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Social Endorsement Cues and Political Participation

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Which individuals are most responsive to get-out-the-vote (GOTV) messages that emphasize the social aspects of voting? Recent literature has shown that GOTV messages that emphasize the social environment in which an individual is embedded are particularly effective at increasing voting rates. Until now, we have not had good estimates for the types of people for whom social GOTV messages are most effective. We report a new set of disaggregated results of a randomized controlled trial of political mobilization messages delivered to 61 million Facebook users during the 2010 U.S. Congressional elections. The results suggest that social endorsement cues are differentially effective for different types of political behaviors—political expression, information seeking, and voting—and for different kinds of people, based on both demographic and social characteristics, raising new questions about the mechanisms explaining social pressure effects.

Keywords   social networks, voter turnout

A growing literature has emphasized the importance of social endorsement cues in predicting individual action (Knobloch-Westerwick, Sharma, Hansen, & Alter, 2005; Messing & Westwood, 2014; Salganik, Dodds, & Watts, 2006). Research shows that turnout decisions are impacted by the voting behavior of members of our social networks. We know that turnout is highly correlated between friends and family (Berelson, Lazarsfeld, & McPhee, 1954; Campbell, Converse, Miller, & Stokes, 1960; Huckfeldt & Sprague, 1995; Kenny, 1992; Sinclair, 2012). This correlation may be due to many factors. Families may socialize voting behavior, people may observe and imitate the behavior of their social contacts, or friends may share similar attitudes toward political involvement. All of these explanations owe to the existence of a social norm dictating that participation in elections is normatively desirable.

Unfortunately for scholars interested in how novel data sources provide insights into variation in the effectiveness of get-out-the-vote (GOTV) messages—whether for political

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campaigns, public service announcements, or nonpartisan campaigns—the literature has struggled to study social pressure strategies on social media as scholars generally lack access to the large-scale data that are available through such platforms. Campaigns often seek to maximize their effectiveness through micro-targeting and utilizing the social aspects of social media, but are loathe to share such information with the academic community. Consequently, we lack information about the variation in effectiveness of these techniques, and whether online mobilization strategies reinforce inequalities created by mobilization techniques in the offline world (Hassell & Monson, 2014). Until these differential effects are explored, we cannot move on to explain the mechanisms under-pinning them.

In this article we make use of a collaboration with the social networking website Facebook in order to implement a massive-scale experiment conducted on Election Day in 2010. Our experiment departs from prior work on the subject of social network informa-tion and voting behavior because the treatments were designed to prime voters to think about the voting behavior of their friends. Participants in our experiment were exposed to one of two treatment conditions or a control condition. In one treatment condition, users were reminded that it was Election Day and encouraged to turn out to vote. In another condition, users were given the same information plus information about the voting behavior of their friends. These social endorsement cues were intended to increase the extent to which participants thought of voting as a social act. That is, users who saw that friends had voted were encouraged to think of voting as a socially desirable act.

We make two important contributions with this study. First, because our sample is large enough (61 million participants), we are able to investigate the heterogeneity of social endorsement cues in appeals to vote by individual characteristics such as age, education, education level, and social connectivity.[1] Second, we investigate whether social endorsement cues affect the representativeness of those who vote and those who report voting online.[2]

Social Endorsement Cues

We argue that social endorsements constitute heuristic cues that people employ when deciding whether to vote and whether to report voting to their online communities. Individuals lack the cognitive capacity to fully calculate and therefore understand costs and benefits of complicated decisions, and even when those costs and benefits are known, optimizing across them can be extremely difficult (Conlisk, 1996; Kahneman, 2003; Simon, 1972). Although this type of decision making can lead to cognitive errors (Tversky & Kahneman, 1974), people still use heuristics to make decisions. Increasingly, such cues may take the form of social endorsements from others about actions or attitudes.

Individuals derive value from social endorsement cues because people "assume that the support of others is likely to predict personal relevance and utility" (Messing & Westwood, 2014, p. 1047; Sundar & Nass, 2001) and that when a large number of people support or endorse an action it may be necessary to follow the crowd (Sunstein, 2009). Research has shown that social endorsement cues may impact the sources of news that individuals access (Knobloch-Westerwick et al., 2005; Lerman, 2007; Messing & Westwood, 2014), the songs people choose to download (Salganik et al., 2006), and the college courses in which students select to enroll(Steffes & Burgee, 2009).

We seek to understand the heterogeneity of the effectiveness of social endorsement cues, and we begin by considering variation in susceptibility to one of the most important mechanisms of social endorsement in the context of the decision to vote: social pressure. We

draw on a diverse literature in order to form expectations about the relationship between demographic characteristics and responsiveness to a social endorsement message. Guiding our theorizing are frameworks put forth by several scholars about factors that alter the effectiveness of norm-based treatments on behavior. Lapinski and Rimal (2005) point to several factors: the extent to which an individual believes that the behavior will achieve the desired outcome; the level of affinity an individual has for the reference group exerting the pressure; the degree to which an individual's self-concept is linked to the pressured behavior; whether the pressure is applied through interpersonal or some form of mass communication; and the attributes (including the public or private nature) of the behavior the norm is designed to evoke. Similarly, Cialdini and Goldstein (2004) argue that the three goals fundamental to human functioning—the desire to form accurate perceptions, the desire to maintain social relationships, and the desire to maintain a favorable self-concept—can interact with external forces such that a person may be more or less responsive depending on the medium and context in which the pressure is delivered.

How might the individual difference characteristics measured in this study, in addition to its delivery via social media, affect the extent to which a person was susceptible to the influence of the mobilization treatment? Applying the ideas just mentioned suggests that our treatment should be most effective for those who are the most psychologically invested in the site and their social network, and that it should act most powerfully on behavior that is most visible to others in the network. Next we consider in more depth the way in which demographics affect response to social pressure generally, consider how the medium of Facebook may affect our results, consider how demographics and the medium interact to affect potential susceptibility to social pressure in the Facebook context, and finally address what is specifically known about social pressure on the behavior of interest, voter turnout.

Demographics and Social Pressure

Past review of the literature suggests that women might be more responsive to social pressure (Cacioppo & Petty, 1980; Eagly, 1978). In a more recent review of the literature of the effects of gender roles on behavior, Eagly (2013) points to several previous hypotheses about why women may be more susceptible to some of the mechanisms of social pressure, such as social influence, and synthesizes previous work arguing that because men are stereotyped to be more agentic, they may desire to be more resistant to influence and that women may be more susceptible to influence because of "the female gender role's emphasis on communal qualities" (p. 98). Based on prior findings about gender differences in campaign effects and men's higher reactance scores in non-political domains, Murray and Matland (2015) argue women may be less susceptible to reactance, the backlash phenomena in which people resist a social pressure technique. However, their results do not support this hypothesis.

Similarly, older people appear to be less susceptible to social pressure (Pasupathi, 1999), more resistant to descriptive norms (Rivis & Sheeran, 2003), and potentially more likely to demonstrate reactance in response to a campaign mailer applying social pressure (Murray & Matland, 2015). A large body of work in social psychology suggests that this may be due to the fact that young people are in a transitional life stage where their needs for affiliation and acceptance are higher (Castro, Maddahian, Newcomb, & Bentler, 1987; Eiser & van der Pligt, 1984; Pasupathi, 1999; Suls & Mullen, 1982; White, Terry, & Hogg, 1994). Thus, based on the literature about social pressure outside the context of social media, we expect that older individuals will be less responsive to

the treatment. Finally, a long literature in political science points to the positive relationship between education level and turnout (Rosenstone & Hansen, 1993; Verba, Schlozman, & Brady, 1995; Wolfinger & Rosenstone, 1980), and it is likely that older individuals are more aware of the normative desirability of voting. Therefore, we expect that the higher a person's education level, the more responsive she will be to the treatment.

