Political Disagreement on Social Media: Exposure, Experience, and Effects

By

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Abstract

This dissertation is a study of political disagreement and social media. Prior research on this topic has focused on *exposure* to disagreement, but by drawing from both classic social-psychological literature and newer ideas about online social information processing, novel hypotheses of the *effects* of experiencing disagreement on social media are developed. It is predicted that even though users are more likely to "write off" the disagreement they encounter on social media about issues they perceive as irrelevant to their political identities, these same users actually end up experiencing more relevant political disagreement overall on social media than they do in face-to-face settings. Finally, it is hypothesized that relevant disagreement will produce uncertainty about political choices and preferences. These claims are tested with a combination of survey, quasi-experimental, and experimental methods on a representative sample of adults in the United States ($N = 649$). Results strongly support the general claims of the dissertation. Social media users are exposed to more relevant political disagreement than non-users, and they are exposed to it on social media more than in face-to-face settings. Furthermore, relevant disagreement generally produces more uncertainty about choices and preferences than irrelevant disagreement or agreement. The ways in which we encounter opinions on social media make us more likely to engage with disagreeable content posted by people we consider relevant to our own lives. This kind of exposure is fundamentally altering the process of how we engage with persuasive messages. Relevant disagreement creates opportunities for us to consider new and different ideas, and understanding social media in this way could have broad implications for how scholars talk about social phenomena related to the public sphere, as well as for journalists, activists, marketers, politicians, and others as they develop and promote messages to get communities talking about issues and ideas.

Chapter 1: Introduction

This dissertation is a study of social media use and political disagreement. Social media such as Facebook or Twitter are important new venues for political communication because they connect individuals with civil society through egocentric social networks. Therefore, in order to understand how a growing subset of individuals currently experiences civil society, it is important to investigate whether and how political disagreement occurs on social media.

There is good reason to believe that social media facilitate exposure to political disagreement in comparison to other communicative settings. In face-to-face settings, disagreement is relatively uncommon because it makes some people uncomfortable (Mutz, 2006) or because social norms discourage it (Eliasoph, 1998; Walsh, 2004). Meanwhile, anonymous online settings display high degrees of ideological and/or interest-based selectivity, a tendency that generally precludes disagreement (Davis, 1998; Hill & Hughes, 1998; Sunstein, 2007).

Social media, on the other hand, promote the articulation of crosscutting and overlapping social affiliations (Barbera, 2014), which often have bases in offline relationships that are not necessarily constituted by shared political interests or preferences (Ellison, Steinfeld, & Lampe, 2007). Furthermore, these affiliations are only loosely bounded by geographical space (Brundidge, 2010). Social media therefore diversify communication within social networks, and individuals are likely to be exposed to more political disagreement as a result (Barnidge, 2015; Kim, 2011).

But social media do not only alter the likelihood of exposure to political disagreement. They also change the ways that individuals experience it. People assess the relevance of messages, in part, based on the messages themselves and, in part, based on the contextual cues that accompany those messages (Frewer & Shepard, 1994). Generally, the amount of

informational cues accompanying a message affects its interpretation or adoption, but this relationship is not linear. In high informational environments, including face-to-face settings (Walther, 2011), people tend to seek common ground. They engage in conversation when they think it will be friendly or rewarding, and they generally seek equilibrium with their discussants through mutual agreement or understanding (McKuen, 1990). Therefore, most people perceive more similarity than difference when face-to-face with others (Mutz, 2006). In low informational environments, including anonymous online settings (Walther, 2011), people tend to assume similarity with discussants based on the few cues that do exist (Lea, Spears, Watt, & Rogers, 2000; Walther, 1996; 2011). Thus, in both high and low information environments, people are more likely to perceive similarity rather than difference between themselves and others.

Social media present an informational middle ground. Users have more information about message sources than they do in anonymous online settings, but social media cues still lack the richness of face-to-face interaction (Walther, 1996). In such a medium information environment, there is no reason to believe that (a) people will seek similarity in social cues or (b) people will assume similarity from social cues. Social media provide physical and psychological distance from social interactions—distance that might obviate the need to seek common ground—and, yet, they also give people enough information to evaluate social relationships without making assumptions about other people (Tong, Van Der Heide, Langwell & Walther, 2008; Walther, Van Der Heide, Hamel, & Shulman, 2009; Walther, Van Der Heide, Kim, Westerman, & Tong, 2008). In general, then, people may be less likely to perceive similarity between themselves and others in social media settings.

Thus, social media present a problem: In comparison to other settings, they increase exposure to political disagreement, but they also decrease the perceived relevance of political

messages. The question of interest therefore becomes: Do social media diminish perceived relevance to the extent that users "write off" the disagreement to which they are exposed? This question can be inverted and simplified: "Do social media expose people to more relevant disagreement than other communication settings?"

I posit that they do, and testing this supposition is the central premise of this dissertation. To do so, I employ a combination of survey, quasi-experimental, and experimental methods using a representative sample of adults in the United States. First, the study examines whether social media expose people to more political disagreement. Second, the study assesses whether individuals experience more relevant disagreement on social media. Finally, the study analyzes the effects of relevant disagreement on uncertainty about political choices and preferences.

Political Disagreement in Communities and Networks

People engage with politics and the public sphere through communities (Friedland, 2001). To be sure, this is not the *only* way people engage with politics—for example, the act of voting is in many ways a direct, individualistic form of political participation. But on the level of day-to-day interaction, communities provide people with venues for the articulation of collective problems and solutions, and they facilitate communication with social and political institutions through collective action. Communication within the community is the mechanism through which collective problems and solutions are articulated. Therefore, a community's communication ecology, that is, the communicative environment in which community members exist, largely shapes political action and resulting outcomes (Friedland, 2001). In theory, a community can only accomplish these things if they have engaged in formal and informal processes of deliberation that account for diverse perspectives and interests within the community (Guttmann & Thompson, 1996; Mansbridge, 1999). In practice, of course, citizen-to-

citizen communication is a lot messier, but the point remains: The ability for a community to sustain crosscutting discussion networks is an indicator of its ability to successfully communicate with democratic institutions in a way that represents full range of interests and identities in the community (Friedland, 2001). In other words, communities that tolerate and incorporate disagreement and its consequences in collective decision-making processes are, generally, more democratic.

The earliest scholarship on community, stretching back to the 1880s, sought to explain social changes brought about by the rise of industrialized mass society. These works often drew from idealized comparisons of community and society, which were not only used to describe physical locations but also to describe the tensions between competing pressures of modern life (Bender, 1978). But over time, the sociological narrative began to emphasize the decline of bounded, place-based communities (Bender, 1978; Norris, 2004; Raine & Wellman, 2012; Wellman, 1979). For example, Wirth (1948) famously theorized that mass society would eventually create "unattached individuals" with "no common customs or traditions" (Wirth, 1948, p. 250). But while the Chicago School scholars expected to observe the decline of community in urban areas, they soon discovered that spatially bounded communities persisted in urban environments, particularly among ethnic groups: "[…] every social group tends to create its own milieu" (Park & Burgess, 1921, p. 32, see also Lynd & Lynd, 1929). The common thread these works share is the systematic investigation of continuity and change in communal solidarity as understood in spatially bounded terms during the rise of urban mass society (Wellman, 1979).

Before long, other scholars began to emphasize the role of personal social networks over bounded, place-based communities. Social networks, they argue, have always played a large role

in providing the kinds of affective solidarity that binds communities together (Bender, 1987; Fischer, 1982). Further, as the role of location becomes less and less important, the study of social networks becomes more fruitful in describing and explaining how communities have changed and continue to change. These scholars saw urban life not in terms of fragmented little worlds, but rather as a fluid structure of personal relationships (e.g., Bender, 1987; Raine & Wellman, 2012). Particularly in the urban environment, communities increasingly became organized around loose, diffused structures of personal social ties distributed across social and physical space (Fischer, 1982; Wellman, 1979). These changes in community structure were brought about by the same forces that supposedly caused the decline of spatially bounded communities, such as increased geographic and social mobility, the rise of affordable telecommunications, and the weakening of extended family bonds and ethnic groups (Raine & Wellman, 2012). The changes are evidenced by declines in traditional voluntary associations and formal organizations (Putnam, 2000) and the proliferation of more ephemeral political groups and organizations (Bimber, Flanagin, & Stohl, 2005; Sirianni & Friedland, 2001).

If the move toward diffused, personalized communities in urban environments in the early 20th century represented the first stage in what has become a large-scale reorganization of social networks, the emergence of digital communication technologies in the latter half of the 20th century represents the second stage (Raine & Wellman, 2012). Active use of these media reshaped and restructured the production, dissemination, and consumption of information (Benkler, 2006; Castells, 2009; Lessig, 2001). Digital media technologies also afforded people new abilities to form and maintain social ties across time and space (Bargh & McKenna, 2004; Dahlgren, 2005; Hampton & Wellman, 2001; McKenna & Bargh, 1998; Rheingold, 1993). Both of these changes had important historical implications for communities.

First, information was distributed and diffused within systems, giving communities greater capacity for self-organization (Benkler, 2006; Bennett & Segerberg, 2011; Friedland, Hove, & Rojas, 2006; Juris, 2005) and for taking new or atypical organizational forms (Bimber, et al., 2005). Second, the ability to connect with other people was enhanced, which arguably strengthened existing communities (Hampton & Wellman, 2003; Matei & Ball-Rokeach, 2003; Mesch & Levanon, 2003) and helped constitute new ones online (Kim & Ball-Rokeach, 2009; McKenna & Bargh, 1998; Rheingold, 1993). This heightened capacity to connect with others and to organize for social or political action represented a shift away from a system of functional dependencies with structural barriers that preclude certain kinds of direct public input in decision-making processes (Friedland et al., 2006). In other words, digital media gave communities the potential to have more direct influence on social institutions.

To summarize up to this point, the social networks that constitute communities have become increasingly diffused and personalized. Moreover, digital media have arguably enhanced the ability to form, maintain, and organize these kinds of communities in a way that makes them potentially more influential to society and social institutions.

Social Media and the Networked Public Sphere

The rise of social media has ushered in a third wave of change in the organization of social networks (Raine & Wellman, 2012). Largely driven by social media, personal and digital networks have become increasingly isomorphic (Friedland et al., 2006; Papacharissi, 2009; Raine & Wellman, 2012; Wojcieszak & Rojas, 2011), that is, the social ties that constitute each are increasingly similar.

Social media allow users to create public or semi-public profiles, articulate lists of connections with others, and navigate their network of connections (boyd & Ellison, 2007). Their

rapid adoption brought new waves of optimism about the ability of the internet to connect people with politics (Loader & Mercea, 2011). Even compared with other online media, social media reduce the costs of information dissemination (Howard & Parks, 2012; Juris, 2012; Lim, 2012), and they afford more possibilities for the interactive production and exchange of political messages (Harlow, 2012; Hirzalla & van Zoonen, 2011; Valenzuela, Arriagada & Scherman, 2012). These affordances facilitate self-organized political action (Bennett & Segerberg, 2011; Eltantawy & Weist, 2011; Harlow, 2012; Howard & Park, 2012; Juris, 2012; Lim, 2012; Valenzuela et al., 2012) and promote public expression (Loader & Mercea, 2011; Papacharissi, 2009; Rojas & Puig-i-Abril, 2009). Finally, social media act as important new channels of communication between democratic representatives and their constituents (Barbera et al., 2015; Gulati & Williams, 2013).

The proliferation of these media therefore raises important questions about their role in processes related to networks, community, and the public sphere. Social media arguably contribute to the emergence of an egocentric public sphere (Papacharissi, 2009; Rojas, 2014; Wojcieszak & Rojas, 2011). Modern individuals are increasingly embedded in loose, personalized networks of affiliation and exchange, (Benkler, 2006; Loader & Mercea, 2011; Raine & Wellman, 2012), and social media are increasingly central to these networks (Bennett, 2008; boyd & Ellison, 2007; Loader & Mercea, 2011). Because of their structures and affordances, social media largely amplify the trend toward social-digital network isomorphism that was already underway (Friedland et al., 2006; Raine & Wellman, 2012). This isomorphism arguably places individuals and their networks at the center of their own sphere of expression and engagement (Papacharissi, 2009; Wojcieszak & Rojas, 2011). Therefore, public engagement with politics in the modern age has become increasingly personalized, that is, egocentric.

Given the egocentric nature of social media, valid concerns arise about the ability of communities constituted and facilitated, in part, by social media to sustain and incorporate political disagreement into their communicative ecologies. In fact, much effort has been devoted to describing the fragmentation and/or marginalization of the public on the internet and its deleterious consequences for democracy (e.g., Hindman, 2009; Sunstein, 2007). The study of disagreement on social media and its consequences contributes to this discussion, and represents a necessary and important endeavor that furthers public understanding of modern democratic processes.

The ideas presented below seek to illuminate, in part, both polarizing and moderating political phenomena by offering a parsimonious model of the social-psychological processes underpinning these larger trends in the public sphere. These processes can help explain attitude change within networked personal communities (Raine & Wellman, 2012), imagined communities of thought (Anderson, 1983), and local communities that have experienced an expansion and proliferation of information sources in their information ecologies (Friedland, 2001). But it can also help explain polarization between communities. Indeed, to explain movement in one group of individuals is often to explain movement toward or away from some other group. Thus, a theory that seeks to explain individual preference change at the micro-level contributes to our understanding of meso-level public phenomena.

Central Ideas and their Implications

The central claims of this dissertation are that (a) social media promote the experience of relevant political disagreement with others, and that (b) relevant disagreement causes uncertainty about political choices and preferences. These claims are built on three basic ideas.

First, social media alter the structure of communication in egocentric networks. In the aggregate, social media diversify communication within social networks (Barbera, 2014; Brundidge, 2010; Kim, 2011; Kim, Hsu, Gil de Zúñiga, 2013; Lee, Choi, Kim, & Kim, 2014; Mitchell, Gotfried, Kiley, & Matsa, 2014), largely because they promote exposure to news posted by a wider array of individuals (Barbera, 2014; Kim, 2011; Messing & Westwood, 2012). On social media, a news post becomes a site of engagement with politics and public affairs, and the perception of disagreement occurs within this space of engagement.

Second, social media alter the experience of disagreement because new and different forms of social information accompany it. When individuals encounter political disagreement, they attribute reasons for holding those views to the source of disagreement (Asch, 1956; Brewer & Brown, 1998; Sherif, Harvey, White, Hood, & Sherif, 1961; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987; Turner, Oakes, Haslam, & McGarty, 1994; Walsh, 2004). In other words, people attempt to explain the difference between themselves and others based on available information about those others and assess the relevance of the disagreement for their own views as a product of those attributions. Social media present visible social information about others users (Tong et al., 2008; Walther et al., 2009; Walther et al., 2008), and it seems reasonable to suppose that people would use that information when making relevance attributions. Thus, social media alter the experience of disagreement because they alter the availability and nature of social information.

Finally, people are only affected by disagreement—at least in terms of being persuaded by it—when they find it to be relevant to their own lives (McGarty, Turner, Oakes, & Haslam, 1993). This idea makes sense, intuitively. If individuals can "write off" or "explain away" disagreement, they will not be very likely to consider the implications of that disagreement for

their own views. Where they cannot attribute disagreement to some dissimilarity between themselves and others, they will become relatively more uncertain about their choices and preferences.

Individuals are motivated to reduce uncertainty when they experience it (Festinger, 1950; Hogg, 2000). To be sure, this tendency is greater among individuals with certain characteristics, such as the lack of openness to experience (McCrae, 1994). Individuals reduce uncertainty through a variety of strategies, including group identification or the modification of preferences and evaluations. These cognitive-evaluative processes determine, in part, preference formation and change (Conover, 1988; Hogg, 2000; Huckfeldt & Sprague, 1987; Mutz, 2006; Sotirovic & McLeod, 2001; Turner et al., 1987; 1994; Walsh, 2004). This dissertation focuses on uncertainty precisely because it is given a central role in various theories of political preference formation and behavioral change (e.g., Hogg, 2000; Mutz, 2006; Turner et al., 1987; 1994). Thus, the dissertation outlines a process of uncertainty production, and leaves it to future research to examine how that uncertainty translates into more distal political outcomes including attitude change or political mobilization.

Terms and Definitions

Political disagreement. *Political disagreement* is the perception of difference resulting from an encounter with politically incongruent information in a setting where it is possible to meaningfully interact with the information source. This definition contains two important assumptions.

The first assumption is that disagreement is a perception. The now-classic studies on political disagreement defined it either as the lack of *congruence* between two discussants (e.g., Huckfeldt, Johnson, & Sprague, 2004) or a perception of difference with one's own political

views (e.g., Mutz, 2006). Studies using measures based on these respective definitions typically yield different results (Klofstad, Sokhey, & McClurg, 2012; Sokhey & Djupe, 2014; Wojcieszak & Price, 2012). Specifically, congruence-based studies generally find more evidence of disagreement, while perception-based studies usually find less. These discrepancies are also reflected in studies of social media, with some employing perceptual measures of exposure to crosscutting views (e.g., Kim, 2011; Kim et al., 2013) and others using comparative measures of social media ties (e.g., Barbera, 2014). This study opts for the perceptual conceptualization of disagreement. As Mutz (2006) argues, it is the experience of disagreement that matters most when it comes to political behavior. While the lack of congruence has a subtle influence on political preferences (Huckfeldt et al., 2004), perceived disagreement has deeper and more lasting effects on political behavior and long-term civic orientations (Mutz, 2006).

The second assumption—that disagreement results from the possibility of meaningful communicative interaction—distinguishes disagreement from informational incongruence, which is a closely related antecedent concept. Informational incongruence occurs in a variety of communicative settings, including both mass-mediated and social settings. But disagreement is only possible in social settings because, by and large, it is not possible to meaningfully interact with the mass media in the same way it is possible to interact with people. To be sure, newspaper readers can write letters to editors and radio listeners or television watchers can sometimes call in to hosts. These interactions are certainly meaningful, and I do not mean to suggest otherwise. But even granting these points, media-to-user interactivity pales in comparison to the size and scope of user-to-user interactivity on social media, where interaction is a primary motivation for use (Brundidge, 2010).

The second part of the definition also sets it apart from the classic political science studies (Huckfeldt et al., 2004; Mutz, 2006), which considered disagreement to result from *direct engagement* with incongruent information, that is, conversation with other people who disagree. But, as I will argue, direct interaction is not necessary to perceive difference with others on social media. In fact, recent studies suggest that direct interaction with incongruent information is quite rare on social media (Hampton, Raine, Lu, Dwyer, Shin, & Purcell, 2014; Yang, Barnidge, Gabay, & Rojas, unpublished manuscript). In other words, social media users don't necessarily enjoy getting into disagreements by commenting on or discussing others' posts. But social media present the *possibility* of meaningful interaction with others, which can promote *indirect engagement* with social conversations. That is, people may engage with other user's opinions as if they were participating in the conversation even when they are "lurking" on the sideline. Thus, direct engagement is not a necessary precondition for the perception of disagreement. Rather, information about specific others' opinions promotes the same social-psychological processes that result in the perception of political difference.

Perceived relevance. *Perceived relevance* is the perception that some message or set of messages is important, useful, or pertinent to an individual's particular circumstance, life experience, or predispositions. This definition is based on a broad review of studies from various disciplines that examine perceived relevance for different reasons. For example, many have defined relevance in terms of importance or usefulness (Brewer & Brown, 1998; Nelson, Oxley & Clawson, 1997; Pinkleton & Murrow, 1999; Weaver, 2006). Others have defined it in terms of alignment with or pertinence to a situation or preferences (Kelly, 1989; Kreuter & Wray, 2003). The definition employed in this study accounts for both of these perspectives.

Individuals assess message relevance based, in part, on the message itself and based, in part, on contextual information in the environment (Frewer & Shepard, 1994; Nelson et al., 1997). In other words, people consider both the message and contextual cues surrounding the message. This observation has important implications for the ways that individuals process messages. While research about persuasion has focused on message-based elements including argument quantity and quality (e.g., Petty & Cacioppo, 1984) or dispositional alignment (e.g., Hirsh, Kang, & Bodenhausen, 2012), these are not the only elements that affect how people assess the relevance of information. Indeed, part of the argument of the study is that differences in the contextual information environment can produce differences in the ways people assess message relevance.

Perceived relevance is closely related to the concept of salience (Nelson et al., 1997). So much so, in fact, that some scholars have thought of salience and importance as two sides of the same coin (Weaver, 2006) or two aspects of the same social-psychological processes (Brewer & Brown, 1998; Nelson et al., 1997). This study opts for an emphasis on importance over salience because it is generally a better indicator of the psychological processes under consideration, that is, the attribution of difference or similarity between political preferences and a set of political messages. Thus, salience is an assumed-but-unobserved antecedent in processes outlined in this study, such that specific considerations must be salient in order to weigh into assessments of relevance.

But people also evaluate information based on impressions. Rather than draw specific considerations from memory, people base responses on impressions updated at the time they encounter information (e.g., Lodge, McGraw & Stroh, 1989). This study is generally agnostic when it comes to the question of online vs. memory-based information processing (see Kim &

Garrett, 2012), except to suggest that both processes occur and that the extent to which each occurs likely varies among individuals and, perhaps, across information environments.

Uncertainty (and ambivalence). *Uncertainty* refers to the lack of strength of some belief, or doubt that the belief is correct (McGarty et al., 1993). This definition differs in subtle but important ways from that of Tversky and Khaneman (1974), who treat uncertainty formally as probabilistic *response variability* over time (see also, Zaller, 1992). While these operationalizations of the concept are clearly related, I have opted for the former because it allows for the observation of uncertainty at a single point in time. The reason for my preference for short-term observation is that uncertainty, as conceptualized here, is an ephemeral and transitive state of mind rather than variation in stated choices or preferences. Uncertainty, as used in this dissertation, is an acute psychological state that individuals are typically motivated to resolve somewhat quickly (Festinger, 1950; Hogg, 2000).

This approach not only distinguishes short-term uncertainty from response variability, it also distinguishes it from long-term cognitive *ambivalence* (Mutz, 2006; Zaller, 1992), a general lack of confidence in one's abilities (or, *internal efficacy*, see Niemi, Craig, & Mattei, 1991), or a general personality trait, such as *openness to experience* (see McCrae, 1994).

Chapter Overview

Chapter 2 reviews the literature and presents hypotheses on social media and political disagreement. It lays out an extended rationale for expectations about social media and exposure to political disagreement before turning to a critical review of the role played by contextual social information in political information processing and how those processes differ in political communication on social media. Finally, the chapter extends this conceptual groundwork to

develop predictions about uncertainty production or reduction in the face of political disagreement.

Chapter 3 describes the methods and measures used in all parts of the study, including survey, quasi-experimental, and experimental methods. Each of these approaches is used to test different hypotheses forwarded in Chapter 2, and, in that way, the various methods work together to tell a larger story about political disagreement on social media.

Chapter 4 presents results of statistical analyses, and Chapter 5 provides a summary of those results and the conclusions they imply. It then discusses these conclusions in light of prior literature and theory about social media and the public sphere. More specifically, it discusses the findings as they relate to three prominent arguments about the online public sphere—the fragmentation argument, the "Babel" argument, and the concentration argument—and goes on to develop original commentary about the role of social media in the networked public sphere.

Chapter 2: Theory and Literature

Exposure to Political Disagreement

Recent research from the United States and Europe shows evidence that social media use is positively related to political disagreement on social media (Bakshy, Messing, & Adamic, 2015; Barbera, 2014; Barnidge, 2015; Kim, 2011; Kim et al., 2013; Mitchell, Gotfried, Kiley, & Matsa, 2014). All else equal, heavy social media users are exposed to more political disagreement than light users. However, no studies, to date, have been able to establish that social media users are exposed to more political disagreement *as compared to non-users* and that they are exposed to it on social media *as compared to other communication settings*. The first aim of this dissertation is, therefore, to explicate an argument about why social media use results in more disagreement as compared to both interpersonal and anonymous online communication settings, and to hypothesize about the mechanisms that drive the effects of social media. To do so, I consider the ways in which social media alter the structure of communication within social networks. I argue that the primary driver of disagreement on social media is news, which acts as a vehicle for communicative diversity and presents users with a site of engagement where political disagreement can occur.

Existing theory about why social media use results in political disagreement rests on two observations: (a) Social media afford opportunities to share information and express personal opinions and (b) social media diversify communication within egocentric networks through the articulation of weak tie relationships (Barbera, 2014; Barnidge, 2015; Brundidge, 2010; Kim et al., 2013). In simpler terms, social media expose people to more information from more sources than they would otherwise be exposed to. Selectivity does little to counteract these forces. Social selectivity is multidimensional and not limited to political choice (Kim et al., 2013).

Informational selectivity, meanwhile, is more likely to be politically motivated. However, people don't necessarily avoid crosscutting news media online (Garrett, 2009) and interpersonal recommendations on social media often trump partisan media cues (Messing & Westwood, 2014). Thus, social media might inadvertently expose individuals to political disagreement (Brundidge, 2010).

Importantly, this theory is built on the concept of *communicative diversity* rather than *social network diversity*. Social media may not diversify social networks, but they do diversify communication that occurs within them. This is a subtle but important distinction that avoids the pitfalls of counterarguments based on social norms of connectivity. Rather than use social media to meet new people, most people use social media to articulate existing social connections (boyd & Ellison, 2007; Ellison et al., 2007), although it must be said that some social media sites (e.g., Twitter) are more conducive to network expansion than others (e.g., Facebook or Instagram). But even while the primary role of social media is to articulate existing social networks rather than to expand them, articulation still diversifies communication in comparison to face-to-face contexts, which are limited by geographic space (Barnidge, 2015; Brundidge, 2010; Huckfeldt et al., 2004), and anonymous online contexts, in which relatively homogeneous political communication occurs (Hill & Hughes, 1998; Wojcieszak, 2008).

Political disagreement in face-to-face settings. In face-to-face settings, people exercise a great deal of selectivity when it comes engaging potential discussion partners about politics or joining political groups (Eliasoph, 1998; Huckfeldt & Sprague, 1995; MacKuen, 1990). In general, people affiliate with others who are like them, that is, people exhibit a general tendency toward homophily in social affiliation (Kandel, 1978; Lazarsfeld & Merton, 1954). Political discussions in face-to-face settings are only moderately contested (Conover, Searing & Crewe,

2002), because most individuals seek signs of equilibrium with potential discussion partners and avoid engagement if equilibrium is not possible (MacKuen, 1990; Mutz, 2006; Noelle-Neumann, 1984 [1993]). Informal group discussions also tend toward agreement, often focusing on group or social identity and/or social cohesion (LeMasters, 1975; Walsh, 2004). Formal groups display similar tendencies (Eliasoph, 1998; Walsh, 2012), unless a group establishes that disagreement is acceptable or encouraged (Eliasoph, 1998; Lichterman, 1999; Walsh, 2007).

But selective affiliation in interpersonal social networks has its limits. The structure of social ties affects how information flows through social networks (Granovetter, 1973). Individual social choice regarding associational patterns and political discussion operates within the opportunities and constrains imposed by social context (Huckfeldt & Sprague, 1987). Less dense networks composed of more weak ties relationships are more likely to sustain disagreement (Huckfeldt, et al., 2004). Thus, even though individuals are selective when it comes to engaging with others about politics, some individuals might encounter disagreement because their social networks connect them with ideas from individuals they did not choose (Huckfeldt et al., 2004). The second reason is that politics is not at the forefront of most social choices that individuals make (Granovetter, 1973; Huckfeldt et al., 2004). Rather, social affiliation is multidimensional—individuals affiliate with a variety of others for myriad reasons, and often they affiliate with a single other for more than one reason. Thus, while people tend to avoid disagreement when politics is at the forefront of the relationship, they are much more likely to encounter political disagreement from others with whom they do not associate for political reasons (Huckfeldt & Sprague, 1987).

Political disagreement in anonymous online settings. Early, anonymous online media—message boards (i.e., bulletin board systems, or BBS) and newsgroups, for example—

also facilitate connection with weak ties and promote information sharing. In fact, these media arguably connect people to the weakest ties of all—virtual ties, that is, individuals who are known only through the internet (Wellman & Gulia, 1999). And while some would argue that these kinds of communication environments lack the richness of face-to-face communities (Calhoun, 1998), others argue that virtual communities offer opportunities for meaningful social interaction (Rheingold, 1993) and provide social support to members (McKenna & Bargh, 1998; 1999; Wellman & Gulia, 1999).

