Social Constraint and Self-Doubt: Mechanisms of Social Network influence on Resistance to Persuasion

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Those around us have a profound influence on our political attitudes and attitude strength, such that people whose social networks include a variety of perspectives have weaker, less deeply entrenched attitudes than those who are surrounded by like-minded others. In particular, those embedded in attitudinally heterogeneous networks are more open to changing their views. The nature and mechanisms of this network influence on openness to attitude change remain unclear. A survey experiment examines two mechanisms proposed by prior literature: (1) social doubt *triggered by network members' dissent and (2)* social constraint *to maintain similar attitudes. It also provides some data on the more commonly assumed mechanism, (3)* information exchange. *Results strongly support social constraint and are mixed on social doubt. This contrasts with the theoretical emphasis of much previous interdisciplinary social network research, which has focused primarily on information exchange, to the detriment of other mechanisms. Findings also indicate that like-minded social network members solidify attitudes at least as much as dissent erodes them, suggesting that prior emphasis on the influence of heterogeneous rather than attitudinally congruent networks is overstated. Implications for political movements are discussed.*

KEY WORDS: social networks, social influence, attitude strength, persuasion

Although a well-informed public making considered judgments is central to the democratic ideal, in reality the public often falls short of this ideal (see Taber, 2003). For example, a large minority of the public continued to judge President Obama to be foreign-born well after his election, despite all available evidence (NYT/CBS poll, 2011; PPP poll, 2012). It is tempting to blame this on lack of political sophistication, lack of access to information, or general disinterest, but these explanations ring hollow in cases like this, where the evidence is so widely publicized and easy to comprehend. The current research examines how the strength and endurance of our attitudes is influenced by those around us. Specifically, a social environment in which one is surrounded by like-minded others may suppress people's willingness to change their attitudes, perhaps even in the face of valid and convincing evidence. Concerns about maintaining positive relationships may make those embedded in attitudinally congruent networks reluctant to contemplate incongruent information and amend their views compared to those in more attitudinally diverse social networks.

The role of network attitudinal heterogeneity in opening our views to change has been repeatedly established (e.g., Levitan & Visser, 2009; Ryan, 2013; Visser & Mirabile, 2004), but the mechanisms of this influence remain relatively obscure, despite the important normative implications. If this change arises from thoughtful consideration of information or arguments provided by others, this has

positive implications for democracy (see Fishkin, 1991). If, on the other hand, this effect stems from more purely social pressures, the outlook may be somewhat less rosy.

Although little research directly addresses this issue, several plausible mechanisms have been proposed, one or more of which may be at work: (1) information exchange with social network members, (2) a metacognitive process in which merely knowing that others disagree causes self-doubt, and (3) a purely social process of constraint by which alternate viewpoints are suppressed to maintain social harmony. Research evidence is ambiguous, however. Previous research, particularly in political science, has often assumed an information exchange mechanism and modeled how information spreads though networks (e.g., Huckfeldt, Beck, Dalton, & Levine, 1995). Yet it is a mistake to assume that this is the only way network members can influence us, as a wealth of psychological research attests. The remaining two proposed mechanisms both have empirical support, but the same findings can be interpreted as supporting multiple mechanisms and so provide definitive evidence for none. The current research will clarify the mechanisms of social network influence by comparing them within a single study. Experimental manipulations will be leveraged to focus on the two non-information-exchange mechanisms to establish their viability in explaining network influences.

Tightly entangled with this question of mechanism lurks a concern so basic that it has generally been implicitly answered in researchers' writing, rather than explicitly examined in research: Which *types* of networks are influential in opening or closing our minds to alternate perspectives? Do attitudinally heterogeneous networks encourage weaker, more malleable attitudes, or do congruent networks strengthen them, leaving people less open to alternate views than they would if left to their own devices? Although research has established that both heterogeneous and congruent groups of strangers have effects in an in-person persuasion context (e.g., Klar, 2014), there is sparse research directly addressing which of the opposing ends of the heterogeneity spectrum drive naturally occurring network effects, particularly on openness to outside perspectives.

The current research proposes that being surrounded by like-minded others suppresses people's willingness to change their opinions. In particular, it proposes that concerns about maintaining positive relationships make those surrounded by like-minded others more reluctant to reconsider their views than those in more attitudinally diverse social networks, thereby suppressing attitude change that might otherwise freely occur.

Social Network Influence

Political attitudes are not maintained in isolation. The influence of those around us has long been studied, particularly with respect to close social network members with whom we interact regularly and discuss important matters (Berelson, Lazarsfeld, & McPhee, 1954; Huckfeldt, 2014; Huckfeldt & Sprague, 1987). Our social networks socialize us politically (Settle, Bon, & Levitt, 2011), influencing our attitudes (Huckfeldt, Mendez, & Osborn, 2004), votes (e.g., Ryan, 2010), and behavior (e.g., McClurg, 2006; Mutz, 2002a), and we carry this socialization with us as we consider political situations.

Of particular importance are network effects that strengthen or weaken attitudes. "Strong attitudes" are defined as attitudes that are resistant to persuasion, persistent over time, and which influence thought and behavior (Krosnick & Petty, 1995), whereas weak attitudes are more flexible and less impactful. A wealth of evidence demonstrates that individuals' attitudes are more malleable and less impactful when some network members hold differing attitudes (attitudinally heterogeneous networks) than when all network members agree with them (attitudinally congruent networks). Those in congruent networks are more likely than those in heterogeneous networks to show an impact of their attitudes on behaviors including vote choice (Ryan, 2010) and political participation (Mutz, 2002a), more likely to have stable attitudes (Huckfeldt & Sprague, 2000; Levitan & Visser, 2009), and more

likely to be resistant to persuasion (Visser & Mirabile, 2004). Overall, those embedded in more like-minded networks have stronger attitudes that are less open to change than those in more attitudinally heterogeneous networks.

One might assume that this relation is spurious or reverse-causal, with those who are most invested in their attitudes choosing to associate with similar others. Ample research, however, supports the causal role of network composition. Social networks are generally formed based on social and demographic characteristics (Sinclair, 2012) and sheer proximity (Festinger, Schachter, & Back, 1950) rather than political agreement. Experimental studies demonstrate that randomly assigned networks influence attitude change (e.g., Visser & Mirabile, 2004). Additionally, in-depth longitudinal and quasi-experimental studies starting at or before a networks' inception show that individuals' attitudes are notably influenced by those of network members (Lazer, Rubineau, Chetkovich, Katz, & Neblo, 2010; Levitan & Visser, 2009; see also Bello & Rolfe, 2014). In contrast, the hypothesis that people select similar others to associate with has been notoriously difficult to confirm outside of limited laboratory circumstances (see a special 1992 issue of *Communications Monographs* 59(2) for thorough discussion; Festinger et al., 1950; Levinger, 1972).

