is simply:  $P_q = P(U_q > U_1, \dots, U_q > U_J)$ . Because we ask respondents to choose stories multiple times, we must index over the individual respondent,  $i$ , the item set,  $k$ , and the alternative,  $l$ , they choose out of  $j$  possible alternatives. We thus estimate the probability for each choice via the following joint probabilistic model:

$$P_{ikl}^r = \frac{\exp(\alpha_l^r + \beta_i x_{ikl} + \gamma_l z_{ik})}{\sum_{j=1}^J \exp(\alpha_j^r + \beta_i x_{ikj} + \gamma_j z_{ik})}$$

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<sup>4</sup> The structure of the choice precludes us from using a logit or ordered logit model, because the choice cannot be conceptualized as a dichotomy, nor can it be said that choosing one source is “greater” than another on some ordered scale.

<sup>5</sup> Strictly speaking, a conditional logit model only estimates alternative-specific predictors.

<sup>6</sup> It is important to note that we use the term “utility” here as a convenient probabilistic representation of the tendency to choose one alternative over others, which can be modeled, rather than as the concept of utility as defined in the economics literature.

where the  $r$  superscript above the  $\alpha$  coefficients signifies a normally distributed random effect. Coefficients for individual-specific variables, including the intercepts, will be alternative-specific. We estimate the model by simulating the random parameters, then estimating the model via Newton-Raphson maximum likelihood optimization as implemented in the “mlogit” R package (Croissant, 2011).

## Results

Prior to presenting the formal results of the model specified above, we present simple summary analyses and visualizations. Though we include non-partisans as a baseline in both studies, we start with more parsimonious comparisons of the effect among Democrats and Republicans.<sup>7</sup> We first note the substantial rate at which partisans selected dissonant sources: 144 of 326 Democrats selected at least one article from Fox, while 74 of 147 Republicans selected at least one MSNBC story. To compare selection rates across conditions, we compute an individual’s mean selection rate for each source (across the 4 topics), in order to avoid artificially inflating the number of observations. Figure 2 compares the mean individual selection rates for participants across the four topic trials, for partisan identifiers by article source, with standard error bars. As posited in H1, the partisan label condition (left) without endorsements clearly shows evidence of political selectivity, with Republicans selecting Fox News at a substantially higher rate than other sources, and Democrats showing a tendency to select MSNBC at a higher rate than other sources. A t-test confirms that Republicans selected Fox News ( $M = .38, SD = .27$ ) at a significantly higher rate than Democrats ( $M = .21, SD = .21$ ),  $T(77) = 4.12, P < .001$ , one-tailed, Cohen’s  $d = .72$ , and likewise, Democrats selected MSNBC

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<sup>7</sup> If we limit our analyses of the impact of social cues to partisans only, the effects of social cues actually grow stronger.

( $M = .30$ ,  $SD = .27$ ) at higher rate than Republicans ( $M = .20$ ,  $SD = .22$ ),  $T(118) = 2.44$ ,  $P = .008$ , one-tailed, Cohen's  $d = .36$ .<sup>8</sup> In the condition where participants also saw social endorsements (right), the mean selection rates are nearly identical for Republicans and Democrats, supporting H3 and H4. The mere presence of endorsements reduced partisan selectivity to levels indistinguishable from chance.

Of course, it is insufficient to argue that social cues reduce selective exposure based on null findings in one condition and not the other, so we turn to a comparison of the selection rates for partisan identifiers between conditions. Comparing the Fox News mean selection rate for Republicans shows that partisan selectivity is significantly higher in the partisan label condition ( $M = .38$ ,  $SD = .27$ ) than in the condition also containing social endorsements ( $M = .25$ ,  $SD = .22$ ),  $T(97) = 2.95$ ,  $P = .002$ , one-tailed, Cohen's  $d = .55$ , and although the MSNBC selection rate for Democrats does not show a significant difference between the partisan label only condition ( $M = .30$ ,  $SD = .27$ ) and the condition that also contains social endorsement cues ( $M = .27$ ,  $SD = .21$ ), conditions  $T(234) = .92$ ,  $P = .18$ , one-tailed, Cohen's  $d = .57$ , the difference is in the expected direction. This provides partial support for H3 and H4—the impact of source cues on Republicans is reduced in the presence of social endorsements.

