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Political persuasion on social media: Tracing direct and indirect effects of news use and social interaction

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Abstract

News use via social media has been linked to pro-democratic political behaviors. However, most people use social media for non-political purposes, like connecting with friends and browsing news feeds. Recent research indicates these behaviors may also have democratic benefits, by means of political expression in social media. Drawing on panel data from a nationally representative sample, this study extends this line of research by exploring how social interaction and news-seeking behaviors on social media lead to diverse networks, exposure to dissenting political opinion, and ultimately reconsidering and changing one's political views. Social media are a unique communication platform, and their attributes might influence exposure to political information. The tendency for users to build and maintain friend networks creates a potential deliberative space for political persuasion to take place. Consistent with prior literature, news use leads to political persuasion. More interestingly, apolitical, but social interactive uses of social media also lead to political persuasion. These relationships are partially mediated through network and discussion attributes.

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In democratic societies, people's political positions are highly dependent upon their tendency to be persuaded. Most people do not form their political ideas independent of the world around them. Citizens are often influenced by messages filtered through the news media, the social context of their peer group, or both. Scholarship on attitude change suggests that persuasion can occur as a result of news consumption (Barker and Lawrence, 2006; Mutz et al., 1996), and other work explains persuasion as the result of a need to maintain social connectedness (Cialdini and Trost, 1998; Wood, 2000). The contemporary social environment is characterized by the rise of social media—a potential space of interaction where citizens are simultaneously exposed to news, and the views of people in their social network. How might individuals be persuaded to reconsider their political views in this relatively new social sphere?

The majority of social media users turn to these platforms to socialize, receive updates from friends in their network, get emotional support, or browse photos and videos (Pew Research Center for the People and the Press, 2014a; Quan-Haase and Young, 2010). Although nearly half of users never discuss politics on these sites, and only a third finds this mode of communication important for political debate (Pew Research Center for the People and the Press, 2014b), recent research indicates that non-political discussion and social interaction on social media can serve as a catalyst for political expression and participation (Gil de Zúñiga et al., 2014). Might these common uses of social media also provide citizens new opportunities to learn about and discuss politics, and perhaps, be persuaded to reconsider their views? In fact, social media might be ideal forums for political persuasion. The attributes of these platforms create a deliberative space that may facilitate persuasive outcomes.

An ideal context for political persuasion to occur is through conversation. According to deliberative theorists, this ideal context would include a shared text, a set of issues to discuss, the opportunity to speak and debate, as well as exposure to diverse opinions (Gastil, 1993; Ryfe, 2005). Social media offer a shared text (in the form of news and other political information) and provide easy opportunities to discuss politics, even if their primary motivation for using these sites is social. Social media also promote other potentially deliberative attributes, like diverse networks (Lee et al., 2014; Gil de Zúñiga et al., 2013) and exposure to discussion disagreement (Kim et al., 2013). Though some scholars have explored the potential for online discussion forums to increase exposure to diverse political views (Wojcieszak and Mutz, 2009), prior research has not examined if, or how, political persuasion occurs in social media.

How might the network and discussion affordances of social media lead to political persuasion? In this article, we argue that both basic social interaction and use of news within social media are directly related to persuasion on social media. We also argue that news and social interaction behaviors indirectly facilitate political persuasion, by increasing the diversity of individuals' networks, which subsequently increases their exposure

to political views that differ from their own. Building on theories of social network maintenance and the effects of exposure to political discussion (e.g. Donath and boyd, 2004; Mutz, 2002; Wojcieszak and Mutz, 2009), this study shows how common discussion attributes of social networking platforms, as well as news use, lead to political persuasion on social media.

News, discussion heterogeneity, and political persuasion

Much evidence indicates that news coverage can directly and powerfully persuade audiences. In these studies, political persuasion occurs as a direct result of news media consumption. In contrast to media theories that focus on persuasion through some indirect function (i.e. framing or agenda setting), direct effects research suggests that factors like issue salience and message exposure alone can explain media effects. For example, Barker and Lawrence (2006) suggest that favorable media coverage of an insurgent candidate leads to popular support for that candidate. Ladd and Lenz (2008) found that when a prominent UK newspaper switched its endorsement of a candidate, subsequently the public's support changed as well. Though strong relationships between political media consumption and attitude change might be explained by partisan cuing (Feldman et al., 2011), some studies have found direct effects of media persuasion, regardless of political leanings.[1] Accordingly, both Feldman (2011) and Barker and Lawrence (2006) suggest that attitude change follows the direction of news opinion, with little variation attributed to partisanship. Although prior research has demonstrated a relationship between news use and persuasion, this association has not yet been tested in the context of social media.

In addition to direct effects, news consumption on social media might also lead to persuasion through an indirect path. In offline contexts, several scholars have emphasized the role of diverse, heterogeneous social networks on one's ability to be flexible in their political opinions. In theory, those that are in contact with a large, diverse group of people will be more likely to be exposed to alternative views (Huckfeldt et al., 2004a; Mutz, 2002), more tolerant of those views (Laumann, 1973; Mutz, 2002), and more likely to change their views over time (Levitan and Visser, 2009). At the heart of this literature is a fairly simple idea: individual's opinions and attitudes are contingent upon characteristics imbedded in their social connections. Since the Internet and social media make it much easier to access and build diverse networks (Brundidge, 2010; Papacharissi, 2011), it stands to reason that persuasion on social media happens through connections in heterogeneous networks.