Mechanisms of Network Influence

Given the at least partially causal influence of network members on openness to attitude change, the question then becomes *how* network members weaken or strengthen attitudes. Several mechanisms have been suggested, but these mechanisms have often been taken for granted without thorough testing. Moreover, evidence consistent with each is generally also consistent with another mechanism, meaning that neither is definitively supported. As an additional issue, most research has assumed that specifically *heterogeneous* networks influence openness to attitude change. The current research seeks to examine these mechanisms of network influence, as well as the role of attitudinally heterogeneous versus congruent social networks in encouraging and suppressing attitude change.

Information exchange with network members is the predominant mechanism assumed in research on political networks either implicitly or explicitly. As explained by the progenitors of much recent networks research, "Political behavior may be understood in terms of individuals tied together by, and located within, networks, groups, and other social formations that largely determine their opportunities for exchange of meaningful political information" (Huckfeldt & Sprague, 1987, p. 1197; see also Burt, 1987). In this line of reasoning, network members provide us with information and arguments supporting their own views. This is expected to reinforce the attitudes of those embedded in congruent networks, and to generate ambivalence and ultimately persuasion in people embedded in heterogeneous networks.

Supporting research has shown that individuals whose networks are more heterogeneous are better informed about opposing positions (Huckfeldt et al., 2004; Mutz, 2002b). Similarly, laboratory experiments show that preferences can be influenced by exchanging information with group members (e.g., Ahn, Huckfeldt, & Ryan, 2010; Klar, 2014). Still, attitude change is not a function of arguments alone, but of our cognitive responses to those arguments (e.g., accepting, counterarguing; Greenwald, 1968; Petty & Cacioppo, 1986). Moreover, information exchange alone cannot account for the finding that individuals in heterogeneous networks are more persuaded by the *same* arguments than are those in more congruent networks (Levitan & Visser, 2009; Visser & Mirabile, 2004).

The *social doubt* mechanism relies more clearly on advances in persuasion research, particularly dual-process models (Chen & Chaiken, 1999; Petty & Cacioppo, 1986). This mechanism suggests that networks influence how deeply individuals consider information, even information they are exposed to outside of the network context. Specifically, it proposes that heterogeneous networks instigate greater systematic processing of available information. "Diversity of opinions among important others may be taken as a signal that something is amiss, and that one's attitude needs to be re-

evaluated. . . [motivating] people to scrutinize new attitude relevant information in an effort to identify and adopt the most valid attitude" (Levitan & Visser, 2008, p. 642). In this case, network members' *attitudes*, rather than their arguments, influence individuals by instilling self-doubt, which motivates deeper examination of issue-relevant information. People judge the validity of their opinions by comparison with similar others through social comparison processes (Festinger, 1954). Therefore, merely knowing that network members hold diverse attitudes, even without knowing why, should instill socially motivated doubt and encourage attitude reassessment and (where warranted) attitude change. After all, how could these well-esteemed yet disagreeing network members be so mistaken? Alternately, if we all agree, how could we all be wrong (e.g., social proof; Cialdini, 1995)?

Supporting evidence for this *social doubt* perspective shows that the relation between network attitudinal composition and attitude change is partially mediated by certainty, and ambivalence (Visser & Mirabile, 2004), such that individuals embedded in heterogeneous networks doubt their attitude more than individuals embedded in congruent networks. Nor do individuals respond to networks regardless of their arguments, as might be expected with pure social conformity. Instead, those embedded in like-minded networks change their attitudes little, even in the face of cogent arguments, whereas those in more heterogeneous networks scrutinize information and change their attitudes *only* for strong arguments (Levitan & Visser, 2008). Moreover, those in heterogeneous social networks are actually more likely to seek out new information (Levitan & Wronski, 2014) to alleviate their uncertainty. This indicates that heterogeneous networks instigate deeper, more central, and systematic processing of relevant information, as would be expected if knowing that network members hold differing attitudes generates doubt.

Perhaps most interestingly, a *social constraint* mechanism is also plausible, but it has been understudied in the network literature. This mechanism proposes that individuals are motivated to maintain attitudes that are in step with the network (see Visser & Mirabile, 2004), even when network members are not present. Individuals are chronically motivated to get along with others, a motivation which continues to have influence when network members are not present because network members may later hold them accountable for attitude change that happened in their absence. This idea is rooted in classic research on social influence and conformity (Deutsch & Gerard, 1955; Kelley, 1952; Kelman, 1958; Kelman & Hamilton, 1989; Ulbig & Funk, 1999). Importantly, however, this social influence need not be conformity as classically studied. Although iconic social influence research focuses on bringing deviant members into the fold (e.g., Asch, 1955; Schachter, 1951), social constraint also affects those who already agree because attitudes can serve a "social adjustment" function (Smith, 1956; see also Katz, 1960). In this case, social constraint can keep people who already agree from straying, for example, by preventing full consideration of information that might encourage less congenial attitudes. To date, this potential mechanism has not yet been tested with respect to network influence, especially in terms of network composition suppressing change in those who initially agree.

Research consistent with *social constraint* demonstrates that humans have a deep-seated "need to belong" (Baumeister & Leary, 1995). When unmet, this need leads to greater sensitivity to social stimuli (Gardner, Pickett, & Brewer, 2000) in order to foster stronger relationships. Individuals therefore seek to emulate members of reference groups (Kelley, 1952) in order to maintain positive social relationships ("identification," Kelman & Hamilton, 1989) and avoid penalties ranging from mild derogation to ostracism for falling out of step with group members' views (e.g., compliance, Kelman & Hamilton, 1989; Schachter, 1951). In short, people worry that others will tease, be angry, or simply think them stupid. At minimum, individuals tend to remain silent about minority views they hold (Noelle-Neuman, 1974). At the extreme, they may express views held by group members even in the face of overwhelming objective evidence (Asch, 1955, although see Ross, Bierbrauer, & Hoffman, 1976). Ultimately, individuals internalize these views (Kelman & Hamilton, 1989), although classic research often focuses on publicly conformity rather than private acceptance.

