

ORIGINAL ARTICLE

Compliance Dynamics Within a Simulated Friendship Network I: The Effects of Agency, Tactic, and Node Centrality

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This study investigated the structural causes of perceptions of power and the way that these perceptions create expectations regarding influence attempts. It applied measures derived from dynamic social impact theory to model predictions of target compliance and agent response to an influence attempt. Sociograms provided the structure within which compliance dynamics were investigated. Results from an experiment (N = 458) showed that structural positions with greater eigenvector and betweenness centrality generated stronger perceived power, and that observers' attributions regarding responses to a compliance request follow a systematic three-step process—agent acts, target responds, and agent reacts. The model, reflecting agency, influence tactic, and power, formalizes the attributional process that observers employ when evaluating compliance requests.

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If powerful agents ask comparatively weaker targets for compliance, the agents are likely to succeed (French & Raven, 1959). Although intuitively simple, this statement suggests that compliance dynamics rest on two key variables: power and communication. Communication research in the past 50 years has illuminated many of the conditions under which agents may find particular communication strategies more or less helpful in gaining compliance from different sorts of targets (Dillard, 1990; Gass & Seiter, 1999; Wheless, Barraclough, & Stewart, 1983; Wilson, 2002), and the way that attributions are generated concerning the consequences of influence attempts (see Tedeschi, 2008). This research, however, has relied largely on agents' and targets' personal characteristics, such as credibility, trustworthiness, skepticism, or ego-involvement, rather than on the relative power that the interactants are perceived to have.

Theoretical work into how people influence others' attitudes or beliefs provides some insight into how to develop a theory of compliance based on power. Dynamic social impact theory (DSIT; Nowak, Szamrej, & Latané, 1990) suggests

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that communicators have the power to both induce change in a target and aid targets to resist change. Drawing from this work, target compliance is conceived to be a function of an agent's persuasive impact (the agent's power and the agent's distance from the target) and the target's social support (the power of the target's supporters and their distance from the target). However, power must be perceived and communicated for it to be effective. What information can observers use to assess the relative power of interactants? A recent study (Smith, High, & Fink, 2008) showed that a person's location within a simulated friendship network (a sociogram) conveys information about that person's power: Within a sociogram, network members with different levels of structural centrality were perceived as differentially powerful and, based on that power, were viewed as more or less likely to gain compliance from another network member. Sociograms, which appear ubiquitously as organization charts and family trees and, most recently, as applications from social networking online programs, provide a formal structure that enables and enhances our ability to theorize and investigate compliance dynamics.

Influence attempts can convey, generate, maintain, diminish, or destroy an agent's power. Furthermore, if the target of an influence attempt spurns or resists the attempt, such resistance can bolster or reestablish that target's power. The relative power of the agent and target determines whether target compliance or target resistance is expected. Further, a target's noncompliance may result in the agent's acquiescence (i.e., the agent gives up the influence attempt) or escalation (i.e., the agent seeks to reassert power and gain compliance). The dynamics of compliance and power, then, involve an agent's influence attempt, the target's compliance or resistance, and, if the target is noncompliant, the agent's response to the noncompliance.

This study seeks to develop a theory of compliance dynamics that includes both agents' and targets' personal characteristics as well as network information. The study reported here has three aims: (a) to test if different levels of structural power create different attributions of power; (b) to determine if DSIT helps in modeling the perceived probability of target compliance; and (c) to model the way that people understand the dynamics of social influence, from the agent's act to the target's response to the agent's reaction.

Power and compliance

Power

Power is the amount of unshared control possessed by one person over another (Georgesen & Harris, 2006), which may be considered a characteristic of the actor. Van Dijke and Poppe (2006) wrote, "power is often considered as social power, which is a possibility or capacity to affect others, even if these others would resist such influence attempts" (p. 538). French and Raven (1959) considered power as potential influence: They argued that an agent is capable, through activity, of exerting influence on a target because of some existing relationship with the target. The agent's power over a target in a given situation is the result of the difference between two

forces: The force of the agent to change the situation minus the force of the target to resist such a change. Those with more power have access to more resources, both material and social; encounter less interference when pursuing rewards (Anderson & Galinsky, 2006); and can control others to gain access to additional resources (Berdahl & Martorana, 2006).