The relationship between news consumption and heterogeneous networks has also been explored. People in diverse networks tend to encounter a variety of viewpoints, which in turn leads to an increased demand for news to digest those viewpoints (Scheufele et al., 2006). Sharing news and information is one of the key activities on social media (Valenzuela et al., 2012) and that information is often circulated as means to connect with others and build diverse networks (Brundidge, 2010). It is not surprising then, that scholars have found positive links between use of social media for news and network heterogeneity (Kim et al, 2013; Lee et al., 2014). Based on these findings and theoretical explanations, the following hypotheses are given:

H1. Social media use for news will be positively associated with network heterogeneity.

H2. Network heterogeneity will be positively associated with political persuasion on social media.

In addition to network diversity, news use on social media might lead to persuasion through exposure to discussion disagreement. Much of the work on offline social network heterogeneity suggests that persuasion occurs through exposure to discussion disagreement. A large, diverse network of social connections should naturally lead to a higher volume of competing or conflicting views, and ultimately more ambivalent attitudes (Keele and Wolak, 2008). For example, heterogeneous political networks have been associated with more ambivalent, and less polarized attitudes toward candidates, and an increased likelihood of being persuaded when political ideology is weak (Huckfeldt et al., 2004a, 2004b). Discussion disagreement exposes individuals to dissenting views, forces individuals to seek more information, reflect on their own opinions, and ultimately increases the willingness to reconsider their views (Fishkin, 1991; Mutz, 2002; Mutz and Martin, 2001). News use also increases the likelihood that one will argue about politics and facilitates exposure to dissimilar views (Kim et al., 1999; Mutz and Martin, 2001). In addition, individuals who experience disagreement are more likely to moderate their opinions (Smith et al., 1996). Although no prior studies have directly explored the relationship between social media for news, discussion disagreement, and persuasion, the evidence in offline research leads to the following hypotheses:

H3. Discussion disagreement will be positively associated with political persuasion on social media.

H4. Social media use for news will be positively associated with political persuasion on social media both directly, and indirectly, through network heterogeneity and discussion disagreement.

Social networking for social interaction as a path to persuasion

Sharing news is only one means of interaction on social media. People predominantly use social media to socialize, keep in touch with family and friends, and reach out to more distant contacts (Pew Research Center for the People and the Press, 2014a; Quan-Haase and Young, 2010). For the most part, these behaviors are typically not politically motivated. In fact, people rarely use politics as a filter when building their networks (Bisgin et al., 2012). But why might political persuasion on social media take place when politics are of low priority on these platforms? One answer is that most political conversations are borne of the basic need for daily social interaction and conversation (Walsh, 2004). There are two related explanations for how social interaction can lead to persuasion on social media: directly through an elevated importance of social influences on attitude formation, and indirectly through the structural affordances of social media in building and maintaining diverse networks.

First, social interaction on social media should have direct effects on political persuasion because of the elevated importance of social influences on opinion formation. This tendency has been explored in offline social networks: when someone is considering the views of their friends or family, persuasion is associated with a concern for a favorable evaluation from their peers, and the need to maintain relationships in that network (Cialdini and Trost, 1998; Wood, 2000). When discussion starts for apolitical reasons, as it often does on social media, this tendency may be stronger, because individuals are not primed to take a political decision-making heuristic based solely on partisanship or ideology (Pratkanis and Turner, 1996).[2] Instead, individuals look to their network for a persuasion cue, either in the form of group consensus or the opinion of someone influential in their network (Eagly and Chaiken, 1993; Lundgren and Prislin, 1998). In social media spaces, the demands of maintaining networks often encourage consensus (Donath and boyd, 2004).

Networks have also been found to influence political consensus directly through social pressure. For example, in a series of field experiments, Sinclair (2012) found that social pressure from those either within the family, or from the community, was a predictor of voter turnout in two different metropolitan areas. In a related study, the threat of publicizing to one's family and neighbors an individual's decision to vote significantly increased the rate of turnout (Gerber et al., 2008). In online and quasi experiments on social media, social pressure was thought to explain an increased tendency to adopt a healthy behavior, influence political self-expression, vote, and participate in political protest (Bond et al., 2012; Centola, 2010; Valenzuela et al., 2014). Results from these experiments suggest that social pressure in friend networks exerts a considerable influence on persuasive outcomes.