Such possibilities have received little attention in accounts of network influence. Still, recent findings provide some support in that individuals embedded in attitudinally congruent networks are less tolerant of alternate viewpoints (Mutz, 2002b, although see Bloom & Bagno-Moldavsky, 2015). Those whose personalities are especially conflict-avoidant also show greater effects of network composition on political *behavior* (Mutz, 2002a). Additionally, individuals exhibit lasting attitude change after exposure to strangers known to hold disagreeing views, even without discussion of the reasons for those views (Carlson & Settle, 2016; Levitan & Verhulst, 2016). In short, several lines of research suggest that individuals may come to their views because they want to agree with others, but ultimately, this social constraint mechanism has not been tested with respect to networks' influence on attitudes and openness to attitude change.

Ambiguous evidence. Unfortunately, the evidence for any one of these processes of network influence is far from overwhelming, particularly in the light of the other two. Evidence that individuals in heterogeneous networks know more about opposition views (supporting *information exchange*) may be due to greater information seeking and scrutiny (as with *social doubt*) or differences in willingness to examine counterattitudinal information at all (as with *social constraint*). Correspondingly, evidence for the *social doubt* perspective, such as differences in certainty, may be due to differences in the knowledge received during network interactions (consistent with *information exchange*) or due to interpersonal ambivalence (Priester & Petty, 2001) (consistent with *social constraint*). As for social constraint, it is a promising direction, but little research has explicitly examined this mechanism for network influence. What findings there are, though suggestive, may be more relevant to responses to an immediate group in a laboratory than to broader network composition altering an individual's mindset and attitude strength in a way that persists when network members are absent.

The Impact of Attitudinally Congruent Social Networks

An important step in disentangling these mechanisms is to reconsider our conceptualization of network composition to bring the role of attitudinally congruent networks to the forefront. Network influence tends to be framed in terms of *heterogeneous* networks providing information, signaling potential problems with attitudes, and applying social pressures. Even the commonly used terms "network heterogeneity" (e.g., Huckfeldt & Sprague, 1987) and "cross-cutting exposure" (Mutz, 2006) emphasize the attitudinally diverse side of the spectrum, rather than the attitudinally congruent end. This may seem to be a semantic concern, but language constrains thought (Whorf, 1956), and this terminology lends itself to discussion of models in which heterogeneous networks instigate change (e.g., by bringing new information), rather than models in which congruent networks inhibit change (e.g., by blocking consideration of information). Nonetheless, attitudinally congruent network members may be driving influences behind network effects.

An effect of any of these mechanisms could theoretically result from support of others who agree as much as subversion from those who do not, but this is especially true of social constraint. Individuals' network compositions tend to range from complete agreement to a mix of views (e.g., Huckfeldt et al., 2004). These heterogeneous networks, which include some disagreement, leave room for multiple perspectives because it is less clear what attitudes might be "unacceptable." It is difficult to rock a boat already laden with a variety of attitudes, and so one need not fear holding deviant attitudes. A congruent network, on the other hand, sends a clear signal about which attitude is appropriate and is less tolerant of alternate views (Laumann, 1973; Mutz, 2002b). Congruent networks may therefore be the motivating end of the scale, suppressing openness to alternate perspectives. Thus, network effects may be characterized by congruent network suppression of natural change, tethering an individual to a particular attitude, whereas heterogeneous networks may not so much encourage change as fail to prevent attitudes from drifting or changing in response to outside influences.

Overall, it is not clear whether heterogeneous or congruent networks or both are key in understanding network-induced attitude change and maintenance, nor does research unambiguously support any of the proposed mechanisms. It may be that only one of these mechanisms underlies the effect of network attitudinal composition upon openness to attitude change, or that each independently contributes to the effect.

The Current Study

The current research seeks to disentangle these mechanisms of social network influence by use of a less causally ambiguous experimental methodology. This survey experiment particularly emphasizes the previously underexamined social constraint mechanism, and the associated possibility that being embedded in an attitudinally congruent network suppresses change, rather than (or perhaps in addition to) heterogeneous networks encouraging change.

Multiple issues complicate research into mechanisms of any effect, but best practice is to manipulate the proposed mediator of the effect rather than to measure the mediator (for detailed discussion, see Bullock, Green, & Ha, 2010). As such, an experimental manipulation designed to disrupt a proposed mechanism provides a strong test of the mechanism. If the relation between the independent variable and the dependent variable is also disrupted, this provides evidence that the proposed mechanism is indeed at work.

Experimental manipulations were therefore used to disrupt two potential mechanisms, while the third was assessed correlationally. As described above, the proposed *social constraint* mechanism operates through individuals' need to belong and fear of social sanctions. Individuals in congruent networks have greater fear of subsequent social sanctions for changing their views, and so avoid attitude change. This mechanism was disrupted by an experimental intervention reassuring participants about the strength of their relationships. If social constraint is at work, this should relieve it by minimizing concern about maintaining relationships when considering attitudes. If participants believe they are well-liked, and they will maintain positive relationships long into the future, then they do not need to worry about keeping their attitudes in step with those of network members to maintain those relationships. This should reduce or eliminate the relation between network composition and attitude strength.

Social doubt was disrupted by reassuring participants about their relative knowledge. Thus, the dissent of network members can no longer be taken as an indicator that participants may be relatively uninformed and need to reevaluate their views. If the social doubt mechanism is at work, this should reduce or eliminate the relation between network composition and openness to attitude change. Participants' knowledge was also assessed, providing evidence relevant to the *information exchange* mechanism.

Additionally, the question of whether heterogeneous networks encourage change or congruent networks suppress it was assessed by examining the specific pattern of results when network influence was disrupted. If severing the link between networks and attitude change disproportionately reduces attitude change of those whose networks are heterogeneous, this supports the idea that heterogeneous networks enable or encourage change. If severing this link disproportionately increases attitude change within congruent networks, this indicates that congruent networks suppress attitude change.