Social Pressure in the Social Media Context

The advent of social media has made information about the actions and preferences of others, particularly of an individual's social network, more readily available for both the individuals embedded in social networks and companies and campaigns that seek to contact them. In fact, some of the major motivations for using Facebook—the need to belong (Nadkarni & Hofmann, 2012), a desire for social connection, and the development of social capital (Ellison, Steinfield, & Lampe, 2007)—all hinge on Facebook users' ability to glean information about the behaviors and attitudes of their social connections. Users may in fact become more inquisitive about their social networks and refine their "analytic labor" skills or their abilities to observe their social connections in order to classify and categorize other members of their network as well as to evaluate and interpret their behavior (Karakayali & Kilic, 2013). This heightened curiosity and increased skill at assessing other people in their network may then inform the decision making of the individual about whether to engage in a particular action, in this case the decision of whether to participate in an election.

Thus, in addition to considering how traits of the individual receiving the social pressure may affect its efficacy, we consider how the Facebook platform may strengthen or weaken the delivery of social norms, and thus on which of our outcome measures we might expect the strongest effects. Kwon, Stefanone, and Barnett (2014) write that social networking sites like Facebook enhance the two preconditions for interpersonal influence (Friedkin, 1993): interpersonal visibility—the extent to which a person knows the opinions, attitudes, and behaviors of others—as well as salience—the perceived value that person puts on the new knowledge learned from social information.

We conceptualize the "I Voted" button as a measure of self-presentation. Facebook users would recognize that this is the information that would be most easily and readily transmitted to their social connections, and that it would generate content related to their impression management goals. The other two dependent variables of study—actual turnout and information seeking—are much more private. While some of a person's Facebook friends may be able to verify that she voted by observing her at the polls or seeing her with an "I Voted" sticker, most will not. Clicking to find out more about the polling location is an entirely private action. Thus, within the Facebook ecosystem, we expect that the behavior that communicates the most social information—the self-reported measure of voting—will show the greatest response to social pressure.

Demographics and Social Media Usage

Compounding the way in which demographic characteristics may moderate a person's susceptibility to social influence generally, these characteristics also appear to affect the way that individuals engage with social media sites. In Lapinski and Rimal's (2005) terms, the way in which demographics affect a person's sense of group identity and ego involvement, as well as the extent to which a person is socially invested in the site, may increase or decrease the strength of the delivery of the social pressure.

To begin, there are competing expectations about whether young people should be more or less responsive to the treatment based on the structure of their social networks. Researchers have found that younger and older users have different motivations for using Facebook (Brandtzæg, Luders, & Skjetne, 2010). Similarly, a nationally representative sample of American adults (Chang, Choi, Bazarova, & Lockenhoff, 2015) found support for socio-emotional selectivity theory (Carstensen, 2006), the idea that changes in motivational priorities over the life span affect the composition and size of people's social networks. The authors argue that these changing priorities for establishing social connections affect individuals' behavior on Facebook, and that older Facebook users are more selective in their friending behavior. While the friend networks of adults are smaller, a greater proportion of those friends are considered to be "actual friends." The implications for our experiment are unclear, however. As we describe more in the following text, the social pressure treatment contained information both about a random subset of a user's friends as well as the number of friends who had voted. Older individuals may have been more likely to receive a treatment with a higher proportion of close friends based on the structure of their network; younger individuals on average have larger networks and therefore were treated with a larger number of total friends who had voted.

Also conflating a clear expectation about the effect of age on susceptibility to pressure is the way in which users of different ages engage with the site. Multiple studies, albeit studies largely conducted on unrepresentative samples, have found that older adults are less likely to use many of Facebook's features, such as posting personal information (Chang et al., 2015; Christofides, Muise, & Desmarais, 2009, 2012; McAndrew & Jeong, 2012), posting status updates (Hayes, Van Stolk-Cooke, & Muench, 2015), and checking information about others (Chang et al., 2015; Glynn, Huge, & Hoffman, 2012), although some of these results may be explained by the degree of usage overall and perception of the importance of the Facebook site, as opposed to active decisions not to use these features (Glynn et al., 2012). However, older individuals may be more likely to interact with other individuals more directly, more likely to look at their own page, and more likely to look at family photographs (McAndrew & Jeong, 2012). Using a convenience sample, Hayes and colleagues (2015) find that not only do younger adults use Facebook more frequently, but that they are more emotionally impacted by the site. The expectation from these patterns are mixed. On the one hand, because younger users are generally more engaged with the site's features and invested in the online community, they may be more responsive to the treatment. Conversely, however, the prominent placement of a banner at the top of the News Feed—a feature that Facebook controls and deploys very rarely—could be more novel and noticeable to older users who are less familiar with all of the site's features.

There are a number of important findings about gender differences in social networking site usage. Gender role expectations may influence the degree to which people seek to manage their self-presentational concerns in the offline world (Eagly, 2013), and perhaps as a consequence of this, most research finds that females are more likely to use, and more intensive users, of Facebook (Hargittai, 2008; Thompson & Lougheed, 2012). This holds true for politically relevant behaviors, such as reading news, posting links to news stories, or commenting on news events (Glynn et al., 2012). Undergraduate women were 1.3 times more likely to respond to an appeal to join an activist Facebook group than were men (Kwon et al., 2014), and undergraduate women were more likely to post public replies and to like other people's status updates (Joiner et al., 2014). However, as the majority of these studies have been conducted on convenience samples of college-aged students, it is hard to generalize to women across the age span.

Social Factors and Voting Behavior

Finally, we return to Lapinski and Rimal's (2005) call to consider the attributes of the behavior the social pressure is meant to encourage, and briefly review the literature on previous experiments aimed at influencing voter turnout. As an attempt to induce greater awareness of the social aspects of voting, campaigns have attempted to activate individuals through GOTV and researchers have increasingly turned to field experiments to systematically understand the choices made by these campaigns. In one study on social pressure and turnout (Gerber, Green, & Larimer, 2008), potential voters were made aware that their neighbors may be updated with their actual vote history after the election. Compared to a control, this treatment significantly increased turnout rates.

Further studies of social pressure have examined how different types of appeals to norm compliance may affect behavior. One study showed that disclosing past turnout behavior through a mailing increases turnout, especially when the mailing disclosed a recent abstention (Gerber, Davenport, Larimer, Mann, & Panagopoulos, 2010). Another showed that publishing either the names of voters (inducing pride) or abstainers (inducing shame) in the newspaper increased turnout (Panagopoulos, 2010). Importantly, not all voters were equally mobilized: The shame treatment mobilized both high- and low-propensity voters, whereas the pride treatment mobilized only high-propensity voters.

Our experimental treatment is intended to alter the extent to which participants have information about the turnout decisions of their social contacts. In contrast to previous work, we simply provide information about the behavior of social contacts, where others (Gerber et al., 2008) also provide their participants with an incentive to comply with the social norm. The experiment we conduct induces descriptive norms (what is done), while other work has induced injunctive norms (what ought to be done) (Cialdini & Goldstein, 2004). While inducing both types of norms may be preferable, there are additional costs and risks associated with inducing injunctive norms. Inducing injunctive norms may require additional contact or may backfire if the description of the norm misaligned with the desired behavior.