Second, basic social interaction on social media offers an opportunity for attitude change through an indirect path, one based on network diversity and discussion disagreement, as opposed to a simple adherence to group norms. One of the major affordances of a social media platform is the development and maintenance of large, semi-public networks. Network building is considered an implicit function of social networking sites (Donath and boyd, 2004). These networks are often more diverse, because the platforms reduce the cost of keeping ties, blur the social boundaries typical of the offline world, and increase the potential pool of discussion participants (Brundidge et al., 2014; Gil de Zúñiga and Valenzuela, 2011; Steinfield, Ellison, and Lampe, 2008). In addition, when an individual reaches out to their network for social interaction, they may be cautious of damaging their public reputations, and thus moderate their discussion behavior (Donath and boyd, 2004). If online networks are more diverse, and the messages circulated are sensitive to the maintenance of that network, it follows that social interaction will lead to networks characterized by a tolerance for diverse viewpoints. Thus, network heterogeneity is a natural outcome of the social and technological incentives for social interaction on these websites.

Finally, everyday conversations in the network can inadvertently lead to political discussion, and since networks tend to be diverse on social media, exposure to dissenting political discourse is possible. Work in offline discussion forums has shown that network heterogeneity alone can be a predictor of participation in political forums (McLeod et al., 1999). When political conversation springs from regular social contexts, they also tend

to be more deliberative, and political opinions become more malleable. For example, Wojcieszak and Mutz (2009) found that online message groups were more likely to be exposed to political disagreement when the themes of the discussion groups were leisure-based. In contrast, politically themed discussion groups displayed the tendency for homogeneous political conversation, and discussion disagreement occurred less often. In offline studies, exposure to discussion disagreement, particularly in a social context where one is aware of the views of others in their network, leads to a tolerance for the views of others, and more ambivalent political opinions (Huckfeldt et al., 2004a, 2004b; Mutz, 2002). Of course, exposure to dissenting opinions alone does not guarantee attitude change will take place, but we expect dissent to be an obvious antecedent to shifting political opinions on social media.

When messages are circulated through the networks based on the need for simple social interaction, persuasion tends to occur directly, and indirectly, through network diversity and discussion disagreement. Persuasion is possible when behaviors are purely social because the tendency to maintain relationships leads to diverse networks, and in turn, exposure to political disagreement. Accordingly, the following hypothesis is posited:

> *H5*. Use of social media for the purpose of social interaction will be positively associated with political persuasion on social media both directly, and indirectly, through network heterogeneity and discussion disagreement.

Method

Sample

Data for this study come from a two-wave national panel survey collected in the United States in December 2013 and March 2014. Survey respondents were drawn from a pool of over 200,000 individuals registered to participate by the media-measurement company, Nielsen. In order to overcome potential limitations of samples drawn from the Internet, Nielsen used a stratified quota sampling to create a purposeful sample whose demographics closely matched those reported by the US Census (for more on this method of sampling, see Bode et al., 2013; Iyengar and Hahn, 2009). The survey was administered using the online survey tool, Qualtrics, a service supplied by a university account.

The first wave of the survey was collected from an initial sample of 5000 individuals. Using the American Association of Public Opinion Research's (AAPOR, 2011: 45) response rate calculator (RR3), the overall response rate was 34.6%, based on 2060 total participants with 247 cases removed due to missing data. This response rate was similar to those of other web-based surveys and is considered to be a valid response rate (Sax et al., 2003). The second wave was collected in garnered 1024 valid cases, a retention rate of 57%.

Compared with US Census data, respondents in the survey collected for this study were older ($M=52.7$ years) than current population estimates ($M=46.3$ years), had higher levels of education and had fewer Hispanics.[3] However, the overall demographic measures were quite similar to others employing random collection methods (Pew

Research Center for the People and the Press, 2013), and was similar to the US national population as whole (to learn more about these data demographic breakdowns, see Molyneux et al., 2015).

Measures

In order to test the assumptions proposed by the hypotheses, five groups of variables were tested in relation to persuasion. Except where noted, the survey used a 10-point Likert scale, where 1 = never or strongly disagree and 10 = always or strongly agree.

Control variables

Demographics. Respondents were asked about their age, gender, income, level of education, and race. The mean age was 52.7 years, (SD = 14.7 years; skewness = −.21), and the sample was equally split in terms of gender (49.9% female; coded as 1 = male), and was mostly White (78% White). Education was operationalized as the highest level of formal education completed (M = 3.61, $Mode$ = some college). For income, each respondent chose one of eight categories of total annual household income (M = 4.46, Mdn = $50,000 to $99,999).

Network size. The size of an individual's political discussion network has been linked to political participation and engagement both online and offline (e.g. Mutz, 2002), so discussion network size is introduced as a control. Survey respondents were asked open-ended questions to estimate, during the last month, "about how many people would you say you have talked to via the Internet, including e-mail, chat rooms, social networking sites, and micro-blogging sites," and "about how many total people have you talked to face-to-face or over the phone about politics or public affairs?" The variable was highly skewed (M = 8.74, Mdn = 2.00, SD = 33.79, skewness = 10.9), so a transformed variable was used as a natural logarithm in the hierarchical regression models (Spearman-Brown reliability coefficient = .60, inter-item r = .09; M = .53, Mdn = .48, SD = .53, skewness = .89).[4]

Strength of party identification. This study also uses strength of party identification as a control variable. Scholarship has recognized the impact of partisanship on one's tendency to strengthen partisan identity, and accordingly, also ifluence the extent to which they are swayed by discussion (Huckfeldt et al., 2004b). Respondents were asked to rate their party identification using an11-point scale including strong Republican (7.5% of respondents), Independent (32.4% of respondents), and strong Democrat (10.5% of respondents). This item was then folded into a 6-point scale such that lower scores represent no party identification and higher values indicate strong partisanship, regardless of which party was supported (M = 2.1, SD = 1.87).