But while early online media connected users with weak ties, there are compelling reasons to believe that online media exposed individuals to *less* political disagreement than face-to-face settings, not more disagreement. Research shows a general tendency toward interest-based selectivity in early online media, which means that virtual relationships have a relatively narrow focus (Wellman & Gulia, 1999). And while it would be a mistake to discount these virtual relationships as sources of sociability, support, and group identification (Spears, Lea, & Postmes, 2001; McKenna & Bargh, 1998; 1999), they are generally based on a single dimension of social relevance and, therefore, individuals engage in homophilous selection based on that single dimension. When it comes to politics, this tendency means that those interested in politics migrate toward like-minded communities (Davis, 1998; Hill & Hughes, 1998; Sunstein, 2007; Wojcieszak & Mutz, 2009). For example, political discussion on message boards is characterized by agreement rather than disagreement (Hill & Hughes, 1998; Wojcieszak & Mutz, 2009). Where disagreement does occur, it is often met with "flaming" (Davis, 1998; Douglas & McGarty, 2001; Hill & Hughes, 1998; Norris, 2002; Postmes, Lea & Spears, 1998)—a way for community members to police the norms of the board.

One prominent exception in the early online environment is political discussion that occurs on message boards not dedicated to politics—for example, a sports message board. But these kinds of interactions occur precisely because selective affiliation occurs along a dimension not related to politics (Brundidge, 2010; Gaines & Mondak, 2009; Wojcieszak & Mutz, 2009)—a characteristic more typical of interpersonal environments. Therefore, early online media, in general, expose individuals to less political disagreement than face-to-face settings, with the exception of political discussion that occurs in settings not specifically devoted to politics.

The structure of communication on social media. Structural features of social media shape network connections and the information that flows between them. Moreover, these structural features also shape the experience of disagreement on social media. This section elaborates about several prominent features that are specifically relevant to the problem of exposure to political disagreement.

***The etiquette of connection*.** Social media norms of connectivity may facilitate or constrain social network diversification. Social media have *etiquettes of connection*, which is to say that particular platforms operate with "unwritten" norms of social connection. Of course, different communication contexts are governed by different etiquettes (Eliasoph, 1998), owing in part to the specific parameters of each. For example, Facebook requires symmetrical, or reciprocal, connection if any is to occur at all (Gruzd & Wellman, 2014). The user faces two choices: Ignore the request or reciprocate. Meanwhile, Twitter employs an asymmetrical system, where it is possible to follow individuals (or entities) who do not follow you (Gruzd & Wellman, 2014). Arguably, symmetrical connection limits social network expansion. For example, sending a Facebook "friend request" to a stranger would be considered counter-normative; users tend to send requests only to individuals they have already met in person. On the other hand,

asymmetrical connection arguably expands (and diffuses) social networks. For example, following a stranger on Twitter expands the egocentric network, and although a reciprocal relationship is unlikely to develop, such an egocentric expansion affords greater possibilities for communicative diversity within the social media platform (Barbera, 2014).

Relational articulation. Although some social media are not well suited for network expansion, it is not strictly necessary in order for the communication that occurs within those social networks to diversify. While social media may not necessarily diversify *social* networks, they do diversify *communication* networks. Rather than use social media to meet new people, most users articulate existing social networks (boyd & Ellison, 2007; Ellison et al., 2007). This articulation has an important influence on the communication that occurs within social media networks because social media promote the visibility of a broader array of people and their opinions at any given time (Barnidge, 2015; Kwon, Stefanone, & Barnett, 2014). For example, in face-to-face settings, individuals are much less likely to encounter discussion about public affairs and politics (Mutz & Martin, 2001), especially with weak ties (Mutz, 2006). Social media, on the other hand, give these weak ties platforms through which to make their views and interests visible to their egocentric networks, and this visibility is what differentiates relational articulation on social media from face-to-face settings (Barnidge, 2015; Kwon et al., 2014).

Multiple contexts. Relational articulation on social media also cuts across geographic contexts (boyd & Ellison, 2007). Local context acts as a "micro-environmental filter" for the information that reaches social networks (Huckfeldt et al., 2004), and it affects electoral preferences (Burbank, 1997) and political engagement (Campbell, 2006). With these considerations in mind, many local contexts in the United States have become more politically homogeneous. The diffusion of social networks along loose lines of personal affiliation

(Wellman, 1979), combined with the technological affordances of digital media (Bennett, 1998), have promoted the rise of lifestyle politics, which emphasize day-to-day orientations toward consumption, communication, and civic engagement in ways that correlate strongly with political preferences (Bennett, 1998; Norris, 2002). These lifestyle choices are also increasingly correlated with migration patterns, where people with similar lifestyle preferences aggregate in specific types of places (Bishop, 2008).

To some extent, social media break down the filter of local context by articulating social connections in various locations (Barnidge, 2015; Brundidge, 2010; Takhteyev, Gruzd, & Wellman, 2012). As people move from place to place, they accumulate social ties embedded in networks with different information, and these connections are articulated in a visible way on social media. Naturally, the extent to which a given egocentric network contains connections from multiple contexts depends a great deal on the life experience of the individual. Individuals who have lived their entire lives in a single place will have less contextual overlap in their social networks than individuals who frequently move to different places. Even still, an individual's social ties might move and connect with others, expanding the individual's extended network.

The logic of aggregation. As previously argued, social media articulate and visualize social information from weak tie relationships—something that sets these environments apart from the interpersonal setting. They are able to do so because they aggregate and display user-generated information from these weak ties relationships in a process some have called the *logic of aggregation* (Juris, 2012). At the egocentric level, this means that social media collect and display information from an individual's social connections into a single information stream. While this point may seem trivial, it is, in fact, vital to understanding how the articulation function results in exposure to political disagreement. Not only do social media articulate

connections between individuals, they also display information from those connections in one communication space. All else equal, the logic of aggregation increases the likelihood that any given user will be exposed a given message at a given time. Where networks are more communicatively diverse, aggregation increases the likelihood of exposure to political disagreement. Where there is less communicative diversity, political disagreement is less likely.

Message juxtaposition. People have always used news to monitor social opinion about public issues (Noelle-Neumann, 1984 [1993]), but social media arguably give users more information with which to do so as compared to other communicative settings (Ho & McLeod, 2008; Schulz & Roessler, 2012). Social media visualize social information about others in extended egocentric networks (see, e.g., Walther et al., 2008; Westerman, Van Der Heide, Klein, & Walther, 2008). Moreover, social media juxtapose information from mass-mediated and interpersonal sources (Walther et al., 2011). Mass-mediated political information is often accompanied by quantitative (e.g., Aggregated User Ratings, see Resnick & Zeckhauser, 2002) and qualitative information (i.e., comments) about the original poster and about individuals who contribute to the thread or conversation. These messages could interact to influence information evaluation and perceptions of others' opinions (Anderson, Brossard, Scheufele, Xenos, & Ladwig, 2013; Paek, Hove, & Jeong, 2013; Xu, 2013; Walther, DeAndrea, Kim, & Anthony, 2010). This juxtaposition can also influence media selection. For example, recommendations from social media ties can trump partisan media cues when it comes to selecting news articles on social media (Messing & Westwood, 2014). Therefore, social media have the capacity to expose individuals to more cross-cutting information from the news media relative to the current news media environment without social media, not only because they draw from a wider range of

interpersonal sources but also because the visibility of social information can influence media-related behavior.

Political disagreement on social media. A perception-based approach to disagreement (see Chapter 1: Introduction) helps to clarify the nature of political disagreement on social media as compared to other communicative settings. This enhanced clarity, in turn, contributes to our understanding of what disagreement is. Recent findings suggest that direct interaction with political disagreement on social media is somewhat uncommon (Hampton et al., 2014b). But on social media, direct interaction is not the only way users can perceive disagreement. Because of message juxtaposition, users can get a sense of what others think and feel about a political subject without discussing it. Therefore, on social media disagreement occurs not just through direct interaction, but also through indirect interaction (Schulz & Roessler, 2012). Mass-mediated information has always been filtered through social networks (Huckfeldt et al., 2004; Katz & Lazarsfeld, 1955; Lazarsfeld, Berelson, & Gaudet, 1944; Lazarsfeld & Merton, 1954; Sotirovic & McLeod, 2001). But interpersonal political communication is largely dependent on direct interactions with interested parties (Eveland, 2004; Eveland, Morey, & Hutchens, 2011; Morey, Eveland, & Hutchens, 2012; Mutz, 2006; Shah, Cho, Eveland, & Kwak, 2005), and thus cueing information embedded in news is filtered through interpersonal discussants. Therefore, individuals who pay habitual attention to the news media are more able to interpret conversations about the news (Gamson, 1992; Sotirovic & McLeod, 2001; Zaller, 1992).

This is not necessarily the case on social media, where mass-mediated messages are juxtaposed alongside social interactions. On these platforms, individuals have direct access to cues about information sources (Messing & Westwood, 2012; Walther et al., 2010). Users can also follow hyperlinks directly to articles, giving users direct access to informational cues in

news articles about social and political issues (Anderson et al., 2014; Barnidge, Carr, Tsang, Lee, & McLeod, unpublished manuscript; Bode, Vraga, Borah, & Shah, 2014). Moreover, visible indicators of user opinion can potentially contribute to the experience of disagreement without direct interaction in the form of discussion (Schulz & Roessler, 2012).

News use as a mechanism. When it comes to political communication on social media, news is (one of) the primary sources of public information, and recent literature emphasizes the role of news in promoting communicative diversity on social media. For example, Lee and colleagues (Lee et al., 2014) show that social media diversify communication networks, in part, through news use (see also, Bakshy et al., 2015; Barbera, 2014; Barnidge, 2015). This idea implies, of course, that social media promote news use, and this conclusion is generally borne out by observational analysis: Research shows a positive relationship between social media use and news use on social media in various political contexts (Gil de Zúñiga, Jung, & Valenzuela, 2012; Valenzuela, et al., 2012).

Part of the explanation for the relationship between general use and news use has to do with network size and structure. Larger, more diffuse networks are better at spreading information in social networks because they contain more weak ties (Granovetter, 1973). Research shows a consistently positive association between network size and content diffusion (Adar & Adamic, 2005; Bakshy, Karrar, & Adamic, 2009; Cha, Mislove, & Gummadi, 2009). Meanwhile, a large-scale Facebook experiment shows that the number of friends posting a link to a story increased the probability of sharing that story (Bakshy, Rosenn, Marlow, & Adamic, 2012). Finally, social media network size is positively related to relevant behaviors, including political participation and/or group formation, commonly thought to result from information exposure (e.g., Backstrom, Huttenlocher, Kleinberg, & Lan, 2006; Gil de Zúñiga et al., 2012;

Valenzuela et al., 2012). And while other structural characteristics of networks are also important for information diffusion (Centola, 2010), network size facilitates the influence of many of these structures (Horowitz & Malkhi, 2003).

While *social media network size* is certainly an important factor in facilitating information flow in online networks, a related, but more proximal, concept is perhaps more germane to existing theories about exposure to political disagreement on social media. Indeed, most theories emphasize the *social media news networks* as the primary driver of communicative diversity on social media (e.g., Bakshy et al., 2015; Barbera, 2014; Brundidge, 2010; Kim, 2011). Theoretically, the larger the network of individuals posting news and public affairs content on social media, the greater the user's chance of encountering cross-cutting information. Therefore, *social media news network diversity* is also an important concept to consider.

Generally, when scholars of social networks refer to diversity, they refer to the presence or absence of weak ties in the network (see Grannovetter, 1973), who are commonly found to be more likely to pass along novel information because they are embedded in different, but overlapping, communicative environments. Some recent research on digital social networks supports these claims. For example, a recent Facebook study shows that weak ties promote the diffusion of information (Bakshy et al., 2012). However, other recent research shows more nuanced findings. For example, some find evidence that intermediate tie strength is optimal for information diffusion (Onnela et al., 2007), while still others have found that network density facilitates or constrains the effects of diversity (Centola, 2010). As a rough indicator, however, it seems reasonable to expect that more diverse news networks will produce more political disagreement because the communicative environment contains more diverse informational

content. This expectation aligns well with the general theoretical predictions about the role of news in promoting disagreement on social media (Barbera, 2014; Brundidge, 2010).

The information-sharing affordances of social media represent another explanation for the relationship between use and news use (Loader & Mercea, 2011). Posting news is relatively uncommon among average users, but it is very common among politically involved users (Glynn, Huge, & Hoffman, 2012). In fact, approximately 20-30% of social media users, who some have called "power users," account for substantially more content than typical users (Hampton, Goulet, Marlow, & Raine, 2014a). In other words, a few users post a lot of news, which means that the average user is exposed to more news than they post. Once again, this conclusion is borne out in research: About 50% of U.S. adult web users get news from social media, which is approximately the same proportion as those who watch TV news (Barbera, 2014; Mitchell et al., 2014).

A space of engagement. News use promotes engagement with politics and public affairs. For example, news use is associated with political learning (Eveland, Shah, & Kwak, 2003), political discussion (Shah et al., 2005), cognitive reflection (Cho et al., 2009), and political participation (Shah, Kwak & Holbert, 2001). These studies, which belong the family of models knows as the communication mediation models, suggest that media effects are largely indirect, and mediated through these indicators of cognitive and/or discursive engagement with information. Political talk, or informal discussion about politics in everyday life, figures centrally into many of these models (e.g., Shah et al., 2005; Nah, Veenstra, & Shah, 2006) and is considered to be a key facilitator of civic and/or political participation.

News use on social media also promotes political expression (Gil de Zúñiga, Jung, & Valenzuela, 2012; Valenzuela et al., 2012). In fact, social media afford new forms of political

messaging (Gil de Zúñiga et al., 2012) built around the virtual spaces that news stories provide online. And even while recent research shows that commenting on news articles is relatively rare on social media (Hampton et al., 2014b), when it does occur, it can have influential effects on information processing and its subsequent outcomes, including political participation (Yamamoto, Kushin, & Dalisay, 2013; Zhang, Johnson, Seltzer, & Bichard, 2010) and exposure to disagreement (Barnidge, 2015; Kim, 2011; Kim et al., 2013).

But expression is not the only way to engage with news and public affairs information on social media. As previously argued, direct interaction with others is not necessary in order to engage with the news and public affairs content because individuals can get a sense of the conversations around stories without participating in those conversations themselves. Thus, news on social media can also result in indirect engagement with politics and public affairs and therefore more pathways to perceiving disagreement.

Hypotheses: Exposure to political disagreement. Based on the theory and literature outlined above, there is ample reason to believe that social media facilitates exposure to political disagreement. And yet, there are various ways to express that belief in the form of a prediction. Two approaches are presented here, although more could undoubtedly be articulated. The first approach poses the question: *Are people exposed more political disagreement on social media or somewhere else?* Answering this question involves mean comparisons across media (e.g., social media vs. interpersonal), controlling for within-subject variation. Based on the theory and literature discussed above, a prediction addressing this question can be phrased as:

H1: Social media users will be exposed to more political disagreement on social media than in (a) face-to-face or (b) anonymous online settings.

By contrast, the second approach poses the question: *Are social media users exposed to more political disagreement than non-users?* This question is, of course, closely related to the first, but conceptually and analytically distinct. Answering it involves a comparison between social media users and non-users along a combined disagreement variable, rather than cross-media comparisons on successive disagreement variables. Essentially, then, the analyses focus on whether social media use raises average levels of disagreement in comparison to non-use. Based on the relevant theory and literature, the prediction is that:

H2: Social media users will be exposed to more political disagreement than non-users.

Finally, based on the discussion of news-as-mechanism, it seems reasonable to predict that, on social media, news use and political disagreement will be positively related. Analytically, this prediction involves assessing the relationship between indicators of news use and political disagreement *on social media*. In other words, the focus is on social media users and social media use, rather than on cross-media comparisons. Consistent with theoretical expectations, three indicators of social media news use are included. The prediction is worded as follows:

> H3: Among social media users, (a) social media news use, (b) social media news network size, and (c) social media news network diversity will be positively related to exposure to political disagreement on social media.

Filtration. Additional comments are warranted at the conclusion of this section in order to guard against two appealing counterarguments. Both are based on the idea of information filtration, that is, the mechanisms that limit or tailor information flows through social media networks (Benkler, 2006). The *filter bubble* argument (Pariser, 2011) suggests that the algorithms social media sites (especially Facebook) employ may filter out disagreeable posts. Unfortunately, not enough is known about these filtration algorithms. However, some have

argued that these filtration systems suppress undesirable posts, in general (Nikolov, Oliviera, Flammini, & Menczer, 2015; Pariser, 2011). The filtration system learns what is desirable to each user through that user's activity on the site (Pariser, 2011). According to this line of thinking, social media users would not be exposed to disagreement unless they engage with posts from disagreeable contacts.

Two considerations temper the arguments presented in this chapter against the filter bubble counterargument. First, the idea that engagement with news is a necessary condition for the experience of disagreement to occur is entirely consistent with the argument presented herein, which predicts that this kind of engagement is precisely what contributes to the perception of political disagreement. Second, recent research shows that given this kind of engagement with news on social media, users report exposure to disagreement despite the filter bubble on Facebook (Bakshy et al., 2015) and Twitter (Barbera, 2014). In other words, even if some disagreeable content is filtered out of user's social media feeds, heavy users still report more disagreement than light users.

The *user filtration* argument suggests that users themselves filter out disagreeable posts by hiding, unfriending, unfollowing, or blocking disagreeable contacts (Noel & Nyhan, 2011; Sibona & Walczak, 2011; Yang et al., unpublished manuscript). According to this argument, users themselves limit exposure to political disagreement on social media because they suppress it when they experience it.

Again, two considers temper my argument. First, user filtration that occurs specifically because of political disagreement is relatively uncommon (Yang et al., unpublished manuscript). While users may "unfriend" or "unfollow" someone for other reasons—for example, some other form of social conflict—doing so in response to political disagreement is not as common as

many would argue (e.g., Noel & Nyhan, 2011). The second consideration is that user filtration in response to political disagreement is one of the behaviors that the present work seeks to explain. While the relationship between the two—exposure to political disagreement and user filtration—is certainly reciprocal (and negative), it is the aim of this dissertation to develop a theory of disagreement and uncertainty that can explain subsequent social and political behavior, including user filtration in the form of unfriending, unfollowing, and blocking.

The Experience of Political Disagreement

Exposure is a starting point in a bigger story about social media and political disagreement. While it is important to establish that social media increase exposure, understanding how people mentally process political disagreement is equally, if not more, important. After all, people don't always accept the messages they encounter wholesale, but rather interpret them in light of existing beliefs and feelings (Petty & Cacioppo, 1986; Shah, Domke & Wackaman, 1996; Gunther & Schmitt, 2004; Kunda, 1990; Zaller, 1992). And, as I have previously argued, political disagreement has a relatively long-lasting impact on attitudes and behavior (Mutz, 2006). Given this relatively lasting impact, people are likely to ask *why* disagreement occurred (O'Brien & McGarty, 2009).

People answer these kinds of questions beginning with "why?" by attributing causes to others' behavior. They do so based, in part, on available information about the situation at hand (Kelley, 1973). When making judgments about others behavior, people rely on both "internal" explanations (i.e., personality-based explanations) based on their assessments of others' dispositions and "external" explanations (i.e., situation-based explanations) based on information about the situation or context (Kelley, 1973; Nir, 2012). Generally, people are more likely to discount internal explanations where plausible external explanations exist. For example, one

experiment presented a scenario in which subjects were required to request something from a low-status or high-status confederate (Thibaut & Riecken, 1955) and were subsequently asked to attribute the confederates' compliance to either personality-based or situation-based factors. Subjects interacting with low-status confederates were more likely to attribute compliance to external causes, that is, situational pressure created by the subjects' request. However, subjects appeared to discount the external explanation for the high-status confederates. Presumably, high-status individuals need not respond to social pressure, and therefore behavior was attributed to personality. Generally, a large body of research in support of causal attribution has accumulated over the course of several decades (see, e.g., Spitzberg & Manusov, 2015; Weiner, 2014), and it has been suggested as a potential mechanism in various theories of group behavior (e.g., Brewer & Brown, 1998) and perceived public opinion (Christen & Gunther, 2003; Gunther, 1998).

External explanations "depend on information flows" (Nir, 2012, p. 564), because people need information about a current situation in order to assess situational causes. Social media restructure information flows—not just in terms of informational diversity (Barbera, 2014), but also in terms of the makeup and type of information that users encounter (Walther et al., 2011). Thus, social media may alter social-psychological processes of attribution because they affect the nature of information. If they do so in such a way that users simply write off any disagreement they encounter—that is, they attribute political disagreement to causes that are irrelevant for their own choices and preferences (O'Brien & McGarty, 2009)—then many of the democratic gains (e.g., political tolerance or community-based deliberation, see Mutz, 2006; Conover, Searing, & Crewe, 2002) that come from increased exposure to disagreement are lost because individuals—and the communities they comprise—will not respond to it.

At this point, an important caveat is warranted. Understanding how differences in contextual information affect attribution processes provides insight into how social media alter the experience of political disagreement. But that is not to say that communication media determine how individuals process information. Rather, specific media provide different kinds of environments that afford individuals different opportunities to use contextual information to assess the relevance of political disagreement.

Causal attribution and perceived relevance. During the process attributing attitudes or events to particular causes, individuals assess the relevance of potential explanations for others' behavior based on contextual information about the individuals and the context (Hilton & Erb, 1996). For example, political disagreement might be caused by genuine differences between individuals, or it could be due to the susceptibility of others to salient political messages in the communication environment (Christen & Gunther, 2003). While both explanations could possibly be true, people weight the relevance of each in light of contextual information. For example, if contextual information gives evidence of political similarity, people might assign greater relevance to situational factors, including media and the communication environment. In these cases, disagreement might have more of an effect on individuals' attitudes and/or behavior because someone similar responded to a situational stimulus differently than they did (causing them to reconsider their position). However, if contextual information suggests a lack of political similarity, people are more likely to attribute disagreement to genuine political differences. Generally, where genuine differences are perceived, messages themselves will be considered to be less relevant to an individual's own choices and preferences (Hilton & Erb, 1996). That is, messages will be "written off" where they can be ascribed to fundamental differences between individuals.

People assess the relevance of information based, in part, on messages themselves, and based, in part, on contextual cues in the environment (Frewer & Shepard, 1994). Generally, research shows that people are likely to think a message is more relevant if it aligns with their existing preferences or prior life experiences. For example, public relations research has shown that messages are perceived as more relevant if their relate to an individual's "particular circumstance, life experience, or predisposition[s]" (Kreuter & Wray, 2003, p. S228). Meanwhile, framing research shows that people place more importance on those frames that resonate with pre-existing political preferences or values (Nelson et al., 1997; Shah et al., 1996; Weaver, 2007). Given this general tendency to consider congruent messages as more relevant than incongruent messages, it seems reasonable to predict that, all else equal, disagreement would likely reduce the perceived relevance of messages.

Research also shows that contextual information affects perceived relevance of messages and their sources. For example, Pinkleton and Murrow (1999) show that contextual information about political candidates affects whether individuals considered particular news sources to be relevant for their political decision-making. Meanwhile, O'Brien & McGarty (2009) showed that attributions for political disagreement varies based on the kind of person subjects disagreed with, that is, attribution depended on information about the individual. Finally, social opinion has been shown to affects the perceived relevance of health messages (Elbogen, Calkins, & Scalora, 2002; Frewer & Shepard, 1994)

Therefore, differences in the nature of contextual information surrounding messages should produce differences in perceived relevance (assuming stochastic variation within populations and across observations of individuals). Moreover, this contextual information should interact with messages themselves, such that disagreeable messages will be considered

more relevant where political disagreement cannot be ascribed to individual differences in political preferences. More generally, expectations derived from theory suggest that the perceived relevance of political disagreement depends on contextual information, and contextual information varies according to the affordances of different communicative settings.

Contextual information and relevant disagreement in various communicative settings. The above assertion warrants a systematic comparison of contextual information in the various communicative settings of interest to this study—a comparison that yields general predictions about disagreement and perceived relevance in each.

Of the three communicative environments of interest to this study—face-to-face, anonymous online, and social media—face-to-face settings provide the most *individuating* information in the contextual environment—that is, face-to-face communication contains a layer of information about a person's unique set of qualities that set them apart from others. Face-to-face settings are rich with interpersonal social cues, most of which are unspoken (Lea et al., 2000; Walther, 2011). People draw from this relatively rich informational layer to learn about the people with whom they interact (as well as about themselves; see, e.g., Knapp, Daly, Albada, & Miller, 2002) and to evaluate their relationships with them (see, e.g., Amabile & Glazebrook, 1982). Typically, with high levels of individuating information come more opportunities for people to perceive differences between themselves and others. However, face-to-face relationships are also typically characterized by closeness, liking, and positive interpersonal evaluation because of a general tendency toward homophily in interpersonal settings (Kandel, 1978). This interpersonal homophily manifests in high levels of agreement in face-to-face conversation (MacKuen, 1990) and perceived similarity between discussants (Huckfeldt & Sprague, 1987). Therefore, despite that fact that face-to-face information provides more

individuating information than other settings, that information typically points toward similarity rather than difference. And with that perceived similarity comes a tendency to attribute differences to situational, rather than personal, explanations (O'Brien & McGarty, 2009), which, of course, increases the likelihood that a given message will be perceived as relevant (Hilton & Erb, 1996). Thus, face-to-face political conversations are generally characterized by low levels of political disagreement and high levels of perceived relevance.

Anonymous online settings provide the least amount of individuating information of the three settings. The rich interpersonal cues that characterized face-to-face settings are not present in anonymous computer-mediated communication (Lea et al., 2000; Walther, 1996; 2011). Such an environment promotes *deindividuation*, that is, the perception of the self and others not in terms of individual qualities, but rather in terms of memberships to real or imagined social groups (Lea et al., 2000). People are more likely to perceive others in idealized, group-based terms rather than according to actual individual qualities (Walther, 1996). As with face-to-face settings, political discussions in anonymous online settings are characterized by agreement (Davis, 1998; Hill & Hughes, 1998) because people exercise a great deal of politically motivated selectivity when choosing venues for political discussion in the first place (Sunstein, 2007; Wojcieszak, 2008). Where political disagreement does occur, it is likely to be the most prominent information about a discussant—information that, of course, suggests political difference. Given the tendency toward deindividuation, people are likely to assume political difference with others (Lea et al., 2000) and attribute disagreement to these differences (O'Brien & McGarty, 2009). Therefore, anonymous online settings, like face-to-face settings, are characterized by low levels of political disagreement; however, they are also characterized by

relatively lower levels of perceived relevance, thereby producing less relevant political disagreement than face-to-face settings.

Social media present an informational middle ground. They provide more individuating information about others than anonymous online settings, but social media cues still lack the richness of face-to-face interaction (Walther et al., 2011). In a medium information environment, there is no reason to believe that (a) people will assume similarity from social cues (through deindividuation) or that (b) people will seek to associate only with similar others (i.e., homophily). Social media give people enough information to evaluate social relationships without making assumptions, and, yet, they also provide physical and psychological distance from social interactions (Tong, Van Der Heide, Langwell & Walther, 2008; Walther, Van Der Heide, Hamel, & Shulman, 2009; Walther, Van Der Heide, Kim, Westerman, & Tong, 2008)—distance that might obviate the need to seek common ground or avoid feelings of discomfort stemming from conflict. As a result, people probably perceive less similarity between themselves and others, and would thus be more likely to attribute differences to personal qualities. Therefore, social media settings may be characterized by high levels of political disagreement, but they are also characterized by relatively low levels of perceived relevance as compared to interpersonal settings.