[Figure 2 about here]

To get a sense of how the presence of social endorsement cues suppressed tendencies toward political selection, we turn to a closer examination of the behavior of partisan identifiers in the condition that contained both social endorsement and source cues. Specifically, we examine the effect of social cues on selection rates when the partisanship of the respondent and the source labels agree (i.e., Republican and Fox News, and Democrat and MSNBC,

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<sup>8</sup> We use one-tailed t-test throughout because the hypotheses we are testing are directional.



respectively) and disagree. Of course, if participants randomly selected articles, they would have selected an article with a high level of social endorsement 25 percent of the time and an article with a low level 75 percent of the time, because only one of the four articles contained a strong endorsement. By comparing actual selection rates with these chance selection rates, we can measure the extent to which social endorsements caused people to select recommended content. We compare the observed rate to the chance rate for each respondent by taking the observed rate minus the chance rate divided by the chance rate, which represents the percent greater or less than chance. Figure 3 (left) clearly shows that partisans were more than twice as likely to select an article with a strong social endorsement from a dissonant source compared to chance, while they were 18 percent less likely to select such an article with weaker endorsements  $\chi^2(1, N = 187) = 15.09, p < .001, \phi = .14$ . The effect of strong social endorsements also applied to sources with which partisans agreed: partisans selected these stories at a rate 76 percent higher than chance, while selecting such articles with weaker endorsements at a rate about one percent lower than chance  $\chi^2(1, N = 187) = 1.73, p = .19, \phi = .14$ . These results provide further support for H2 and H3.

While we have evidence that social endorsements dilute the effect of political selectivity, we have yet to examine whether the effect of high social cues are diluted in the presence of partisan cues. Figure 3 (right) provides evidence that they are not. The selection rates compared to chance for stories with the same level of social endorsement are, if anything, stronger in the condition with both social and partisan cues. Participants in the social endorsement only condition selected stories with stronger levels of social endorsement at a rate 17% greater than chance, while selecting stories with weaker endorsements at a rate 5% below chance  $\chi^2(1, N = 111) = 3.89, p = .04, \phi = .19$ . The effect was slightly stronger in the condition with both social

and partisan cues: participants selected stories with stronger levels of social endorsement at a rate 24% greater than chance, while selecting stories with weaker endorsements at a rate 8% lower than chance  $\chi^2(1, N = 299) = 23.12, p < .001, \phi = .11$ . These results provide yet more support for H2 and H3, as consumers utilize social endorsements, and do so regardless of the availability of partisan source cues.

[Figure 3 about here]

We now turn to an examination of the differential effects of social cues among partisan identifiers. Interestingly, Republicans were more likely to utilize the high social cue when selecting articles ( $M = .41, SD = .43$ ) than Democrats ( $M = .30, SD = .40$ ),  $T(270) = 2.43, P = .008$  in the condition with both social cues and partisan labels, a pattern which comes close to reaching significance in the condition with only social cues present—Republicans ( $M = .39, SD = .42$ ), Democrats ( $M = .28, SD = .37$ ),  $T(40) = 1.33, P = .096$ . Though this finding does not speak to our hypotheses, it provides additional evidence that the process of selection is different among Republicans (Iyengar & Hahn, 2009), which raises the question of whether conformity, which is stronger among conservatives (e.g., Hoffman, 1953; Tarr & Lorr, 1991), is a key factor driving individuals to utilize social cues.

Having found considerable evidence supporting our political selection hypothesis and the social cue hypothesis, we evaluate the models specified above. The interaction between a respondent's self-reported political ideology and each of the source labels (using the political affiliation "Other" and the news source "Reuters" as the baselines), allows us to formally test the political selection hypothesis in each condition. Table 1 shows the estimates of our mixed logit regression on story selection. The significant interaction between Fox News and Republican partisans provides further evidence of partisan selectivity in the partisan labels condition.

Moreover, though not significant, the signs of all coefficients are in the expected direction in the partisan condition. In the social endorsements condition, however, the partisan alignment coefficients on source lose significance—conditional on the presence of social endorsement cues, there is no observable effect of political selection, which is consistent with the hypothesis tests above that support both H3 and H4.<sup>9</sup>

[Table 1 about here]