Method

In order to uncover the processes behind network influences on resistance to persuasion, a national probability sample participated in a survey experiment. Prescreened participants first reported their attitudes and knowledge about an issue (capital punishment) and described network members' attitudes. Participants then experienced a randomly assigned condition (social affirmation, knowledge affirmation, or control). Resistance to persuasion was then assessed. Manipulation checks and control
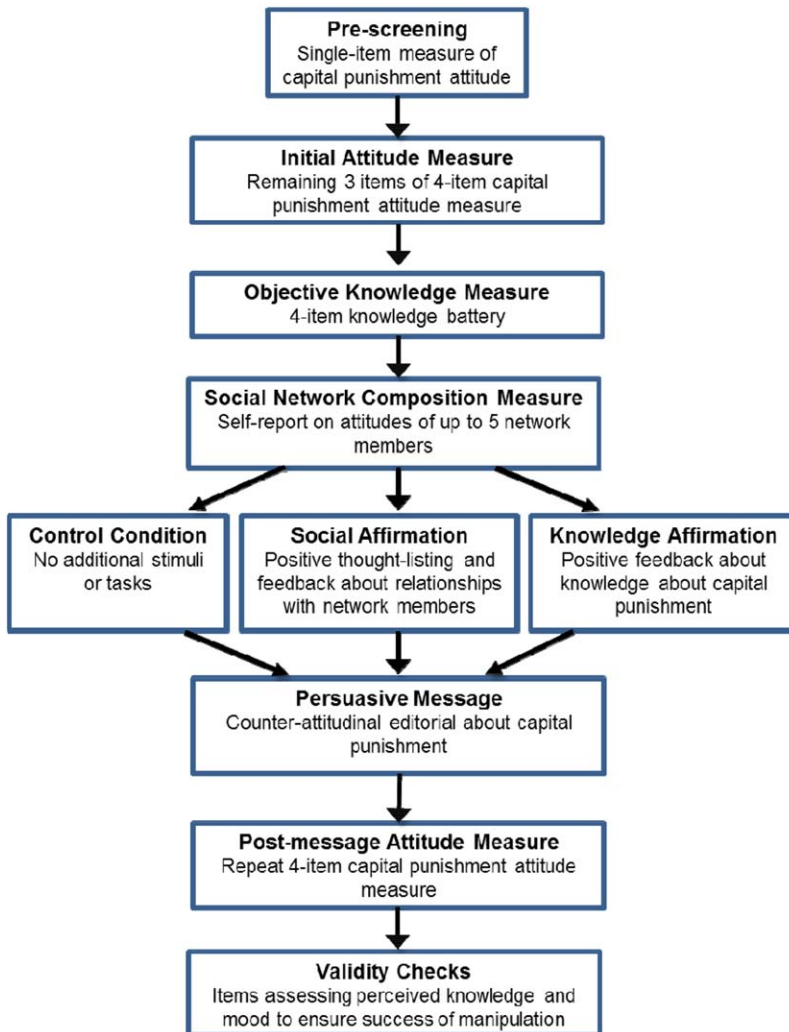
Figure 1. Study procedure. [Color figure can be viewed at wileyonlinelibrary.com]

variables were also included. An outline of the procedure is depicted in Figure 1. Following participation, respondents were thanked and debriefed.

Participants and Prescreening

Four hundred and fifty-three participants were recruited from a nationally representative panel initially recruited through a combination of random-digit-dialing and address-based sampling by Knowledge Networks.[1]

Potential participants first completed a screening item asking the extent to which they favored or opposed capital punishment on a fully labeled 7-point bipolar scale. Participants who did not indicate pro-capital punishment attitudes were excluded from the study, so that the subsequent persuasive message would be counterattitudinal. (Participants cannot be persuaded to change their attitudes if they

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already agree.) As expected based on previous studies, 67% of those screened qualified for the study (see Table S1 in the online supporting information for sample characteristics).[2]

Initial Attitude Measure

After the single-item prescreening, qualified participants reported their capital punishment attitudes on an additional three 7-point semantic differential items, with anchors of good/bad, foolish/wise, and harmful/beneficial. All four items were averaged to form a measure of initial attitudes (Cronbach's alpha = .86). Participants who did not indicate pro-capital punishment attitudes on this full four-item measure despite a positive prescreening response were excluded. This measure allows for a reliable assessment of resistance to persuasion.

Factual Knowledge

Next, participants completed a four-item knowledge battery about capital punishment. Items follow recommendations for assessing domain-specific knowledge (Iyengar, 1986) and were pretested to include both easy and difficult questions. Additionally, some questions whose answer undermined pro-death-penalty arguments were included (see Appendix S3 in the online supporting information).

Social Network Composition

Next, social network attitudinal composition was assessed by asking participants to list up to five individuals with whom they interact regularly and discuss important matters (used in the General Social Survey; see Burt, 1984). Eighty percent of participants listed five network members. They were then asked to report the capital punishment attitudes of each network member on the screening item described above.[3] Systematic research indicates that individuals are reasonably accurate when reporting their perceptions across a variety of issues and candidates, particularly for close network members, (e.g., Goel, Mason, & Watts, 2010; Huckfeldt & Sprague, 1987; Levitan & Visser, 2009; Mutz, 2006), although it is beyond the scope of this article to assess accuracy of network perceptions.

This article will remain agnostic about whether it is network members' actual attitudes or individuals' perceptions of those attitudes that is responsible for the previously established influence of network composition. It is likely that participants' perceptions of their network members are key: Presumably one cannot be influenced by views that others keep well-hidden. Nonetheless, the current study does not offer a test of this possibility, but it instead focuses on the mechanisms of the established effect.

In order to calculate degree of network heterogeneity, the absolute difference between the participant's attitude and those of each network member was calculated, and those differences were averaged across network members (see Levitan & Visser, 2009). The measure was scaled to range from 0 (no disagreement with network members) to 1, (maximum possible disagreement). As with prior studies (e.g., Huckfeldt et al., 2004; Huckfeldt & Sprague, 1987; Levitan & Wronski, 2014; Visser & Mirable, 2004), network composition was skewed toward attitudinal

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[2] Several participants were excluded for providing invalid responses, specifically nonpositive views on the subsequent full capital punishment measure (22 participants), leaving the IV blank (41), completing it improperly (e.g., listing "Facebook" as a network member, four participants), leaving the DV blank (1), or requesting that their responses be ignored (1). With the exception of the final two, these responses occurred prior to the manipulation and therefore do not compromise random assignment.