Social media and relevant political disagreement: A paradox. Thus, social media present a paradox for political communication: Despite the fact that social media increase exposure to political disagreement, these increases are offset, to a certain extent, by the fact that social media also lower the perceived relevance of political disagreement. The question therefore becomes: Does this kind of cognitive offset mean that people are exposed to more or less relevant political disagreement as compared to other communicative settings? In other words, do

social media depress perceived relevance to the point where people "write off" the additional disagreement they encounter? As previously noted, I posit social media do not indemnify users from the effects of disagreement. Rather, I predict that the balance between disagreement and perceived relevance results in net gains in relevant political disagreement. In other words, I predict that social media promote relevant disagreement as compared to other communicative settings.

Intervening variables. Two classes of intervening variables are notable, one cognitive and the other affective. There are good reasons to believe that one or more of these variables moderate the relationship between exposure to political disagreement and perceived relevance.

On the cognitive side, there is a large body of evidence that suggests people who are highly involved in politics process political information differently than those who are not (e.g., Gunther & Schmitt, 2004; Shah et al., 1996; Zaller, 1992). When it comes to disagreement, some evidence suggests that these individuals are more likely to perceive it in the first place (Barnidge & Rojas, 2014), perhaps because fewer considerations fall within their latitude of acceptance (Sherif & Hovland, 1961). It also seems likely that the highly involved would be quicker to perceive differences between themselves and others (Christen & Gunther, 2003) and would therefore be more likely to attribute the causes of disagreement to individual rather than situational factors (Kelley, 1973). Thus, political involvement is probably negatively related to perceived relevance.

On the affective side, it seems likely that interpersonal evaluations may also moderate causal attribution processes. Interpersonal evaluations play a critical role in perceptual and identity-based processes (Brewer & Brown, 1998), and positive evaluation promotes perceived

similarity (see, e.g., Tajfel, 1982a; 1982b), which promotes situational attribution (Kelley, 1973). Thus, positive evaluation likely increases the perceived relevance of political messages.

Hypotheses: The experience of political disagreement. Both messages and contextual information affect perceived relevance. Therefore, I predict a direct relationship between each and perceived relevance. Moreover, I hypothesize that these elements will interact to affect perceived relevance. Specifically, where contextual information suggests relevant causes for disagreement, the negative effect of disagreement on perceived relevance should be weaker. Where contextual information suggests irrelevant causes, disagreement should be freed to affect perceived relevance negatively. Based on this logic, the following hypotheses were formulated:

H4: Disagreement and perceived relevance will be negatively related.

H5: The valence of contextual information affect perceived relevance.

H6: Disagreement and the valence of contextual information will interact to affect perceived relevance, such that (a) the effects of disagreement will be stronger where the contextual information suggests irrelevant causes and (b) weaker where contextual information suggests relevant causes.

However, it remains an open question whether contextual information operates more strongly along cognitive or affective dimensions. Therefore, the study poses the following research question:

RQ1: Do the effects hypothesized in H4-H6 differ according to the salient dimension (cognitive vs. affective) of contextual information?

Based on the above comparison of various communicative settings, it is possible to formulate hypotheses comparing aggregate levels of perceived relevance and relevant disagreement in these settings. Specifically, I predict that social media inhibits perceived relevance. However, on

balance, social media also promote relevant disagreement. As with before, these predictions are worded in terms of both *where* these processes happen and to *whom* they happen.

H7: Social media users will perceive less relevant political messages on social media than in face-to-face settings.

H8: Social media users will perceive less relevant political messages than non-users.

H9: Social media users will experience more relevant political disagreement on social media than in face-to-face settings.

H10: Social media users will experience more relevant political disagreement than non-users.

Finally, based on the above discussion of intervening variables, I present the following research questions that ask whether political involvement and/or interpersonal evaluations intervene in the process of relevant disagreement.

RQ2: Do either (a) political involvement or (b) interpersonal evaluations intervene in the process of experiencing relevant political disagreement.

The Effects of Relevant Political Disagreement

Uncertainty (and ambivalence). Uncertainty—and its conceptual cousin, ambivalence—holds a prominent place in theories of social norms (Sherif, 1935), social comparison (Festiger, 1950), and social identity/self-categorization (Hogg, 2000; 2006; Huddy, 2001; Turner, 1985). For example, uncertainty reduction has been suggested as a potential mechanism for social identification. While most social identity studies focus on other motivations, such as the need for positive distinctiveness, the motivation to reduce uncertainty offers a plausible alternative or complimentary explanation for the same psychological processes (Hogg, 2000; 2006; Huddy, 2001). For example, findings about the clarity of political group cues

(e.g., Conover, 1988) could be explained by either the need for positive distinctiveness (i.e., clearer cues help people know what the "correct" way to think and act is) or by uncertainty reduction (i.e., clearer cues provide a more efficient resolution of identify conflicts caused by political disagreement and/or overlapping affiliations). Therefore, uncertainty could be the catalyst for many well-known intergroup processes, and, given that people engage with politics through communities, political processes.

Other theories come specifically from political science. For instance, Zaller (1992) considers response variation (an indicator of ambivalence) as the underlying condition that makes attitude change possible. Because individuals hold conflicting considerations, they may change their response based on the salience of various cues in the communication environment. In another example, Mutz (2006) treats ambivalence as a demobilizing mechanism caused by disagreement with others. Disagreement creates long-term uncertainty, which makes people less likely to participate in political processes.

Experimental evidence speaks to the conditions that create more or less certainty. For example, uncertainty is higher when experimental tasks are difficult, when experimental stimuli are ambiguous, when experimental confederates are perceived to be competent, or when the experimental subject has little to no social support (Asch, 1956; McGarty et al., 1993). All of these findings imply a pivotal role played by uncertainty, but, importantly, they point toward multiple sources of influence. Specifically, these findings suggest that people use both message-based and social information to assess the degree of confidence they have in their own choices and/or preferences formed based on a message.

Disagreement and uncertainty. In general, research shows that exposure to disagreement creates uncertainty (in the short term) or ambivalence (in the long term) about

social and political preferences. For example, experimental research in social psychology shows that disagreement reduces certainty in comparison to agreement (Abrams, Wetherell, Cochrane, Hogg, & Turner, 1990; Hogg, 2007; McGarty et al., 1993; Turner, 1991). Possible explanations for this relationship include self-categorization and social comparison processes (McGarty et al., 1993). Both of these processes involve referent informational influence, that is, the influence of social information used for comparison and/or categorization, rather than normative influence, that is, overt conformity to social norms in the face of incentive or sanction (Price & Allen, 1990; Price, Nir, & Capella, 2006; Salmon & Kline, 1983).

Further evidence of the role of disagreement in producing uncertainty comes from the network studies in political science and sociology. Specifically, the cross-pressures hypothesis, which has a long history dating back to Lazarsfeld and colleagues' (1944) seminal study of interpersonal networks and political, predicts that overlapping social affiliation and discussion networks produce cognitive and/or affective inconsistencies that may delay an individual's vote decision (Lazarsfeld et al., 1944). Scholars later articulated both cognitive (i.e., ambivalence) and affective (i.e., conflict avoidance) mechanisms for this process (Green, Visser, & Tetlock, 2000; Huckfeldt et al., 2004; Mutz, 2006). Either way, cross-pressures manifested as a result of disagreement in interpersonal or social communication (Mutz, 2006; Rojas, 2008). These effects are particularly acute among individuals in the minority (Huckfeldt & Sprague, 1995; McClurg, 2006) because they cannot selectively ignore disagreement.

The role of perceived relevance. Not all disagreement affects individuals in the same way. Political disagreement produces uncertainty only when agreement is expected (Abrams et al., 1990; McGarty et al., 1990; Turner, 1985), that is, when disagreement occurs with another person(s) who is socially relevant along at least one dimension. There are three related

explanations for why this is the case, which likely work together as part of the same social-psychological process.

The first explanation involves referent informational influence. When individuals can't directly test reality, which is often the case with politics, they accept social opinion as evidence of reality, particularly when others are perceived to be similar in at least one relevant aspect (Price & Allen, 1990; Salmon & Kline, 1983). Therefore, disagreement with relevant others creates more uncertainty than disagreement with irrelevant others, because individuals are more likely to take relevant opinion as evidence of reality (Price & Allen, 1990; Salmon & Kline, 1983). By extension, relevant disagreement has a bigger influence on their own choices and preferences, and these influences likely occur through the resolution of uncertainty produced *via* disagreement.

The second explanation involves reflexive self-concept generation. Opinions and identities are not fixed, but rather existing self- and social-identity schemas interact with information in the communication environment to produce new opinions and identities that are specifically tailored to the communication context at hand (Turner et al., 1987; Walsh, 2004; Zaller, 1992). Where information signifies that communication is relevant, individuals will more seriously engage in these reflexive processes.

Finally, these processes likely involve the fundamental attribution error (Kelley, 1977; Ross, 1977). Individuals are likely to think of similar others in terms of situational nuance, while they are more likely to think of dissimilar others in terms of their personal characteristics (Milgram & Van den Haag, 1978; Ross, 1977; Ross, Greene, & House, 1977). Social information provides people with which to "explain away" the differences between themselves

and others (Ross, 1977). But where these differences cannot be explained away due to conflicting affiliations or identities, uncertainty will be produced.

Some evidence exists that supports the idea that relevant disagreement produces uncertainty. For example, McGarty and colleagues (1993) performed an experiment that showed that disagreement produced uncertainty only under low information conditions. When subjects had more information about the group—information they used to "explain" the differences between themselves and the group—disagreement produced less uncertainty. Meanwhile, Abrams and colleagues (1990), in an extension of Asch's famous experiments (1956), showed that subjects conformed to an obviously wrong in-group position, but not to the out-group position. Walsh (2004) found that disagreement with an in-group prompts a reevaluation of in-group "fit" (see also, Turner et al., 1987). These processes are more likely to occur when groups have broad, multivalent bases of affiliation (Lichtermann, 1999), because overlapping layers of affiliation produce varying levels of perceived similarity and difference. Finally, the network studies in political science shows that disagreement only demobilizes individuals in the minority. This finding could be interpreted as evidence that people "write off" socially irrelevant opinion, that is, irrelevant disagreement does not produce the same kind of attitudinal ambivalence as relevant disagreement.

The implications of uncertainty. Individuals are motivated to reduce uncertainty when they experience it (Festinger, 1950; Hogg, 2000). To be sure, this tendency is greater among individuals with certain characteristics, such as the lack of openness to experience (McCrae, 1994). Motivations are oriented around some goal and are thought to be important psychological drivers of goal-oriented behavior (Nevid, 2012). Implicitly or explicitly, the role of motivations pervades the literatures on social influence and communication (e.g., Hogg, 2006; Katz, Blumler

& Gurevitch, 1974; Shah et al., 2001a; Shah et al., 2001b; Tajfel, 1982; Turner et al., 1987). And yet, scholars of motivations have found it difficult to separate motivations from behavior or other psychological processes (Ajzen, 1991; Ajzen & Fishbein, 1977). Despite these operational issues, motivations are still considered to be the primary drivers of uncertainty reduction (Hogg, 2000).

Individuals reduce uncertainty through a variety of strategies, including the modification of preferences and evaluations. This perspective reflects a cognitive-evaluative approach to preference formation and modification (Conover, 1988; Huckfeldt & Sprague, 1987; Mutz, 2006; Sotirovic & McLeod, 2001; Turner et al., 1987; Walsh, 2004), where the cognitive and evaluative aspects of preference change represent distinct but overlapping psychological processes. Whether from the political communication or social influence literature, these approaches typically emphasize cognitive elaboration, on one hand, and affective evaluation, on the other (Brewer & Brown, 1998; Cho et al., 2009; Conover, 1988; Eveland et al., 2003; Turner et al., 1987). Cognitive elaboration represents the process of fitting information within pre-existing mental schema so that it can be interpreted and understood within the framework of an individual's existing knowledge (Eveland et al., 2003; Mutz, 1998). Affective evaluation is the process of assessing how one "feels" about a particular social location or position implied by the integration of new information (Brewer & Brown, 1998; Conover, 1988). These processes work in a pull-and-tug relationship, as individuals seek to optimize both cognitive consistency and positive evaluation of social position (Conover, 1988).

Therefore, the process of reducing the uncertainty produced through relevant disagreement, individuals could change their pre-existing preferences and/or identities. At the

group level, therefore, understanding these responses to uncertainty could help to explain within- and between-group opinion processes.

Hypotheses: The effects of relevant political disagreement. Given the preponderance of evidence from multiple fields of study, it seems a rather straightforward prediction that exposure to political disagreement, in whatever form, will reduce certainty (and increase ambivalence) as compared to agreement. The hypothesis below is presented in two parts, each framed for a particular method. H1a is worded for a between-subjects experiment designed to test the effects of agreement on short-term certainty about political choice. H1b, meanwhile, is worded to reflect the survey portion of the study, designed to test the long-term relationship between exposure to political disagreement and ambivalence about political preferences.

H11a: Subjects exposed to political disagreement will be less certain than subjects exposed to political agreement.

H11b: Exposure to political disagreement will be positively related to ambivalence about political preferences.

Once again, the preponderance of evidence points toward the conclusion that relevant disagreement affects uncertainty (or ambivalence) more strongly than irrelevant disagreement. For analytical purposes, the hypotheses below therefore predict an *interaction* between exposure to political disagreement and perceived relevance.

H12: Disagreement and perceived relevance will interact to affect uncertainty (ambivalence), such that (a) the effects of disagreement will be stronger where it is perceived to be relevant and (b) weaker where it is not.

Chapter 3: Methods

Sample and Data

Data were collected between March 26 and March 29, 2015 using an online survey panel administered by a private company, Survey Sampling International (SSI). The sample was designed to reflect the population of adults (age 18+) in the United States. Importantly, the population includes both social media users and non-users. SSI used a three-stage sampling process. First, subjects were randomly selected from an online panel constructed with geographic and demographic parameters. Next, subjects were randomly presented with profiling questions. Finally, subjects were randomly directed to the study based on their likelihood to complete it.

The cleaned dataset contained 649 complete responses; approximately 30 responses were discarded due to excessive missing responses and/or failure to take an appropriate amount of time with experimental stimuli. The sample reflects the U.S. adult population in terms of social media use (76% in the current sample vs. 74% in a recent Pew sample; see Duggan, Ellison, Lampe, Lenhart, & Madden, 2015). The sample over-represents females (67% of the sample) as compared to males. However, it tracks closely with U.S. Census population demographics (see http://census.gov) for age (M = 46.49, SD = 16.90), education (35% bachelor's degree; average respondent [M = 3.87, SD = 1.65] has completed some college or associate's degree work), and income (average [M = 2.57, SD = 1.55] between $35,000 and $75,000 per year).

Additional information. The Educational and Social/Behavioral Science Internal Review Board at the University of Wisconsin-Madison approved the study on March 25, 2015. The approval letter and the final SSI invoice are included in Appendix 1. Table 1 at the end of this chapter provides descriptive statistics. See Appendix 2 for exact question wording and Appendix 3 for experimental stimulus materials.

General Study Design

The study combines survey, quasi-experimental, and experimental methods. The survey includes (a) general indicators of dependent, independent, covariate, and control variables typical of survey measures in political communication, (b) quasi-experimental name generators to measure disagreement and its covariates with specific others, and (c) two parallel, embedded experiments designed to manipulate disagreement and relevance.

Survey design. The general survey employs a repeated measures design to observe disagreement in various communicative contexts. All respondents answer successive questions about the general amount of disagreement they encounter on social media, in face-to-face settings, and in anonymous online settings.

Quasi-experimental design. The survey also includes name generators for social media and interpersonal talk, along with subsequent items measuring disagreement and its covariates with regard to specific others. Each respondent was asked for up to three names per medium. This portion of the survey can be characterized as quasi-experimental because the survey contains two "groups"—social media users and non-users—and thus social media use can be viewed as a "treatment" variable.

Experimental design. Finally, the survey included two embedded experiments that randomized exposure to different screenshots of Twitter containing tweets about the mandatory vaccination issue. Both experiments manipulate disagreement and informational relevance, but each manipulates a different dimension of informational relevance (cognitive vs. affective).

Survey Measures

Political disagreement. Based on recent recommendations (Klofstad et al., 2012), this study includes both general measures and name generator measures of *political disagreement*.

This section describes the general measures only (for information about the name generators, see Quasi-Experimental Measures: Political disagreement). Respondents completed nine questionnaire items—three for each medium (social media, face-to-face, unknown others online)—about the frequency with which they encounter disagreement about (a) politics or elections, (b) news or current events, and (c) public or community issues (0 = "Never" and 5 = "Frequently"). The final measure took the pairwise individual means. If respondents indicated that they did not use social media (see below: Social media use), their social media disagreement score was set to zero. Likewise, if they did not talk politics face-to-face (see below: Face-to-face political talk), their face-to-face score was set to zero. A combined variable was created for matching by averaging the scores pairwise. See Figure 1 for distributions.

Ambivalence. To construct a generalized measure of uncertainty, that is, *ambivalence* (see, e.g., Mutz, 2006), respondents responded to four statements about certainty and confidence about political opinions. Two items asked about (a) certainty and (b) confidence when faced with (1) an expert or (2) a close friend (0 = "Strongly Disagree" and 4 = "Strongly Agree"). These two dimensions—expertise and closeness—are highly correlated (r = .59) and were combined by row means (see Figure 2).

Social media use. *Social media use* was measured with four items that asked respondents to first indicate how many days per week they used (a) Facebook and (b) Twitter, and to then indicate how many times per day (0 = "Never" and 6 = "More than several times a day") they check (a) Facebook and (b) Twitter. Within-medium correlations for these items were strong (r = .91 for both Facebook and Twitter). Therefore, the items were multiplied within media before the

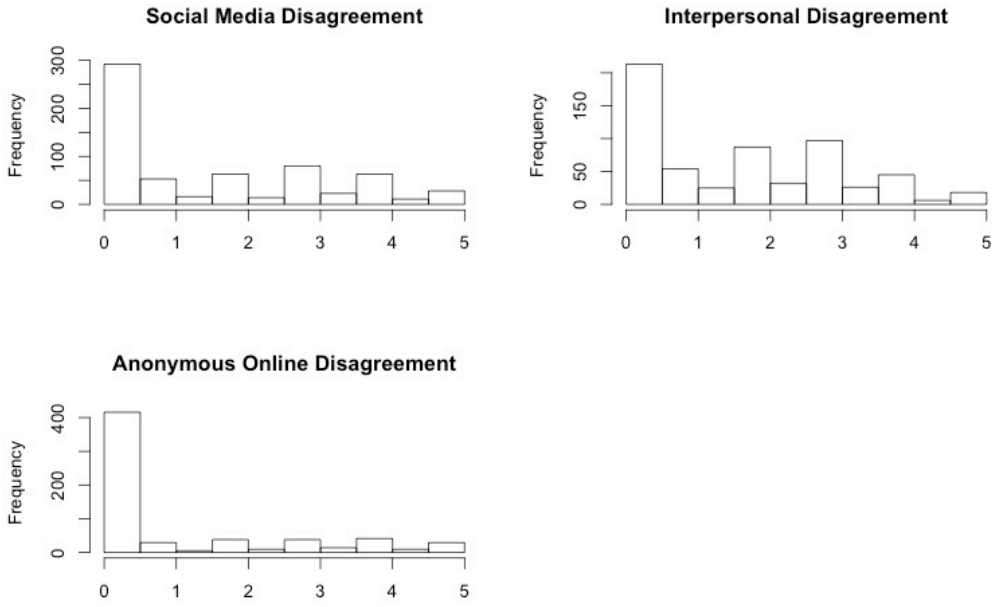

Figure 1. Sample distributions of general survey measures of political disagreement in social media, face-to-face (interpersonal), and anonymous online settings.

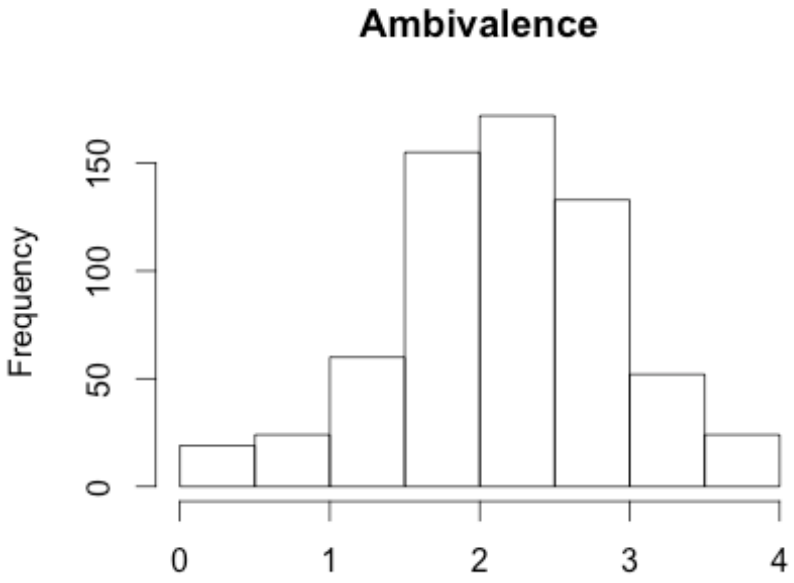

Figure 2. Sample distribution of general survey measure of ambivalence.

products were averaged across media. A grouping variable was also created (1 = social media user) for use in repeated measures and matching analyses.

Social media news use. *Social media news use* was measured with four items—two apiece for Facebook and Twitter, respectively—asking (a) how many days in the last week respondents read news or political commentary and (b) how much attention they paid when they did (0 = "Not at all" and 5 = "A great deal"). This approach is based on the recommendations of Eveland, Hutchens, and Shen (2009) to combine dimensions of news use (i.e., exposure and attention) within specific media. Reception of these items was filtered based on social media use. For example, respondents who indicated they do not use Twitter did not receive any subsequent items asking about Twitter. Respondents who do not use social media (about 24%) skipped these items entirely. The items exhibited moderately strong inter-medium correlations (for Facebook, r = .50 and for Twitter, r = .73). The items were multiplied within media and then averaged across media.

Social media news network size. Respondents were asked how many (a) family members, (b) friends, (c) coworkers or classmates, and (d) other acquaintances post news or political commentary on (1) Facebook and/or (2) Twitter. The same filtering strategy was used as described for social media news use. To calculate *social media news network size*, scores were added within media and then averaged. A ceiling of 200 was imposed to reduce variable skew.

Social media news network diversity. A *social media news network diversity* variable was created based on the social media news network size variable. First, the proportion within each social tie category out of the total network was calculated. From an ecological perspective, perfect diversity would mean that the categorical proportions are equal, that is, they would all be .25. But from a socio-structural perspective, diversity refers to the prevalence of certain types of

social ties over others (e.g., Fischer, 1982; Granovetter, 1973). Hence, the best measure is one that captures a weighted deviation from ecological equality (i.e., from .25). Therefore, each category's deviation from .25 was calculated and assigned the following weights: family members = *-1, friends = *-.5, coworkers or classmates = *1, other acquaintances = *1. The measure thus considers coworkers, classmates, and acquaintances to be more diverse, and it considers friends and family to be less so.

Social media political talk. *Social media political talk* was measured using 16 questionnaire items about the (a) number of people (*Max* = 200) and (b) frequency (0 = "Never" and 4 = "Very often") with which they discuss politics on social media with (1) family members, (2) friends, (3) coworkers or classmates, and (4) other acquaintances on (i) Facebook and (ii) Twitter. Network size (a) and talk frequency (b) were multiplied within social tie categories within media (for Facebook, $.17 < r < .26$ and for Twitter, $.24 < r < .44$), then averaged pairwise across media ($.34 < r < .88$), and then finally averaged pairwise across social tie categories ($.38 < r < .76$).

Face-to-face political talk. The *interpersonal political talk* item mimicked the method used for social media political talk, with the exception that it only includes one medium (by definition) and therefore uses eight items instead of 16. Once again, network size and frequency were multiplied within social tie categories ($.16 < r < .35$). These scores were then averaged pairwise ($.21 < r < .51$). A grouping variable was created (1 = Talker, 0 = Non-talker) for repeated measures analyses.

Email political talk. *Email political talk* was measured with a single questionnaire item asking respondents how often they sent or received emails about politics in the last six months (0 = "Never" and 4 = "Very often").

Online news use. To measure *online news use*, the survey asked respondents how many days in the last week they watched, read, or listened to news online, not including news they saw on social media. Respondents who answered more than zero were asked how much attention they paid to that news (0 = "Not at all" and 5 = "A great deal"). These items were multiplied to obtain the final measure. These measures are based on the recommendations of Eveland et al. (2009).

Offline news use. A method similar to that used for online news use was used to measure (a) television news use and (b) newspaper news use. Items were multiplied within media (for television, $r = .60$ and for newspapers, $r = .53$) and then averaged to obtain the final measure.

Political orientations. *Political interest* was measured with two questionnaire items asking respondents how interested they are in local or regional politics and national politics (0 = "Not at all" and 5 = "Very"). Based on the Colombia surveys (e.g., Barnidge & Rojas, 2014), these items were averaged. *Political knowledge* was measured with four items designed to tap different dimensions of political knowledge (Delli Carpini & Keeter, 1996). Scores were coded as either right (1) or wrong (0; category includes "Don't know" answers) and added together. *Strength of political ideology* also mirrored the Columbia surveys, asking respondents to place themselves on an 11-point scale where 0 = Liberal and 10 = Conservative. This item was recoded with zero at the midpoint. The absolute value was then taken as the final measure. Finally, *internal political efficacy* was measured with two items taken from the classic political science scale (Niemi et al., 1991). These two items were highly correlated ($r = .78$) and therefore averaged.

Demographics. Analyses also controlled for sex (1 = female), age, education (0 = "None" and 7 = "Post-graduate degree"), and annual household income (0 = less than $15,000 and 6 = $150,000 or more).

Quasi-Experimental Measures

Political disagreement. Respondents were asked to name the three people in their social media networks who post the most about politics. They were also asked to name the three people they talk to the most about politics in face-to-face settings. If they provided a name—or initials—to a given question, they were asked a series of follow-up questions about the individual they named. Generally, this method is based on Mutz' (2006) now-common name generator measurement strategy. *Political disagreement* was measured with three items per name asking respondents about the named individual's political views in comparison to their own (0 = Agreement and 4 = Disagreement). Separate variables were created for social media and face-to-face responses by averaging responses for each name (three items each; Cronbach's α ranges from .94 to .95 for social media items and from .92 to .93 for interpersonal items), then using available information to average across responses and within media (r ranges from .15 to .20 for social media items and from .19 to .28 for interpersonal items). The variables include repeat names. A combined variable used in the matching analysis was constructed by averaging the resulting scores pairwise (r = .16). See Figure 3 for distributions.

Perceived relevance. *Perceived relevance* was measured with three items per name asking whether respondents think the individual's posts or views are relevant, important, or useful for their own views (0 = "Not at all" and 5 = "Very"). These measures are adapted from Pinkleton and Murrow (1999). Media-specific and combined variables were created using the same strategy as with *political disagreement*. Items were first combined within names

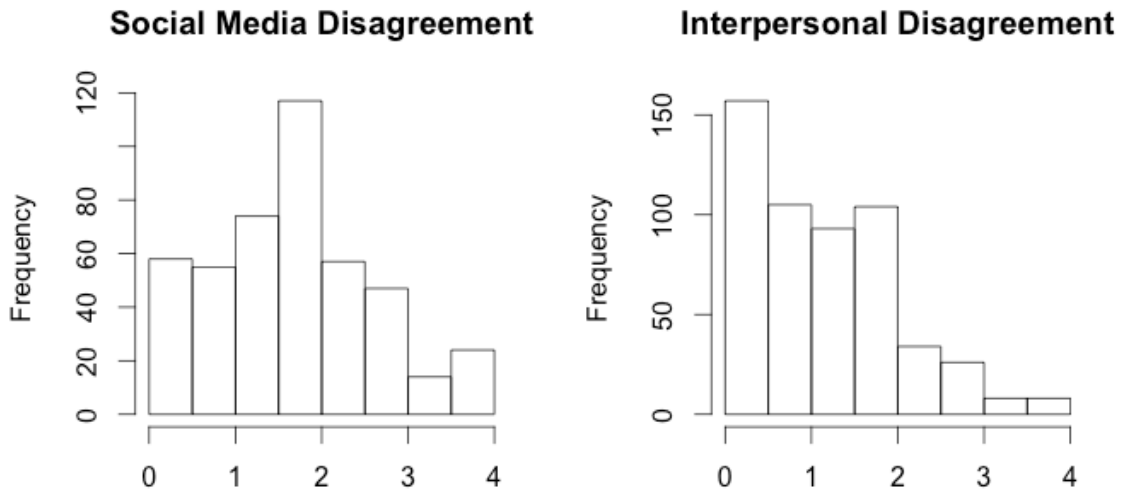

Figure 3. Sample distributions of quasi-experimental measures of political disagreement in social media and face-to-face (interpersonal) settings.