### **Study 2: Individual recommendations and aggregate popularity**

In this study, we replicate and extend the findings above with a within-subjects design, in the context of a much richer web application that simulates the dynamic experience of browsing and reading the news in an online environment. Stories were harvested daily from The New York Times, The Wall Street Journal and Fox News, and CNN (CNN stories were labeled under the MSNBC brand to test for left-leaning political selectivity).<sup>10</sup> Participants saw a list of story headlines accompanied by one of these source labels; a random subset of stories were assigned a social cue, as shown in Figure 4.<sup>11</sup> Unlike study 1, this interface gave participants the opportunity to browse and read through the 80 stories, selecting only those they wanted to read. In addition to displaying content, the system required participants to rate how interesting they found each article before moving on to the next item. The system also featured a timer displaying

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<sup>9</sup> Pseudo-R<sup>2</sup> measures offer very little utility for mixed logit models. They are not interpretable as the “amount of variance explained” by the model and are instead a ratio of the log-likelihood of an intercept-only and the full model. We instead provide AIC and BIC.

<sup>10</sup> MSNBC.com contains mostly photos and video media, with little original text content suitable for this experiment.

<sup>11</sup> In order to maximize ecological validity, social endorsements were borrowed from real-world examples. These included Facebook’s “N people like this. Be the first of your friends,” where N was randomly drawn from between either 1-35 or 150-650, and the “most emailed” rank, which varied from 1-5. Additional detail and an example of the former social cue can be found at <http://developers.facebook.com/docs/reference/plugins/like/>.

a 15-minute countdown, which was intended to add some time pressure to the experience of browsing the news, in an effort to make the experience more representative of typical online news reading habits.<sup>12</sup>

[Figure 4 about here]

### Sample

Participants included 153 undergraduates at a West Coast research university. Twelve subjects were removed because they did not complete the experiment, selected nothing, or had heard about the study beforehand, leaving 141 subjects for the analysis. Participants were 60% female. The sample was racially diverse, with 45% identifying as White, 7% Black, 12% Hispanic, 16% Asian, and 20% other. Politically, the sample skewed left, with 57% identifying as Democrats, 20% identifying as Republicans, and 23% identifying as independent or other. Most participants were between 18 and 22; all were younger than 29 years of age.

### Results

We begin as before by documenting the effect of the social endorsement cue on each participant's mean rate of selection. Indeed, even in a noisy realistic environment with a much smaller sample, we find support for H2 as participants were significantly more likely to select stories that were endorsed ( $M = .141$ ,  $SD = .150$ ) than stories that were not ( $M = .129$ ,  $SD = .146$ ), based on a paired t-test  $T(139) = 1.957$ ,  $P = .026$ , one-tailed, Cohen's  $d = .08$ . We were unable to detect any effect favoring partisan agreement with source—in fact every partisan participant

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<sup>12</sup> Because time pressure can cause a reduction in information search and processing (Zakay, 1993), the timer might serve to make heuristic processing more likely, serving to strengthen both manipulations. It is possible that in study 2, we would have seen weaker results absent this timer.

selected a substantial number of stories from dissonant sources and the non-significant effects for Republicans were in the wrong direction.<sup>13</sup>

Table 2 shows the results of a mixed logistic regression model with a random intercept for each participant, estimating the effect of story and user attributes on story selection. The first specification confirms that the effect of social endorsement is significant (pooling across the individual and aggregate-level endorsement conditions). The second and third columns present specifications that include interactions between story source and participant ideology. As before, these models show scant evidence of political selection (H1), and the significance of the social endorsement variable in the third specification provides further evidence supporting H2, H3, and H4; the effect of social endorsement cues is robust and trumps any effect of partisan source labels.

[Table 2 about here]

### **Conclusion**

Our findings suggest that social endorsements fundamentally alter the way news is consumed and shared on the internet. In study 1, social endorsements proved to be a much stronger predictor of selection than did source cues. Moreover, the effect of social endorsements was strongest for partisans selecting articles from ideologically misaligned sources, and stronger for Republicans than for Democrats. Indeed, the mere presence of social endorsements reduced partisan selectivity to levels indistinguishable from chance. Study 2 helps establish the external and ecological validity of the effect of social endorsements in a realistic environment. The

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<sup>13</sup> We performed a manipulation check to ensure that source ideology was perceived as we intended: we asked 75 of these participants to rate each source on a five-point scale. The means for each source align as we would expect: MSNBC to the left ( $M=2.15$ ,  $SD=.85$ ), NYT also to the left ( $M=2.28$ ,  $SD=.76$ ), the WSJ to the right ( $M=3.32$ ,  $SD=.94$ ), and FOX on the far right ( $M=4.43$ ,  $SD=.92$ ). All means were significantly different from the midpoint in the expected direction at the .01 level.

evidence here suggests that social endorsements change the calculus and the heuristics that people utilize to select news in the context of social media.