Hypotheses

The experiment described in this article tests whether the effect of social endorsement cues extends to the realm of political participation, particularly to subsets of the population who are especially responsive to such messages. We hypothesize that social endorsement cues are effective at increasing participation, as the information is highly relevant to an immediate decision (early voting aside, voting takes place on one day). Voting is by its nature a social activity, and studies have shown that the turnout behavior of an individual's contacts is related to an individual's likelihood of voting. As we described earlier and further explain next in the procedures, we expect to see the largest effects of our treatment on the most visible measure of voting, the self-report measure that is communicated to a person's network.

Taken collectively, we have competing expectations about which users should be most responsive to the mobilization treatment. Previous research on social pressure outside the context of social media suggests that women and younger people should be most responsive; however, these expectations become muddled when we consider the way in which these characteristics interact with the medium of the message delivery. We hypothesize that we will detect the greatest effect on the most public of the outcome behaviors we measure: self-reported voting. However, the novelty of our experiment, and relative

paucity of prior research on how individual differences moderate the effects of social pressure online, lead us to weaker predictions about the effects of our demographic variables. Women and more educated individuals may be more susceptible to the social normative pressure about voting. Older individuals are less susceptible to pressure in the offline world, but we are unclear if this finding will persist based on the age-dependent patterns of Facebook behavior and network structure. We hypothesized that users who have more friends should be more responsive to social treatment, as they would have a larger number of friends to whom they expect their behavior will be reported. However, as the number of friends overall increases, the likelihood that the faces and names shown in the social message will be those of close, influential friends decreases, as the faces are randomly drawn from the set of all friends who have previously reported voting. For users with many friends, the social treatment may actually be less influential because the faces shown in the treatment are less likely to be close friends whose behavior is likely to influence the user's decision.

Method

Participants

Participants were 61,279,316 American adults at least 18 years old who accessed Facebook.com on November 2, 2010, the day of the U.S. Congressional elections.

Procedure

Participants were randomly assigned to one of three groups: social message, informational message, or control. Participants in the social message group ($N = 60,055,176$) were shown a statement at the top of their "News Feed" (the homepage that greets users upon entering the site). Random assignment ensures that a participant's treatment group is uncorrelated both with her characteristics and the characteristics of her friends (see Supplemental Material). This message encouraged the user to vote, provided a link to find local voting poll locations, showed a clickable button reading "I Voted" with a counter indicating how many other Facebook users had previously reported voting, and displayed up to six small randomly selected "profile pictures" of the participant's Facebook friends who had clicked the "I Voted" button prior to the individual logging in (Figure 1).[3] Participants in the informational message group users ($N = 611,044$) were shown the message, poll information, counter, and button, but they were not shown any faces of friends. Participants in the control group ($N = 613,096$) did not receive any message at the top of their News Feed. As such, the randomly assigned treatment variable is the message (social message, informational message, no message) that an individual saw at the top of the News Feed when he or she logged into Facebook on Election Day. The treatment group of the individual was stable throughout the day. For instance, individuals in the social message group would see the message containing the profile pictures of up to six randomly chosen friends who had previously clicked the "I Voted" button each time they logged into the site.

Because the social message group was shown the self-reported voting behavior of friends, participants in this condition were encouraged to think of voting as a social act. They were aware of the voting behavior of some of their friends, and they were aware that their (self-reported) voting behavior would be broadcast to their friends. For these reasons, we argue that the social message users were aware that members of their social network

had endorsed voting. Participants in the social message condition were exposed to more information related to the social aspect of voting, and were thus more likely to take this into account when making their decisions about whether to turn out and also whether to report having done so to Facebook.

There were three dependent variables: (a) clicking the "I Voted" button, (b) clicking the polling information link, and (c) validated turnout (see Supplemental Material for details on matching to voting records). Clicking the "I Voted" button is most similar to traditional measures of self-reported voting. However, unlike most instances of self-reported voting in which the respondent reports his or her voting behavior to a survey administrator, participants self-report their voting behavior to their social community. Therefore, we view self-reported voting not as a direct measure of voting behavior, but as a measure of political communication. The literature suggests that people use social media such as Facebook for self-presentation and impression management (Nadkarni & Hofmann, 2012); our measure of self-reported vote captures how a user seeks to portray herself and the extent to which participants desire to be seen as a voter by their social contacts. This ability to broadcast behavior to one's social network may in fact encourage participants to report voting when they have not voted (an over-report) due to social desirability. We expect the strongest effects of the treatment on this vote reporting, compared to information seeking and actual voting, because this is the behavior most aligned with the purposes for which users engage with the Facebook site.

To assess the effect of the treatment on political communication, we focus on rates of reported voting using the "I Voted" button. Because the control group did not have the option to click an "I Voted" button, we cannot compare the treatment group to the control group that received no message at all. We can compare the proportion of participants who clicked the "I Voted" button between the two treatment groups to estimate the causal effect of exposure to social endorsement cues (the faces and names of friends who had previously self-reported voting) on the political communication measure of self-reported turnout.

Results

Overall Results

Here we briefly describe the overall effects of the experiment, as previously reported in (Bond et al., 2012), before then discussing the relationships between the results for the subgroups in our study. Participants who received the social message (self-reported turnout = 20.23%) were 2.09% (SE 0.05%, t-test $p < 0.01$) more likely to self-report voting to their social contacts than those who received the informational message (self-reported turnout = 18.14%). Participants who received the social message were 0.26% (SE 0.02%, $p < 0.01$) more likely to seek information through the polling place information link than users who received the informational message.

Comparison of validated turnout rates showed that participants who received the social message were 0.39% (SE 0.19%, t-test $p = 0.02$) more likely to vote than users who received no message at all. Similarly, the difference in voting between those who received the social message and those who received the message was 0.39% (SE 0.17%, t-test $p = 0.02$), suggesting that seeing faces of friends significantly contributed to the overall effect of the message on real-world voting. In fact, turnout among those who received the informational message was identical to turnout among those in the control group (treatment effect 0.00%, SE 0.28%, $p = 0.98$), which raises doubts about the effectiveness of information-only appeals to vote in this context.

Moderating Role of Individual Differences

The results just provided show that online political mobilization can affect voter behavior in the aggregate. Our focus in this article, however, is how these effects vary based on the characteristics of the individual. The massive scale of our study allows us to disaggregate the effects more easily than in previous studies due to the increased statistical power to detect differences in behavior. Owing to our ability to only match approximately 10% (6.3 million) of our experimental participants to the validated voting record, and the small effect size and wide confidence interval we found for the main effect on validated voting, we do not have enough power to detect subpopulation differences in validated voting behavior. We therefore restrict our analysis of effects on subpopulations to the other two dependent variables—self-reported voting and information seeking—for which we have sample sizes large enough to detect significant effects in subpopulations. To test for heterogeneous effects we begin by simply subsetting the sample based on pre-treatment characteristics and conducting *t*-tests on the resulting groups.

All pretreatment covariates come from user-supplied Facebook data. When people create a Facebook account they must enter their birth date to ensure they meet the minimum age requirement of 13 years. Users are also encouraged to enter their gender at sign-up. Therefore, for most of our sample we know the age and gender of the users.