(Cronbach's α ranges from .91 to .96 for social media items and from .93 to .97 for face-to-face items), then within media (r ranges from .40 to .47 for social media and .33 to .39 for face-to-face), and finally across media for the combined variable (r = .43). See Figure 4 for distributions.

Relevant disagreement. To create a single *relevant disagreement* variable, the political disagreement and perceived relevance variables (r = -.52 for social media and r = -.35 for face-to-face) were multiplied without centering. Thus, high values indicate relevant disagreement, moderate values indicate either relevant agreement or irrelevant disagreement, and low values indicate relevant agreement. A combined variable was also created (r = .48). See Figure 5 for distributions.

Evaluation. *Evaluation* of named individuals was measured with four items per name (within name Cronbach's α ranges from .87 to .90 for social media and from .86 to .90 for

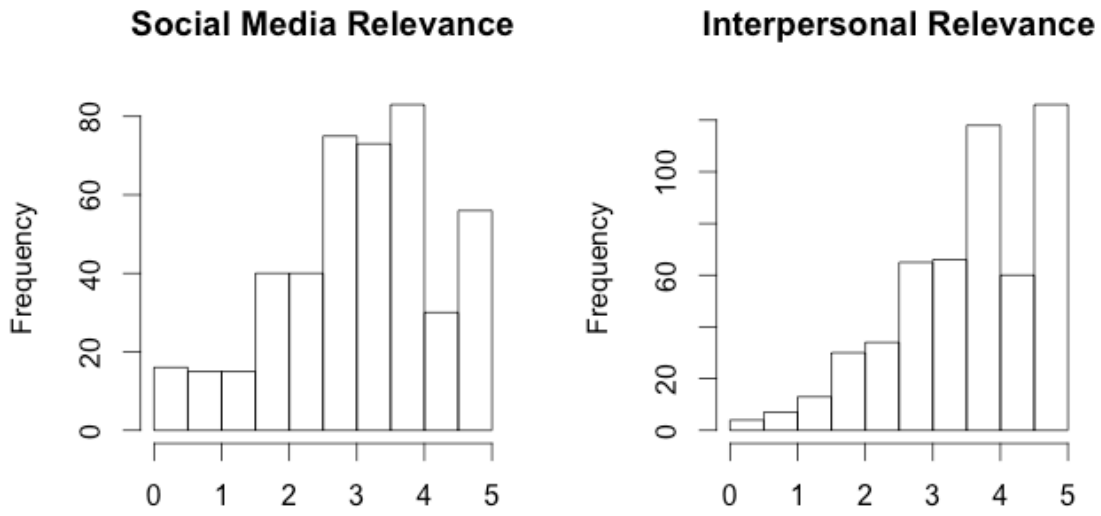

Figure 4. Sample distributions for quasi-experimental measures of perceived relevance in social media and face-to-face (interpersonal) settings.

interpersonal). Respondents were asked how much they have in common with named individuals, how similar they are, how much they like the individuals, and whether they would like working with them on a project (0 = Negative and 6 = Positive). Initially, the strategy was to measure two different concepts: perceived similarity (two items per name) and liking (two items per name). These items are based on validated scales commonly used in psychology (e.g., Kandel, 1978), and they are highly correlated within media in these data (r = .76 for social media and r = .78 for face-to-face) and were therefore combined within media (Cronbach's α = .80 for social media and Cronbach's α = .69 for face-to-face). Inter-medium correlations across names (.68 < r < .81) are strong. Variable construction followed a similar pattern as above. These items

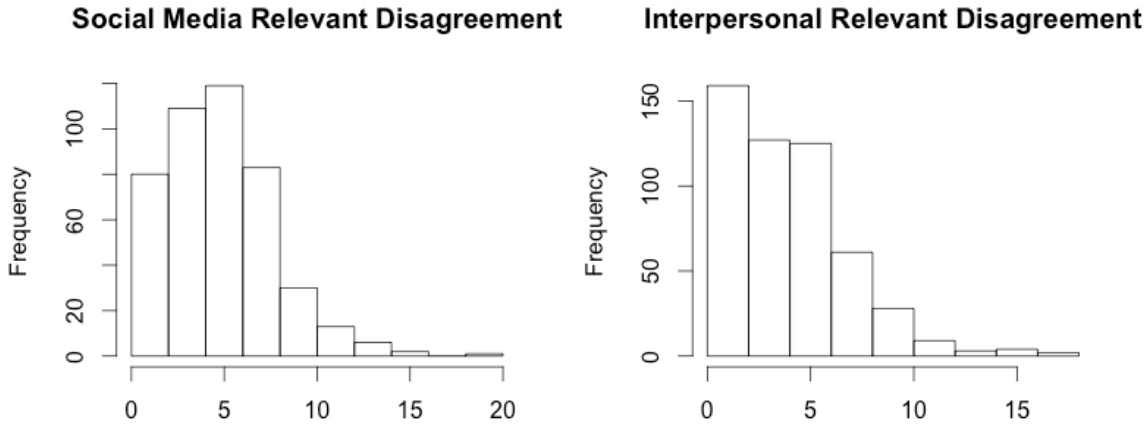

Figure 5. Sample distributions for quasi-experimental measures of relevant disagreement in social media and face-to-face (interpersonal) settings.

were averaged pairwise within media and across names and then averaged pairwise across media for use in the matching analysis.

Closeness. *Closeness* was measured with one item per name, which employs the IOS (Inclusion of the Other in the Self) closeness image scale (Aron, Aron, & Smollan, 1992). Respondents were shown seven sets of circles with varying degrees of overlap and selected the image they thought best represented their current relationship with the named individual. These items were averaged pairwise within media and across names and then averaged pairwise across media for use in the matching analysis.

Strong tie. *Strong tie* was measured with one item per name asking respondents to categorize the individual (family, friend, coworker or classmate, neighbor, other acquaintance, other). Family and friends were considered strong ties, and therefore coded one. All others were considered weak ties and therefore coded zero (see Granovetter, 1973; Raine & Wellmann,

2012). Scores were added within media across names. A combined variable was created by taking the average across media.

Correlations. Within media, political disagreement displays moderate and negative correlations with perceived relevance (r = -.53 for social media and r = -.35 for interpersonal), as well as with the covariates (-.34 < r < -.15 for social media and -.36 < r < -.03 for face-to-face). The covariates are positively related to one another (.27 < r < .57 for social media and .04 < r < .44 for face-to-face). Generally, the strong tie variable displays the weakest correlations among the covariates.

Experimental Design

Subjects participated in one of two randomized experiments embedded in the survey. Both experiments relied on 2 x 2 (agreement x informational relevance) pre-test/post-test full-factorial designs. These experiments are loosely based on previous work by McGarty and colleagues (McGarty et al., 1993), who manipulated agreement and available information about it (high vs. low information conditions) and examined the effects of these factors on uncertainty. Similarly, the current experiments manipulate relevance by varying available information about message authors.

Both experiments manipulated the agreement factor, which had two levels (agreement & disagreement), in the same way. But each experiment manipulated informational relevance, which also had two levels (relevant & irrelevant), along different dimensions—expertise for the first and closeness for the second. Thus, the first experiment was designed to tap the cognitive dimensions of informational relevance, while the second was intended to tap the affective dimensions. Both experiments focus on the issue of mandatory childhood vaccination, which was chosen because (a) the uncertainty surrounding popular interpretation of scientific results

regarding the safety and effectiveness of vaccinations and (b) opinion on the issue doesn't sort cleanly according to political ideology or political party affiliation. Thus, the vaccination issue involves some uncertainty and political identity-based heuristics cannot be used to resolve it.

Experimental Procedure

Subjects were first exposed to a prompt that described the mandatory childhood vaccination issue. The prompt started by framing the issue, which were derived from recent questionnaire wording in polls by major reputable organizations ("all children should be required" vs. "parents should be able to decide"; see, e.g., Anderson, 2015; CNN/ORC International, 2015). The prompt went on to inform participants that 17 states (unnamed) have recently passed exemptions to public school vaccination requirements based on philosophical objections to vaccination, and, in reaction to this trend, that six states (named) have tightened public school requirements. Neither statement is true. The six states (Montana, Iowa, Kentucky, Massachusetts, Nebraska, and Oregon) were chosen (a) because they represent different geographical regions of the United States and (b) they provide some political balanced so that subjects could detect no partisan trend based on the states involved (e.g., Montana is Republican-leaning and Massachusetts is Democrat-leaning). At the end of the prompt, subjects were told that two of the six states are holding public referenda on the issue in the near future.

After reading the prompt, subjects completed a short pre-test that measured their pre-existing attitudes on the mandatory vaccination issue. After the pre-test, subjects were randomly assigned to one of four experimental conditions in one of two experiments: (1) pro-vaccination message, relevant information ($n_1 = 78$ and $n_2 = 81$); (2) pro-vaccination message, irrelevant information ($n_1 = 84$ and $n_2 = 82$); (3) anti-vaccination message, relevant information ($n_1 = 81$ and $n_2 = 82$); and (4) anti-vaccination message, irrelevant information ($n_1 = 88$ and $n_2 = 73$).

Note that in order to create agreement/disagreement conditions, the pro-/anti-vaccination message groups were sorted according to subjects' pre-existing attitudes (see below for details about factors).

Subjects were then exposed to one of eight screenshots of Twitter (four in each experiment) that correspond with the experimental conditions described above. After exposure to the screenshots, subjects completed a post-test questionnaire. The post-test presented them with a hypothetical referendum on the mandatory vaccination issue and then asked them how they would vote in the referendum ("Yes," for mandatory childhood vaccines, vs. "No"). After making a decision, subjects were asked to rate the confidence they had in their decision. Subjects also answered questions about perceived relevance, interpersonal evaluations, and issue involvement. After completing the post-test, subjects went on to complete the remainder of the survey. They were debriefed at the end of the study, at which point they were informed about the fictitious aspects of the experiment.

Experimental Materials

Experimental scripts and stimulus materials can be found in Appendix 3. In both experiments, subjects were exposed to one of four screenshots of a Twitter profile preview for a fictitious Twitter user. The top tweet in the preview was about the mandatory childhood vaccination issue. These screenshots were created on Twitter using a fictitious account to maximize the realism of the stimulus. Elements of the screenshot were edited in Adobe Photoshop afterwards. All of the screenshots included a fictitious hashtag to incorporate this popular element of Twitter into the stimuli. A second tweet about an unrelated topic (mobile phone technology) was also included in the screenshot to maximize its realism.

In the first experiment, the author's photo, location (Baltimore, MD), and website are visible in the screenshot. The number of tweets, follows, and followers were made larger in order to maximize the author's reach and credibility. These supplemental elements were held constant across conditions in the first experiment. Pro- and anti-vaccination messages were manipulated via the content of the tweets, which focused on the "danger to other children" that unvaccinated children pose and reiterated the pro- or anti-vaccination frame. Pro-vaccination messages claimed that there is evidence of danger and reiterated the pro-vaccination frame ("all children should be required"). Anti-vaccination messages claimed that there is no evidence of danger and reiterated the primary anti-vaccination frame ("parents should decide"). Finally, informational relevance—in this case, along the expertise dimension—was manipulated via the author's biographical information. In the expert conditions, the author is said to be a "Biomedical researcher at Johns Hopkins Hospital." In the non-expert condition, the author is said to be a "Marketing associate at Jos. A. Bank Clothiers." Both companies are located in Baltimore, MD.

The second experiment used the same manipulation of pro- and anti-vaccination messages. However, it manipulated informational relevance—in this case, along the closeness dimension—quite differently. Subjects were asked to imagine that the tweet was written by their "best friend" or "a co-worker or classmate." In order to manipulate closeness in such a way, it was necessary to redact the identifying information from the screenshots, including the photo, bio, location, website, and user metrics. Thus, experiment two differs from experiment one not just in the manipulation of informational relevance, but also in the presentation of supplemental author information.

Experimental Pre-test Measures

Pre-existing attitude. Two items measured *pre-existing attitude* in the pre-test. Subjects were asked whether vaccination should be required for all children and whether unvaccinated children should be allowed to attend public school (0 = Anti-vaccination and 5 = Pro-vaccination). These items were averaged (r = .59), and the final variable was used to create the agreement factor (M = 3.66, SD = 1.55). The wording of these questions is based on recent polls by organizations including Pew Research Center (see, e.g., Anderson, 2015) and CNN (CNN/ORC International, 2015).

Experimental Factors and Manipulation Checks

Agreement. To create the *agreement* factor, the pre-existing vaccination attitude was first dichotomized by the scale midpoint (2.50). Cases at the midpoint or above were assigned a score of 1 (i.e., pro-vaccination) and cases below received 0 (i.e., anti-vaccination). If scores matched the stimulus message valence, subjects were assigned to the agreement conditions (n_1 = 148 and n_2 = 166). If scores did not match message valence, they were assigned to the disagreement conditions (n_1 = 183 and n_2 = 151). This manipulation of agreement and disagreement was adapted from McGarty et al. (1993).

Contextual information. Subjects were randomly assigned to *contextual information* conditions, which provided relative balanced in terms of group sample sizes (for relevant information conditions: n_1 = 159 and n_2 = 163 and for irrelevant information conditions n_1 = 172 and n_2 = 155). Once again, this manipulation was adapted from McGarty et al. (1993).

Manipulation check items. Subjects in both experiments were asked whether the viewpoint expressed in the tweet was pro-vaccination, anti-vaccination, or neutral. Subjects in the first experiment were also asked whether the author was an expert, had some expertise, or

had no expertise. Meanwhile, subjects in the second experiment responded to an IOS closeness image item (Aron et al., 1992); see Quasi-Experimental Measures: Closeness). All items were measured or recoded to be on two-point scales.

Manipulation check results. Subjects scored well above the scale midpoint on three of the four manipulation check items (for experiment 1: message valence, $M = 1.73$, $SD = .56$; for experiment 2: message valence, $M = 1.71$, $SD = .60$; for experiment 1: expertise, $M = 1.44$, $SD = .66$). The exception is experiment 2: closeness, on which subjects scored close to the midpoint ($M = 1.06$, $SD = .82$).

Independent samples *t*-tests were also performed to check for significant differences across the agreement and information factors. No significant differences were found for message valence (for experiment 1: $t\ (325.26) = -1.46$, $p = .14$; for experiment 2: $t\ (296.61) = -1.21$, $p = .23$) or for informational relevance (for experiment 1: $t\ (326.97) = 1.46$, $p = .15$; for experiment 2: $t\ (315.58) = 1.88$, $p = .06$.

Experimental Post-test Measures

Referendum choice. Subjects were asked to imagine that their state was holding a referendum that would require all children, except those with medical exemptions, to be vaccinated in order to attend public schools. Subjects were then asked how they would vote in such a referendum (1 = "Yes" and 0 = "No").

Certainty. *Certainty* was measured by next asking subjects (a) how confident they were in their decision (0 = "Not at all confident" and 100 = "Completely confident") and (b) how strongly they feel about their decision. The measurement strategy is based on McGarty et al. (1993). The items were averaged to create the final variable. See Figure 6 for distributions.

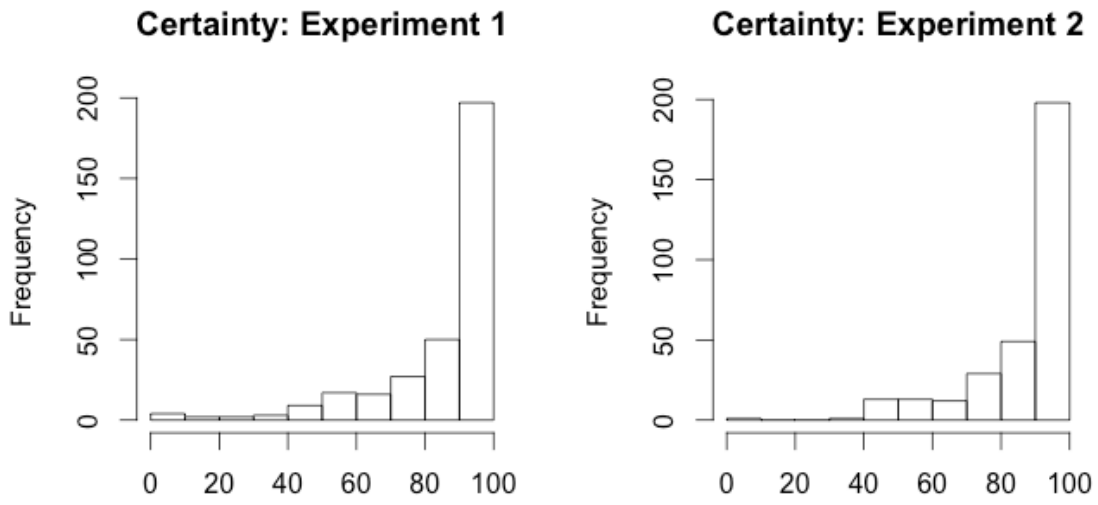

Figure 6. Sample distributions for experimental measures of certainty.

Perceived relevance. *Perceived relevance* was measured in an identical manner as described in the quasi-experimental measures section. See Figure 7 for distributions.

Evaluation. *Evaluation* was measured in an identical manner as described in the quasi-experimental measures section, with the exception that it only uses one of the two items for the perceived similarity dimension (see Appendix 2). This decision was made in an effort to reduce the length of the experiment.

Issue importance. *Issue importance* was measured with a single questionnaire item asking how important the mandatory childhood vaccination issue is to them, personally (0 = "Not at all" and 6 = "Very").

Analysis

Data were first cleaned and then entered into R, where the variables were constructed and data were preprocessed for analysis, which unfolds in three stages.

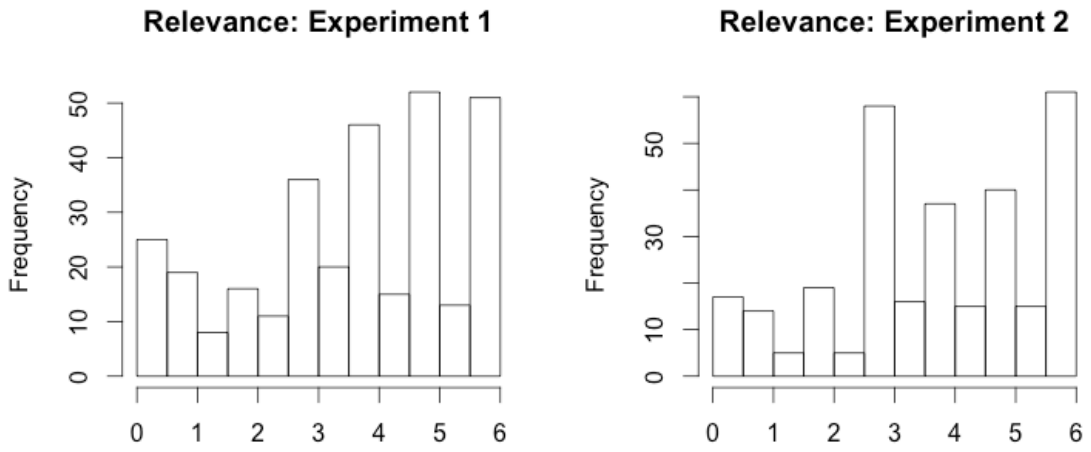

Figure 3.7. Sample distributions for experimental measures of perceived relevance.

Exposure. The first stage of the analyses examines exposure to political disagreement. First, repeated measures analyses are performed for both the name generators and general indicators of political disagreement using mixed effects linear modeling with the R package, "lme4," to examine H1a (Bates et al., 2015). Next, a nearest-neighbors matching technique, which uses the R package "MatchIt" (Ho, Imai, King, & Stuart, 2007) is combined with ordinary least squares (OLS) regression to estimate the "treatment" effect of social media use on political disagreement (name generators and general indicators). These analyses address H1b. Finally, OLS regression is used to assess H2a-c, and a final model is submitted to a three-fold cross-validation (see, e.g., Colleoni, Rozza, & Arvidsson, 2014). All relationships of interest are visualized with the R package "visreg" (Breheny & Burchett, 2013).

Experience. The second stage of the analysis examines the experience of disagreement, that is, the relationship between disagreement and perceived relevance. Using ANCOVA with the experimental data, the analysis first establishes the relationship between exposure to political disagreement and perceived relevance. Next, the informational relevance factor is added, along

with the factorial interaction term, to examine whether information that accompanies agreement/disagreement affects perceived relevance. The analysis then turns to the examination of the process of attributing relevance and the moderating role of interpersonal evaluations. The analyses examine these relationships using OLS regression and the PROCESS macro for SPSS (Hayes, 2013). Finally, the repeated measures (using "lme4") and matching analyses (with "MatchIt") are repeated with the combined relevant disagreement outcome (name generators) to determine who is exposed to more political disagreement and where. Once again, "visreg" is used to visualize key relationships.

Effects. ANCOVA is used on the experimental data to assess the effects of relevant disagreement on decision certainty. Interactions are submitted to Holm post-hoc tests with the R package "phia" (De Rosario-Martínez, 2015). Finally, OLS regression is used to assess the relationship between political disagreement and ambivalence in the general survey data.

Table 1

Descriptive Statistics for Variables in Analyses

Variable	Items	α or *r*	*M*	*SD*	*Min*	*Max*	*NA*
Survey Outcome							
Ambivalence	4	α = .68	2.25	0.76	0	4	10
Political Disagreement:							
Social Media	3	α = .93	1.53	1.64	0	5	19
Interpersonal	3	α = .91	1.68	1.47	0	5	64
Anonymous Online	3	α = .96	1.07	1.61	0	5	63
Survey Explanatory							
Social Media Use	4	see text	12.11	10.97	0	42	0
Survey Intervening							
Social Media News Use	4	see text	7.92	10.00	0	35	150
Social Media Network Size	8	index	23.91	32.15	0	200	319
Social Media Network Diversity	8	index	0.28	0.23	-0.12	0.88	342
Social Media Political Talk	16	see text	19.40	56.13	0	550	147
Survey Control							
Offline News Use	4	see text	11.69	9.75	0	35	7
Online News Use	2	*r* = .44	9.98	11.23	0	35	17
Interpersonal Political Talk	8	see text	16.51	31.74	0	360	10
Email Political Talk	1	--	0.92	1.04	0	4	3
Internal Political Efficacy	2	*r* = .78	2.03	1.09	0	4	9
Political Knowledge	4	index	2.16	1.17	0	4	6
Political Interest	3	*r* = .78	2.92	1.48	0	5	6
Political Ideology (absolute)	1	--	2.05	1.80	0	5	6
Quasi-Experimental Outcome							
Perceived Relevance							
Social Media	9	see text	3.11	1.20	0	5	206
Interpersonal	9	see text	3.62	1.08	0	5	126
Political Disagreement							
Social Media	9	see text	1.72	0.98	0	4	203
Interpersonal	9	see text	1.16	0.93	0	4	114
Relevant Disagreement							
Social Media	2	*r* = -.52	4.76	2.99	0	18.89	206
Interpersonal	2	*r* = -.39	3.90	3.15	0	17.78	131

Table 1, continued

Descriptive Statistics for Variables in Survey and Quasi-Experimental Analyses

Variable	Items	α or r	*M*	*SD*	*Min*	*Max*	*NA*
Quasi-Experimental Covariate, continued							
Positive Evaluation							
Social Media	12	α = .80	3.87	1.18	0	6	226
Interpersonal	12	α = .69	4.60	1.17	0	6	187
Closeness							
Social Media	3	α = .59	2.55	1.72	0	6	203
Interpersonal	3	α = .51	3.93	1.66	0	6	111
Strong Tie							
Social Media	3	index	1.57	1.00	0	3	203
Interpersonal	3	index	1.80	0.92	0	3	112
Experimental Outcome							
Certainty							
Experiment 1	2	r = .92	86.17	18.95	0	100	2[#]
Experiment 2	2	r = .83	88.19	15.70	0	100	4[#]
Perceived Relevance							
Experiment 1	3	α = .90	3.61	1.79	0	6	19[#]
Experiment 2	3	α = .88	3.78	1.71	0	6	16[#]
Experimental Covariate and Intervening							
Referendum Choice							
Experiment 1	1	--	0.81	0.39	0	1	0[#]
Experiment 2	1	--	0.87	0.33	0	1	2[#]
Positive Evaluation							
Experiment 1	3	α = .88	2.55	1.50	0	6	6[#]
Experiment 2	3	α = .88	3.31	1.59	0	6	4[#]
Issue Importance							
Experiment 1	1	--	3.58	1.44	0	5	3[#]
Experiment 2	1	--	3.58	1.49	0	5	4[#]

Notes. See Appendix 2 for question wording. See text for description of variable construction.
[#]NA within experimental subset (n_1 = 331 and n_2 = 318). Study N = 649.

Chapter 4: Results

Exposure to Political Disagreement

The statistical analysis starts with empirical tests of H1-H3, which made predictions about exposure to political disagreement on social media.

Repeated measures analyses. The first set of hypotheses (H1a & H1b) posits that people will be exposed to more disagreement on social media than elsewhere. Thus, the hypotheses make predictions about *where* political disagreement occurs. To test this prediction, repeated-measures analyses were conducted with both the name generator items (which has two categories within individuals: social media and face-to-face) and the general disagreement indicators (three categories: social media, face-to-face, anonymous online) using a hierarchical linear modeling (HLM) technique that treats individual respondents as a second-level variable with a random intercept while assessing mean levels of disagreement in each medium at the first level. The results are presented in Tables 2 (name generators) and 3 (general indicators). All continuous covariates have been mean-centered, so that the intercept is interpretable as the mean of political disagreement in the reference category (social media), adjusted at the mean of all other variables. The lone exception to this rule is the sex variable (1 = female), which was not mean centered. Thus, results are reported among males (where sex = 0; note that the coefficient is not statistically significant in either model, nor does sex interact with other variables in the models). Importantly, these two models include only social media users.

At the level of individual respondents, both models show relatively low levels of variation within respondents, indicated by the fact that the residual variance (i.e., variance not explained by the within-subjects term) is larger than the within-subjects variance in both models. For the name generators, the within-subjects variance is .10 (vs. residual variance of .66); for the

Table 2

Estimated Differences in Political Disagreement among Social Media Users across Media (Name Generators)

Variable	*B (Var.)*	*SE (SD)*
Fixed Effects: Mean Differences		
Intercept (Social Media)	1.69*	.05
Medium (Face-to-Face)	-.51*	.06
Fixed Effects: Covariates		
Evaluation: Social Media	-.17*	.05
Evaluation: Face-to-Face	-.01	.05
Closeness: Social Media	-.02	.03
Closeness: Face-to-Face	-.09*	.03
Strong Tie: Social Media	.00	.04
Strong Tie: Face-to-Face	.02	.04
Social Media Use	.00	.00
Online News Use	.00	.00
Offline News Use	.00	.00
Email Political Talk	.07	.04
Face-to-Face Political Talk	.00	.00
Political Efficacy	-.03	.05
Political Knowledge	-.06	.04
Political Interest	-.01	.04
Conservative Ideology	-.01	.01
Sex (1 = Female)	.01	.08
Age	.00	.00
Education	.00	.03
Income	.00	.03
Random Effects		
Intercept (Subject)	(.10)	(.32)
Residual	(.66)	(.81)
Log Likelihood	-852.40	

Notes. Cell entries are unstandardized beta coefficients (*B)*, standard errors (SE), variances (*Var.*), and standard deviations (*SD*) estimated by maximum likelihood (ML) from a mixed effects linear model with a repeated measures (within-subjects) design predicting political disagreement (name generators). $n = 334$, observations = 666. The reference group for the medium variable is social media. Covariates are mean-centered. *$p < .05$ (two-tailed tests).