Internal political efficacy. Political efficacy is often thought to be an important prerequisite for deliberation and political discussion (see Jacobs et al., 2009). Respondents were asked the extent to which they agree with the following questions: "I consider myself well qualified to participate in politics," and "I have a good understanding of the

important political issues facing our country." A two-item index was created (Spearman-Brown reliability coefficient = .87, $M = 5.34$, $SD = 2.56$).

News media use. News use has been linked to the ways people connect with friends, particularly to learn new things and discuss politics (Gil de Zúñiga, 2002). Thus, this study controls for its effect by asking respondents a number of questions related to news consumption, including questions about a variety of news genres and platforms. Respondents were asked to rate how often they get news from network TV, local TV, national and local newspapers, cable, radio, online, citizen journalism and hyper-local news websites, and fake news sources. In all, 10 items assessed general news consumption; those items were then averaged to create an index of overall news consumption (Cronbach's $\alpha = .72$; $M = 3.9$; $SD = 1.5$).

Political Knowledge. Political knowledge was measured following Delli Carpini and Keeter (1996) and used items similar to those on the National Election Survey. News topics were selected based on Pew Research Center's *News Coverage Index* top stories for the weeks prior to the survey administration dates. Respondents were given either multiple-choice or fill-in-the-blank options for each question: "What job or political office does Joe Biden currently hold?" "How many years are there in one full term of office for a U.S. Senator?" "What job or political office does John Roberts currently hold?" "On which of the following does the US federal government currently spend the least?" "Do you happen to know [what party] introduced the immigration bill before Congress?" "Do you happen to know what the ruling of the Supreme Court about Obamacare was?" "Which organization's documents were released by Edward Snowden?" and "Recently, the UN and US were in negotiations with the Syrian government over the removal of what?" Correct answers were changed into a binary coding scheme (1 = correct answer) and then added together to create a scaled score for political knowledge (eight items, Cronbach's $\alpha = .75$; Range 0–8; $M = 4.6$; $SD = 2.2$).

Predictor variables

Social media for news. This item was taken from the first wave of data collection and measured respondents' use of social media sites to get news and stay informed. The survey asked respondents how often they "encounter or come across news when using social networking sites," how often they "encounter or come across news when using micro-blogging sites," how often they use social media to "stay informed about current events and public affairs," and how often they use it to "stay informed about your local community" Three additional items asked about the frequency of getting news from Facebook, Twitter, and finally, how often they get news from the general news media through social media (seven items, Cronbach's $\alpha = .89$; $M = 2.7$; $SD = 1.96$).

Social media use for social interaction. Respondents' use of social media for social interaction was also measured. Drawing on data from the first wave, respondents were asked how often they used social media "to stay in touch with friends and family," "meet new people who share interests," and "to contact people you wouldn't meet otherwise." (three items, Cronbach's $\alpha = .78$; $M = 3.56$, $SD = 2.3$).

Network heterogeneity. Two items asked how often respondents "talk about politics or public affairs online and offline with people from a different race or ethnicity," and "how often do you talk about politics or public affairs online and offline with people from a different social class?" The two items were combined and averaged (Spearman-Brown reliability coefficient = .93, inter-item $r = .87$; $M = 3.6$, $SD = 2.64$).

Discussion disagreement. This item sought to capture respondents' exposure to political views that differ from their own. Respondents were asked how often they "talk about politics or public affairs online and offline with people whose political views are different from yours," and how often they "talk about politics or public affairs online and offline with people who disagree with you." The two items were combined and averaged (Spearman-Brown reliability coefficient = .92, inter-item $r = .86$; $M = 3.6$, $SD = 2.5$).

Outcome variable

Social media political persuasion. The key criterion variable in the study asked how often respondents reconsidered or changed their political views based on information they encountered on social media. Respondents were asked how much they agree with the following statement: "I have changed an opinion based upon what someone influential to me posted on social media." They were also asked to rate how often they "take part in changing your mind about political issues because of information or interactions on social media," and how often they "take part in reconsidering your political views because of information or interactions on social media." Using data from the second wave of the survey, the three items were added and averaged (Cronbach's $\alpha = .87$; $M = 2.22$, $SD = 1.69$).