Gender. We found no difference in mean (treatment effect) between men (1.955%, 95% CI 1.806% to 2.103%) versus women (2.186%, 95% CI 2.056% to 2.316%) for self-reported voting. Similarly, there was no difference in mean (treatment effect) on information seeking for men versus women.
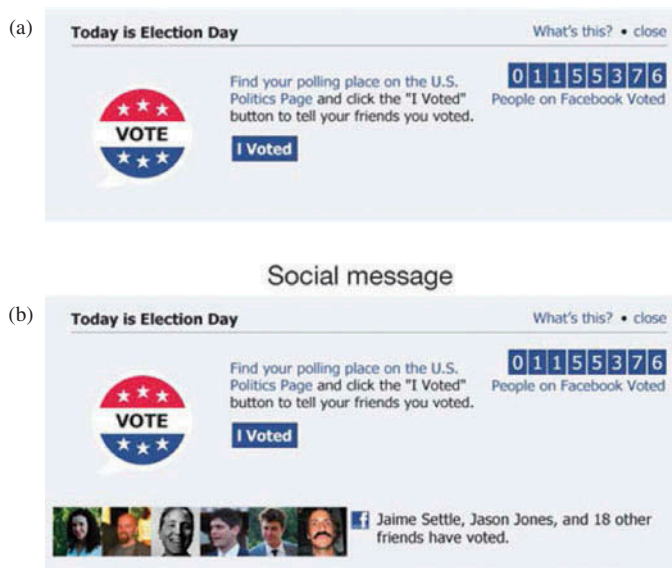

Figure 1. Examples of the treatment message: (a) Example of the social message condition; (b) example of the informational message. Note that the social message and the informational message are identical except for the faces of up to six friends who had previously self-reported voting, the names of up to three additional friends who had previously self-reported voting, and the number of previously voting friends shown at the bottom of the social message.

Age. Among older participants, the inclusion of social endorsement cues has a larger effect on self-reported voting and information seeking (Figure 2). The effect size for those 50 years of age and older versus that of those ages 18 to 24 is nearly 4 times as large for self-reported voting and nearly 8 times as large for information seeking.

Education. Facebook allows users to enter their education history, including the school attended by name and type (high school, college, or graduate school), the year graduated, and the degree obtained. We coded anyone who listed a graduation year from 2010 or prior as a graduate from that type of school and classified each user as a high school, college, or graduate school graduate, taking the highest degree listed for each user. For instance, a user may list a graduation year in the future when they expect to graduate, so a user who listed a high school graduation year of 2008 and a college graduation year of 2012 would be coded as a high school graduate (as they would not yet have graduated college by the time of the election). The treatment effect on self-reported voting seems to increase as education level increases (Figure 3, left panel). However, we found no significant differences in treatment effect on information seeking by education level (Figure 3, right panel).

Inequality in Participation. We were interested in whether the messages affected inequality in voting behavior. There are systematic differences in the voting population versus the population overall, and these differences may make some groups underrepresented politically (Lijphart, 1997; Verba et al., 1995). Increasingly, scholars have become interested in variation in treatment effect across various levels of voting propensity. Recent work has shown that partisan campaigns are more effective for mobilizing new registrants (Alvarez, Hopkins, & Sinclair, 2010), that nonpartisan GOTV leaflets have the strongest impact on nonpartisans who are recent voters (Gerber & Green, 2000), and that canvassing is most
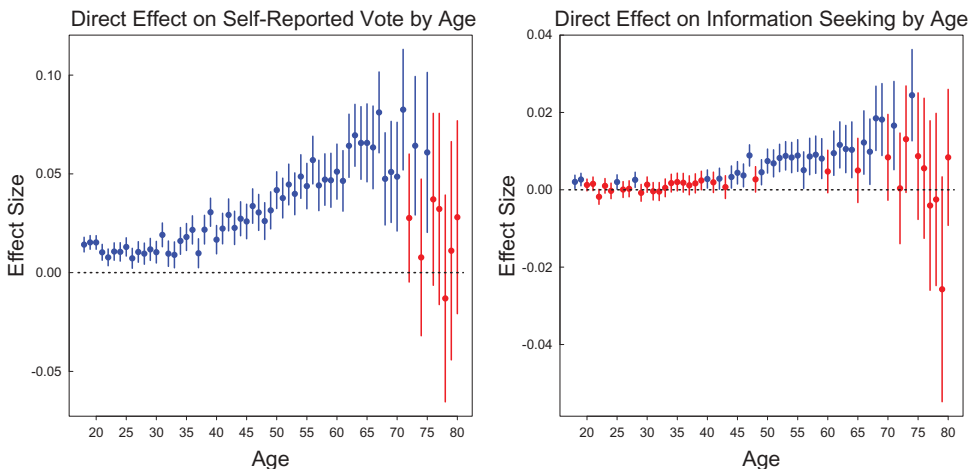

Figure 2. Self-reported voting and information-seeking effects disaggregated by age. The left panel shows the difference in mean (treatment effect) on self-reported voting due to the inclusion of social endorsement cues, by age. The right panel shows the difference in mean (treatment effect) on information seeking due to the inclusion of social endorsement cues, by age. In each, points indicate the average treatment effect for the group and bars represent 95% confidence intervals. Blue indicates a group for which the comparison was statistically significant. Red indicates a group for which the comparison was not statistically significant.
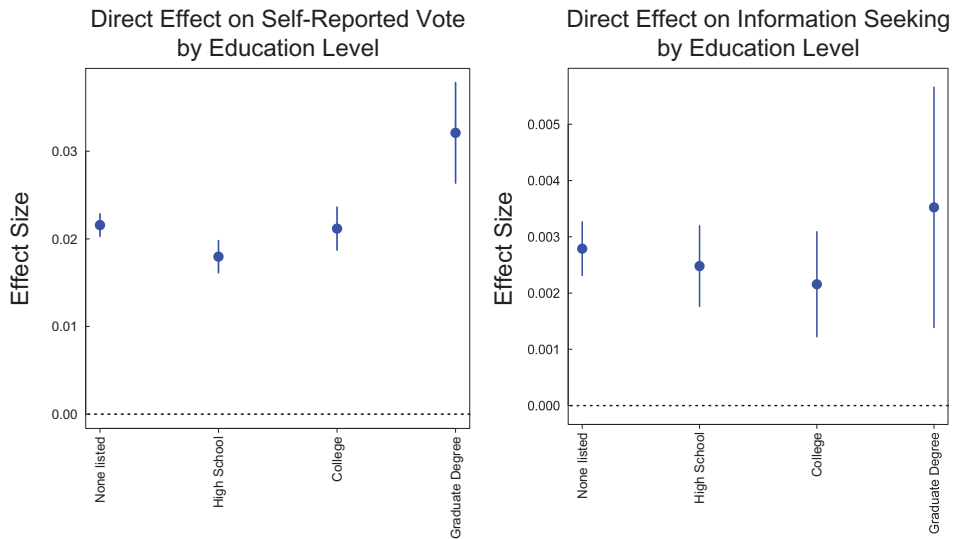
Figure 3. Self-reported voting and information-seeking effects disaggregated by education level. The left panel shows the difference in mean (treatment effect) on self-reported voting due to the inclusion of social endorsement cues, by education level. The right panel shows the difference in mean (treatment effect) on information seeking due to the inclusion of social endorsement cues, by education level. In each, points indicate the average treatment effect for the group and bars represent 95% confidence intervals. Blue indicates a group for which the comparison was statistically significant. Red indicates a group for which the comparison was not statistically significant.

effective among those who voted in the most recent previous election (Green & Gerber, 2008). While GOTV efforts are aimed at increasing voting in the aggregate, we may also investigate whether they increase turnout in groups that are underrepresented (Enos, Fowler, & Vavreck, 2014). By studying whether a particular treatment disproportionally affects individuals who have a low likelihood of voting, we are able to understand whether GOTV efforts are affecting gaps in turnout across types of individuals.