Table 3

Estimated Differences in Political Disagreement among Social Media Users across Media (General Indicators)

Variable	*B (Var.)*	*SE (SD)*
Fixed Effects: Mean Differences		
Intercept (Social Media)	2.31*	.13
Medium (Face-to-Face)	-.45*	.02
Medium (Anonymous Online)	-.91*	.12
Fixed Effects: Covariates		
Evaluation: Social Media	-.16	.09
Evaluation: Face-to-Face	.31*	.10
Closeness: Social Media	.06	.06
Closeness: Face-to-Face	-.11	.06
Strong Tie: Social Media	.14	.08
Strong Tie: Face-to-Face	.03	.08
Social Media Use	-.02*	.01
Online News Use	.01	.01
Offline News Use	-.01	.01
Email Political Talk	.00	.00
Face-to-Face Political Talk	.43	.07
Political Efficacy	.11	.09
Political Knowledge	-.09	.06
Political Interest	.15	.07
Conservative Ideology	-.05*	.02
Sex (1 = Female)	-.01	.16
Age	.00	.00
Education	.06	.04
Income	.04	.05
Random Effects		
Intercept (Subject)	(.42)	(.65)
Residual	(1.43)	(1.20)
Log Likelihood	-1093.60	

Notes. Cell entries are unstandardized beta coefficients (*B)*, standard errors (SE), variances (*Var.*), and standard deviations (*SD*) estimated by maximum likelihood (ML) from a mixed effects linear model with a repeated measures (within-subjects) design predicting political disagreement (general indicators). $n = 228$, observations = 642. The reference group for the medium variable is social media. Covariates are mean-centered. *$p < .05$ (two-tailed tests).

general indicators, the within-subjects variance is .42 (vs. residual variance of 1.43). These figures yield relatively low intraclass correlation coefficients (ICC = .13, for the name generators; ICC = .23, for the general indicators).

Both models also show significant differences by medium. In Table 4.1, the fixed intercept term (the mean of the social media category) is 1.69 (SE = .05, p < .05), while the mean in the face-to-face discussion category is significantly lower at 1.18 (B = -.51, SE = .06, p < .05). This difference is illustrated in Figure 8.

Difference is also detected with the general indicators. Social media users (Intercept = 2.31, SE = .13, p < .05) are exposed to more political disagreement on social media than in interpersonal talk and anonymous online settings (face-to-face talk: B = -.45, SE = .24, p < .05; anonymous online: B = -.91, SE = .23, p < .05). These differences are also illustrated in Figure 8.

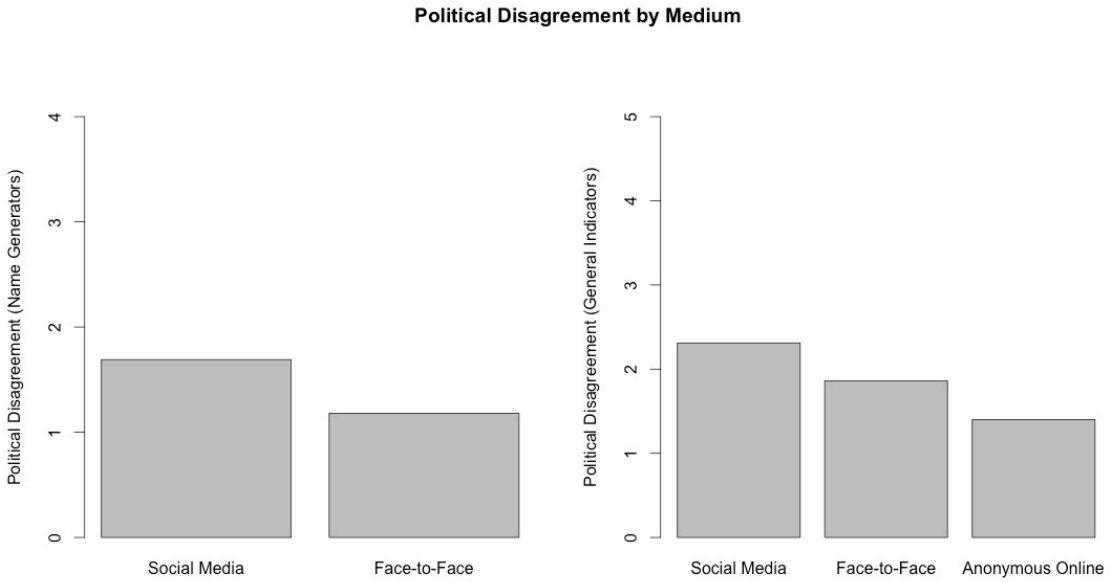

Figure 8. Adjusted means for exposure to political disagreement for the name generators (left) and general indicators (right) among social media users in social media and face-to-face settings, estimated from the models shown in Tables 2 and 3.

These results provide relatively strong support for H1a and H1b. Social media users are generally exposed to more political disagreement on social media than elsewhere.

Matching analyses. The second hypothesis predicts that social media users would be exposed to more political disagreement than non-users. However, a simple comparison of means between these two groups would introduce selection bias into the estimation process. Therefore, a matching procedure was used to develop comparable subsets of randomly selected individuals before estimating the "treatment" effect of social media use. Separate data frames were constructed for the name generators and general indicators (in the interest of using all available cases; the different sets of indicators have different patterns of missing data).

First, propensity scores were constructed using logistic (logit) regression to develop a good set of predictors of social media use (1 = user, 0 = non-user). The results of this model are shown in Table 4. Next, the nearest neighbor method was used to randomly match non-users to each user (and, thus, some users were necessarily excluded from the analysis). After several iterations, this procedure yielded improvement in balance across all variables, except for one in the name generators data frame (education) and two in the general indicators data frame (sex and education). Table 5 shows percent improvement in balance in both frames. With this information in hand, the "treatment" effect of social media use was estimated through a simple ANCOVA-by-regression (OLS) procedure. Covariates were mean-centered to ease the interpretation of the intercept (the mean for the non-users group at the mean of the covariates). Results, shown in Table 6, show that estimated means in the users group (1.30 in the name generators model [B = .41, SE = .10, $p < .05$] and 1.54 in the general indicators model [B = .97, SE = .13, $p < .05$]) are higher than the non-users group (.89 [SE = .07, $p < .05$] in the name generators model and .57 in the general indicators model [SE = .11, $p < .05$]). These means were re-estimated with

Table 4

Relationships between Matching Variables and Social Media Use

Variable	*B*	*SE*
Intercept	2.12*	.42
Sex (1 = Female)	.59*	.21
Age	-.03*	.01
Education	-.10#	.06
Conservative Ideology	-.07#	.04
Online News Use	.01	.01
Email Political Messaging	.78*	.13
Face-to-Face Political Talk	-.01#	.00
McFadden Pseudo R^2	.17*	

Notes. Cell entries are coefficients (*B*) and standard errors (*SE*) from a logistic regression (logit) model predicting social media use (1 = User, 0 = Non-User). $n = 606$. *$p < .05$, #$p < .10$ (two-tailed tests). Model estimates were used to construct propensity scores.

Table 5

Percent Improvement in Balance between Treatment and Control Groups after Matching

Variable	Name Generators	General Indicators
Distance	16.22	11.31
Sex (1 = Female)	33.47	-29.79
Age	24.69	10.05
Education	-70.49	-22.01
Conservative Ideology	10.46	47.04
Online News Use	19.34	35.35
Email Political Messaging	16.37	23.85
Face-to-Face Political Talk	96.70	46.42

Notes. Cell entries are the percent improvement in mean differences between matched treatment cases (i.e., social media users; $n_1 = 144$ and $n_2 = 145$) and control cases (i.e., non-users; $n_1 = 144$ and $n_2 = 145$). The nearest neighbor method was used to match cases. Five cases were discarded from each dataset because they were outside the support of the propensity distance measure, and approximately 200 treated cases (210 in the name generator set and 211 in the general indicator set) went unmatched because there were fewer control cases than treated. Treatment cases were randomly selected for matching.

Table 6

Estimated "Treatment" Effect of Social Media Use on Political Disagreement

	Name Generators		General Indicators	
Variable	*B*	*SE*	*B*	*SE*
"Treatment"				
Intercept ($M_{Non\text{-}Users}$)	.89*	.07	.57*	.11
Social Media Use	.41*	.10	.97*	.13
Covariate				
Evaluation	.04	.05	.20*	.07
Closeness	-.01	.04	-.03	.05
Strong Tie	.21	.06	.36*	.08
R^2	.15*		.26*	

Notes. Cell entries are unstandardized beta coefficients (*B*) and standard errors (*SE*) from ordinary least squares (OLS) regression analyses. Covariates are mean centered so that the intercept is interpretable as the mean of the non-users group, adjusted at the mean of the covariates. The coefficient for social media use is interpretable as the difference from the intercept, adjusted at the mean of the covariates. Data were matched based on propensity scores (nearest neighbor method) derived from estimates in Table 4. $n_1 = 288$ and $n_2 = 258$. *$p < .05$ (two-tailed test).

Table 7

Mean Differences in Political Disagreement between Social Media Users and Non-Users

	Name Generators		General Indicators	
"Treatment" Group	*M*	*SD*	*M*	*SD*
Social Media Users	1.30	.07	1.70	.08
Non-Users	.90	.07	.72	.08

Notes. Cell entries are bootstrapped adjusted means (*M*) and standard deviations (*SD*) based on the models shown in Table 6 (simulations = 1,000).

boostrapping techniques (1000 simulations); results are shown in Table 7 and illustrated in Figure 9.

These results strongly support H2. Social media users are generally exposed to more political disagreement than non-users in the matched samples.

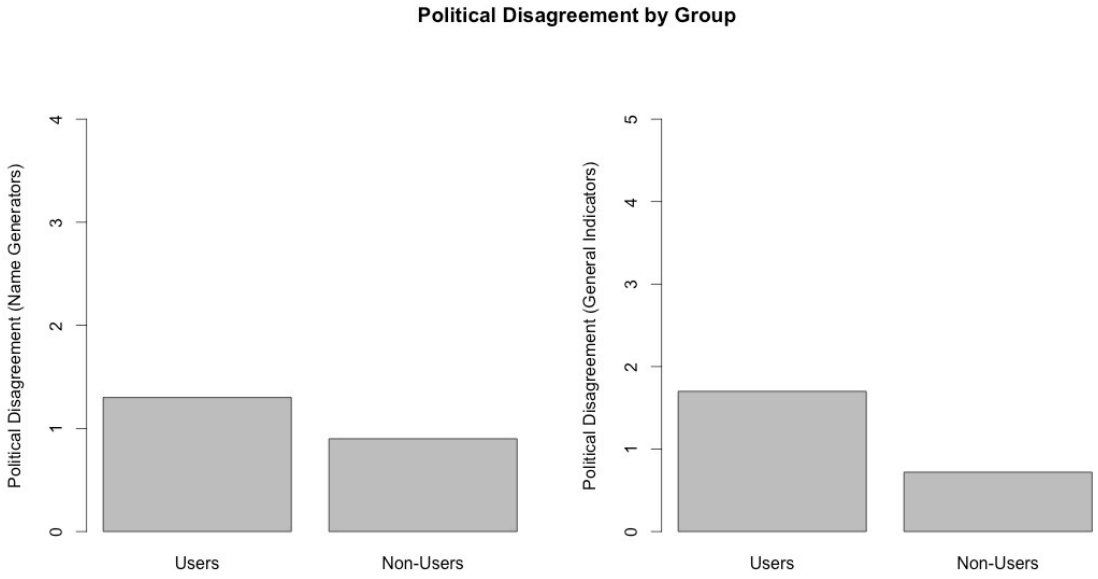

Figure 9. The estimated "treatment" effect of social media use on exposure to political disagreement for the name generators (left) and general indicators (right), estimated from the models shown in Table 7.

Analysis of mechanisms. If using news from diverse sources is the mechanism through which social media expose users to political disagreement, then one or more indicators of social media news use and networks should be positively related to political disagreement on social media. Tests were constructed with the general indicators of political disagreement. Results of these tests (OLS regression) are shown in Table 8. Of the three indicators—social

Table 8

The Relationship between News Use and Political Disagreement on Social Media (General Indicators)

Variable	*B*	*SE*	*β*
Intercept	1.30*	.31	--
Social Media News Use	**.03***	**.01**	**.17***
Social Media News Network Size	.00	.00	-.03
Social Media News Network Diversity	-.31	.30	-.04
Social Media Political Talk	.00	.00	-.03
Social Media Use	.00	.01	.01
Face-to-Face Political Disagreement	.35*	.05	.32*
Anonymous Online Political Disagreement	.44*	.05	.47*
Email Political Messaging	-.02	.08	-.01
Face-to-Face Political Talk	.00	.00	-.04
Online News Use	.00	.01	.01
Offline News Use	.01	.01	.05
Political Efficacy	-.08	.09	-.06
Political Knowledge	-.04	.06	-.03
Political Interest	.03	.07	.03
Conservative Ideology	-.04	.02	-.06
Sex (1 = Female)	.10	.15	.03
Age	-.01*	.00	-.14*
Education	.01	.05	.02
Income	-.03	.04	-.03
R^2		.50*	

Notes. Coefficients are unstandardized beta coefficients (*B*) with standard errors (*SE*), along with standardized beta coefficients (*β*), from ordinary least squares (OLS) regression model predicting political disagreement on social media. $n = 377$. *$p < .05$ (two-tailed test). A three-fold cross-validation shows that the model performs better with the social media news use variable (mean squared prediction error [MSPE] = 115.35) than without it (MSPE = 129.53). When either interpersonal political disagreement or anonymous online political disagreement is removed from the model, explained variance decreases while the coefficients for the primary variables of interest change little.

media news use, social media news network size, and social media news network diversity—only social media news use is significantly related ($B = .03$, $SE = .01$, $p < .05$). The model was subjected to a three-fold cross-validation comparing it to a null model (without the social media news use variable). The full model (mean squared prediction error [MSPE] = 115.35) performed

better than the null model (MSPE = 129.53). Because of the relatively high R^2 statistic (.50), models were also estimated without interpersonal and anonymous online disagreement (both of which were strongly related to social media disagreement). When either is removed, explained variance decreases while the coefficients of interest change little.

These results strongly support H3a, but not H3b and H3c. On social media, news use and political disagreement increase or decrease in tandem.

The Experience of Political Disagreement

In the next section, the analysis turns to the experience of political disagreement on social media, that is, the perceived relevance of opinion on social media.

Experimental tests: Agreement, contextual information, and perceived relevance. H4 suggests that disagreement and perceived relevance will be negatively related, and H5 suggests that contextual information will affect perceived relevance in a valence-consistent manner. H6 predicted an interaction between disagreement and contextual information. Finally, RQ1 asks whether these effects differ according to the salient dimension of relevance—cognitive versus affective.

To test these hypotheses, the analysis turns to the experimental data. Table 9 shows the results of an ANCOVA model estimating the effect of (dis) agreement on perceived relevance. The effect of agreement on perceived relevance was significant in both experiments (F (1, 299) = 69.65, $p < .05$, in Experiment 1 F (1, 293) = 81.43, $p < .05$ in Experiment 2, indicating a consistent, albeit small, influence of disagreement (η^2 = .01 and .04, respectively). Post-hoc comparisons, illustrated in Figure 10, show that subjects in the disagreement conditions scored lower than subjects in the agreement condition on perceived relevance in both experiments.

Table 9

Effects of Agreement on Perceived Relevance

	Experiment 1			Experiment 2		
Variable	F	df_1	Partial η^2	F	df_1	Partial η^2
Factors						
Agreement	69.65*	1	.01	81.43*	1	.04
Covariates						
Evaluation	158.51*	1	.33	136.17*	1	.30
Issue Importance	2.05	1	.01	5.86*	1	.02
Level of Agreement	$M_{Adjusted}$		SE	$M_{Adjusted}$		SE
Agreement	3.78		.11	4.07		.11
Disagreement	3.48		.12	3.48		.11

Notes. Cell entries are summary statistics and adjusted means and standard errors from ANCOVA analyses predicting perceived relevance. $n_1 = 303$ and $n_2 = 297$. $df_{2,1} = 299$ and $df_{2,2} = 293$. *$p < .05$ (two-tailed test). An ordinary least squares (OLS) regression model was used to test whether the coefficients for Experiments 1 and 2 were significantly different. A dummy variable for experiment was included (1 = Experiment 1) in the model, as well as an interaction term between the dummy variable and the agreement factor. Results reveal significantly different intercepts between the two experiments—the dummy variables' coefficient was statistically significant ($B = .41$, $SE = .15$, $p < .01$). However, there is no significant difference in slopes (the interaction term was not statistically significant ($B = -.10$, $SE = .22$, *n.s.*).

The ANCOVA model shown in Table 10 adds the contextual information factor and the factorial interaction. The effect of agreement remains consistently positive and significant in this model (F (1, 297) = 70.93, $p < .05$; F (1, 291) = 81.52, $p < .05$) with identical effect sizes (η^2 = .01 and .04, respectively). Meanwhile, the contextual information factor exhibits a significant effect ($\eta^2 = .02$) only in Experiment 1 (F (1, 297) = 21.18, $p < .05$). Post-hoc comparisons reveal a valence-consistent effect of information on perceived relevance (see Figure 11). The above results support H4 and H5. However, there is no support for H6, which predicted an interaction

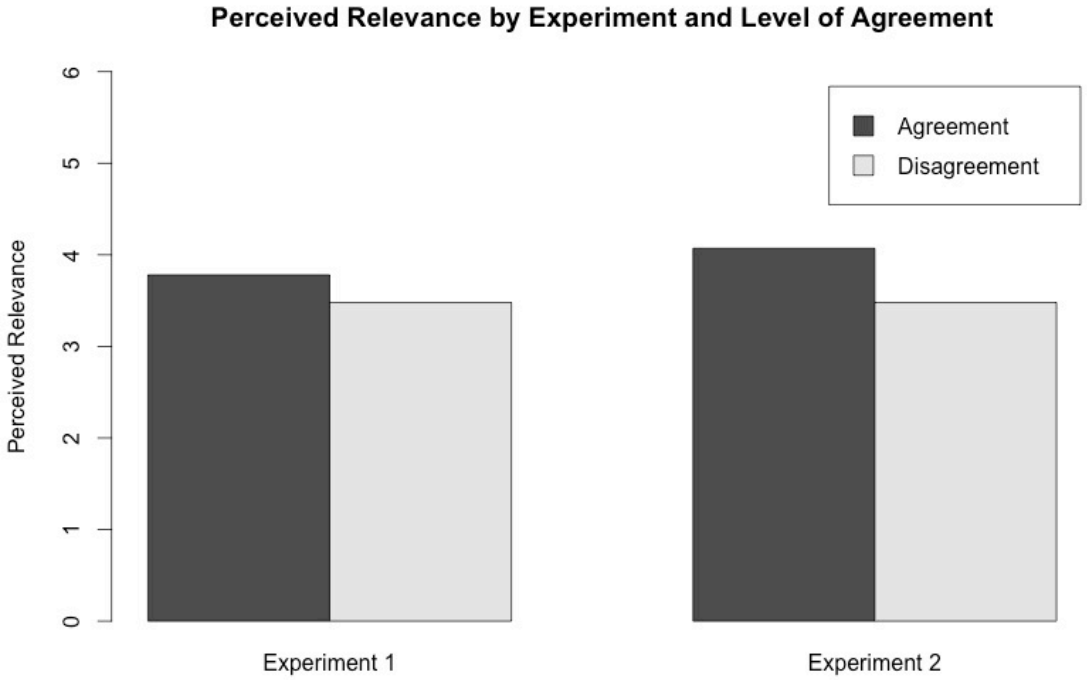

Figure 10. Adjusted mean differences in perceived relevance between the agreement and disagreement conditions estimated from the models in Table 9.

between agreement and information. Post-hoc comparisons do show expected patterns. In particular, the relevant disagreement conditions scored higher than the irrelevant disagreement conditions in both experiments. But the differences are not statistically significant.

Finally, RQ1 asked whether these results differed according to the salient dimension of relevance. These dimensions—cognitive versus affective—were represented by Experiment 1 and Experiment 2, respectively. Immediately, one can ascertain that there is a significant difference between the experiments in terms of contextual relevance. That is, the cognitive dimension of information tended to have an effect on perceived relevance, while the affective dimension did not.

Table 10

Interaction between Agreement and Contextual Information on Perceived Relevance

	Experiment 1			Experiment 2		
Variable	F	df_1	Partial η^2	F	df_1	Partial η^2
Factors						
Agreement	70.93*	1	.01	81.52*	1	.04
Contextual Information	21.18*	1	.02	.21		.00
Agreement * Contextual Information	1.16	1	.00	.17		.01
Covariates						
Evaluation	146.49*	1	.32	136.32*	1	.30
Issue Importance	2.15	1	.01	6.08*	1	.02
Level of Agreement by Level of Contextual Information	$M_{Adjusted}$		*SE*	$M_{Adjusted}$		*SE*
Agreement-Relevant	3.91		.18	3.91		.17
Disagreement-Relevant	3.75		.15	3.53		.15
Agreement-Irrelevant	3.70		.16	4.21		.15
Disagreement-Irrelevant	3.20		.15	3.41		.17

Notes. Cell entries are summary statistics and adjusted means and standard errors from ANCOVA analyses predicting perceived relevance. $n_1 = 303$ and $n_2 = 299$. $df_{2,1} = 297$ and $df_{2,2} = 291$. *$p < .05$ (two-tailed test).

Tests show no significant differences in the effect of disagreement across experiments. An ordinary least squares (OLS) regression model was used to test whether the coefficients for Experiments 1 and 2 were significantly different. A dummy variable for experiment was included (1 = Experiment 1) in the model, as well as an interaction term between the dummy variable and the agreement factor. Results reveal significantly different intercepts between the two experiments—the dummy variables' coefficient was statistically significant ($B = .41$,

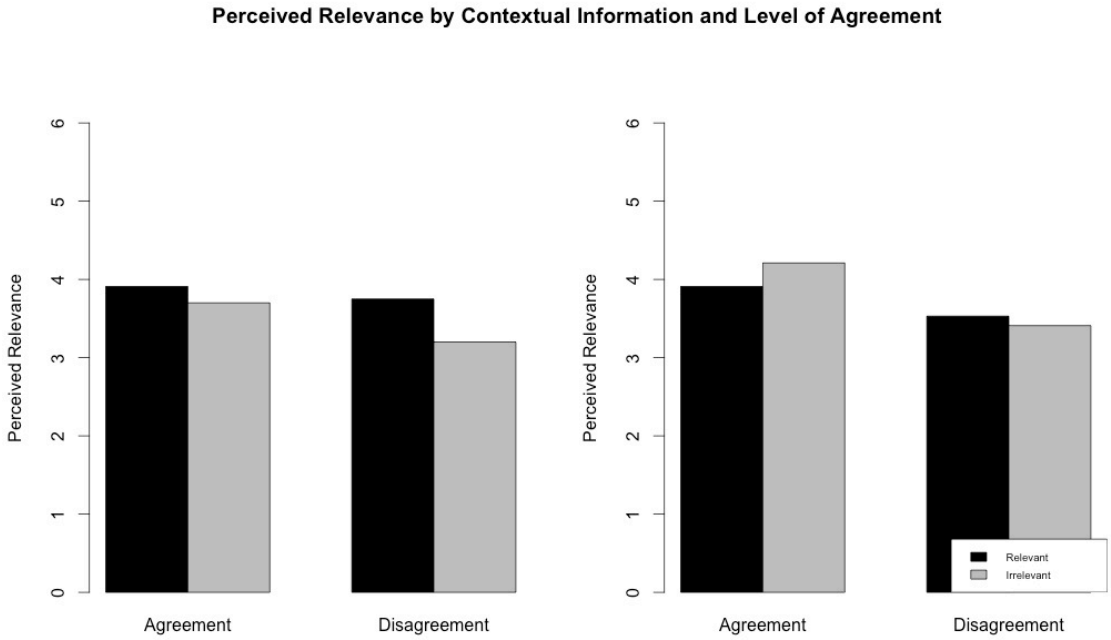

Figure 11. Adjusted mean differences in perceived relevance by agreement and informational relevance in Experiment 1 (left) and Experiment 2 (right), estimated from the models in Table 10.

SE = .15, $p < .01$). However, there is no significant difference in slopes (the interaction term was not statistically significant (*B* = -.10, *SE* = .22, *n.s.*).

Repeated measures: Perceived relevance. H7 and H8 make predictions about social media and perceived relevance. Just as with the analysis for exposure to disagreement, both repeated measures and matching analyses are used, with the same setup and logic as before, only with different outcome variables and using the name generators only.

As with the previous repeated measures analysis (for exposure to political disagreement), results in Table 11 show that within-subject variance for perceived relevance is relatively low (ICC = .24). The adjusted mean of relevance in social media is 3.08 (*SE* = .06, $p < .05$), while the coefficient for face-to-face discussion (*B* = .45, *SE* = .06, $p < .05$) indicates that the mean

Table 11

Estimated Differences in Perceived Relevance Across Media

Variable	*B (Var.)*	*SE (SD)*
Fixed Effects: Mean Differences		
Intercept (Social Media)	3.08*	.06
Medium (Face-to-Face)	.45*	.06
Fixed Effects: Covariates		
Evaluation: Social Media	.28	.05
Evaluation: Face-to-Face	.10	.05
Closeness: Social Media	.03	.04
Closeness: Face-to-Face	.05	.04
Strong Tie: Social Media	.01	.05
Strong Tie: Face-to-Face	.06	.05
Social Media Use	.00	.00
Online News Use	.01	.00
Offline News Use	.01	.01
Email Political Talk	.06	.04
Face-to-Face Political Talk	.00	.00
Political Efficacy	.01	.05
Political Knowledge	-.08	.04
Political Interest	.02	.04
Conservative Ideology	-.01	.01
Sex (1 = Female)	.05	.09
Age	-.00	.00
Education	.06	.03
Income	-.09	.03
Random Effects		
Intercept (Subject)	(.20)	(.45)
Residual	(.64)	(.80)
Log Likelihood	-864.80	

Notes. Cell entries are unstandardized beta coefficients (*B)*, standard errors (SE), variances (*Var.*), and standard deviations (*SD*) estimated by maximum likelihood (ML) from a mixed effects linear model with a repeated measures (within-subjects) design predicting perceived relevance. $n = 332$, observations = 656. The reference group for the medium variable is social media. Covariates are mean-centered. *$p < .05$ (two-tailed tests).

is significantly higher (3.53). Therefore, these results show that face-to-face discussion is seen as more relevant than social media messaging (see Figure 12). Thus, these results support H7.

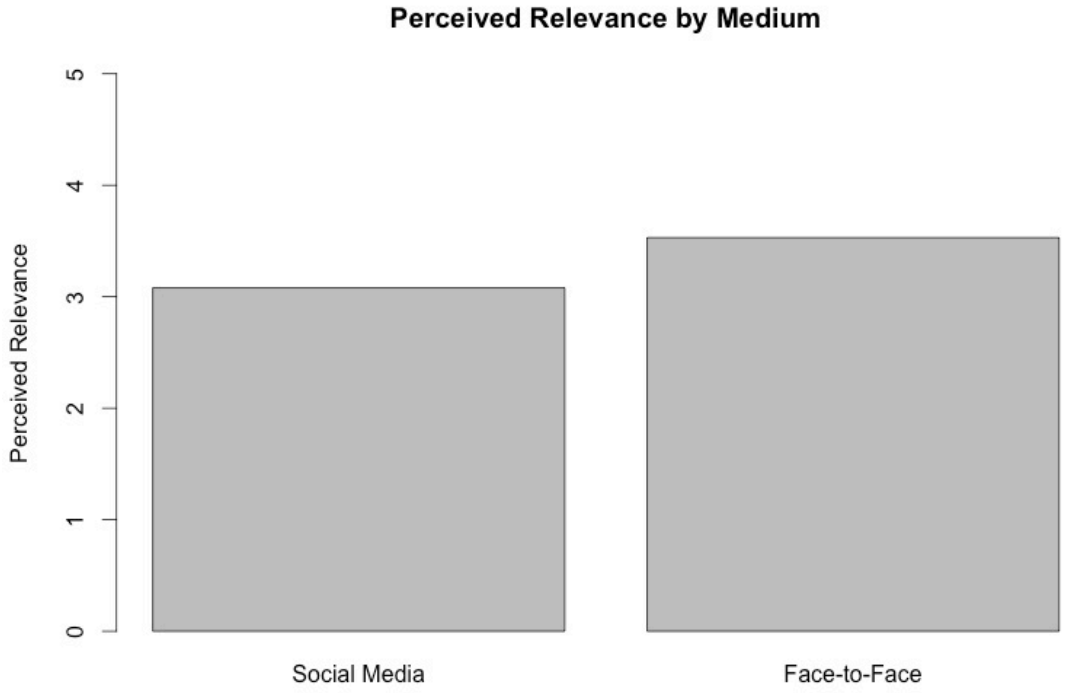

Figure 12. Adjusted means for perceived relevance among social media users in social media and face-to-face settings estimated from the model shown in Table 11.