Thus, power is also a relational variable: A person's power has meaning in reference to another person or group (Anderson & Galinsky, 2006). For example, French and Raven (1959) and Raven (1965) described six bases of power: coercive, reward, referent, expert, legitimate, and informational; all these bases of power reflect an implicit contract between the agent and target. For example, agents and targets can be governed by the norms of their role relationship (consistent with legitimate power), or they can exchange some reward for compliance (reward power). In every case, power reflects a relationship between agent and target.

Given the salience of power in people's lives, it is no wonder that people spend time "attending to, thinking about, and discussing the thoughts and behaviors of powerful and prestigious individuals" (Anderson & Galinsky, 2006, p. 511), and these thoughts may have strategic value (Mast, Hall, & Ickes, 2006). When attained, power has dramatic effects on how people behave (e.g., Mast et al., 2006; Milgram, 1965), and the powerful are viewed as being corrupted by power: "Power tends to corrupt and absolute power corrupts absolutely" (Lord Acton, 1887, as quoted in Bartlett, 1992, p. 521; see also Georgesen & Harris, 2006; Kipnis, 1972; cf. Overbeck & Park, 2001). The powerless, in contrast, must consider constraints on their behavior (Anderson & Galinsky, 2006), including how powerholders may respond to their actions (Berdahl & Martorana, 2006).

The formation of power hierarchies in interpersonal interaction is ubiquitous and perhaps universal (see Aberle, Cohen, Davis, Levy, & Sutton, 1950, p. 106), and people may be continually attending to signs of power in others (Mast et al., 2006). One indication of power is the location of an individual in a communication network, such as a friendship sociogram.

Sociograms and power perceptions

Sociograms display connections between members of a network, with relationships appearing as lines between members (Moreno, 1953; Wasserman & Faust, 1994). Organization charts typically represent people or organizational units as nodes in a network with lines indicating decision-making authority (e.g., who reports to whom; Oxford English Dictionary, 2009). Many academic databases provide visualizations of the interconnectedness of scholarly papers as indicated by patterns of citations (e.g., ISI Web of Knowledge v.4.4, 2009). Online applications in social networking sites (e.g., Facebook) can indicate the people within a person's network who are connected to that person via shared friendships.

Social network analysis provides a means to "explain variation in structural relations and their consequences" (Knoke & Yang, 2008, p. 9). One use of social network analysis is to identify the most important actors in a network, which is tied

to the notion of network centrality (Wasserman & Faust, 1994). There are several centrality measures, and they provide a way to quantify an actor's involvement; a central actor is "one involved in many ties" (Wasserman & Faust, 1994, p. 173). Knoke and Burt (1983) noted that centrality measures are well suited to concepts related to access and control over resources (e.g., power). This study focuses on two centrality measures, eigenvector centrality and betweenness centrality, which highlight different aspects of structural power.

Eigenvector centrality (Bonacich, 1972; Borgatti, Everett, & Freeman, 1999) measures the importance of an actor by estimating the number of direct ties each actor has, weighting connections to highly connected actors more than connections to weakly connected actors. Thus, the most important actor has more connections to well-connected members. Burt (1992) was instrumental in understanding that more connections, even to well-connected others, may not be most beneficial to the actor: Each network connection has opportunity costs, and energy spent on redundant contacts is inefficient. A person with nonredundant contacts, that is, one who is between actors who are not directly connected to each other (Monge & Contractor, 2003), may have a great deal of power because of the resources that he or she controls (Freeman, 1979). This person may serve as a conduit for information flow in the network, thereby controlling information and its interpretation (Monge & Contractor, 2003). This brokerage position is encapsulated in the structural measure of *betweenness centrality* (Freeman, 1979).