In order to investigate whether our treatment disproportionately affected particular groups, we used a procedure to test for the effect that the treatment has on inequality in participation for each of our three dependent variables (Enos et al., 2014). First, we estimate an OLS regression model for each of the three dependent variables using pretreatment characteristics without including treatment status, using only observations from the control group. For the validated vote analysis, the control group is the group that received no GOTV message at all. For the self-reported vote and the information-seeking analyses, the control group is the group that received the informational appeal to vote without social endorsement cues. Thus, for validated vote we are able to compare the control group to both the informational message group and the social message group, while for self-reported vote and information seeking we are only able to compare the social message group to the informational message group. Table 1 shows the results of the regression of pretreatment characteristics on the three dependent variables for the control groups.[4] Using this regression model, we compute a propensity score for each user to engage in each of the three participatory behaviors. The propensity score measures the individual's propensity to participate if they were not contacted at all (validated vote) or if

they were contacted only with information about the election rather than social endorse-ment cues (self-reported vote and information seeking). Finally, we rescale the propensity variable to have mean 0 and standard deviation 1 for ease of interpretation in the subsequent model in which it is an independent variable.

Using the propensity score, we estimate a regression in which we include the propensity to engage in the dependent variable without treatment as estimated from the models in Table 1 with the treatment. These models take the form

$$Participation = \alpha + \beta_1 \times treatment + \beta_2 \times propensity$$
$$+ \beta_3 \times treatment \times propensity + \varepsilon$$

In this model the coefficients we are most interested in are β_1 and β_3. β_1 represents the treatment effect for a user with an average propensity score (that is, an average likelihood of participation). β_3 represents the extent to which the effect of the treatment varies based on an individual's propensity to participate without treatment. If β_3 is significant and greater than 0, then the treatment is more effective among individuals who were already likely to participate, which means that the treatment increases inequality in participation. If β_3 is significant and less than 0, then the treatment is more effective among individuals who were less likely to participate without treatment, which means that the treatment decreases inequality in participation.

Table 2 shows the results of the three models. For validated vote we find a negative but insignificant coefficient for the social message (β_3 for validated vote = –0.001, $p = 0.502$) and the informational message (β_3 for validated vote = –0.002, $p = 0.435$), indicating no difference between low- and high-propensity individuals. For self-reported vote we find a positive, significant coefficient for the effect of the social message (β_3 for self-reported vote = 0.008, $p < 0.001$). For self-reported voting, the social message was more effective among those who were already likely to self-report. This indicates the social message made participation in self-reported voting less equal than had users only received an informational appeal. For information seeking, we find a positive, but insig-nificant, coefficient (β_3 information seeking = < 0.001, $p = 0.791$), indicating no difference between low- and high-propensity individuals.

Number of Facebook Friends and Close Friends. We were interested in how the treatment effect varied by both the number of friends and close friends an individual has. We use both the total number of friends that a user has as well as a more restrictive measure that helps us to identify closer friendship relationships. Recent work has shown that online interactions are highly predictive of real-world friendships (Jones et al., 2012). To identify close friend-ships we used photo "tagging" behavior. On Facebook users can upload photos and then "tag" them with the names of their friends (akin to writing "Grandma Lucy, Grandma Betty, Mom, and Micaella" on the back of a physical photo). We defined close friends as people who tagged one another in at least one Facebook photo (Christakis & Fowler, 2009; Lewis, Kaufman, Gonzalez, Wimmer, & Christakis, 2008) during the year prior to the election. Tagging suggests that the friends are more likely to be physically proximate, have a higher level of commitment to the friendship, experience more positive affect with each other, and a have a desire for the friendship to be socially recognized (Lewis et al., 2008). Not all such friendships will be close, but we expect them to be closer on average.

We found some evidence of a curvilinear relationship between the effect of the social message versus the message for both the number of friends and the number of close

Table 1

OLS regression results using pre-election demographic variables available from Facebook to predict each of the three political behaviors

	Validated Vote			Self-Reported Vote			Information Seeking		
	Est.	SE	p	Est.	SE	p	Est.	SE	p
Age	0.010	0.002	<0.001	0.003	<0.001	<0.001	<0.001	<0.001	<0.001
Female	−0.011	0.004	0.005	0.005	0.001	<0.001	−0.002	<0.001	<0.001
Republican	0.009	0.058	0.883	0.075	0.016	<0.001	<0.004	0.006	0.559
Democrat	0.066	0.051	0.190	0.065	0.014	<0.001	0.010	0.006	0.076
College	0.077	0.004	<0.001	0.065	0.001	<0.001	0.006	0.001	<0.001
Conservative	0.188	0.025	<0.001	0.142	0.007	<0.001	0.013	0.003	<0.001
Liberal	0.064	0.027	0.016	0.102	0.008	<0.001	0.014	0.003	<0.001
Number of close friends	<0.001	<0.001	0.850	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Number of friends	<0.001	<0.001	0.834	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Employed	0.026	0.011	0.019	0.040	0.003	<0.001	0.005	0.001	<0.001
Married	0.097	0.004	<0.001	0.059	0.001	<0.001	0.001	<0.001	0.007
Constant	0.086	0.007	<0.001	0.012	0.002	<0.001	0.010	0.001	<0.001
N	63,095			603,558			603,558		
R-squared	0.105			0.038			0.002		

Table 2
OLS regression results of treatment status interacted with predicted probability of each of the three political behaviors

	Validated Vote			Self-Reported Vote			Information Seeking		
	Est.	SE	p	Est.	SE	p	Est.	SE	p
Constant	0.504	0.002	0.001	0.182	0.001	<0.001	0.022	<0.001	<0.001
Social message	0.005	0.002	0.017	0.021	0.001	<0.001	0.003	<0.001	<0.001
Predicted probability	0.161	0.002	0.001	0.070	0.001	<0.001	0.006	<0.001	<0.001
Social message * Predicted probability	–0.001	0.002	0.502	0.008	0.001	<0.001	<0.001	<0.001	0.791
Informational message	–0.006	0.003	0.823						
Informational message * Predicted probability	–0.002	0.003	0.435						
N		6,316,163			59,895,087			59,895,087	
R-squared		0.103			0.038			0.002	