Statistical analysis

To test the hypothesized relationships proposed in this study, a series of regression analyses was performed. First, a hierarchical regression model was used to determine the relationship between all independent variables and the outcome variable. Predictor variables included two blocks of controls: demographics and social orientations and news exposure. The third block included independent variables related to network diversity. The fourth and final block comprised measures related to news and social behaviors on social media. Next, two path models tested for the direct and indirect effects using the PROCESS macro (model 6) in the Statistical Package for Social Sciences 22 (SPSS 22) (Hayes, 2013).[5] Serial mediation analyses are an ideal tool for testing path models through multiple mediators; in this case, fulfilling the requirements of H4 and H5. If we expect specific, non-political uses of social media to lead to persuasion directly, we might avoid spurious correlations by including a full range of predictor variables. This study also argues that certain social media uses (news use and social interaction) encourage the growth and maintenance of diverse networks, which in turn lead to persuasion through exposure to discussion disagreement. Therefore, a mediation model that tests for direct and indirect effects through two mediators is ideally suited for this analysis.

Results

The goal of this study was to identify the process through which political persuasion might take place on social media. Zero-ordered correlations (Table 1) indicate strong correlations between social media for news and political persuasion on social media in time 2 (T2) ($r=.61$, $p<.001$) and social media for social interaction and persuasion (T2) ($r=.51$, $p<.001$). Network heterogeneity ($r=.27$, $p<.001$) and discussion disagreement ($r=.24$, $p<.001$) were also positively correlated with being persuaded on social media. Age ($r=-.27$, $p<.001$) and race ($r=-.12$, $p<.01$) were inversely correlated to the dependent variable of interest, indicating younger, non-Whites were more likely to report they had been persuaded on social media.

News and political persuasion on social media

The first group of hypotheses examined the effects of news consumption on political persuasion in social media. Results from the hierarchical regression model (see Table 2) suggest that social media for news use in time 1 (T1) had a particularly strong, positive association with political persuasion on social media (T2) ($\beta=.42$, $p<.001$). Of the control variables in the model, political knowledge ($\beta=-.11$, $p<.001$), income ($\beta=-.07$, $p<.05$), and age ($\beta=-.12$, $p<.001$) were negatively related to social media political persuasion, while political efficacy ($\beta=.07$, $p<.05$) and network size ($\beta=.11$, $p<.001$) demonstrated positive relationships.

In order to simultaneously examine the direct and indirect effects of each variable of interest (H4 and H5) on the outcome variable, a sequential mediation model was tested. The first hypothesis predicted that social media for news use would be positively related to network heterogeneity. As demonstrated in Figure 1, social media for news use was positively associated network heterogeneity ($b=.18$, $se=.05$, $t=3.31$, $p=.012$). Results from the hierarchical model (Table 2) indicated that no statistically significant relationship between network heterogeneity and persuasion on social media (T2) (H2) exists. Reconsidering or changing political views on social media does not seem to directly depend on the diversity of one's social network. Discussion disagreement, however, was positively related to social media political persuasion (H3) in both the mediation model (Figure 1) ($b=.08$, $se=.03$, $t=2.63$ $p=.008$) and the hierarchical model ($\beta=.09$, $p<.05$). In the hierarchical regression model (Table 2), network and discussion variables had a modest, but statistically significant, and positive impact on the dependent variable ($\Delta R^2=1.5\%$).

H4 predicted both direct and indirect effects of social media for news on persuasion (T2). As demonstrated in Figure 1, there is a direct effect of social media for news use on social media political persuasion (T2) ($b=.39$, $se=.03$, $t=11.9$, $p<.001$). Holding all other variables in the model constant, social media for news had the strongest effect on social media political persuasion. H4 also predicted that the effect of social media for news on social media political persuasion (T2) is sequentially mediated through network heterogeneity and discussion disagreement. Social media for news uses were positively related to network heterogeneity (H1), which in turn was strongly related to political discussion disagreement ($b=.71$, $se=.02$, $t=33.1$, $p<.001$), which was then related to

Table 1. Zero-order correlations among all independent and dependent variables in the study.[5]

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Age	–														
2. Gender (male)	.11**	–													
3. Education	−.02	.04	–												
4. Income	.01	.11***	.29***	–											
5. Race (white)	.13***	.14	01	.10**	–										
6. Discussion network size (Lg)	.13***	.17***	.14**	.16***	.07*	–									
7. News consumption	.17***	.03	.05	.20***	−.03	.26***	–								
8. Political efficacy	.21***	.26***	.16***	.17***	.05	.40***	.32***	–							
9. Strength partisanship	.10**	−.05	01	.03	−.04	.09**	.12***	.18***	–						
10. Political knowledge	.26***	.36***	.26***	.27***	.14***	.40*	.20***	.51***	.13***	–					
11. Social media interaction	−.26***	−.09**	.01	−.05	−.06	.18***	.21***	.08*	.07*	−.05	–				
12. Social media for news	−.33***	−.08*	−03	.01	−.08*	.17***	.30***	.06	.02	−.09**	.68***	–			
13. Network heterogeneity	.10**	.11***	.12***	.11**	−.02	.52***	.33***	.41***	.05	.32***	.24***	.24***	–		
14. Discussion disagreement	.11**	.17***	.12***	.14***	.05	.54***	.30***	.42***	.05	.36***	.18***	.16***	.80***	–	
15. Social media persuasion (T2)	−.27***	−.01	−.01	−.04	−.12**	.24***	.26***	.13***	.03	−.06	.51***	.61***	.27***	.24***	–

All cell entries are two-tailed zero-order Pearson correlation coefficients, with the exception of gender and race (Phi) (Total $N = 947$). Superscript: *$p < .05$, **$p < .01$, ***$p < .001$.