Given the diversity of social network contacts within the context of social media websites, these findings suggest that social media should be expected to increase users' exposure to a variety of news and politically diverse information. The evidence presented here, combined with the success that the online news media have experienced by partnering with social media companies in order to drive traffic to their websites, also suggests that social media may constitute a force that drives citizens to read news, or at least headlines and abstracts. Of course, social endorsement is not a panacea—de-facto selective exposure and partisan polarization will continue to occur offline in the context of cable news, and online to the extent that an individual limits their news consumption to partisan news websites and maintains a politically homogeneous network of online contacts. Nonetheless, in the context of the diverse social, work, school, and intergenerational familial ties maintained via online networking websites, the odds of exposure to counter attitudinal-information among partisans and political news among the disaffected strike us as substantially higher than interpersonal discussion or traditional media venues.

These findings also highlight the need for social media companies to carefully consider the macro-level social implications of the interfaces through they structure their customers' interaction with online content. Companies like Facebook and Google often select content to display by employing filtering algorithms that predict which content a customer will be most likely to view and endorse (i.e., "like" or "+1" respectively), which may serve to isolate individuals in a "filter bubble" (Pariser, 2011). Likewise, if friend-suggestion algorithms tend to

propose only like-minded individuals as potential online contacts, the political diversity of the public's online network of contacts may suffer.

Our findings also provide some optimism regarding the state of the citizenry. The widespread sharing of news content (1) limits the extent to which individuals can simply ignore hard news altogether as when watching television (Prior 2003), (2) makes it less likely for individuals to fall victim to falsehoods intentionally reinforced by a single news source (Kull et al. 2003), and (3) suggests that attitudinal polarization should decrease as source diversity increases (Stroud 2010). Social media may not be a panacea for democracy's ills, but their technological affordances are a spot of hope in an otherwise dark media landscape.

These findings also carry implications for agenda-setting—increasingly the window through which the public views the world is no longer the front page of the New York Times, but the Facebook news feed, and especially so for the increasingly active 18-30 demographic. Our results suggest a diffusion of agenda-setting power from newsrooms to social networks—in a sense harkening back to the two-step flow model of political communication (Katz, 1957), wherein exposure to information depends upon social context, or perhaps as others have argued, wherein agenda-setting power is vested in the wisdom of crowds or the individual (e.g., Holbert et al., 2010). We expect the impact of social media to grow—social networking websites, including Facebook, are the single fastest growing source of news referrals online—with more than a billion items shared each day.

As with any experimental study, concerns related to external and ecological validity must be addressed. Our experimental paradigms were specifically designed to present visually realistic cues, actual news stories randomly selected from the real world, and authentic feedback mechanisms within an environment that closely mirrored true news aggregators and social media

websites. This ensured that news was relevant at the time the users completed the study and that social and partisan cues presented that participants saw were comparable to how these cues exist on most websites. Although study 1 focused participants on the story selection decision, study 2 replicated our social endorsement findings in a fully interactive news reading environment characteristic of social media websites. Though our sample comprised only of members of the population we care about—active internet users—the use of a non-representative internet sample limits our ability to generalize. Finally, while our data and operationalization of theory are accurate in the face of the current internet, the world may very well change. Nonetheless, we see little reason to expect the trend toward the socialization of web- and mobile media to reverse course any time soon.

While we do not study individual-level social endorsements such as recommendations issued via email, twitter, or directly from a Facebook friend here, it strikes us as quite likely that individual-level attributes of recommenders should also be expected to affect how people use social media. Both demographic and attitudinal biases against certain recommenders might give scholars cause to temper some of the optimistic implications we describe here. It strikes us as likely that many factors affecting persuasive processes including similarity/homophily, attraction, and perceived status should be likely to affect the tendency to act on another's recommendation. Additionally, we expect patterns to emerge with respect to what type of content shared, with what expectations and for what reasons. The opportunities for scholars exploring social media effects are vast in scope and critical to our understanding of how communication is evolving.