friends (Figure 4). For both friends and close friends, we found an increase in effect size when comparing the group with few friends or no close friends to the group with a moderate number of friends or close friends. Among those who have at least a moderate number of friends or at least one close friend, an increasing number of social contacts relates to a smaller effect size, for both self-reported voting and information seeking.
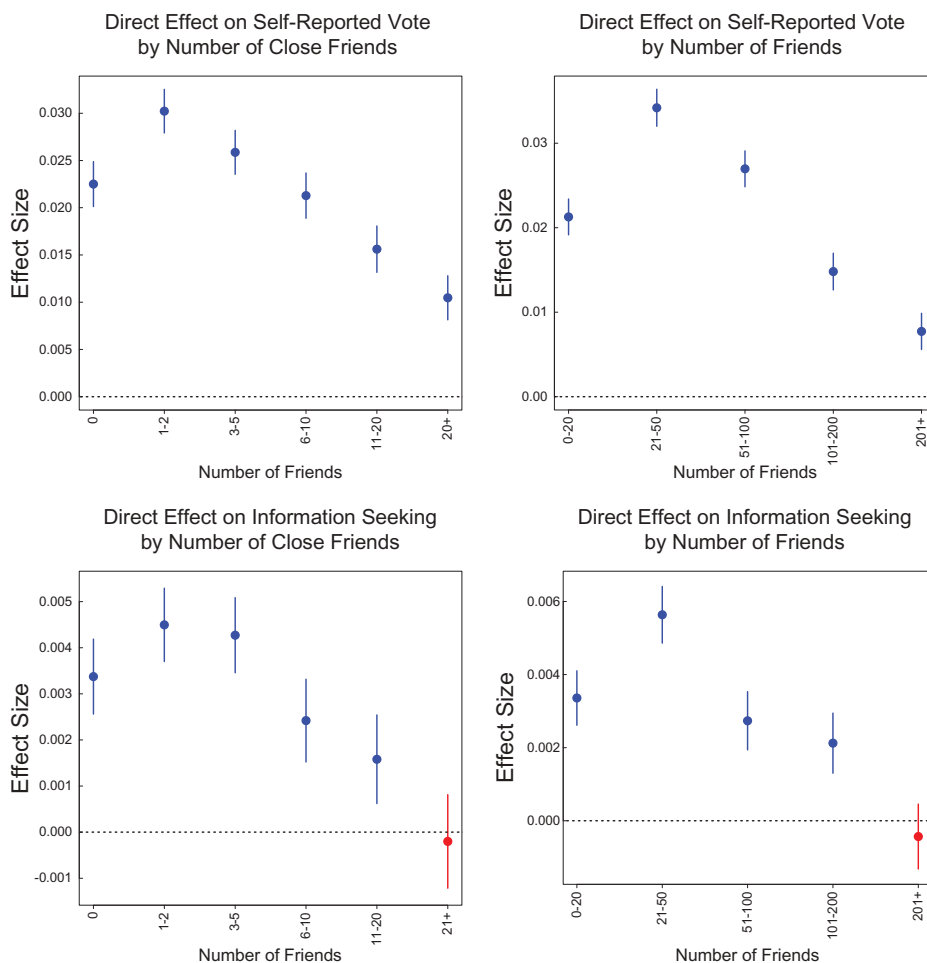

Figure 4. Self-reported voting and information-seeking effects disaggregated by number of friends and close friends. The upper left panel shows the difference in mean (treatment effect) on self-reported voting due to the inclusion of social endorsement cues, by the number of close friends. The upper right panel shows the difference in mean (treatment effect) on information seeking due to the inclusion of social endorsement cues, by the number of close friends. The lower left panel shows the difference in mean (treatment effect) on self-reported voting due to the inclusion of social endorsement cues, by the number of friends. The lower right panel shows the difference in mean (treatment effect) on information seeking due to the inclusion of social endorsement cues, by the number of friends. In each, points indicate the average treatment effect for the group and bars represent 95% confidence intervals. Blue indicates a group for which the comparison was statistically significant. Red indicates a group for which the comparison was not statistically significant.

This may owe to multiple factors. The groups with the fewest friends may simply be infrequent Facebook users for whom a GOTV message delivered through the site is not particularly effective. If that is the case, then the relationship is more straightforward—more friends indicate a smaller effect of the social message as compared to the informational message. As the number of friends overall increases, the likelihood of close friends being present in the social message is lower. As more distant friends are included in the message, its effectiveness may diminish for two related reasons. First, the friends shown are less likely to be influential. Second, the individual may be less concerned that close friends will monitor whether or not he or she claims to have voted.

Discussion

In this study we used a large-scale GOTV experiment to study how the voting behavior of an individual's social network differentially influences people to vote based on both their demographic characteristics and their propensity to engage in voting-related behaviors. The size of our sample allowed us to examine the moderating role of gender, age, level of education, and social connectedness. While we observed no difference in treatment effect by gender, we found that as people age they become more sensitive to the inclusion of a social endorsement cue in appeals to vote. Furthermore, users reporting a higher level of education are more responsive to social endorsement cues for self-reported voting, though this result is only suggestive.

However, through further investigation of the experiment, we found social endorsement cues treatment had the greatest effect on political expression (self-reported vote) for those who already had a high propensity of political expression. We found no such effects for information seeking or validated voting. This suggests an important part of the effect of the mobilization effort may be related to how individuals choose to portray their identity on social media through political expression. People who are more likely to vote may respond to social pressure by sharing information about their behavior, but may be no more likely to engage in ways that democratic theorists argue are most critical for our political system: being informed and casting a vote.

A full understanding of the way that campaigns and individuals interact necessitates consideration of the way that individuals are embedded in social networks. We study this through analyzing the degree to which social pressure is effective for individuals most socially connected on the Facebook site. While people who have at least one close friend are more responsive to the social pressure treatment, once that threshold is crossed, we found that, for most people an increasing number of social contacts relates to a smaller effect from social endorsement cues. This result merits future study. It may result from how network size affects the *content* of the message: the average closeness of a friend randomly selected to appear in the mobilization message is lower for a person with a large social network. Alternatively, it may be that the *power* of the message is weaker: an individual with a large network may be less concerned that friends will monitor her vote reporting. Understanding the mechanisms through which social pressure works in the online world is critical for harnessing social networks for mobilization.

Limitations and Directions for Future Research

One significant limitation of the current study is the use of dependent variables—self-reported voting and information seeking—rather than validated voting, for most of the study of differential effects. Relying on self-reported measures of turnout can yield over-

estimates of treatment effects (Vavreck, 2007). However, using validated turnout is not a panacea. A recent comparison of self-reports and validated voting concluded that using validated voting records may cause more problems than they solve (Berent, Krosnick, & Lupia, 2011). Both measures are important for the study of political participation.

We also note that the treatment administered was an Election Day message delivered through a social networking site. A more broad-based campaign, using multiple methods of contact, may be considerably more powerful. Nevertheless, our findings underscore the power of social endorsement cues in affecting a variety of participatory behaviors across heterogeneous individuals. In a more broad-based campaign, one may expect that social endorsement cues would play a role not only for voting, but also for other forms of participation, such as registering to vote or donating to campaigns.

One must consider the replicability and generalizability of the study. We do not assume that these results would hold in other settings. At the time the study was fielded, more than 50% of U.S. adults were Facebook users (Facebook, 2011), but these results may not hold for non-Facebook users. The generalizability to other electoral settings (such as presidential or local elections) is an area for future research. Furthermore, because our treatment relies heavily on social endorsement cues and social norms differ greatly by culture, it is not clear that treatment effects would be similar in other countries. Likewise, individuals in other countries may use technological tools, such as social networking sites, in different ways that may change how they react to GOTV campaigns such as these.