Table 2. Lagged regression models of variables in time 1 predicting political persuasion on social media in time 2.

	Social media political persuasion W2
Block 1: Demographics W1	
Age	−.122***
Gender	.051
Education	.017
Income	−.066*
Race (White = 1)	−.052*
ΔR^2	8.1%
Block 2: Social orientations and news exposure W1	
Political efficacy	.065*
Discussion network size (lg)	.110***
Strength of partisanship	.004
News use	.092***
Political knowledge	−.107***
ΔR^2	17%
Block 3: Network diversity W1	
Network heterogeneity	−.010
Discussion disagreement	.090*
ΔR^2	1.5%
Block 4: Social media use W1	
Social media for news	.429***
Social media for social interaction	.117**
ΔR^2	19%
Total R^2	46%

$N = 946$; Cell entries are final-entry ordinary least squares (OLS) standardized Beta (β) coefficients.
* $p < .05$; ** $p < .01$; *** $p < .001$.

persuasion (T2)(H3). This indirect effect was significant, as the 95% confidence interval did not contain zero (Table 3). That is, when people use social media for news, they may be persuaded to reconsider their political views on social media, in part because of their exposure to heterogeneous networks and discussion disagreement (point estimate = .01, 95% CI = [.0019, .027].

Social interaction and persuasion on social media

According to prior research, social media use for everyday interaction might be just as important as news use in facilitating participatory behaviors online (Gil de Zúñiga et al., 2014). In the hierarchical model (Table 2), social media for social interaction and news use accounted for a large portion of the total variance in the model ($\Delta R^2 = 19\%$). This suggests that these two social media behaviors are major predictors of attitude flexibility on social media.

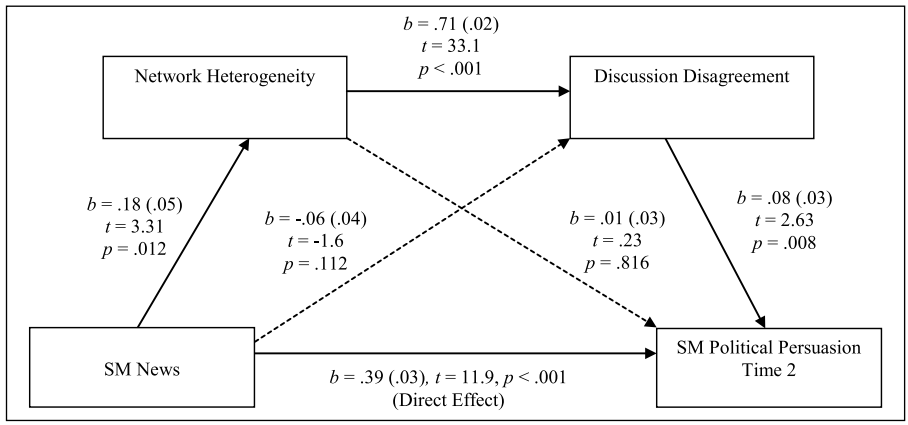

Figure 1. Effect of social media use for news on social media political persuasion, mediated through network heterogeneity and discussion disagreement.
Path entries are unstandardized coefficients. The effects of demographic variables (age, gender, education, race, and income), sociopolitical antecedents (political efficacy, strength of partisanship, discussion network size, and political knowledge), general news consumption, and social media for social interaction were included as control variables. Solid arrows indicate statistically significant paths at $p = .05$ or below. Sample size = 947.

Table 3. Indirect lagged effects over social media political persuasion.

Indirect effects path	Point estimate	95% confidence interval
Social media for news (T1) → Network heterogeneity (T1) → Discussion disagreement (T1) → Social media political persuasion (T2)	.01	[.0019, .027]*
Social media for social interaction (T1) → Network heterogeneity (T1) → Discussion disagreement (T1) → Social media political persuasion (T2)	.007	[.0012, .018]*

Path estimates are unstandardized coefficients. Indirect effects based on bootstrapping to 10,000 samples with biased, corrected confidence intervals. The effects of demographic variables (age, gender, education, race, and income), sociopolitical antecedents (political efficacy, strength of partisanship, discussion network size, political knowledge), and both general news consumption and social media for news (or social interaction) were included as control variables. Sample size = 947. The asterisk (*) represents a significant indirect effect, as the confidence interval does not contain zero.

The final hypothesis (H5) predicted both direct and indirect effects of social media for social interaction on political persuasion (T2). In the hierarchical model, social interaction motivations were positively associated with political persuasion on social media (T2) ($\beta = .11$, $p < .001$). In the mediation model (Figure 2), social media for social interaction had a significant, direct effect on social media political persuasion (T2) ($b = .09$, $se = .03$, $t = 3.61$, $p = .001$). After accounting for other variables in the model, social interaction uses lead to persuasion on social media, suggesting that everyday social interaction is a powerful predictor for political attitude change on social media.