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Figure 1: Design for Study 1

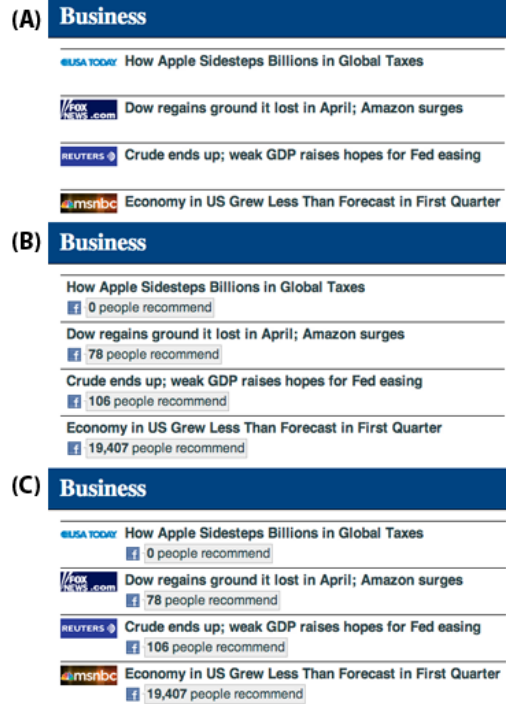


Figure 2: The presence of social endorsements impacts partisan selectivity

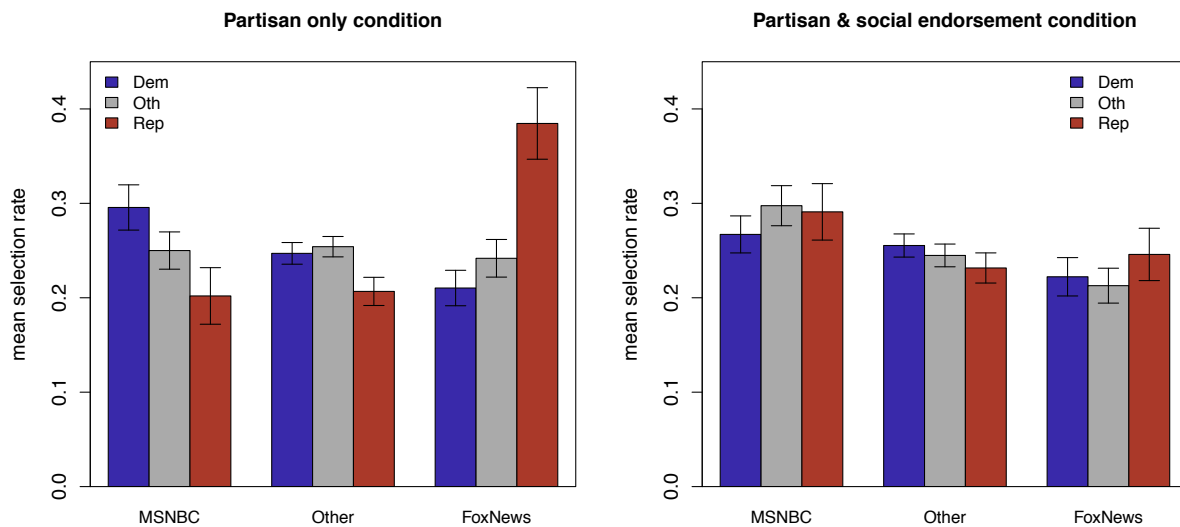




Figure 3: The robust effect of social endorsement cues

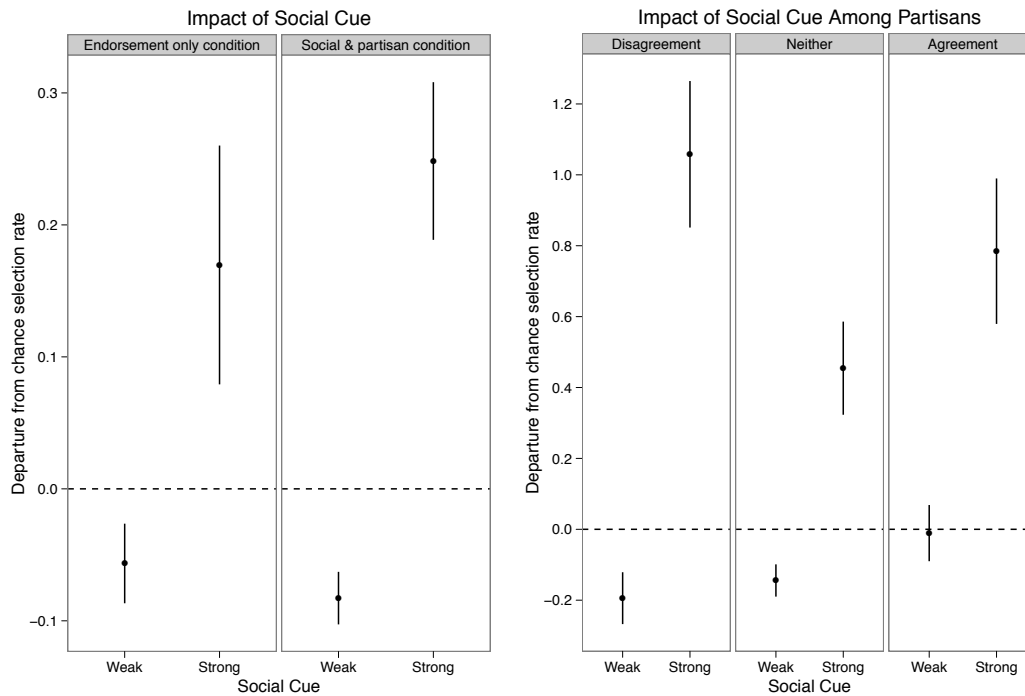


Figure 4: News simulation interface (study 2)



Table 1: Mixed logit model of article choice, by condition

Fixed Effects	Partisan	Condition	
		Endorsement	Both
Social Endorsement		0.214*	0.322***
		(0.107)	(0.064)
Democrat × Fox	-0.239		-0.111
	(0.188)		(0.191)
Democrat × USA Today	-0.267		-0.280
	(0.182)		(0.188)
Democrat × MSNBC	0.093		-0.272
	(0.185)		(0.179)
Republican × Fox	0.560*		0.296
	(0.236)		(0.235)
Republican × USA Today	-0.239		0.110
	(0.251)		(0.235)
Republican × MSNBC	-0.141		0.101
	(0.258)		(0.225)
Order	-0.140***	-0.168***	-0.129***
	(0.026)	(0.041)	(0.025)
Random Effects	Partisan	Endorsement	Both
$\alpha_{Fox}$	-0.007	0.092	-0.130
	(0.143)	(0.147)	(0.146)
$\sigma_{Fox}$	0.346	0.004	0.148
	(0.308)	(32.557)	(0.701)
$\alpha_{MSNBC}$	-0.007	0.135	0.238
	(0.140)	(0.218)	(0.242)
$\sigma_{MSNBC}$	0.585**	0.013	-0.014
	(0.200)	(8.278)	(6.438)