Overall, this study indicates that GOTV campaigns that include social endorsement cues appear to be more effective than messages including information about the election alone, but the importance of social endorsement cues in affecting participation varies greatly according to both demographic and social characteristics of the individual. Studies like the present one help us to understand whether and how online appeals may work and, when they do, how campaigns can most effectively and efficiently target their resources. This information should help policymakers and campaign managers plan successful GOTV campaigns, as they will have a better understanding of what types of appeals are effective for which types of individuals.

Future researchers have a greater challenge ahead: explaining the mechanism of these effects in order to translate the vast body of knowledge about political behavior in the offline world to understand how people behave politically on social media. This article is an initial assessment of the degree to which social endorsement and pressure can be utilized through online social networking, but a full understanding of these processes will require the efforts of researchers interested not only in campaign techniques and social media, but also those interested in social psychology and sociology.

Supplemental Material

Supplemental data for this article can be accessed on the publisher's website at http://dx.doi.org/10.1080/10584609.2016.1226223.

Notes

1. The experimental treatment, as described next, does not enable participants to provide an actual "endorsement" of voting. However, the "news story" that is generated by a participant reporting having voted does imply such an endorsement. As such, we refer to this as a "social endorsement cue," although a less charitable interpretation may be that this is simply social sharing of information and that any endorsement or not is inferred by the reader.

2. Note, however, that our results show that we find differences in the self-reporting of turnout rather than in turnout itself. Due to sample size limitations among those whose voting behavior we were able to validate, much of our analysis is restricted to study of self-reported turnout and polling place search rather than validated voting.
3. For people who had fewer than six friends who had clicked on the "I Voted" button, all friends who had clicked were included in the set of profile pictures that were shown to friends.
4. We note that partisanship and ideology were measured using the "political views" section of participants' Facebook profiles. Few participants used political views that were classifiable as partisan or ideological, so our measure of partisanship is likely different from most other studies. The political views measure of ideology has been shown to be highly correlated to other, validated measures of ideology (Bond & Messing, 2015).

References

Alvarez, R. M., Hopkins, A., & Sinclair, B. (2010). Mobilizing Pasadena democrats: Measuring the effects of partisan campaign contacts. *The Journal of Politics*, *72*(1), 31–44. doi:10.1017/S00223381609990454

Berelson, B. R., Lazarsfeld, P. F., & McPhee, W. N. (1954). *Voting*. Chicago, IL: University of Chicago Press.

Berent, M. K., Krosnick, J. A., & Lupia, A. (2011). *The quality of government records and "overestimation" of registration and turnout in surveys: Lessons from the 2008 ANES Panel Study's registration and turnout validation exercises*. Working Paper No. nes012554. Ann Arbor, MI; Palo Alto, CA: American National Election Studies. Retrieved from http://www.electionstudies.org/resources/papers/nes012554.pdf

Bond, R. M., Fariss, C. J., Jones, J. J., Kramer, A. D. I., Marlow, C., Settle, J. E., & Fowler, J. H. (2012). A 61-million-person experiment in social influence and political mobilization. *Nature*, *489*(7415), 295–298.

Bond, R. M., & Messing, S. (2015). Quantifying social media&s political space: Estimating ideology from publicly revealed preferences on Facebook. *American Political Science Review*, *109*(1), 62–78.

Brandtzæg, P. B., Luders, M., & Skjetne, J. H. (2010). Too many Facebook "friends"? Content sharing and sociability versus the need for privacy in social network sites. *International Journal of Human-Computer Interaction*, *26*, 1006–1030. doi:10.1080/10447318.2010.516719

Cacioppo, J. T., & Petty, R. E. (1980). Sex differences in influenceability: Toward specifying the underlying processes. *Personality and Social Psychology Bulletin*, *6*(4), 651–656.

Campbell, A., Converse, P. E., Miller, W. E., & Stokes, D. E. (1960). *The American voter*. New York, NY: Wiley.

Carstensen, L. L. (2006). The influence of a sense of time on human development. *Science*, *312*, 1913–1915. doi:10.1126/science.1127488

Castro, F., Maddahian, E., Newcomb, M. D., & Bentler, P. M. (1987). A multivariate model of the determinants of cigarette smoking among adolescents. *Journal of Health and Social Behavior*, *28*, 273–289. doi:10.2307/2136846

Chang, P. F., Choi, Y. H., Bazarova, N. N., & Lockenhoff, C. E. (2015). Age differences in online social networking: Extending socioemotional selectivity theory to social network sites. *Journal of Broadcasting & Electronic Media*, *59*, 221–239. doi:10.1080/08838151.2015.1029126

Christakis, N., & Fowler, J. H. (2009). Social network visualization in epidemiology. *Norwegian Journal of Epidemiology*, *19*, 5–16.

Christofides, E., Muise, A., & Desmarais, S. (2009). Information disclosure and control on Facebook: Are they two sides of the same coin or two different processes? *CyberPsychology & Behavior*, *12*, 341–345.

Christofides, E., Muise, A., & Desmarais, S. (2012). Hey Mom, what's on your Facebook? comparing Facebook disclosure and privacy in adolescents and adults. *Social Psychological and Personality Science*, *3*, 48–54. doi:10.1177/1948550611408619

Cialdini, R., & Goldstein, N. (2004). Social influence: Compliance and conformity. *Annual Review of Psychology*, *55*, 591–621. doi:10.1146/annurev.psych.55.090902.142015

Conlisk, J. (1996). Why bounded rationality? *Journal of Economic Literature*, *34*, 669–700.

Eagly, A. H. (1978). Sex differences in influenceability. *Psychological Bulletin*, *85*, 86–116. doi:10.1037/0033-2909.85.1.86

Eagly, A. H. (2013). *Sex differences in social behavior: A social-role interpretation*. Hillsdale, NJ: Erlbaum.

Eiser, J. R., & van der Pligt, J. (1984). Attitudinal and social factors in adolescent smoking: In search of peer group influence. *Journal of Applied Psychology*, *14*, 348–363.

Ellison, N. B., Steinfield, C., & Lampe, C. (2007). The benefits of Facebook "friends": Social capital and college students' use of online social network sites. *Journal of Computer-Mediated Communication*, *12*, 1143–1168. doi:10.1111/jcmc.2007.12.issue-4

Enos, R. D., Fowler, A., & Vavreck, L. (2014). Increasing inequality: The effect of GOTV mobilization on the composition of the electorate. *Journal of Politics*, *76*(1), 273–288.

Facebook. (2011). *Statistics*. Retrieved from http://www.facebook.com/press/info.php?statistics

Friedkin, N. E. (1993). Structural bases of interpersonal influence in groups: A longitudinal case study. *American Sociological Review*, *58*, 861–872. doi:10.2307/2095955

Gerber, A., Davenport, T., Larimer, C., Mann, C., & Panagopoulos, C. (2010). The enduring effects of social pressure: Tracking campaign experiments over a series of elections. *Political Behavior*, *32*, 423–430. doi:10.1007/s11109-010-9122-0

Gerber, A. S., & Green, D. P. (2000). The effect of a nonpartisan get-out-the-vote drive: An experimental study of leafletting. *The Journal of Politics*, *62*(3), 846–857. doi:10.1111/0022-3816.00035

Gerber, A., Green, D., & Larimer, C. (2008). Social pressure and voter turnout: Evidence from a large-scale field experiment. *American Political Science Review*, *102*, 33–48. doi:10.1017/S000305540808009X

Glynn, C. J., Huge, M. E., & Hoffman, L. H. (2012). All the news that's fit to post: A profile of news use on social networking sites. *Computers in Human Behavior*, *28*, 113–119. doi:10.1016/j.chb.2011.08.017

Green, D. P., & Gerber, A. S. (2008). *Get out the vote: How to increase voter turnout*. Washington, DC: Brookings Press.