[3] Some participants answered "don't know" with reference to network member attitudes. They were then prompted to guess. The analyses presented here do not include guesses, but substantively similar results were obtained when guesses were included, although results were weaker, as expected with more error-prone measures. Thirty-four participants reported guessing on all network members. The remaining participants guessed on 18% (< 1 per network) on average. Additionally, seven individual "network members" were deleted for noncompliance (e.g., listing a group as one network member). All network measures occurred *prior* to the manipulations.

congruence, with the vast majority falling in networks ranging from complete agreement to an even mix of views.[4]

Experimental Manipulations

Participants then experienced one of three randomly assigned conditions: social affirmation, knowledge affirmation, or control.

Social affirmation manipulation. If social constraint is indeed at work, then people are maintaining network-congruent attitudes to service belongingness needs. In this case, reassuring participants of their present and future connectedness will satisfy belongingness needs and reduce fear of rejection and other social consequences of holding aberrant views. This will disrupt the effects of social constraint and make individuals more open to alternate attitudes. Participants in the social affirmation condition (see Appendix S4 in the online supporting information) first described a time when they felt particularly close to network members (adapted from Maner DeWall, Baumeister, & Schaller, 2007). Previous research using this social acceptance manipulation found significantly less desire to "connect" with others in this condition, which is indicative of satisfied belongingness needs (Maner et al., 2007).[5] Participants were then told that, due to requests from prior participants, they would be given personality feedback purportedly based on their responses. The feedback explained that they would, in general, have rewarding social relationships, close friends, and a happy marriage (adapted from Twenge, Baumeister, Tice, & Stucke, 2001, studies 1 and 3, with an added reference to close friends). This manipulation has been previously used to establish a sense of belonging in contrast with social rejection and generates results similar to studies which employ acceptance or rejection by live group members (Twenge et al., 2001). Based on prior research, the social affirmation manipulation therefore is expected to reassure participants about their social acceptance in their network and establish a feeling of belongingness and reduce concerns about social rejection.

Knowledge affirmation manipulation. If the social doubt mechanism is in effect, such that those in attitudinally heterogeneous networks doubt their own judgments more, an intervention telling them that their level of knowledge on the issue is relatively high should counteract this doubt. Participants in the knowledge affirmation condition therefore received positive feedback about the earlier knowledge battery, also purportedly requested by prior participants. Specifically, participants were told that they "know more about the death penalty than 91% of Americans" (see Appendix S4 in the online supporting information). If one knows so much about capital punishment, the dissent of network members no longer implies that one is misinformed, disrupting social doubt.

Control condition. Control condition participants moved directly to the persuasive message.

Resistance to Persuasion

Next, participants read a counterattitudinal persuasive message regarding capital punishment taken from Visser and Mirabile (2004, study 3), who adapted it from arguments disseminated by organizations such as the ACLU (see Levitan & Visser, 2008, Appendix A.1. for full text). Each paragraph was presented on a separate screen, to facilitate reading. Attitudes were then reassessed on the same four-item measure as initial attitudes, described above (Cronbach's alpha = .94). Resistance to persuasion was calculated by subtracting postmessage attitudes from initial attitudes, such that positive numbers indicate change in the direction of the persuasive message. The result was then scaled to range from −1 to 1.

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[4] For further information on the distribution and correlates of network composition, see Appendices S1 and S2 in the online supporting information.

[5] Individuals who claimed to never have been close to network members or left the question blank were excluded from analyses relevant to this manipulation (26), since they effectively skipped the manipulation. Results were similar, although predictably weaker, when these participants were included. This occurred prior to receiving any feedback from a manipulation.

Control Variables

To account for the possibility that the generally positive nature of the manipulations might influence persuasion (see Schwarz et al., 1991a), participants described their mood on a 7-point, fully labeled, bipolar scale with anchors of very negative (sad, angry, upset) and very positive (happy, proud, enthusiastic). To confirm that the knowledge affirmation effectively influenced perceived knowledge, participants were asked how knowledgeable they consider themselves to be about capital punishment on a 5-point scale ranging from not at all to extremely. Demographic information, including age, had previously been assessed by Knowledge Networks.

Results

In order to replicate and extend prior results, network composition and control variables were used to predict attitude change in an OLS regression. Age and its quadratic effects were included to account for life-cycle differences in attitude strength (Visser & Krosnick, 1998). Network composition marginally predicted persuasion, such that as individuals' networks became more attitudinally heterogeneous, their attitudes changed more (Table 1, Model 1). According to a priori analyses of control-condition participants, as network heterogeneity increased, attitude change in response to the persuasive message significantly increased as well (Table 2, Column 1), replicating prior findings. The relatively weaker effect averaged across conditions suggests that the experimental manipulations may, indeed, reduce this network influence. To examine this possibility, we now turn to an examination of the impact of the experimental conditions.

Social Constraint

In order to examine the mechanisms of network influence more closely, a similar regression analysis was conducted, this time including as predictors dummy variables for each experimental condition, and the two-way interaction of network composition with each condition dummy (Table 1, Model 3). Consistent with the social constraint perspective, the interaction of social affirmation and

Table 1. Impact of Network Heterogeneity Upon Attitude Change and Moderation by Social Affirmation and Knowledge Affirmation

	Model 1: Network Heterogeneity and Controls	Model 2: Experimental Conditions Included	Model 3: Interactions Included
(Constant)	0.18 (.04)**	0.19 (.04)**	0.19 (.04)**
Network heterogeneity	0.10 (.05)†	0.10 (.05)†	0.18 (.08)*
Knowledge affirmation		−0.02 (.02)	−0.02 (.02)
Social affirmation		0.01 (.02)	0.01 (.02)
Knowledge affirmation ×Network heterogeneity			−0.07 (.11)
Social affirmation ×Network heterogeneity			−0.28 (.14)*
Male = 1	−0.03 (.01)*	−0.03 (.01)*	−0.03 (.01) †
Party identification (Democrat high)	0.05 (.02)**	0.05 (.02)**	0.05 (.02)**
Age	−0.07 (.10)	−0.08 (.10)	−0.08 (.10)
Age squared	0.15 (.11)	0.16 (.11)	0.15 (.11)
Education	−0.05 (.02)*	−0.05 (.02)*	−0.05 (.02)*
Income	−0.03 (.03)	−0.03 (.03)	−0.03 (.03)
Metropolitan area = 1	0.04 (.02)*	0.04 (.02)*	0.04 (.02)*
Mood	−0.12 (.03)**	−0.13 (.03)**	−0.12 (.03)**
R^2	.12	.13	.14

Note. Standard errors are indicated in parentheses. Gender and living in a metropolitan area and experimental conditions were dummy coded as indicated above. Network composition was mean-centered before calculating the interaction terms (see Aiken & West, 1991). All other variables were scaled from 0 to 1. $\dagger p \leq .1$, *$p \leq .05$, **$p \leq .01$.