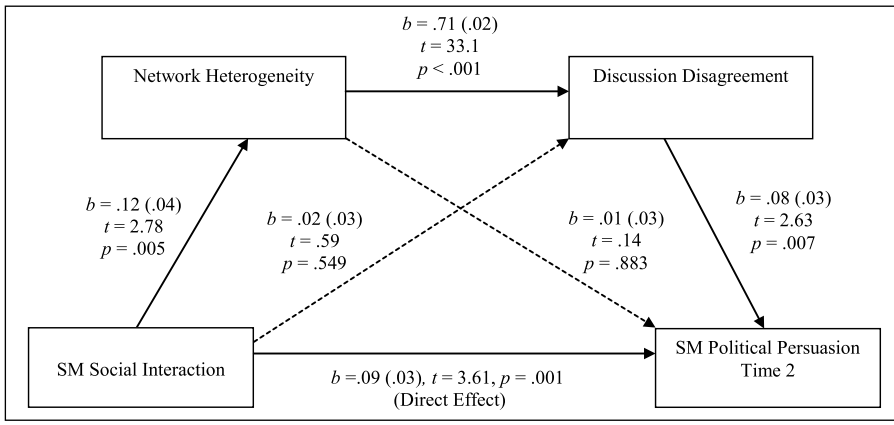

Figure 2. Effect of social media for social interaction on social media political persuasion, mediated through network heterogeneity and discussion disagreement.
Path entries are unstandardized coefficients. The effects of demographic variables (age, gender, education, race, and income), sociopolitical antecedents (political efficacy, strength of partisanship, discussion network size, and political knowledge), general news consumption, and social media for news were included as control variables. Solid arrows indicate statistically significant paths at p = .05 or below. Sample size = 947.

H5 also predicted that social interaction on social media is related to political persuasion indirectly through network heterogeneity and political discussion disagreement. Social media use for social interaction was positively associated with network heterogeneity (b=.12, se=.04, t=2.78, p=.005). Since each mediation model contains the same control variables for any given relationship, the remaining effects pathways in Figure 2 are identical to Figure 1. The indirect path between social media for interaction and political persuasion (T2) was also statistically significant and positive (point estimate=.007, CI=[.0012, .018] (Table 3). A lack of zero in the confidence interval means the null hypothesis can be rejected, and a mediation effect is taking place. The model indicates that social interaction uses of social media impact political persuasion on social media directly and indirectly through network heterogeneity and discussion disagreement.

Discussion

Exploring the conditions under which political persuasion might occur in digital media environments is an important step in determiningthe nature of political discussion in contemporary democratic society. Social media greatly expand our pool of potential discussion participants, offer an alternative means to consume news, learn about politics, and blur the boundaries between private social interactions (Yoo and Gil de Zúñiga, 2014). This study extends the literature around social media behavior to include political persuasion as an outcome of social media use for news and social interaction. The results indicate that social media for certain apolitical purposes directly lead to reconsidering or changing political views on social media. Though most people do not maintain social networks online for political reasons, evidence here indicates that organic exposure to

political diversity is taking place. In addition, the technology seems to be stimulating persuasion through normative discussion attributes: network heterogeneity and political discussion diversity.

Our data show that social media for news has the strongest impact on political persuasion on social media, indicating that the ability to be persuaded on social media depends in large part on whether or not one keeps up with current events through their social networking website of choice. We know that news use is related to political persuasion in offline contexts (e.g. Barker and Lawrence, 2006), but this study is the first to demonstrate that news consumption and persuasion are related within the realm of social media. The findings also confirm previous work on using social networks for news and network heterogeneity; we found that news use on social media was positively related to respondents reporting that they include people of varying social status and political identity in their friend lists. The data illustrate how this general social diversity leads to exposure to conversation with people who hold political opinions that conflict with their own. These conversations, in turn, are positively associated with changing political attitudes or opinions on social media. Overall, the indirect effects of news use in social media on political persuasion represent a unique contribution to the study of political attitude formation in new media environments.

This study also provides additional theoretical evidence that social, non-political uses of social media can have important democratic consequences (see, for example, Gil de Zúñiga et al., 2014). When people come to these websites for the specific purpose of connecting with friends or family, or to meet new people, they also become more likely to reconsider their political views in light of content they came across on their social network. We find that social uses of social media directly influence political persuasion. These findings offer some confirmation of earlier work on the role of social pressures on political attitude formation (Gerber et al., 2008; Sinclair, 2012; Valenzuela et al., 2014). Individuals might also be influenced by their social connecting motives alone; perhaps opting to change their mind before they sacrifice perceived benefits of the network in general (Cialdini and Trost, 1998). Future studies might carefully consider the potential costs and benefits of attitude formation in socially mediated discussion forums. In this vein, rational choice theory might offer insights into how "in network" opinion formation takes place on social media (Blais, 2000; Pescosolido, 1992). For example, we might find that social media users adjust not only their political opinions, but also their preferences, profiles, or other behaviors based on a constant "adjustment" to preferences expressed in their network. A follow-up study might explore this idea.