$\alpha_{USAToday}$	0.143	0.160	0.045
	(0.135)	(0.157)	(0.138)
$\sigma_{USAToday}$	0.231	0.423	0.332
	(0.453)	(0.416)	(0.298)
Log-likelihood	-1632.232	-604.657	-1626.685
McFadden $R^2$	0.019	0.016	0.016
LRT $X^2$	61.532	19.958	53.532
LRT P	0.000	0.001	0.000
AIC	3290.464	1225.314	3281.370
BIC	3356.635	1258.081	3352.585
N	1200	444	1196
Alternatives	4	4	4
$N_{subjects}$	300	111	299

Table 2: News simulation interface (Study 2)

Fixed Effects	Social Cue	Model	
		Partisan Cue	Both
(Intercept)	-2.157*** (0.057)	-2.173*** (0.092)	-2.220*** (0.096)
Social Endorsement	0.119* (0.062)		0.119* (0.062)
Fox News		-0.040 (0.118)	-0.042 (0.118)
MSNBC		-0.190 (0.122)	-0.190 (0.122)
Republican		0.251 (0.157)	0.249 (0.158)
Democrat		0.236 (0.130)	0.234 (0.130)
Rep × Fox		-0.506 (0.215)	-0.505 (0.215)
Rep × MSNBC		0.130 (0.199)	0.131 (0.199)
Dem × FOX		-0.078 (0.165)	-0.074 (0.165)
Dem × MSNBC		-0.002 (0.170)	-0.004 (0.170)
Random Effects	Social Cue	Partisan Cue	Both
$\sigma_\alpha$	0.224 (0.473)	0.220 (0.469)	0.221 (0.470)
Log-likelihood	-3905.446	-3897.470	-3895.619
Deviance	7810.892	7794.941	7791.238
AIC	7816.892	7814.941	7813.238
BIC	7838.824	7888.048	7893.656
N	11056	11056	11056
Groups	140	140	140
Pct. Cor.	88	88	88