Table 2. Impact of Network Heterogeneity Upon Attitude Change in Each Experimental Condition

	Control Condition	Social Affirmation Condition	Knowledge Affirmation Condition
(Constant)	.28 (.07)**	.19 (.09)*	.04 (.06)
Network heterogeneity	.19 (.08)*	−.10 (.13)	.11(.07)
Male = 1	.00 (.02)	−.06 (.03)*	−.02 (.02)
Party identification (Democrat high)	.06 (.03)*	.07 (.04)	.04 (.03)
Age	−.36 (.17)*	−.05 (.21)	.24 (.16)
Age squared	.43 (.19)*	.15 (.24)	−.15 (.17)
Education	−.06 (.04) †	−.08 (.05)	−.01 (.04)
Income	−.03 (.05)	−.06 (.07)	−.03 (.05)
Metropolitan area = 1	.02 (.03)	.04 (.04)	.03 (.03)
Mood	−.22 (.05)**	−.04 (.07)	−.09 (.05) †
R^2	.21	.14	.12

Note. Gender and living in a metropolitan area were dummy coded as indicated above. Other variables were scaled 0–1.
† $p \leq .1$, * $p \leq .05$, ** $p \leq .01$.

network composition significantly predicted attitude change, suggesting that the social affirmation manipulation disrupted the relation between network composition and openness to attitude change.

A visual examination of Figure 2 shows that participants embedded in attitudinally congruent networks exhibited substantially more attitude change on average when in the social affirmation condition than in the other two conditions. It appears that these participants have been freed from social concerns constraining their attitudes to agreement with network members. Indeed, those embedded in attitudinally congruent networks exhibited more than 50% more attitude change than participants in other conditions. In contrast, those embedded in more heterogeneous networks exhibited similar amounts of attitude change across conditions. Those in the social affirmation condition exhibited roughly the same amount of change across network compositions, suggesting that social affirmation eliminated network effects.

A priori analyses of the social affirmation condition confirm that the social affirmation manipulation eliminated the significant effect of network composition on persuasion observed in the control
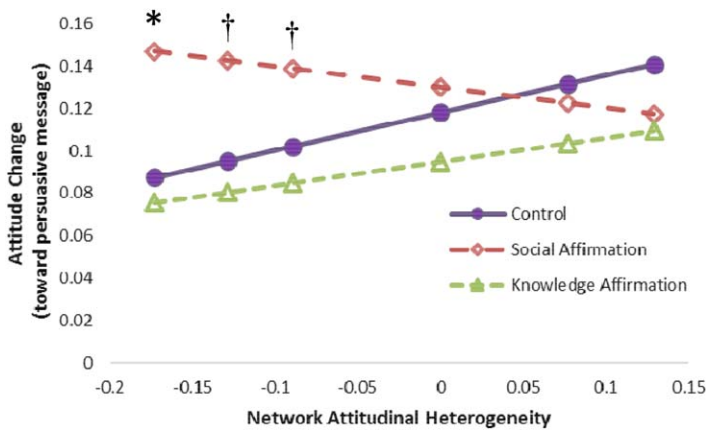

Figure 2. Impact of network heterogeneity across conditions. Plotted points are the minimum, one standard deviation below and above the mean level of network heterogeneity, the first and third quartiles, and the mean. Note that heterogeneity was mean-centered. Asterisks indicate level of significance of the marginal effect of the social affirmation condition over the control, as indicated by simple effects tests (Aiken & West, 1991). † $p \leq .1$, * $p \leq .05$. [Color figure can be viewed at wileyonlinelibrary.com]

condition (Table 2, Column 2), providing strong support for the social constraint mechanism. Simple effects tests following Aiken and West (1991) confirm that participants with congruent networks in the social affirmation condition did indeed experience significantly more attitude change than those in either of the other two conditions.

In other words, participants who were reassured about the strength of their relationships exhibited striking attitude change compared to others with similar networks receiving the same political information. Once social concerns were relieved by affirming participants' social relationships, participants embedded in congruent networks showed higher levels of attitude change previously only observed in individuals embedded in more heterogeneous networks. This supports the hypothesis that relationship concerns constrain individuals in congruent networks to remain attitudinally in step with the network and therefore resistant to attitude change.

This finding is also noteworthy given that prior research has frequently focused on the role of *heterogeneous* networks in instigating attitude change rather than the role of like-minded others in preventing change by making individuals less willing to consider other perspectives. This is, however, consistent with prior literature showing that individuals embedded in heterogeneous networks are more willing to seek out and more deeply consider issue-relevant information (Levitan & Visser, 2008; Levitan & Wronski, 2014).

Social Doubt

In contrast, evidence for the self-doubt mechanism was decidedly mixed. In the full model, the interaction of network composition and knowledge affirmation did not approach significance ($p = .57$; Table 1, Model 3) suggesting that the knowledge manipulation did not modify network influence. This result is somewhat softened by a priori analyses, in which knowledge affirmation did disrupt the effect of network composition on persuasion, such that it was no longer significant (network effect: $p = .16$; Table 2, Column 3). Thus, the social doubt mechanism may have some merit. In Figure 2, it appears that those in more heterogeneous networks exhibited less attitude change in this condition, consistent with the idea that being connected to network members with differing opinions ordinarily generates doubt about one's knowledge and increases willingness to consider other perspectives. Still, without a significant interaction between knowledge affirmation and network composition, the mechanism cannot be considered clearly supported.

The lack of strong social doubt effects might have been due to the difficulty of some knowledge questions. To assess the possibility that these weak results were due to a failure of the manipulation, a manipulation check analysis was conducted. If the knowledge affirmation did indeed bolster participants' confidence in their own level of knowledge, then those in the knowledge affirmation condition should have reported feeling more knowledgeable than those in other conditions. As anticipated, the dummy variable for the knowledge affirmation condition significantly predicted subsequent self-reported level of knowledge in a regression analysis controlling for network heterogeneity, the social affirmation condition, and all previous control variables, $b = 0.22$, $SE = 0.06$, $p \leq .001$. Thus, the knowledge affirmation was successful in increasing participants' perception of their own knowledge, but this did not translate into a significant weakening of network composition's influence.