Matching analysis: Perceived relevance. An identical method as before was used to prepare the data for matching analysis. The same predictors were used to construct propensity scores, and these scores were used to randomly match social media users to each non-user. This process yielded improvement in balance in all but one variable (age, see Table 12). With these matched cases, the "treatment" effect of social media use was estimated with ANCOVA-by-regression (covariates are mean-centered; see Table 13). Results show no significant difference in perceived relevance among users and non-users ($M_{\text{Non-Users}} = 2.86$, $M_{\text{Users}} = 2.94$). These means were re-estimated through bootstrapping techniques, and these tests produced similar results (see Table 14). Thus, these results lead to a rejection of H8. No evidence was found of differences in perceived relevance between social media users and non-users.

Table 12

Percent Improvement in Balance between Treatment and Control Groups after Matching

Variable	%Δ
Distance	6.51
Sex (1 = Female)	11.84
Age	-5.74
Education	75.91
Conservative Ideology	19.95
Online News Use	21.79
Email Political Messaging	28.40
Face-to-Face Political Talk	11.91

Notes. Cell entries are the percent improvement in mean differences between matched treatment cases (i.e., social media users; n = 150) and control cases (i.e., non-users; n = 150). The nearest neighbor method was used to match cases. Three cases were discarded from each dataset because they were outside the support of the propensity distance measure, and 212 treated cases went unmatched because there were fewer control cases than treated. Treatment cases were randomly selected for matching.

Table 13

Estimated "Treatment" Effect of Social Media Use on Perceived Relevance

Variable	*B*	*SE*
"Treatment"		
Intercept ($M_{Non\text{-}Users}$)	2.86*	.07
Social Media Use	.06	.10
Covariate		
Evaluation	.53*	.05
Closeness	.06	.04
Strong Tie	.37*	.07
R^2	.71*	

Notes. Cell entries are unstandardized beta coefficients (*B*) and standard errors (*SE*) from ordinary least squares (OLS) regression analyses. Covariates are mean centered so that the intercept is interpretable as the mean of the interpersonal group, adjusted at the mean of the covariates. The coefficient for social media use is interpretable as the difference from the intercept, adjusted at the mean of the covariates. Data were matched based on propensity scores (nearest neighbor method) derived from estimates in Table 4. n = 299. *p < .05 (two-tailed test).

Table 14

Mean Differences in Perceived Relevance between Social Media Users and Non-Users

"Treatment" Group	*M*	*SD*
Social Media Users	2.86	.07
Non-Users	2.91	.07

Notes. Cell entries are bootstrapped adjusted means (*M*) and standard deviations (*SD*) based on the models shown in Table 13 (simulations = 1,000).

Repeated measures: Relevant disagreement. H9 and H10 pose similar predictions about relevant disagreement, where H9 pertains to the medium in which people experience more and H10 pertains to the groups who experience more. The set up of these analyses (repeated measures and matching) are identical to the set up for tests of perceived relevance reported above.

Repeated measures results, shown in Table 15 support the prediction that people experience more relevant political disagreement on social media than in interpersonal discussion. Generally, much more variance is attributable to within-subjects differences than in the other repeated measures analyses (ICC = .44). The intercept (mean of the social media items) is 4.66 (SE = .18, $p < .05$), while the coefficient for medium (mean of the face-to-face items) is -.89 lower (or, 3.77, SE = .17, $p < .05$). See Figure 13 for visualizations of these means. These results provide strong support for H9.

Matching analysis: Relevant disagreement. The matching procedure yielded improvement in balance in all variables (see Table 16). Subsequent analysis (see Table 17) reveals that social media users experience more relevant political disagreement than non-users ($B_{\text{Non-Users}}$ = 3.18, SE = .21, $p < .05$; B_{Users} = .91, SE = .10, $p < .05$). These means were re-estimated with bootstrapping techniques ($M_{\text{Non-Users}}$ = 3.17, SD = .21; M_{Users} = 4.09, SD = .22; see

Table 15

Estimated Differences in Relevant Political Disagreement among Social Media Users across Media

Variable	*B (Var.)*	*SE (SD)*
Fixed Effects: Mean Differences		
Intercept (Social Media)	4.66*	.18
Medium (Face-to-Face)	-.89*	.17
Fixed Effects: Covariates		
Evaluation: Social Media	.02	.18
Evaluation: Face-to-Face	-.02	.18
Closeness: Social Media	.04	.12
Closeness: Face-to-Face	-.28*	.12
Strong Tie: Social Media	.14	.16
Strong Tie: Face-to-Face	.08	.16
Social Media Use	-.01	.01
Online News Use	.03*	.01
Offline News Use	.01	.02
Email Political Talk	.33*	.14
Face-to-Face Political Talk	.01	.02
Political Efficacy	-.14	.18
Political Knowledge	-.42*	.14
Political Interest	.05	.14
Conservative Ideology	-.04	.05
Sex (1 = Female)	-.02	.01
Age	-.01	.01
Education	.12	.10
Income	-.09	.10
Random Effects		
Intercept (Subject)	(3.52)	(1.88)
Residual	(4.67)	(2.16)
Log Likelihood	-1582.80	

Notes. Cell entries are unstandardized beta coefficients (*B)*, standard errors (SE), variances (*Var.*), and standard deviations (*SD*) estimated by maximum likelihood (ML) from a mixed effects linear model with a repeated measures (within-subjects) design predicting relevant political disagreement (name generators). $n = 331$, observations = 654. The reference group for the medium variable is social media. Covariates are mean-centered. *$p < .05$ (two-tailed tests).

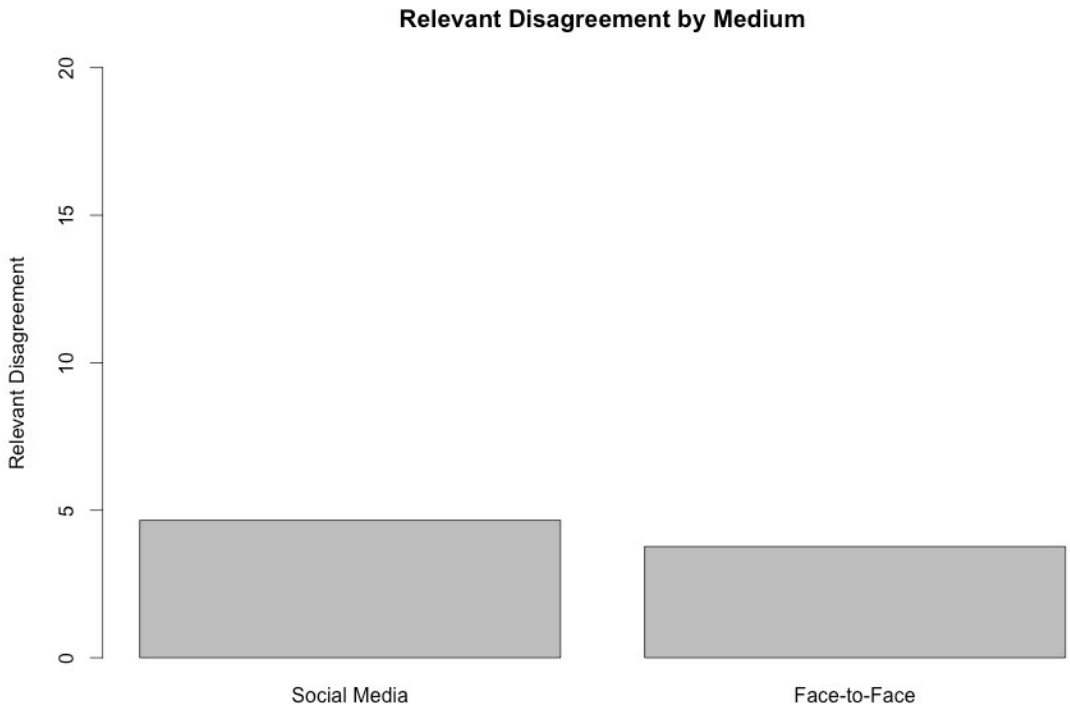

Figure 13. Adjusted means for exposure to relevant political disagreement (name generators) among social media users in social media and face-to-face settings estimated from the model shown in Table 15.

Table 18). These distributions are depicted in Figure 14. The results of the matching analysis lend strong support to H10—social media users experience more relevant political disagreement than non-users.

Intervening variables. The intervening variables were tested using OLS regression (see Table 19) and the PROCESS macro for SPSS (see Table 20). Results show a statistically significant interaction between interpersonal evaluation and political disagreement on perceived relevance ($B = .10$, $SE = .03$, $p < .05$). Post-hoc analyses reveal that slopes are significant at -1*SD, M*, and +1*SD* values, but that the slope gets steeper as evaluation decreases in value

Table 16

Percent Improvement in Balance between Treatment and Control Groups after Matching

Variable	%Δ
Distance	8.68
Sex (1 = Female)	8.81
Age	10.21
Education	11.53
Conservative Ideology	17.29
Online News Use	8.04
Email Political Messaging	10.29
Face-to-Face Political Talk	71.59

Notes. Cell entries are the percent improvement in mean differences between matched treatment cases (i.e., social media users; n = 150) and control cases (i.e., non-users; n = 150). The nearest neighbor method was used to match cases. Four cases were discarded from each dataset because they were outside the support of the propensity distance measure, and 212 treated cases went unmatched because there were fewer control cases than treated. Treatment cases were randomly selected for matching.

Table 17

Estimated "Treatment" Effect of Social Media Use on Relevant Political Disagreement

Variable	*B*	*SE*
"Treatment"		
Intercept ($M_{Non\text{-}Users}$)	3.18*	.21
Social Media Use	.91*	.10
Covariate		
Evaluation	.46*	.17
Closeness	-.20	.14
Strong Tie	.95*	.20
R^2	.24*	

Notes. Cell entries are unstandardized beta coefficients (*B*) and standard errors (*SE*) from ordinary least squares (OLS) regression analyses. Covariates are mean centered so that the intercept is interpretable as the mean of the interpersonal group, adjusted at the mean of the covariates. The coefficient for social media use is interpretable as the difference from the intercept, adjusted at the mean of the covariates. Data were matched based on propensity scores (nearest neighbor method) derived from estimates in Table 4. n = 300. *p < .05 (two-tailed test).

Table 18

Mean Differences in Relevant Political Disagreement between Social Media Users and Non-Users

"Treatment" Group	*M*	*SD*
Social Media Users	4.09	.22
Non-Users	3.17	.21

Notes. Cell entries are bootstrapped adjusted means (*M*) and standard deviations (*SD*) based on the models shown in Table 17 (simulations = 1,000).

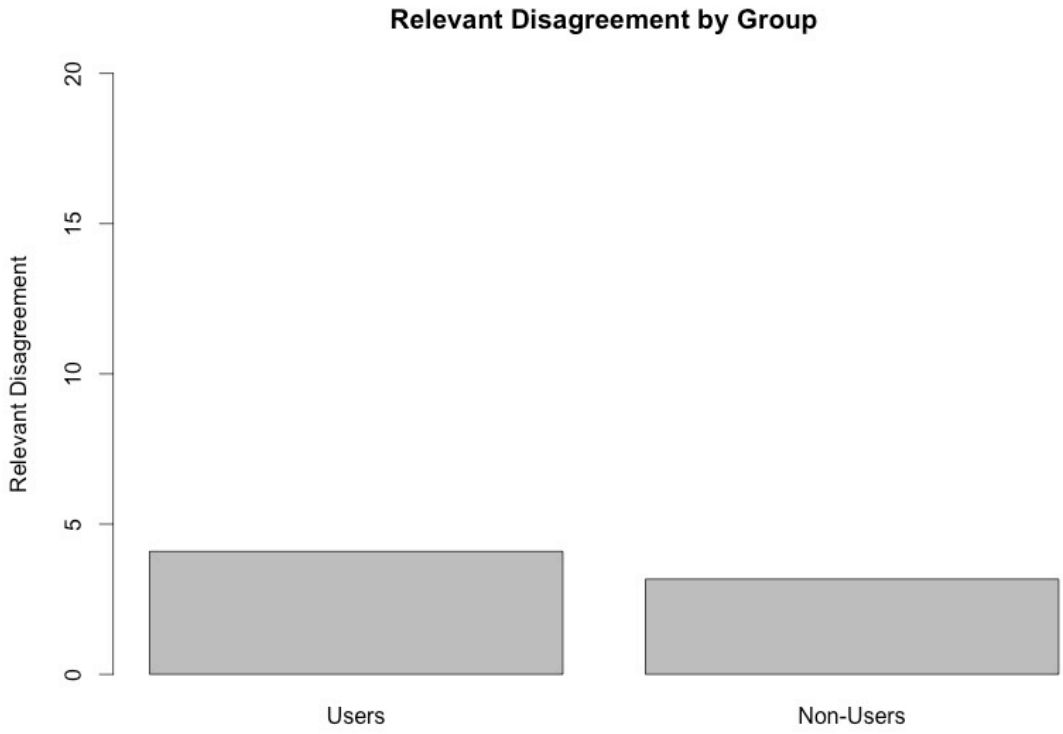

Figure 14. The estimated "treatment" effect of social media use on exposure to relevant political disagreement (name generators), estimated from the model shown in Table 18.

Table 19

The Relationships among Political Disagreement on Social Media (Name Generators), Evaluation of Social Media Ties, and Perceived Relevance on Social Media

Variable	*B*	*SE*	*β*
Explanatory			
Political Disagreement	-.84*	.14	-.63*
Evaluation	.17*	.08	.19*
Political Disagreement * Evaluation	**.10***	**.03**	**.06***
Covariate			
Closeness	.05	.03	.07
Strong Tie	.10*	.05	.08*
Control			
Social Media Use	.01*	.00	.09*
Political Efficacy	.08	.05	.07
Political Knowledge	-.12*	.04	-.12
Political Interest	.09*	.04	.11
Conservative Ideology	-.01	.02	-.03
Sex (1 = Female)	.08	.10	.03
Age	.00	.00	-.04
Education	.02	.03	.03
Income	-.06	.03	-.07
Intercept	2.84*	.39	--
R^2		.51	

Notes. Cell entries are unstandardized (*B*) with standard errors (*SE*), along with standardized coefficients (*β*) fro ordinary least squares (OLS) regression. $n = 393$. *$p < .05$ (two-tailed test). The interaction term was submitted to a three-fold cross-validation. The mean squared prediction error (MSPE) is lower with the interaction term (96.65) than without it (106.86).

(see Figure 15). To some extent, then, positive evaluations counteract the negative influence of disagreement on perceived relevance. Thus, R2b is answered in the affirmative: Evaluations do moderate the relationship between disagreement and perceived relevance on social media.

Interactions with two indicators of political involvement, political interest and ideology, were tested, but no significant results were found. Therefore, RQ2a is answered in the negative.

Table 20

Conditional Relationship between Political Disagreement on Social Media and Perceived Relevance on Social Media Various Levels of Evaluation of Social Media Ties

Level of Evaluation	*B*	*SE*	LLCI	ULCI
Evaluation = -1 *SD*	-.58*	.07	-.71	-.45
Evaluation = *M*	-.47*	.05	-.57	-.38
Evaluation = +1 *SD*	-.36*	.06	-.47	-.25

Notes. Cell entries are bootstrapped, unstandardized beta coefficients (*B*), standard errors (*SE*), and confidence intervals (LLCI, ULCI) estimated using the PROCESS macro for SPSS (Hayes, 2013). An omnibus test of the interaction term is statistically significant ($\Delta R^2 = .01$, F (1, 378) = 8.44, $p < .05$). Model coefficients not reported. Model $R^2 = .51$, $n = 393$.

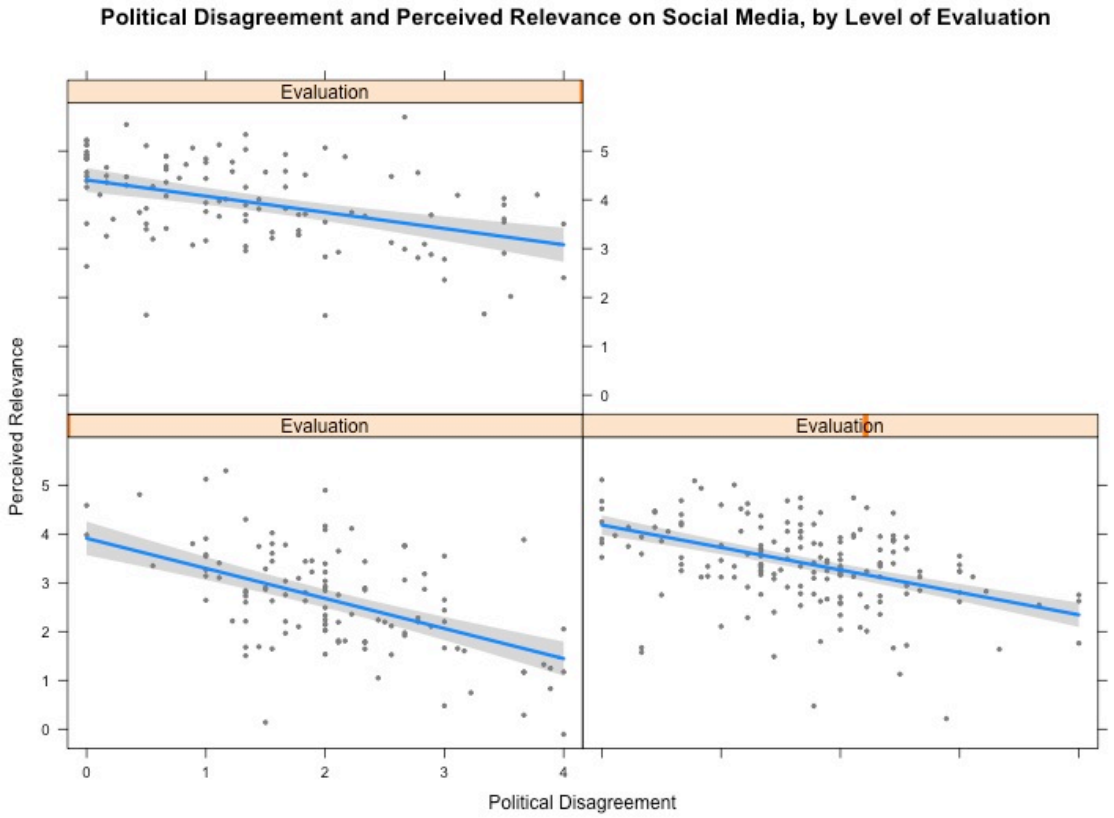

Figure 15. The relationship between political disagreement and perceived relevance at various levels of evaluation, as estimated by the model in Table 19.

Effects of Political Disagreement

The final section examines the effects of perceived relevance on uncertainty (or ambivalence) using both experimental and survey data. H11a and H11b make predictions about political disagreement and uncertainty. H12a and H12b add the interaction with perceived relevance.

Experimental results. Experimental results (ANCOVA) show no main effect of the agreement factor on certainty (see Table 21). However, it does interact with perceived relevance (dichotomized, 1 = relevant; F (1, 292) = 4.00, SE = .01, $p < .05$ in Experiment 1 and F (1, 288) = 5.74, SE = .02, $p < .05$ in Experiment 2). In Experiment 1, Holm post-hoc tests show that the disagreement group scored significantly lower than the agreement groups when perceived relevance = 1 (F (1, 292) = 7.12, $p < .05$). In Experiment 2, the same set of tests showed that the disagreement group scored significantly higher than the agreement groups when perceived relevance = 0 (F (1, 288) = 5.31, $p < .05$). These results are illustrated in Figure 16 and show that, in one case, relevant disagreement diminishes certainty, and, in the other, that irrelevant disagreement bolsters certainty.

These results provide some support for H12a and H12b, which predicted the negative effect of disagreement on certainty would be stronger when considered relevant. However, in one test the reverse scenario was observed; disagreement had a positive effect on certainty when considered irrelevant. H11a, which predicted a main effect of disagreement on certainty, is rejected.

Survey results. No significant effects of political disagreement or relevant political disagreement were found in the survey results, which are presented in Table 22. H11b is therefore rejected. This lack of significant results is not surprising, given that the survey

Table 21

The Effects of Relevant Disagreement on Certainty

Variable	Experiment 1			Experiment 2		
	F	df_1	Partial η^2	*F*	df_1	Partial η^2
Factors						
Agreement	1.09	1	.01	.01	1	.00
Contextual Information	.03	1	.00	.02	1	.00
Perceived Relevance	1.99	1	.00	1.49	1	.00
Covariates						
Evaluation	.23	1	.00	4.00*	1	.01
Issue Importance	12.77*	1	.03	30.26*	1	.09
Interactions						
Agreement * Contextual Information	2.17	1	.00	2.05	1	.01
Agreement * Perceived Relevance	4.00*	1	.01	5.74*	1	.02
Level of Agreement by Level of Perceived Relevance	$M_{Adjusted}$		*SE*	$M_{Adjusted}$		*SE*
Perceived Relevance = 1						
Agreement	88.91		2.60	88.01		1.91
Disagreement	81.00		2.66	85.93		2.35
Perceived Relevance = 0						
Agreement	84.67		4.23	83.91		2.99
Disagreement	87.25		2.83	91.38		2.26

Notes. Cell entries are summary statistics and adjusted means and standard errors from ANCOVA analyses predicting certainty. $n_1 = 300$ and $n_2 = 298$. $df_{2,1} = 292$ and $df_{2,2} = 288$. *$p <$ .05 (two-tailed test). In Experiment 1, Holm post-hoc tests show that the disagreement group scored significantly lower than the agreement groups when perceived relevance = 1 (F (1, 292) = 7.12, $p < .05$). In Experiment 2, the same set of tests showed that the disagreement group scored significantly higher than the agreement groups when perceived relevance = 0 (F (1, 288) = 5.31, $p < .05$).

measures long-term willingness to think about political choices and preferences. Survey measures do not capture the acute type of resulting from disagreement.

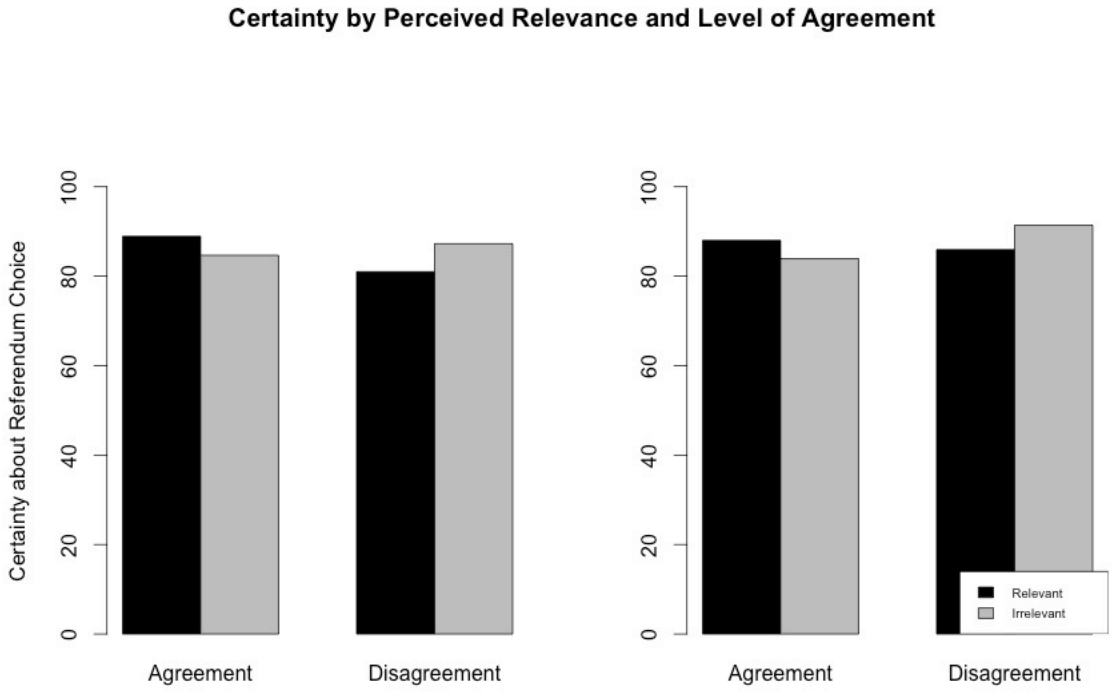

Figure 16. The conditional effects of agreement on certainty at different levels of perceived relevance in Experiment 1 (left) and Experiment 2 (right). Adjusted means are estimated from the model shown in Table 21.

Summary

Results show that social media users are (1) exposed to more political disagreement on social media than in other venues and (2) exposed to more political disagreement than non-users. News use acts as a mechanism through which users are exposed to political disagreement on social media.

Results also show that social media users perceive social media messages to be less relevant than face-to-face discussions. Evidence suggests this occurs because (a) disagreement

Table 22

The Relationship between Relevant Disagreement and Ambivalence

Variable	*B*	*SE*	*β*
Explanatory			
Political Disagreement	.11	.09	.11
Perceived Relevance	.08	.05	.15
Political Disagreement * Perceived Relevance	-.02	.03	-.02
Covariate			
Closeness	-.02	.03	-.04
Strong Tie	.09*	.05	.11*
Control			
Online News Use	.00	.00	.03
Offline News Use	.00	.00	.04
Email Political Messaging	.01	.04	.02
Interpersonal Political Talk	.00	.00	-.04
Political Efficacy	-.05	.04	-.08
Political Knowledge	-.11*	.03	-.17*
Political Interest	.09*	.03	.17*
Conservative Ideology	.00	.01	-.02
Sex (1 = Female)	-.12	.07	-.07
Age	-.01*	.00	-.12*
Education	.01	.02	.03
Income	.00	.02	-.01
Intercept	2.26*	.16	--
R^2		.09*	

Notes. Cell entries are unstandardized beta coefficients (*B*) and standard errors (*SE*), along with standardized beta coefficients (*β*) from ordinary least squares (OLS) regression analyses predicting ambivalence. $n = 519$. *$p < .05$.

has a negative effect on perceived relevance, conditional upon interpersonal evaluations, and (b) contextual information also affects perceived relevance in a valence-consistent manner.

However, this does not mean that social media users experience less relevant disagreement. To the contrary, evidence shows that social media users (1) experience more

relevant disagreement on social media than in face-to-face settings and (2) experience more relevant disagreement than non-users.

Finally, results show that relevant disagreement can reduce certainty about political choices and preferences in some cases, and that irrelevant disagreement can bolster certainty in other cases. No evidence of a long-term relationship between relevant disagreement and ambivalence was found.

Chapter 5: Discussion

Conclusions

Social media increase exposure to political disagreement, but they also decrease the relevance of disagreement because they make it easier to "write off" oppositional political messages. However, on balance, social media actually promote relevant disagreement, which produces uncertainty about political choices and preferences in some cases.

Furthermore, assessments of relevance and the production and/or reduction of uncertainty are related, in some way, to contextual information available in the communication environment. Therefore, understanding the effects of political disagreement on social media requires more than knowledge about exposure and individual predispositions. Rather, the effects also depend on the experience of encountering disagreement in a particular communicative context.

Exposure to political disagreement. All three hypotheses regarding *exposure* to political disagreement received some support. Social media users are exposed to more disagreement than non-users, and they are exposed to more of it on social media than elsewhere. Furthermore, news use on social media provides at least part of the explanation for these differences between groups and across communicative settings.