Hargittai, E. (2008). Whose space? Differences among users and non-users of social network sites. *Journal of Computer-Mediated Communication*, *13*, 276–297. doi:10.1111/j.1083-6101.2007.00396.x

Hassell, H. J. G., & Monson, J. Q. (2014). Campaign targets and messages in campaign fundraising. *Political Behavior*, *36*, 359–376. doi:10.1007/s11109-013-9230-8

Hayes, M., Van Stolk-Cooke, K., & Muench, F. (2015). Understanding Facebook use and the psychological effects of use across generations. *Computers in Human Behavior*, *49*, 507–511. doi:10.1016/j.chb.2015.03.040

Huckfeldt, R., & Sprague, J. (1995). *Citizens, politics, and social communication: Information and influence in an election campaign*. New York, NY: Cambridge University Press.

Joiner, R., Stewart, C., Beaney, C., Moon, A., Maras, P., Guiller, J.,… Brosnan, M. (2014). Publically different, privately the same: Gender differences and similarities in response to Facebook status updates. *Computers in Human Behavior*, *39*, 165–169. doi:10.1016/j.chb.2014.07.004

Jones, J. J., Settle, J. E., Bond, R. M., Fariss, C. J., Marlow, C., & Fowler, J. H. (2012). Inferring tie strength from online directed behavior. *PLoS ONE*, *8*(1), e52168.

Kahneman, D. (2003). A perspective on judgment and choice: Mapping bounded rationality. *American Psychologist*, *58*, 697–720. doi:10.1037/0003-066X.58.9.697

Karakayali, N., & Kilic, A. (2013). More network conscious than ever? Challenges, strategies, and analytic labor of users in the Facebook environment. *Journal of Computer-Mediated Communication*, *18*, 61–79. doi:10.1111/jcc4.12005

Kenny, C. B. (1992). Political participation and effects from the social environment. *American Journal of Political Science*, *36*, 259–267. doi:10.2307/2111432

Knobloch-Westerwick, S., Sharma, N., Hansen, D. L., & Alter, S. (2005). Impact of popularity indications on readers' selective exposure to online news. *Journal of Broadcasting & Electronic Media*, *49*, 296–313. doi:10.1207/s15506878jobem4903_3

Kwon, K. H., Stefanone, M. A., & Barnett, G. A. (2014). Social network influence on online behavioral choices: Exploring group formation on social network sites. *American Behavioral Scientist*, *58*, 1345–1360. doi:10.1177/0002764214527092

Lapinski, M. K., & Rimal, R. N. (2005). An explication of social norms. *Communication Theory*, *15*, 127–147. doi:10.1111/comt.2005.15.issue-2

Lerman, K. (2007). Social information processing in news aggregation. *IEEE Internet Computing*, *11*, 16–28. doi:10.1109/MIC.2007.136

Lewis, K., Kaufman, J., Gonzalez, M., Wimmer, A., & Christakis, N. (2008). Tastes, ties, and time: A new social network dataset using Facebook.com. *Social Networks*, *30*, 330–342. doi:10.1016/j.socnet.2008.07.002

Lijphart, A. (1997). Unequal participation: Democracy's unresolved dilemma presidential address, American Political Science Association, 1996. *American Political Science Review*, *91*, 1–14. doi:10.2307/2952255

McAndrew, F. T., & Jeong, H. S. (2012). Who does what on Facebook? Age, sex, and relationship status as predictors of Facebook use. *Computers in Human Behavior*, *28*, 2359–2365. doi:10.1016/j.chb.2012.07.007

Messing, S., & Westwood, S. J. (2014). Selective exposure in the age of social media: Endorsements trump partisan source affiliation when selecting news online. *Communication Research*, *41*, 1042–1063. doi:10.1177/0093650212466406

Murray, G. R., & Matland, R. E. (2015). "You've gone too far": Social pressure mobilization, reactance, and individual differences. *Journal of Political Marketing*, *14*, 333–351. doi:10.1080/15377857.2015.1086135

Nadkarni, A., & Hofmann, S. G. (2012). Why do people use Facebook? *Personality and Individual Differences*, *52*, 243–249. doi:10.1016/j.paid.2011.11.007

Panagopoulos, C. (2010). Affect, social pressure and prosocial motivation: Field experimental evidence of the mobilizing effects of pride, shame and publicizing voting behavior. *Political Behavior*, *32*, 369–386. doi:10.1007/s11109-010-9114-0

Pasupathi, M. (1999). Age differences in response to conformity pressure for emotional and none-motional material. *Psychology and Aging*, *14*, 170–174. doi:10.1037/0882-7974.14.1.170

Rivis, A., & Sheeran, P. (2003). Descriptive norms as an additional predictor in the theory of planned behaviour: A meta-analysis. *Current Psychology*, *22*, 218–233. doi:10.1007/s12144-003-1018-2

Rosenstone, S. J., & Hansen, J. M. (1993). *Mobilization, participation, and democracy in America*. New York, NY: Longman Classics in Political Science.

Salganik, M. J., Dodds, P. S., & Watts, D. J. (2006). Experimental study of inequality and unpredictability in an artificial cultural market. *Science*, *311*, 854–856. doi:10.1126/science.1121066

Simon, H. A. (1972). Theories of bounded rationality. *Decision and Organization*, *1*, 161–176.

Sinclair, B. (2012). *The social citizen*. Chicago, IL: University of Chicago Press.

Steffes, E. M., & Burgee, L. E. (2009). Social ties and online word of mouth. *Internet Research*, *19*, 42–59. doi:10.1108/10662240910927812

Suls, J., & Mullens, B. (1982). From the cradle to the grave: Comparison and self-evaluation across the life span. In J. Suls (Ed.), *Psychological perspectives on the self* (vol. 1, pp. 97–125). Hillsdale, NJ: Erlbaum.

Sundar, S. S., & Nass, C. (2001). Conceptualizing sources in online news. *Journal of Communication*, *51*, 52–72. doi:10.1111/jcom.2001.51.issue-1

Sunstein, C. (2009). *Going to extremes: How like minds unite and divide*. New York, NY: Oxford University Press.

Thompson, S. H., & Lougheed, E. (2012). Frazzled by Facebook? An exploratory study of gender differences in social network communication among undergraduate men and women. *College Student Journal*, *46*, 88–99.

Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science*, *185*, 1124–1131. doi:10.1126/science.185.4157.1124

Vavreck, L. (2007). The exaggerated effects of advertising on turnout: The dangers of self-reports. *Quarterly Journal of Political Science*, *2*, 325–343. doi:10.1561/100.00006005

Verba, S., Schlozman, K. L., & Brady, H. (1995). *Voice and equality*. Cambridge, MA: Harvard University Press.

White, K. M., Terry, D. J., & Hogg, M. A. (1994). Safer sex behavior: The role of attitudes, norms and control factors. *Journal of Applied Social Psychology*, *24*, 2164–2192. doi:10.1111/jasp.1994.24.issue-24

Wolfinger, R. E., & Rosenstone, S. J. (1980). *Who votes?* New Haven, CT: Yale University Press.