Still, it is possible that while the participants believed the feedback that they knew more than others, they were still not confident that they knew *enough* because the difficulty of the questions asked ($M = 49\%$ questions correct) highlighted their lack of knowledge (see Schwarz et al., 1991b). This possibility is exemplified by one participant's report: "I'm very surprised that I ranked in the 91st percentile . . . it's scary to think how many people could be mis-informed about [capital punishment]." This clearly indicates that the participant believed the feedback, but felt that this amount of knowledge was distressingly insufficient.

These knowledge affirmation results also provide a useful comparison to rule out alternate explanations for social affirmation effects, such as mood boosting. In both experimental conditions,

participants received positive information about themselves, which could plausibly be self-affirming or mood boosting. Therefore, if positive feedback in general was responsible for the above social constraint findings, one would expect a similar pattern of results in the knowledge affirmation condition. Instead, the knowledge affirmation manipulation actually leans toward *reducing* open-mindedness (as per social doubt), rather than increasing it as the social affirmation manipulation did (see Figure 2). Additional analyses including predictors from prior models show that neither condition had an appreciable influence on participants' moods ($ps > .5$). Furthermore, experimental effects remain despite controlling for mood (Tables 1 and 2). Thus, these results strongly suggest that specifically *social* feedback and not merely positive feedback, is responsible for the observed social constraint effects.

Information Exchange

As previously stated, this design does not provide an experimental test of the information-exchange mechanism. It does, however, allow us to examine some relevant information, specifically whether initial knowledge mediates the relation between network composition and attitude change. An OLS regression used network heterogeneity and control variables to predict initial knowledge. This did not yield supporting evidence. Participants who were embedded in heterogeneous networks correctly answered no more capital punishment knowledge questions than others, $b = -0.002$, $SE = 0.07$, $p = .98$. Logistic regression analyses were also conducted predicting correct responses to individual knowledge items using network composition and control variables. Network composition marginally predicted one knowledge item in the *wrong* direction (whether any women had been executed in the last 25 years), $b = -1.65$, $SE = 0.89$, $p = .06$. Network composition did not significantly predict correct answers to any other question ($ps > .15$, with coefficients in both directions). Network composition notably failed to predict items testing knowledge which might be construed as counterattitudinal, in contrast with prior research. Thus, the Baron and Kenny (1986) mediation of network effects by knowledge fails. Sobel tests conducted with the control condition alone and the full sample also failed, $ps > .15$. Although these results do not disprove the information exchange perspective, they do suggest a need for further study regarding how pervasive it is.

Discussion

People think about politics differently when close others hold the same attitudes. These results illuminate the complex role of social networks, not just as a source of information, but as a source of goals and motivations that alter how we interact with the world. These results are particularly important in that careful, deliberate consideration of political attitudes is crucial to the democratic ideal (e.g., Fishkin, 1991). These findings do not challenge prior findings that individuals embedded in more heterogeneous social networks hold more flexible views (Huckfeldt & Sprague, 2000), or that bringing diverse groups of ordinary citizens together can yield normatively positive outcomes (e.g., List, Fishkin, Luskin, & McClean, 2005). Instead, they explain *why* this may be the case, with noteworthy implications for how to stimulate greater thought and shake unified groups' presumption of rectitude. In particular, these results highlight a uniquely social role of networks in guiding attitudes by demonstrating that belongingness needs motivate individuals to maintain attitudes that are similar to those of their network members.

Particularly important in these results is the finding that, among those whose social affiliation goals have been met, attitudinal flexibility is the rule, rather than attitude stability. These results firmly demonstrate the role of attitudinally *congruent* networks in socially motivating *suppression* of attitude change. Prior research has generally framed the impact of network composition in terms of network heterogeneity, rather than network attitudinal congruence, implying that heterogeneous networks were generating influence (by bringing deviating individuals into the fold and providing novel information). The current study, however, reveals that attitudinally congruent networks suppress attitude change at

least as much as, if not more than, heterogeneous networks encourage it. Given the same strong arguments, those surrounded by like-minded others will still be less persuaded because of social rejection and belongingness concerns. When those concerns are alleviated, those in congruent networks are just as open to change as their heterogeneous network counterparts.

This effect of social constraint may, in part, explain the oft-observed attitudinal similarity among close network members, in that attitudes that are consonant with those of network members have a quasi-gravitational pull. Once people have similar attitudes, social motivations dictate that they are much less likely to change them, but those in more attitudinally heterogeneous networks are not so constrained and may continue to hold unstable views unless, over time, their attitudes drift closer to those of network members, and thence spiral into agreement.

Limitations

It should be noted that these results do not completely rule out other mechanisms of social network influence, although they are unique in supporting the social constraint mechanism with findings that cannot be attributed to other proposed mechanisms. It is possible that both heterogeneous and congruent networks impose countervailing influences through different mechanisms: congruent networks applying social influences to maintain congenial views, while heterogeneous networks bring new information and generate doubt and ambivalence. One should not generalize from null results, and it may well be that additional mechanisms simply remained undetected here. Evidence for the social doubt mechanism in particular was mixed. Similarly, we have uncovered evidence that the attitudinally congruent end of the spectrum is influential, but we must not repeat prior mistakes and simply assume that the other end of the scale of network composition is an inactive baseline. Such possibilities await further research.

The information exchange results especially require further consideration. The current study did not experimentally test the information exchange account, but these survey results differed notably from previous results (Huckfeldt et al., 2004; Mutz, 2002b). This may be due to differences in methodology. Prior studies counted the number of offered "rationales" for views, potentially capturing thoughts and hearsay rather than the factual knowledge, as tested here. Additionally, the current study used closed-ended questions, so participants in heterogeneous networks may have known more, but not in these specific areas. As such, the influence of information exchange may have gone undetected. Alternately, it may only occur on a subset of salient topics. It may be useful for future research to examine what kind of information is exchanged and when.

With respect to social doubt, mixed findings may have been a function of a weak manipulation that did not truly convince participants that they knew enough, as discussed above, although the manipulation check limits such concerns. Regardless of what other mechanisms may also be at work, these results strongly support a social constraint account and cannot be accounted for by the other mechanisms.