Our results also offer an encouraging picture for the role of social media in facilitating political discussion in an everyday social context. The indirect paths reported in Figure 2 suggest that political discussions of diverse viewpoints are the result of a combination of basic social needs, and the affordances of a technology that enable heterogeneous networks. In other words, basic social interaction leads to more diverse networks, more political discussion with people who hold dissenting opinions, and finally, more flexibility in the formation of political attitudes based on encounters in their online social network. Even without a political motive, political conversations seem to be taking place. The indirect paths reported here offer an alternative approach to political conversation and opinion formation; perhaps network and discussion

diversity online offers a reproach to less optimistic accounts of the online public sphere as one marked by polarization and fragmentation.

The lack of a direct relationship between network heterogeneity and persuasion on social media was also interesting and unexpected. One possible explanation is that the size of one's network is just as important for persuasion as network diversity (see Table 2). Another interpretation is that network heterogeneity alone does not necessarily mean that persuasion on social media will occur. The results suggest that political attitude formation on social media depends on exposure to discussion disagreement. This finding is in agreement with work on political discussion in offline contexts. If one discusses issues with those of an opposing view, they are more likely to be aware of their own position, and more likely to understand the counter viewpoint (Mutz, 2002; Rojas and Gil de Zúñiga, 2010). It seems rather unlikely that persuasion can occur if one does not reap the cognitive benefits of dissenting discussion in the first place.

This study has limitations that must be noted. First, the sample was older than current population estimates by 6 years; a younger sample might be less prone to discuss politics. Surveys also rely on self-reported measures, which are prone to over- and underestimation. Future studies might employ a combination of content analysis and experiments to overcome this limitation. We have no measures of the news content people consume on social media, or the specific nature of their social interactions. This raises additional questions about how social media news use, or social connection uses, directly impact political persuasion. Consequently, future research should address how the content of messages on social media persuades. Identifying the details of these messages might help answer other questions about political discourse on social media, like whether or not persuasion leads to group consensus, partisan sorting, or more complete knowledge of public affairs and current events.

Exposure to political discussion in media spaces characterized by both news media and inter-personal interaction is a rich context for the study of political outcomes. For example, how might concerns for one's standing in the social network moderate political behavior online? Perhaps, the need to protect a public identity in the view of the network leads to cognitive cues for apolitical information processing. If this is true, information mediated through social networks might offer an opportunity to study political discourse outside traditional theoretical bounds. Other uses of social media might also have political outcomes, like motivations for hedonism or entertainment (Holbert et al., 2013). The presence of political persuasion on social media outlined here should challenge researchers to take a wider account of media uses when studying political effects.

Exposure to discussion disagreement through diverse networks on social media has clear benefits for political discussion. The results indicate everyday conversation and news browsing lead to improved conditions for democratic discourse. However, such benefits must incur some cost. It may be possible that tolerance is gained at the expense of more reasoned, deliberative debate. It is also unclear if tolerance for dissent on social media influences political discussion in offline or institutional settings. These considerations aside, this study adds to the mounting evidence that social media for particular purposes boost democratic outcomes in a variety of ways (Brundidge, 2010; Gil de Zúñiga et al., 2014; Lee et al., 2014). The motivations for engaging in social network

activity offer a unique, alternative path to politics. As these platforms continue to grow in acceptance, exploiting potential social benefits is increasingly important for those concerned with greater political inclusion, media literacy, and alternative means of deliberative action.

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Notes

1. Direct effects of social media news use on persuasion might also be explained by the degree to which one selects information according to their political views (Stroud, 2008). However, recent work in this area suggests that though individuals often select news stories with pro-attitudinal content, they rarely avoid counter-attitudinal information altogether (see Garrett and Stroud, 2014; Gil de Zúñiga et al., 2012). Strength of partisanship was included in the model, but no statistically significant relationship was observed on the dependent variable.
2. In Wood's (2000) review, persuasion might occur through either elaboration or heuristics (as deferring to group consensus), though both have been studied in terms of social influences.
3. Average age reported is for US adults over 18, based on data culled from the US Census Bureau, Population Division.
4. To limit any bias in models where normality assumptions are made, the authors employed a log transformation. The Spearman-Brown coefficient of the untransformed variable was low (.18). However, the authors felt that transformation yielded an acceptable reliability score (.60). Open-ended, summary measures of network size, as employed here, have been shown to perform well against other methods, though they are not without limitations (see Eveland et al., 2013).
5. The theoretical models were also tested as one structural equation model. After introduction of all controls and predictors, the model became saturated. Since we could not present a saturated model, we chose two separate path models. Some cases (74) were deleted due to missing data patterns. Other missing data were imputed using expectation maximization (EM) in SPSS.
6. SPSS Pearson correlation calculations account for bi-serial relationships. Exclusively nominal correlations (gender and race) were calculated using Phi.

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