These findings move theory forward in two ways. First, they provide new kinds of evidence in the form of between-group comparisons (i.e., the matching analyses) and within-subject comparisons (i.e., the repeated measures analyses). Much of the prior survey research on social media and exposure to political disagreement relies on assessing linear relationships between disagreement and generic social media use (e.g., Barnidge, 2015; Kim et al., 2013) or specific uses of social media (e.g., Barnidge, 2015; Kim, 2013; Lee et al., 2014). Meanwhile, prior research using web data shows evidence of exposure to politically incongruent messages

and connections with politically incongruent social ties on Facebook (Bakshy et al., 2015) or Twitter (Barbera, 2014). These findings establish that disagreement occurs on social media, and that it is associated with frequency of use and/or news use.

But none of this evidence satisfactorily answers the question: Do social media expose people to more political disagreement *than they would otherwise encounter*? Nor does it answer: Are social media users exposed to more political disagreement on social media *than in other settings*?

The current study provides a first step at answering these questions. By collecting observations about both social media users and non-users, the study affords the possibility of making the between-group comparisons necessary for the first. By making within-subject comparisons across communicative settings, the study affords the possibility of the answering the second. Both kinds of evidence provide powerful leverage over the problem of social media and political disagreement. While they may seem—rightfully so—like fundamental, straightforward comparisons for answering central questions about social media and political disagreement, prior literature has been limited by study design: Most studies use non-comparable measures of exposure to disagreement in different communicative settings and virtually none use quasi-experimental within-subjects or between-subjects comparisons. The design of the current study is therefore a major strength, and it enables the kinds of basic comparisons that, in this case, have provided support for central theoretical claims about social media and political disagreement (e.g., Brundidge, 2010).

The second way that these findings move theory forward is that they provide additional evidence that news use may act as a mechanism that explains why social media expose people to more political disagreement. Thus, the study joins a growing body of literature that points toward

a similar conclusion (e.g., Bakshy et al., 2015; Barbera, 2014; Barnidge, 2015; Kim, 2013; Lee et al., 2014).

These conclusions—that social media expose people to more political disagreement and that news use has something to do with why—provide a strong empirical foundation for existing theoretical claims. Social media alter the structure of public communication. They promote social connection (Gruzd & Wellman, 2014), articulate information about relationships (Kwon et al., 2014), cut across local communication contexts (Takhteyev et al., 2012), aggregate public information for users (Juris, 2012), and juxtapose that information with indicators of user opinion (Walther et al., 2011). Social media therefore broaden the base of public information (i.e., news) to which users are exposed (Bakshy et al., 2015; Barbera, 2014; Barnidge, 2015; Brundidge, 2010), and they afford more opportunities for people to perceive disagreement without direct interaction (Barnidge, 2015; Schulz & Roessler, 2012). The result is that users perceive more disagreement than they would without social media.

Experience of political disagreement. Analysis also provides strong support for the prediction that social media use promotes the experience of relevant disagreement; social media users are exposed to more relevant disagreement than non-users, and they are exposed to it on social media, rather than elsewhere. However, results are mixed with regards to the process of relevance perception. Disagreement and contextual information both play important roles, but they do not interact. Furthermore, evidence about social media use and perceived relevance is inconclusive. Results do provide one clue about the process, however: Interpersonal evaluations moderate the relationship between disagreement and perceived relevance.

These conclusions have several implications for theory. First, they establish that social media use does promote relevant disagreement. Certainly, more evidence from different contexts

is needed in order to increase confidence in that conclusion. But these findings provide a starting point for moving beyond the study of exposure to disagreement by assessing the weight or importance that individuals give to it. Theoretically, relevant disagreement should have more of an influence of individuals' political choices and preferences than irrelevant disagreement (Conover et al., 2002). Therefore, the disagreement people encounter on social media is not trivial; to the contrary, it has important implications for the ways in which social media users experience political communication. To some extent, these implications should allay popular concerns about the triviality or banality of political communication on social media (e.g., McElvoy & Parkinson, 2015).

Despite having established evidence that social media promote relevant disagreement, the process through which this occurs remains unclear. Prior theory suggests that, when disagreement occurs with somebody they know and like, people are likely to ask why it occurred (O'Brien & McGarty, 2009). Where context cues provide individuating information, people are more likely to make personality-based assessments about the causes of disagreement (Kelley, 1973). Depending on the valence of the cues, people may find disagreement more or less relevant (O'Brien & McGarty, 2009). But if this was true, an interaction between disagreement and contextual information should have been observed.

What the study does show is that contextual information is in some way related to the process of assessing the relevance of political messages. This is the second implication of this research for theory, and, one could say, it is the "big idea" of the dissertation project. People process political information differently in different communicative settings because different settings provide different kinds of contextual cues. This is not to say that media *determine* how

individuals experience messages, but rather that individuals are sensitive to subtle changes in the communication environment in predictable ways.

This idea draws from research on social interaction in computer-mediated settings. That literature provides evidence that people use contextual cues in the communication environment to assess and evaluate personal relationships (e.g., Walther et al., 2008; 2009; Westerman et al., 2008). Furthermore, different kinds of information, juxtaposed against one another, can interact to affect how people process socially beneficial messages (e.g., Anderson et al., 2013; Paek, Hove, & Jeon, 2013; Walther et al., 2010). Meanwhile, disparate bodies of research show the influence of online social cues on consumer behavior (e.g., Resnick & Zeckhauser, 2002) and the selection and evaluation of news stories (e.g., Xu, 2013).

Speaking more generally, this study adopts a social-psychological approach to develop and test expectations about the experience of political communication on social media, and therefore goes beyond questions about exposure to particular messages. This kind of approach can provide valuable information that "big data" research cannot—that is, it is less concerned with network structures and message flows than it is with how these things, along with other elements of communication on social media, affect information processing. Research of this nature brings the study of social media squarely in line with a long tradition of scholarship concerned with the last part of that now-famous question (Lasswell, 1948): Who says what to whom in what channel with what effect?

Effects of political disagreement. At the most basic level, results support expectations about relevant disagreement and uncertainty. In both experiments, the agreement factor interacted with perceived relevance to affect certainty about subjects' referendum choices. But it

is unclear whether relevant disagreement reduces certainty or irrelevant disagreement increases it. The study shows evidence of both effects.

This evidence contributes to the body of literature examining disagreement and uncertainty. For example, similar to McGarty and colleagues' (1993) study, the current project treats information—as it relates to perceived relevance—as a key factor in determining whether disagreement reduces certainty (see also, Abrams et al., 1990). Relevant disagreement prompts a re-evaluation of social and political identities and affiliations (Lichtermann, 1999; Turner et al., 1987; Walsh, 2004) and re-elaboration about social and political choices and preferences (Huckfeldt et al., 2004; Mutz, 2006). But it could also be that irrelevant disagreement bolsters certainty through counter-arguing (Mutz, 1998) or group identification (Walsh, 2004). These findings also fit with a long tradition of research on the persuasive capabilities of strong versus weak arguments (see, e.g., Sorrentino, Bobocel, Gitta, Olson, & Hewitt, 1988).

The study found no long-term effect of relevant disagreement on ambivalence about political attitudes or preferences. From the survey evidence, it is not possible to ascertain whether relevant disagreement reduces certainty in the short term. Rather, the survey is a test of ambivalence, and evidence suggests that relevant disagreement doesn't exhibit long-term effects. In other words, relevant disagreement doesn't make people more ambivalent in the long-term; rather, it has a short-term effect on uncertainty—a tension that individuals are motivated to resolve over time by altering their attitudes or behaviors (Hogg, 2000; 2006).

From a theoretical standpoint, results are largely inconclusive. However, they certainly warrant further research about the relationship between relevant disagreement and uncertainty. For example, future research should focus on replicating the basic interactions and testing potential explanations for them, including referent informational influence (i.e., adjustment of

social comparison; Salmon & Kline, 1983), social identification processes (i.e., in-group re-evaluation; Turner et al., 1987), or attribution (i.e., reassessment of social explanation; Ross, 1977). Quite possibly, these explanations could work together in the same complex social-psychological processes.

Generally, this conclusion implies a need to think carefully about how experimental scenarios might affect uncertainty production and/or reduction, and how scenarios can be constructed that might isolate particular aspects of the production/reduction process. While this study has provided an example of a starting point for such an endeavor, more experimental work must be done to uncover the specific processes at play when individuals encounter relevant disagreement on social media. The study shows reason to believe that doing so will provide a fruitful framework for understanding attitude and/or behavioral change in response to engagement with political communication on social media not only among individuals, but also within and between groups, movements, organizations, and publics.

More generally, the idea that social media research can benefit from experimentation represents a promising avenue of future research for scholars interested in the effects of social media communication. As the subfield becomes more and more dominated by descriptive and relational research based on web data, experimentalists might find a niche by testing some of the theoretical innovations that "big data" research develops.

Of course, constructing an externally valid scenario while maintaining internal control is a major challenge for a new generation of experimentalists to overcome. Likely, experiments will trend toward the naturalistic direction. In fact, social media companies have already conducted several major experiments on users while they use social media (see, e.g., Bakshy et al., 2012). And whatever controversies about privacy might have been raised by these studies

(e.g., Goel, 2014, but see Meyer & Chabris, 2015, for a counterpoint), they are methodologically innovative in that they maintain a semblance of experimental control in a naturalistic environment. But combining experiments with "big data" is not the only way to achieve situational realism. Small group research also holds promise for social media experimentalists. Again, some semblance of control can be maintained while examining social relationships as they develop in a relatively naturalistic manner within small groups.

These kinds of methodological innovations are necessary in order to advance theory about social media and politics in a systematic and meaningful way. Only through experimentation can researchers understand how the experience of communication differs from one medium to the next. But in order to accurately reproduce that experience, experimentalists must adapt to the methodological challenges posed by digital media.

Limitations

Given these conclusions, it seems appropriate to outline the limitations of this study before moving on to discuss their big picture implications. In this section, I briefly elucidate some important questions beyond the scope of this study before enumerating some technical limitations involved with study design, measurement, and data analysis. Finally, I highlight some directions for future research.

Unanswered questions. The conclusions of this study are related to several important questions that they do not address directly. These include questions about political polarization and depolarization. Some have argued that social media depolarize public opinion and political attitudes (Barbera, 2014; Wojcieszak & Rojas, 2011). While the uncertainty framework certainly provides a useful explanation for how opinions might change—whether more or less extreme—this study does not directly examine whether social media moderates or polarizes individuals'

political attitudes, beliefs, preferences, or choices. Rather, it leaves it to future research to examine whether uncertainty results in political moderation or polarization.

A related question pertains to political tolerance and discrimination. Research shows that disagreement increases tolerance in some scenarios (Mutz, 2006), but if it leads to in-group identification it could also contribute to intergroup discrimination (Tajfel, 1982). But while disagreement and uncertainty are certainly related to tolerance/discrimination, this study does not directly examine these outcomes. Given the clear necessity for communities to tolerate political difference in a democratic society (Friedland, 2001; Guttmann & Thompson, 1996), future research should examine the circumstances under which relevant disagreement increases tolerance or results in discrimination.

Another related question pertains to political mobilization versus demobilization. Mutz (2006) famously argued that disagreement demobilizes people, while others have shown that this effect depends on local context (Ikeda & Boase, 2011) or the particular measurement strategy employed (Klofstad et al., 2012). Meanwhile, if irrelevant disagreement increases certainty, it could result in mobilization in some circumstances. More research is needed to extend the findings of this study to political mobilization and/or demobilization, and uncover the specific situations in which each is likely to occur.

Finally, the study cannot address cultural or socio-institutional factors related to political disagreement. For example, there could be cultural differences in expression or valuation of agreement (Eveland et al., 2011). The present study has focused on disagreement in a single political culture, and, in that sense, has held it constant. However, it is unclear whether different effects might occur in different cultures. The same can be said of socio-institutional structures, including political party structure. Research shows that disagreement is more likely to occur in

multiparty systems (Smith, forthcoming). More research is needed to understand the role that cultures and institutions play in affecting exposure to and the experience of political disagreement on social media. Moreover, to the extent that social media cross national contexts (cf. Takhteyev et al., 2012), these cultural and institutional differences could become important in terms of explaining how people from two different places might perceive political messages differently. In that sense, future research should strive to understand culture and institutions so that it can better understand individuals—that is, what factors are common to individuals in any political or cultural context?

Technical limitations. There are two sample-based limitations that are important to discuss at this point. The first stems from the distribution of social media users. While it reflects the U.S. population distribution (see, e.g., Duggan et al., 2015), it does leave the analyst with more users than non-users, which has implications for the type and structure of the analyses that can be performed (e.g., the average treatment effect on the treated could not be assessed after the matching procedure because not all "treated" cases were included in the analysis). A related, sample-based limitation stems from the online administration through a private survey company. The danger, here, of course, is that the study recruited "professional respondents," that is, respondents who take surveys for a living. Speaking generally, however, online panels have been shown to approximate face-to-face sample estimates along important demographic and political criteria (see, e.g., Berinsky, Huber, & Lenz, 2012; Yeager et al., 2011), particularly if the survey sample is relatively broad (e.g., a sample of the U.S. population).

Several important limitations are related to measurement. First, there is conceptual and empirical slippage between the name generators, which ask about specific people, and the general indicators of political disagreement, which ask respondents for their general impressions

of how much disagreement occurs. These sets of indicators exhibit different patterns of association with antecedent and outcome variables. Some thought has been given in this project to the differences between the two. However, future research could approach this in a more systematic manner, assessing the reliability and validity of each approach to measuring disagreement. Second, the name generators themselves produce some noise in the data, specifically in the form of "junk" entries—that is, non-interpretable or non-applicable answers. This is particularly true of online surveys, as there is no face-to-face interviewer to press respondents for useable answers. On a related note, the name generators typically promote skipping answers in the online context, and some cases had to be discarded from the raw data due to extensive missingness on these (and other) items. Another limitation of the name generators is that they do not include items for political disagreement in anonymous online settings. While this exclusion was unfortunate, it was also necessary to limit survey length and to avoid survey fatigue. Likewise, perceived relevance is not measured at the general level for similar reasons.

The survey portion of the study relies on cross-sectional data, and therefore the results based on these data should be interpreted with caution. Causal inferences cannot be drawn; rather, relationships have been assembled that fit with theoretical predictions. Any and all survey analyses that examine mediation or moderation must be interpreted with caution—these are time-ordered processes and this study is unable to establish time order using the survey data.

There are also important limitations relating to the quasi-experimental portion of the study. The groups are not randomly assigned, but rather self-selected. And while matching procedures were used to minimize the bias introduced by this self-selection, these comparisons are only as good as the propensity scores used to match cases. While the matching procedure

yielded improvement in balance, it certainly did not yield perfect balance, as an experiment theoretically would. Furthermore, the "treatment" is not administered in a controlled environment. Thus, the quasi-experimental portion of the study traded control for naturalism.

Finally, some technical limitations are associated with the experimental portion of the study. Specifically, the experiments—like most experiments—lack the external validity of surveys or qualitative interviews. Rather, the experiments opt for control through random assignment over realism. However, every effort was made to construct a plausible scenario so that the situation would be believable and the subjects would take the experiment seriously. Another limitation comes from the online administration of the experiment. There is no way of knowing if subjects did things or saw things while taking the experiment that may have altered their results (e.g., conducting a web search for the author of the tweet). The study's best guard against this limitation is to discard cases that took too long to complete the experimental portion of the study (subjects that didn't take long enough, i.e., didn't take the experiment seriously, were also discarded). A third limitation comes into play when comparing the two experiments. There are at least two differences between the two experimental stimuli (the presence of information and the nature of information). Therefore, it is impossible to know if differences between the experiments are due to one or the other. Future research should take this potential confounding factor (low/high information) into account.

Future research. Having established a relationship between social media use and political disagreement, future research should focus on further testing proposed mechanisms including news use and other variables. Likewise, future research should test mechanisms for the perception of relevant disagreement.

In a similar vein—that is, in the interest of explanation—future research should adopt an international, comparative approach to the study of political disagreement on social media. These comparisons are important because they would allow researchers to observe variation in cultural and socio-structural factors that affect the occurrence and experience of political disagreement. Understanding these factors will help further our conceptualization of how social media shapes the experience of political messages for individuals.

Additionally, future research should focus on contextual description through "big data" and/or network analyses. In order to fully understand the effects of political messages on social media, researchers must also understand the nature and structure of communication on these media. Ideally, these methodologies could be combined to (a) refine conceptualization and measurement of disagreement and (b) triangulate observation to maximize leverage over important research problems.

Future research should also focus on theoretical advancements with regard to the process of experiencing disagreement and its subsequent effects. More work can be done to test different conditions that alter the effects of disagreement on a range of politically related outcomes. This work could be greatly aided by interdisciplinary collaboration with the subfields of computer-mediated communication (CMC) and human-computer interaction (HCI).

Finally, more research is needed to understand uncertainty production or reduction in response to political disagreement. Likewise, future research should focus on extending uncertainty production/reduction to outcomes with implications for meso- and macro-level social structures.

Extensions

In the following section, the conclusions outlined above are discussed in light of several prominent arguments about digital media and the public sphere. The goal here is not to prove or disprove any of these arguments, but rather to relate the findings of this study to larger conversations about online political communication.

The "fragmentation" argument. The fragmentation argument, perhaps best expressed by Sunstein (2007), suggests that the internet contributes to interest- and/or identity-based political fragmentation. Such fragmentation threatens social cohesiveness because it undermines the coherence of the public sphere. That is, people no longer come together in public spaces to discuss common issues; rather, they express their opinions online to people who are predisposed to agree with them. Therefore, the internet is generally bad for democratic governance because it keeps people who are different apart from one another.

From a broader view, these changes brought about by the internet represent only part of a larger shift in social structure. Place-based and lifestyle segmentation (e.g., Bishop, 2007) drives individuals to cities and neighborhoods filled with people who are similar to themselves socioeconomically and politically. These elements—place, socioeconomics, and political identity—are increasingly associated with one another (Bennett, 1998; Walsh, 2012). Meanwhile, several mainstream media channels in the United States have become increasingly partisan and polarized (e.g., Stroud, 2011), and selective exposure to these media deprives people of politically diverse views in the media, which used to be a primary source of cross-cutting exposure (Mutz & Martin, 2001). In short, people encounter less and less disagreement in their everyday lives—both in face-to-face contexts and from the media. The internet, the argument goes, contributes to this problem.

Clearly, the present study provides an important counterpoint to this claim. Social media expose people to more political difference, not less. They diversify, rather than normalize, communication within egocentric networks. The question, then, is not whether social media contribute to the fragmentation of the public sphere, but whether they are important enough to counteract other trends towards fragmentation online, in face-to-face settings, and in the media.

While social media are growing in popularity, particularly as a source of news and information (Mitchell, Gottfried, & Matsa, 2015), the (likely) answer is that they probably do not completely counteract larger trends towards selective affiliation and exposure in other communicative settings. But what can be said is that social media users are exposed to broader array of information and opinion than they would be without social media.

The "Babel" argument. The so-called "Babel" argument claims that people are overloaded with informational choice in the online environment. With so many choices, many people simply tune out politics altogether. Prior (2009) provides a good example of this kind of argument, showing that internet access creates political dropouts. Without the disinterested, politics has become more polarized because anyone who is highly involved is also likely to be highly partisan. Clearly, this is not a good situation from the democratic point of view—a scenario in which all participating individuals already have their minds made up seems neither inclusive nor deliberative (cf. Mutz, 2006).

This argument also fits within a broader view of political and social change in modern times. Traditional, hierarchically organized social and political groups are on the decline (Putnam, 2000), while political mobilization increasingly occurs via loosely organized, ephemeral networks of organizations (Bennett, 2008; Juris, 2012). So while the decline of traditional solidarity groups doesn't spell the end of political engagement, it does mean that

political engagement has become increasingly personalized and loosely involved, such that individuals can "check in" and "check out" whenever they please. It also means there is a growing litany of political causes and movements that attract interested parties. The result: a cacophonous political culture—one in which there are too many political causes *du jour*; one in which commitment to any single cause is ephemeral, if not fleeting; one in which the disinterested can easily find a quiet corner to avoid the din.

The current project provides an interesting counterpoint to this argument, as well. Social media, to some extent, draw the disinterested back into politics by exposing them to a diverse array of news and political information. But people are not only exposed to disagreement on social media, they also think it is relevant to their own lives. In other words, people don't think *all* political disagreement on social media is trivial (cf. McElvoy & Parkinson, 2015). Nor do they simply ignore it. To the contrary, results of this study show that not only is disagreement memorable, people also think it matters. Of course, this is not to say that social media provide all the answers when it comes to engaging the politically disinterested. However, it does imply that the disinterested are more engaged with social media than without.

The "concentration" argument. The concentration argument, articulated by Hindman (2009), is closely related to both the fragmentation and the "Babel" arguments. It asserts that most of the online attention goes to information from mainstream sources because the link structure of the web directs most of the traffic to them. In fact, the concentration of attention to mainstream sources may be even more pronounced online than it is offline. Thus, while the internet enables anyone to express their views, the lion's share of attention goes to mainstream media outlets and political elites.

The present study assumes that social media diversify communication sources (Barbera, 2014)—diversification that ultimately produces the perception of disagreement (Barnidge, 2015). Meanwhile, the study also assumes that aggregated traffic phenomena (i.e., the "logic of aggregation," Juris, 2012) help to drive exposure to political disagreement on social media. But these seemingly contradictory assumptions are, in fact, perfectly compatible.

Social media facilitate the dissemination of non-mainstream news and information and mainstream news alike (Carr, Barnidge, Tsang, & Lee, 2014). Thus, even while most of the attention may go to mainstream news, users are still exposed to more news from non-mainstream sources than they otherwise would have been. Additionally, despite the fact that ownership over major media outlets has concentrated in recent years, their content has polarized (Stroud, 2011). Compared to the non-social media environment, where selective exposure is the rule of the day, social media may expose people to mainstream news on "the other side." Thus, social media are, once again, relatively more diverse than non-social media environments.

In sum, the perspective adopted here implies that user aggregation processes drive information exposure, as claimed by Hindman (2009) and others. However, it also assumes that these processes are not limited to mainstream information (cf. Benkler, 2006) and that mainstream information can expose people to diverse views (Stroud, 2011).

Social Media and the Networked Public Sphere

It is clear from the above discussion that social media do not fragment social networks and communities based on political identity or interest. Nor do they preclude attention to messages from non-elite individuals or non-mainstream organizations. But this is not to say there are no democratic tradeoffs involved in the emergence of social media as a venue for political communication in the modern public sphere.

Social media arguably help to reconstitute the public sphere (Rojas, 2014). In the face of socio-demographic and communicative fragmentation, social media bring people together in ways that they wouldn't otherwise be connected, and they inadvertently expose people to a wider array of viewpoints from institutions and everyday individuals alike (Brundidge, 2010).

But they do so at the cost of privacy. University of Wisconsin-Madison professor Lewis Friedland recently said social media contribute to "[…] an erosion in people's norms of public space" (Mendoza, 2015). That is, people increasingly forget what is and what is not appropriate behavior in public because so much of their private lives are exhibited in semi-public spaces. But this doesn't mean people aren't watching. Quite the contrary—online public shaming has become a new social phenomenon gaining traction in popular discussion (Ronson, 2015), and online bullying has become a very real concern in public schools across the country (boyd, 2014). Shaming and bullying are but extreme examples of what some have called the "dark side" of online social connectivity (McKenna & Bargh, 1998). That is, social connection can, at times, exhibit powerful normative pressure on individuals, and counter-normative behavior can be met with insidious social sanction.

When it comes to political disagreement, expression may not be so comfortable for the expressive. Most people are unwilling to get entangled in actual political debates or arguments involving direct interaction with one or more discussants on social media, partly because they perceive that such behavior is not acceptable in these venues (Hampton et al., 2014). But this doesn't stop them from watching disagreement between others as it occurs. Indeed, the semi-public nature of disagreement on social media is part of the argument of this dissertation—one doesn't need to participate in a discussion in order to experience disagreement. Rather, people can experience it from a relatively comfortable psychological distance.

But what does it mean to have a public sphere in which disagreement is common but discussion is rare? Some have suggested that social media contribute to the perception of a dissatisfied public (Papacharissi, 2009). Egocentrism arguably promotes agonistic expression—that is, political expression about perceived wrongs that the individual cares about personally. Sometimes this kind of expression is aimed at correcting those wrongs (Barnidge & Rojas, 2014; Rojas, 2010). For the social media user, then, the impression is that most people who care about politics are dissatisfied with the political situation—a *plaintive society*.

Some have suggested such a plaintive tone might give people the perception that politics is more combative than it actually is, even while social media have a net moderating force on individuals' attitudes and ideologies (Wojcieszak & Rojas, 2011). The implications of such a paradoxical trend are still unclear; more research is needed to fully understand its scope.

Final Remarks: Understanding User Experience

A final word is warranted at the closing of this dissertation to discuss the broader implications of this study to the field of digital media and communication technology. In examining how contextual information affects the interpretation of messages, the study has, essentially, given a prominent role to what web industry professionals call "user experience" (UX). Indeed, it has been a central argument throughout this project that users' experience of political disagreement matters when it comes to its effects.

Understanding how user experience affects the interpretation of disagreeable messages has implications that extend well beyond political communication to virtually any communication sub-discipline, including health and science communication, journalism and public relations, interpersonal communication, and organizational communication, as well as a host of other social-scientific fields that study social processes intimately related to

communication. In fact, political communication may pose a relatively high bar for uncertainty production—political identities are relatively stable (Huddy, 2001) and political attitudes typically follow from them (Zaller, 1992). Thus, relevant disagreement could have even bigger effects in other communicative contexts.

Returning to the subfield of political communication, it could benefit as much from turning to the sub-disciplines of computer-mediated communication (CMC) and human-computer interaction (HCI) for interdisciplinary inspiration as it could from computer science and engineering (i.e., through "big data"). These sub-disciplines should inform one another, and, in ideal cases, their methodologies could be combined into a single study. Thus, user experience in political communication points towards a rich and promising research agenda that can be adapted as online and mobile technologies continue to develop and change.

The dissertation also has implications for professional communicators, particularly as journalists and strategic communicators increasingly experiment with new digital designs, information architectures, and content strategies. Understanding how users experience messages in one communicative context versus the next will help professionals deliver content in a meaningful and effective manner.

For communication scholars and professionals alike, the take home message is the same: Its not just about traffic, its about how people experience messages, and contextual information affects those experiences.

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Appendix 1: Supplemental Study Information

Internal Review Board Approval Letter

Education and Social/Behavioral Science IRB

Submission ID number:	2015-0118
Title:	Social Media Use, Political Disagreement, and Uncertainty
Principal Investigator:	Hernando Rojas
Point-of-contact:	Matthew Barnidge
IRB Staff Reviewer:	Casey Pellien
Date of Determination:	3/25/15

The IRB has reviewed the study indicated above. Please review the determination indicated below and any additional guidance provided by the IRB. If you have questions about this determination, please contact the staff reviewer listed above. For additional information about this application, please log into your ARROW account at arrow.wisc.edu.

Determination

☐ IRB review is not required because, in accordance with federal regulations, your project does not:
- ☐ constitute research as defined under 45 CFR 46.102 (d)
- ☐ involve human subjects as defined under 45 CFR 46.102 (f)

Additional information:

■ Your study qualifies for exemption under category:
- ☐ 45 CFR 46.101(b)(1): Research in educational settings
- ■ 45 CFR 46.101(b)(2): Research involving the use of educational tests, surveys, interviews
- ☐ 45 CFR 46.101(b)(3): Research involving the use of educational tests, surveys, interviews with public officials or required by federal statute
- ☐ 45 CFR 46.101(b)(4): Research involving existing data or specimens
- ☐ 45 CFR 46.101(b)(5): Demonstration projects
- ☐ 45 CFR 46.101(b)(6) Taste and food quality evaluation

Although your study is exempt from federal regulations, UW-Madison Human Research Protection Program policy requires that all human subjects research be conducted in accordance with the highest ethical standards/Belmont Report.