Of course, full understanding and support of the mechanisms of any effect are not the work of a single study, but of a broad body of research conducted using multiple paradigms (Bullock et al., 2010). As with any single study, the possibility of alternate explanations cannot be completely ruled out, only vigilantly guarded against. Nonetheless, this study has followed such recommendations as can be practically followed in a single component of a program of research and should be given what credence such a practice allows. Importantly, this research has manipulated proposed mechanisms directly and independently, rather than only manipulating the initial causal factor (networks) and then measuring proposed mediators. Additionally, the current research has compared proposed mechanisms within the same dataset and taken pains to ensure that manipulations are influencing only the mechanism in question. These steps minimize both theoretical and statistical concerns about correctly identifying mechanisms.[6]

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[6] See Bullock et al. (2010) for a detailed analysis of hurdles in identifying mechanisms.

A more specific concern that often plagues the area of social networks is direction of causality. It is tempting to suppose that individuals who differ in their level of open-mindedness or attitude strength have differing likelihoods of selecting into heterogeneous networks. This concern has limited relevance here on several counts. First, it cannot explain the current result that the relationship between open-minded attitude change and social network composition differs as a function of randomly assigned experimental condition. There is no plausible explanation for how a social manipulation (irrelevant to capital punishment) might influence attitude change without some causal role of the network itself, particularly when the impact of the manipulation is conditional, depending on an individual's network (assessed prior to the manipulation). More broadly, as noted in the introduction, much prior research supports the causal role of networks in influencing attitudes and openness to attitude change, using experiments, quasi-experiments, and longitudinal methods (e.g., Lazer et al., 2010; Levitan & Visser, 2009; Visser & Mirabile, 2004), yet those same studies and others have failed to find evidence supporting the role of political attitudes in network construction (see also a special issue of *Communication Monographs*, 1992). Even if individuals intend to form bonds with politically similar others, the lack of constraint among attitudes across political issues (Converse, 1964) would render this nearly impossible because bringing a network into congruence in one area, such as on economic policy, would not inherently generate agreement in other areas, like foreign policy, social issues, or here capital punishment. Add to this the host of network members who are effectively chosen for us (coworkers, family, spouse's friends, neighbors, etc.; see also Festinger et al., 1950; Sinclair, 2012), and it is perhaps not surprising that so many studies have failed to find evidence that individuals choose politically congruent network members. Taken together, selective network construction certainly becomes an implausible explanation for how an experimental manipulation could negate the relation between network composition and openness to persuasion in the current study.

Some readers may wonder whether the mere act of listing social network member views might be enough to activate or "prime" social pressures, thus making our self-report measure itself an influence on openness to attitude change. This serious concern would undermine the broader body of research that relies on self-report assessments of network composition. Fortunately, previous research has experimentally examined this exact possibility. Visser and Mirabile (2004) manipulated the order in which participants responded to a counterattitudinal message and reported on their social network, such that some participants' attitude change was assessed before reporting on their networks, and others reported on their networks first. Neither the impact of order of measures nor its interaction with network heterogeneity approached significance in two separate studies. Therefore, the act of reporting network composition did not significantly alter network influence. Openness to attitude change is increased as network heterogeneity increases, regardless of whether participants have explicitly been asked about their network, and reporting on one's network does not significantly change the size of the relation.

These limitations notwithstanding, the experimental test here supports the idea that social network composition influences resistance to persuasion in part through individuals' motivations to maintain positive social relationships. Further, these results remind us that network influence is not an inevitable result of being exposed to close others with differing views. Network influence has boundary conditions and can be nullified by circumstances which alter an individual's construal of the situation (see also Bloom & Levitan, 2011). This research also highlights the importance of going beyond information and cognitive processing when attempting to understand attitudes. To fully understand attitudes and persuasion, we must take into account the social context, including social goals, motivations, sanctions, and rewards.

Broader Implications

The current study has implications not only for the basic literatures on public opinion, persuasion, and social networks, but also for a variety of fields and subfields with an interest in improving group

decision-making. These results echo the classic groupthink theory (Janis, 1982) in that even groups of otherwise intelligent experts can make foolhardy and conformist decisions, in part due to their desire to maintain group members' positive regard. If attitudinally congruent networks are actively or even incidentally suppressing dissent, then information alone will not be sufficient to dislodge misinformed views and encourage good decisions. Instead, a more psychological approach is required, such as making people feel more secure about the steadfast positive regard of their network (as in the current study) or perhaps emphasizing support outside their network for attitudes with which immediate network members might not agree.

These results also suggest a different spin on motivated reasoning with respect to attitudes (Kunda, 1990; Redlawsk, 2002; Taber & Lodge, 2006): We may be attached to our attitudes not for the sake of consistency alone, but also for the sake of social adjustment. Therefore, the goal of approaching and maintaining attitudes that are congenial to the network may also underlie motivated reasoning. This has special relevance for the flourishing literature on political networks, which has generally emphasized accuracy goals. These results highlight that uniquely social goals can motivate individuals to "go along to get along" and avoid attitudes that might rock the boat (see also DeWall, Visser, & Levitan, 2006). When their social affiliation goals are sated, however, individuals feel less social constraint and are free to consider less congenial attitudes, as seen here.

It would be taking these results too far, however, to infer that networks of similar others are inherently damaging to the process of maintaining correct attitudes. Much like students conferring after an exam, if we all agree, we're more likely to be right. Thus, our network members may hold us to a correct position, saving us time and energy (cognitive misers that we are), and making political action less complicated and more frequent (Mutz, 2002a). Of course, the crowd will not always be correct, and therein lies the dilemma.

Conclusions

Factors underlying the *maintenance* of attitudes, rather than attitude change, should receive renewed attention as research continues. We turn to others to help us form attitudes and make decisions, but so too do we respond to them once those attitudes have formed. Those around us play a role in solidifying our attitudes and judgments just as they contribute to eroding and changing them. This role of networks in suppressing our willingness to consider alternate viewpoints may ultimately be responsible for many perplexing phenomena, including various situations in which individuals continue to hold views contrary to all available evidence. "Birthers'" continued belief that President Obama was not born in the United States despite objective disproof is likely an extreme example of the more common social process examined above, whereby individuals are reluctant to consider information that might bring their attitudes out of step with those around them. Attitudes are formed and maintained in a complex social environment, one whose effects we are only beginning to understand.

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Supporting Information

Additional supporting information may be found in the online version of this article at the publisher's website:

Appendix S1. Sample Characteristics

Table S1. Sample Characteristics

Appendix S2. Correlates of Network Composition

Table S2. Correlates of Network Composition in Current Study

Appendix S3. Measure of Knowledge About Capital Punishment

Appendix S4. Manipulations