Additional information:

Final Invoice from Survey Sampling International

SSI
Science. People. Innovention

Survey Sampling International, LLC
6 Research Drive
Shelton, CT 06484
USA

Invoice Date: **4/8/2015**
Invoice Number: **U1PI00079367**
Page: **1 / 1**
Project Manager:
Account Executive: **Frank Markowitz**
Client Contact: **Matt Barnidge**

Invoice

Bill To: U1CA001069
University of Wisconsin

Attn: **Matt Barnidge**
475 N. Charter Street, 4323 Sterling Hall
Madison, WI 53706
USA

Reference: **ORD–159941–YFXZ–US01 / RE: New project quote**

Description	Quantity	Unit price	Currency	Line Amount
Online Survey Respondents				3,564.75
			Taxable Amount	0.00
			Sales Tax: 0%	0.00
Exchange Rate: 1.00			**Total Amount: USD**	3,564.75

Due to rounding differences, the total amount may differ slightly from our offer.

Invoices not paid by due date incur a 1.5% per month finance charge
To insure proper credit, please reference the invoice number on your payment

Payment Terms: **Net 30 days**
Our Tax ID Number: **92–0188807**

ACH/EFT/Wires Payment:

To: **Wells Fargo Bank, N.A., 12 East 49th Street, New York, NY 10017**
For Account: **Survey Sampling International**
ABA/Sort/Transit#: **121000248**
Account Number: **2000031628378**

Check Payments:

Survey Sampling International
Account # 2000031628378
P.O. Box 8500–7741
Philadelphia, PA 19178–7741

Comments: 679 Completes. $5.25 CPI. 96% IR. 19 Minute LOI.

Appendix 2: Question Wording

Survey Measures

Political Disagreement

S109 In all, how frequently do you encounter disagreement about:

	On social media						Face to face						From unknown others on online news websites or message boards					
	Never 0 (1)	1 (2)	2 (3)	3 (4)	4 (5)	Frequently 5 (6)	Never 0 (1)	1 (2)	2 (3)	3 (4)	4 (5)	Frequently 5 (6)	Never 0 (1)	1 (2)	2 (3)	3 (4)	4 (5)	Frequently 5 (6)
Politics or elections (1)	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍
News or current events (2)	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍
Public or community issues (3)	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍

Ambivalence

S110 Please indicate how much you agree or disagree with the following statements?

	Strongly Disagree 1 (1)	2 (2)	3 (3)	4 (4)	Strongly Agree 5 (5)
When a close friend of mine disagrees with me, I am willing to revisit my own opinion. (1)	❍	❍	❍	❍	❍
When I read something from an expert that disagrees with my opinion, I feel a little less certain about what I think. (2)	❍	❍	❍	❍	❍
I feel more confident when people who are close to me agree with my opinion. (3)	❍	❍	❍	❍	❍
I feel more confident when I read expert opinions that agree with my own. (4)	❍	❍	❍	❍	❍

Social Media Use

S1 We would like to ask you some questions about your social media use. How many days per week do you spend using:

Facebook (1)	❍	0 (1)	❍	1 (2)	❍	2 (3)	❍	3 (4)	❍	4 (5)	❍	5 (6)	❍	6 (7)	❍	7 (8)
Twitter (2)	❍	0 (1)	❍	1 (2)	❍	2 (3)	❍	3 (4)	❍	4 (5)	❍	5 (6)	❍	6 (7)	❍	7 (8)

S2 How many times per day would you say you check Facebook and/or Twitter?

	More than several times a day (1)	Several times a day (2)	One or two times a day (3)	Several times a week (4)	One or two times a week (5)	One or two times a month (6)	Never (7)
Facebook (1)	❍	❍	❍	❍	❍	❍	❍
Twitter (2)	❍	❍	❍	❍	❍	❍	❍

Social Media News Use

S3a Some people like to read news and political commentary on social media such as Facebook or Twitter. For each of the following, please indicate how many days you used it in the last week to read news or political commentary.

Facebook (1)	❍	0 (1)	❍	1 (2)	❍	2 (3)	❍	3 (4)	❍	4 (5)	❍	5 (6)	❍	6 (7)	❍	7 (8)
Twitter (2)	❍	0 (1)	❍	1 (2)	❍	2 (3)	❍	3 (4)	❍	4 (5)	❍	5 (6)	❍	6 (7)	❍	7 (8)

S4a How much attention did you pay to news or political commentary on social media?

	Not at all 0 (1)	1 (2)	2 (3)	3 (4)	4 (5)	A great deal 5 (6)
Facebook (1)	❍	❍	❍	❍	❍	❍
Twitter (2)	❍	❍	❍	❍	❍	❍

Social Media News Network Size

S5a Now we would like you to think more specifically about the people who post news or political commentary on your social media networks. For each of the following groups of people, how many haved posted news or political commentary on Facebook or Twitter in the last 6 months? Write you answer in the blank spaces below.

	Facebook	Twitter
	Number of People (1)	Number of People (1)
Family members (1)		
Friends (2)		
Other coworkers or classmates (3)		
Other acquantainces (4)		

Social Media News Network Diversity

See text

Social Media Political Talk

S23a From time to time, people comment about government, elections, politics, and the news on social media such as Facebook or Twitter. Excluding any discussions you might have had in face to face settings, how many of the following people's messages would you say you have commented on about these issues on in the last 6 months:

	Facebook	Twitter
	Number of People (1)	Number of People (1)
Family members (1)		
Friends (2)		
Other coworkers or classmates (3)		
Other acquaintances (4)		

S24a How often have you talked to family members about government, elections, politics, and the news on social media in the last 6 months?

	Never (1)	Rarely (2)	Sometimes (3)	Quite Often (4)	Very Often (5)
Facebook (1)	❍	❍	❍	❍	❍
Twitter (2)	❍	❍	❍	❍	❍

Online News Use

S10 Excluding articles you were linked to from Facebook or Twitter, but including articles you found on online search websites (e.g., Google, Yahoo), how many days in the last week did you visit online news or political commentary websites?

❍ 0 (1)
❍ 1 (2)
❍ 2 (3)
❍ 3 (4)
❍ 4 (5)
❍ 5 (6)
❍ 6 (7)
❍ 7 (8)

S11 How much attention did you pay to news or political commentary in online news?

❍ Not at all 0 (1)
❍ 1 (2)
❍ 2 (3)
❍ 3 (4)
❍ 4 (5)
❍ A great deal 5 (6)

Offline News Use

S12 Excluding their online versions, how many days in the last week did you use each of the following for news or political commentary?

	0 (1)	1 (2)	2 (3)	3 (4)	4 (5)	5 (6)	6 (7)	7 (8)
Newspapers (1)	❍	❍	❍	❍	❍	❍	❍	❍
Television (broadcast or cable) (2)	❍	❍	❍	❍	❍	❍	❍	❍

S13 How much attention did you pay to news or political commentary in:

	Not at all 0 (1)	1 (2)	2 (3)	3 (4)	4 (5)	A great deal 5 (6)
Newspapers (1)	❍	❍	❍	❍	❍	❍
Television (broadcast or cable) (2)	❍	❍	❍	❍	❍	❍

Email Political Talk

S28 How often have you sent or received emails about these topics with the people you mentioned above in the last 6 months? Be sure to exclude any discussions you may have had on social media.
- ❍ Never (1)
- ❍ Rarely (2)
- ❍ Sometimes (3)
- ❍ Quite Often (4)
- ❍ Very Often (5)

Interpersonal Political Talk

S62 Now we would like you to think about the people you talk with about government, elections, politics, and the news in face-to-face settings. Excluding any discussions you might have had online, how many of the following people would you say you have discussed these issues with:

	Number of People (1)
Family members (1)	
Friends (2)	
Other coworkers or classmates (3)	
Other acquaintances (4)	

S63 How often have you talked about government, elections, politics, and the news with family members?
- ❍ Never (1)
- ❍ Rarely (2)
- ❍ Sometimes (3)
- ❍ Quite Often (4)
- ❍ Very Often (5)

Internal Political Efficacy

S111 Using a scale from 0 to 5, where 0 means strongly disagree and 5 means strongly agree, how much do you agree with the following statements?

	Strongly Disagree (1)	Disagree (2)	Neither Agree nor Disagree (3)	Agree (4)	Strongly Agree (5)
I consider myself to be well qualified to participate in politics. (1)	❍	❍	❍	❍	❍
I think I am better informed about government and politics than most people. (2)	❍	❍	❍	❍	❍

Political Ideology (absolute)

S114 Using a scale where 0 means liberal, 5 means neutral and 10 means conservative, how liberal or conservative would you say you are?
- ❍ Liberal 0 (1)
- ❍ 1 (2)
- ❍ 2 (3)
- ❍ 3 (4)
- ❍ 4 (5)
- ❍ Neutral 5 (6)
- ❍ 6 (7)
- ❍ 7 (8)
- ❍ 8 (9)
- ❍ 9 (10)
- ❍ Conservative 10 (11)

Political Knowledge

S115 The current president of Russia is:
- ❍ Vladimir Putin (1)
- ❍ Nicolae Timofti (2)
- ❍ Angela Merkel (3)
- ❍ Dmitry Medvedev (4)
- ❍ Don't Know (5)

S116 Please identify the Majority Leader of the U.S. House of Representatives:
- ❍ Kevin McCarthy (1)
- ❍ Eric Cantor (2)
- ❍ Rand Paul (3)
- ❍ Paul Ryan (4)
- ❍ Don't Know (5)

S117 How long is the term of office for a U.S. Senator?
- ❍ 2 years (1)
- ❍ 4 years (2)
- ❍ 5 years (3)
- ❍ 6 years (4)
- ❍ Don't Know (5)

S118 Which political party would you say is more likely to support 2nd Amendment rights for gun owners?
- ❍ Republicans (1)
- ❍ Democrats (2)
- ❍ Don't Know (3)

Political Interest

S119 On a scale where 0 means not at all and 5 means a lot, how interested are you in:

	Not at all 0 (1)	1 (2)	2 (3)	3 (4)	4 (5)	Very 5 (6)
Local or regional politics (1)	❍	❍	❍	❍	❍	❍
National politics (2)	❍	❍	❍	❍	❍	❍

Demographics

S122 What is your sex?
- ❍ Male (1)
- ❍ Female (2)

S123 How old are you currently? *[Dropdown menu ranges from "18" to "more than 90"].*

S124 What is the highest level of education you have attained?
- ❍ None (1)
- ❍ Some high school (2)
- ❍ High school diploma or equivalent (3)
- ❍ Some college or trade school (4)
- ❍ Associate degree or trade school certificate (5)
- ❍ Bachelor's degree (6)
- ❍ Some post-graduate (7)
- ❍ Post-graduate degree (8)

S125 What is your annual household income?
- ❍ Less than $15,000 (1)
- ❍ Between $15,000 and $34,999 (2)
- ❍ Between $35,000 and $49,999 (3)
- ❍ Between $50,000 and $74,999 (4)
- ❍ Between $75,000 and $99,999 (5)
- ❍ Between $100,000 and $149,999 (6)
- ❍ $150,000 or more (7)

Quasi-Experimental Measures

Social Media Name Generators

Prompt From time to time, people post information and opinions about government, elections, and politics on social media such as Facebook and Twitter. We'd like to know the first names or just the initials of people in your social media networks who post about these matters. Be sure to exclude face to face discussions you may have had. These people might be from your family, from work, from the neighborhood, from some other organization you belong to, or they might be from somewhere else.

S29 Who is the person in your social media networks who posts the most about politics?

S40 Aside from ${q://QID82/ChoiceTextEntryValue}, who is the person who posts the most about politics?

S51 Aside from anyone you've already mentioned, who is the person who posts the most about politics?

Interpersonal Name Generators

Prompt Now we'd like to talk about the conversations you've had in face-to-face settings. We'd like to know the first names or just the initials of people you talk with about government, elections, politics, and the news in face to face settings. Be sure to exclude any online interactions you have had. These people might be from your family, from work, from the neighborhood, from some other organization you belong to, or they might be from somewhere else.

S67 Who is the person you've talked with the most about politics?

S81 Aside from ${q://QID135/ChoiceTextEntryValue}, who is the person you've talked with the most about politics?

S95 Aside from anyone you've already mentioned, who is the person you've talked with the most about politics?

Political Disagreement

S31 Compared with ${q://QID82/ChoiceTextEntryValue}, would you say that your political views are much the same, somewhat different, or very different?
- ❍ Much the same 0 (1)
- ❍ 1 (2)
- ❍ Somewhat different 2 (3)
- ❍ 3 (4)
- ❍ Very different 4 (5)

S32 Overall, do you feel ${q://QID82/ChoiceTextEntryValue} shares most of your views on political issues, opposes them, or doesn't ${q://QID82/ChoiceTextEntryValue} do either one?
- ❍ Shares most views 0 (1)
- ❍ 1 (2)
- ❍ Neither 2 (3)
- ❍ 3 (4)
- ❍ Opposes most views 4 (5)

S33 Overall, do you feel ${q://QID82/ChoiceTextEntryValue} likely supports the same political party as you, likely opposes the party you support, or doesn't ${q://QID82/ChoiceTextEntryValue} do either one?
- ❍ Supports the same party 0 (1)
- ❍ 1 (2)
- ❍ Neither 2 (3)
- ❍ 3 (4)
- ❍ Opposes the party you support 4 (5)

Perceived Relevance

S39 Thinking about your own views and preferences, do you typically find ${q://QID82/ChoiceTextEntryValue}'s posts to be:

	Not at all 0 (1)	1 (2)	2 (3)	3 (4)	4 (5)	Very 5 (6)
Relevant (1)	❍	❍	❍	❍	❍	❍
Important (2)	❍	❍	❍	❍	❍	❍
Useful (3)	❍	❍	❍	❍	❍	❍

Relevant Disagreement

See text

Positive Evaluation

S34 Aside from politics, how much do you think you have in common with ${q://QID82/ChoiceTextEntryValue}?
- ❍ Nothing or almost nothing 0 (1)
- ❍ 1 (2)
- ❍ 2 (3)
- ❍ 3 (4)
- ❍ 4 (5)
- ❍ 5 (6)
- ❍ A great deal 6 (7)

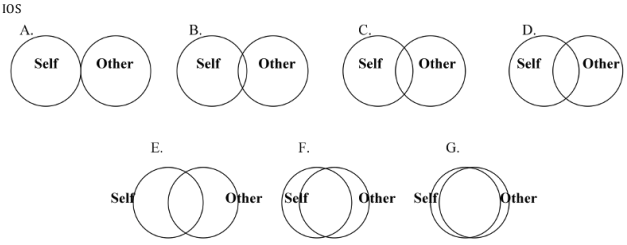
S35 Aside from politics, how similar are you and ${q://QID82/ChoiceTextEntryValue}?
- ❍ Not at all 0 (1)
- ❍ 1 (2)
- ❍ 2 (3)
- ❍ 3 (4)
- ❍ 4 (5)
- ❍ 5 (6)
- ❍ Very similar 6 (7)

S36 How much do you like ${q://QID82/ChoiceTextEntryValue}?
- ❍ Not at all 0 (1)
- ❍ 1 (2)
- ❍ 2 (3)
- ❍ 3 (4)
- ❍ 4 (5)
- ❍ 5 (6)
- ❍ A great deal 6 (7)

S37 How would you feel about working with ${q://QID82/ChoiceTextEntryValue} on a project?
- ❍ I feel that I would probably dislike working with this person 0 (1)
- ❍ 1 (2)
- ❍ 2 (3)
- ❍ 3 (4)
- ❍ 4 (5)
- ❍ 5 (6)
- ❍ I feel that I would probably like working with this person 6 (7)

Closeness

IOS



S38 Please indicate the picture that best describes your current relationship with ${q://QID82/ChoiceTextEntryValue}:
- A (1)
- B (2)
- C (3)
- D (4)
- E (5)
- F (6)
- G (7)

Strong Tie

S30 Which category best applies to ${q://QID82/ChoiceTextEntryValue}?
- Family member (1)
- Friend (2)
- Other coworker or classmate (3)
- Other acquaintance (4)
- Neighbor (5)
- Other (6) _____

Experimental Measures

Pre-existing Vaccination Attitude

PT1 When it comes to childhood diseases like measles, mumps, and whooping cough, should all children be required to get vaccinations or should parents be able to decide whether or not to vaccinate their children?
- All children required 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- Parents decide 6 (6)

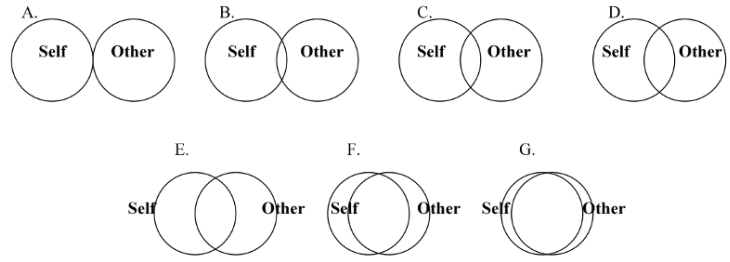
PT2 Should children who have NOT been vaccinated from diseases like measles, mumps, and whooping cough be allowed or not allowed to attend public schools?
- Not allowed 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- Allowed 6 (6)

Manipulation Checks

MC1a Was the viewpoint expressed in the tweet pro- or anti-mandatory vaccination for all children, or was it neutral?
- Pro-mandatory vaccination (1)
- Anti-mandatory vaccination (2)
- Neutral (3)

MC2a Was the author of the tweet presented as an expert on the subject of childhood vaccinations?
- Expert (1)
- Some expertise (2)
- No expertise (3)

IOS



MC2b Please indicate the picture that best describes your current relationship with the person we asked you to think about.
- A (1)
- B (2)
- C (3)
- D (4)
- E (5)
- F (6)
- G (7)

Referendum Choice

Prompt We would like for you to imagine that your state (or territory) is holding a public referendum on the childhood vaccination issue. In this scenario, citizens like you would decide the outcome through a direct vote. If passed, the referendum would require all children, except those with medical exemptions, to be vaccinated for childhood diseases in order to attend public schools in the state (or territory).

PS1 In this scenario, how would you vote in the referendum?
- Yes (1)
- No (2)

Certainty

PS2 On a scale where 1 means "Not at all confident" and 100 means "Completely confident," how confident are you in your decision?
_____ Confidence (1)

PS3 Using the same scale, how strongly do you feel about your decision?
_____ Strength of Feeling (1)

Perceived Relevance

See above: Quasi-Experimental Measures

Positive Evaluation

PS5 Thinking now of the author of the tweet you just read, how much do you think you have in common with this person?
- Nothing or almost nothing 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- A great deal 7 (7)

PS6 Thinking now of the author of the tweet you just read, how much do you like this person?
- Not at all 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- A great deal 7 (7)

PS7 Thinking now of the author of the tweet you just read, how would you feel about working with this person on a project? ?
- I feel that I would probably dislike working with this person 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- I feel that I would probably like working with this person 7 (7)

Issue Importance

PS8 How important is the childhood vaccination issue to you, personally?
- Not at all 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- Very 6 (6)

Appendix 3: Experimental Materials

Introductory Script

The issue of childhood vaccines has been in the news a lot lately. When it comes to childhood diseases like measles, mumps, and whooping cough, some people think that all children should be required to be vaccinated. Others think that parents should be able to decide whether to vaccinate their children.

To date, 17 states have passed laws allowing an exemption to childhood vaccination based on philosophical, personal, or conscientiously held beliefs. In order to exercise a philosophical exemption, parents or children old enough to give consent (usually age 12 or older) must object to all vaccines and not just one vaccine.

In reaction to these trends, six states, including Montana, Iowa, Kentucky, Massachusetts, Nebraska, and Oregon, are introducing initiatives that would eliminate or restrict non-medical exemptions to state vaccine laws. These initiatives would require all children to be vaccinated in order to attend public schools, unless vaccination would cause medical harm to the child. Two of these states will hold public referenda in the next state election.

Pre-Stimulus Prompts

Experiment 1. We are about to show you a screenshot of a tweet about the childhood vaccination issue that has recently garnered a lot of attention. The tweet is written by [an expert in the medical field]/[a marketing professional]. Ronald W. Massey, [Ph.D., M.D., M.Sc.]/[], is a [biomedical researcher at the Johns Hopkins Hospital]/[marketing associate at Jos. A. Bank Clothiers] in Baltimore, MD.

When you are ready, please click the red button below. The "continue" button will appear on the next page after 15 seconds.

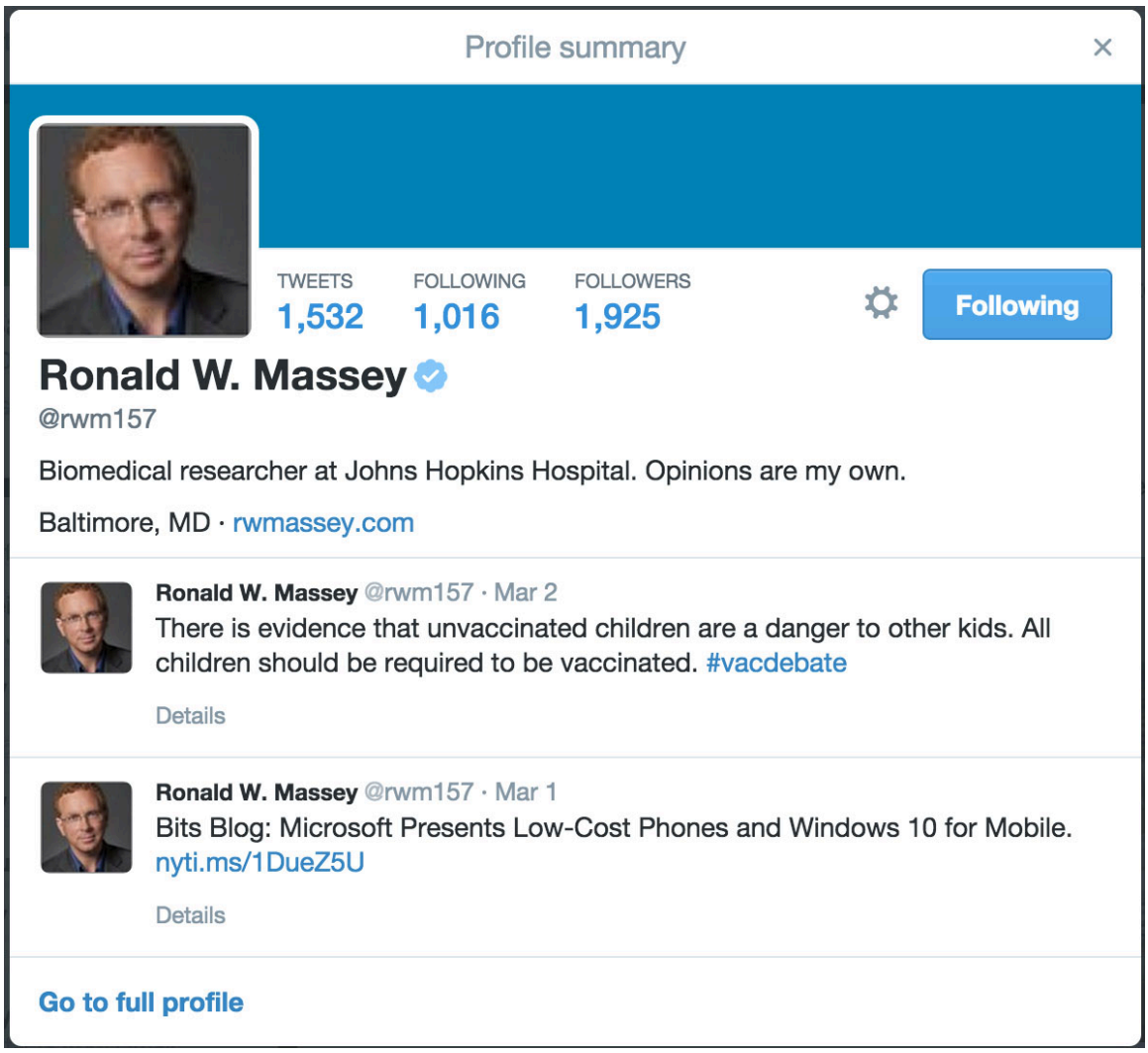
Experiment 2. We are about to show you a screenshot of a tweet about the childhood vaccination issue that has recently garnered a lot of attention. We would like you to imagine that the tweet was written by [**your best friend**]/[**a coworker or classmate**].

Once you have this person in mind, please click the red button below. The "continue" button will appear on the next page after 15 seconds.

Stimuli

Expert/anti-vaccination.

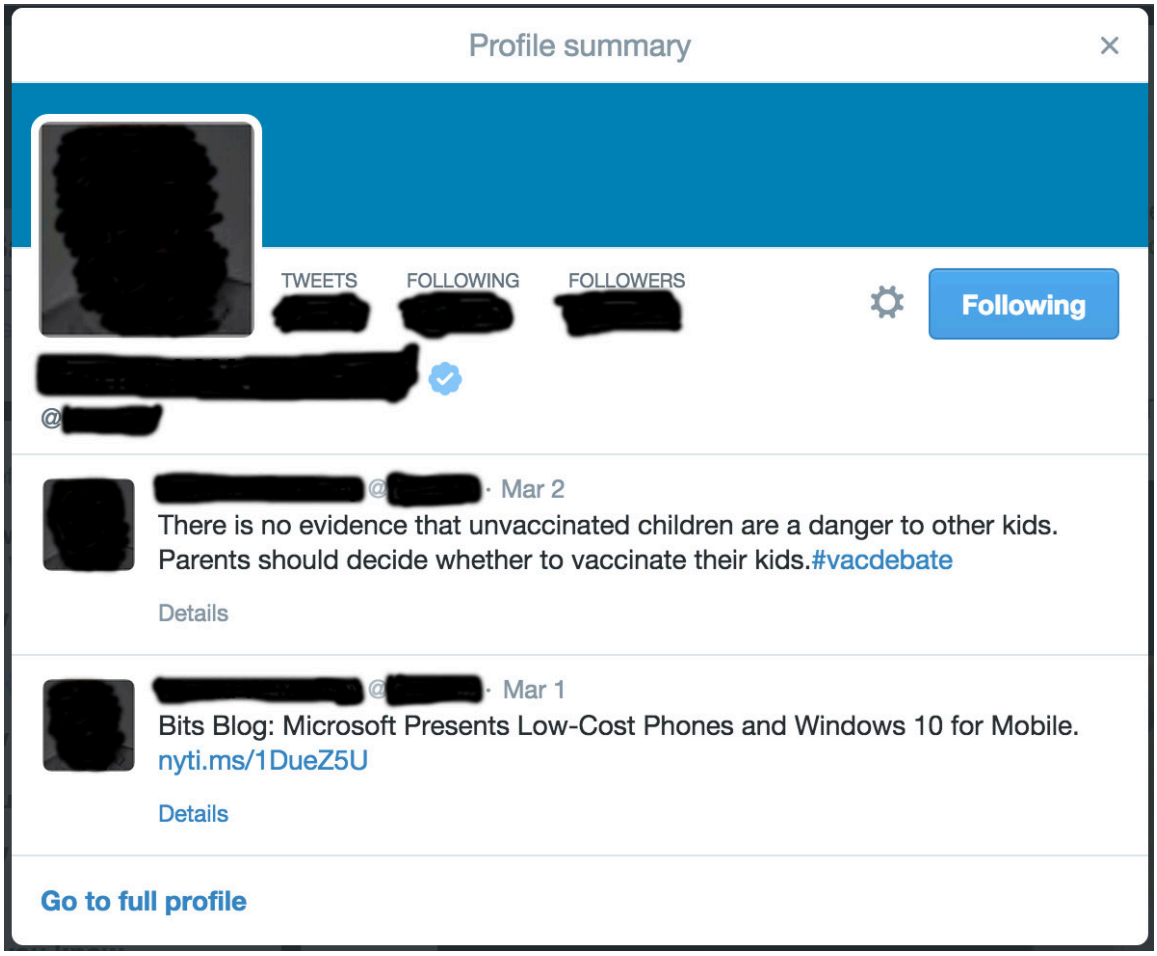
Expert/pro-vaccination.



Non-expert/Anti-vaccination.

Non-expert/Pro-vaccination.

None/Anti-vaccination.



None/Pro-vaccination.