In the sociogram depicted in Figure 1, nodes labeled 1, 2, 3, and 4 differ in their eigenvector and betweenness centrality. Specifically, node 1 has high eigenvector centrality but low betweenness centrality; node 2 has high eigenvector centrality and high betweenness centrality; node 3 has low eigenvector centrality but high betweenness centrality; and node 4 has low eigenvector centrality and low betweenness

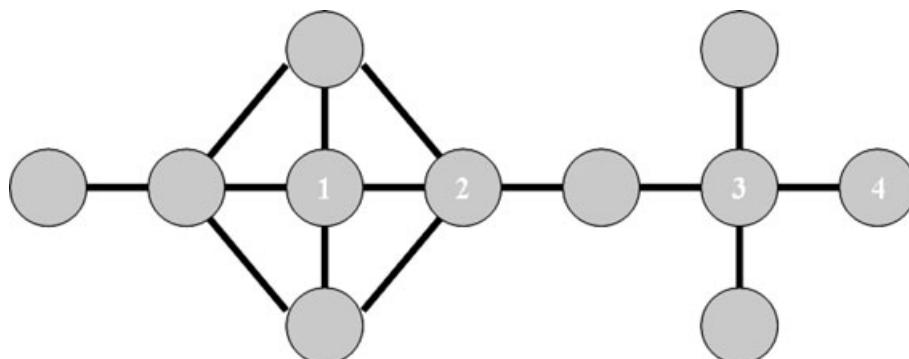


Figure 1 Sociogram used to represent 11 students in a class, with the circles representing students and the lines representing friendships. Numbers are shown on four circles to indicate the four positions that could be held by agents and targets under the different experimental conditions.

centrality. In this hypothetical example, the correlation between these two centrality measures for these four nodes is .11 (*ns*).

The relationship between network structure and measures of centrality has been well studied; observers' attributions regarding network structure have received less attention. Attributions are defined as "the linking of an event with its underlying conditions" (Heider, 1958, p. 89). An observer perceives that a network member's location in a sociogram reflects underlying conditions, such as that member's leadership, power, or likeability (Richard, Bond, & Stokes-Zoota, 2003).

Moreno and Jennings (1938) wrote, "an individual has a pretty good idea of his own sociogram and a fair intuitive perception when changes take place within it" (p. 188). However, the attributions that observers make about sociograms remain relatively unexplored. Thus, the present study examines whether observers, in fact, connect network position with attributes of the person in that position. Specifically, do observers attribute more power to individuals who reside in network locations of high eigenvector and betweenness centrality? Thus, this study builds on Krackhardt's (1987) work on cognitive social structures and those of other scholars who have considered the determinants of the perception of network members and their behaviors (Marsden, 2005).

Smith et al. (2008) had participants view a sociogram of a hypothetical friendship network and asked participants for their perceptions of the network members' power. These power perceptions were almost perfectly correlated with the network members' eigenvector centrality scores ($r = .97$) but not with their betweenness centrality scores ($r = .07$). Smith et al.'s study provides compelling evidence that structural centrality, as assessed by eigenvector centrality, is a substantial determinant of perceived power; however, their study used a sociogram that confounded eigenvector and betweenness centrality. In the current study, the centrality values of the agent and the target of an influence attempt are manipulated orthogonally: Both agents and targets are independently high or low on eigenvector centrality and betweenness centrality. This research design allows for a clear assessment of the role of eigenvector and betweenness centrality for both parties of an influence attempt. Thus, the present study provides a replication of two of Smith et al.'s hypotheses within a better design. The following hypotheses are proposed:

H1: The greater the eigenvector centrality of a network member, the greater that member is perceived to be powerful.

H2: The greater the betweenness centrality of a network member, the greater that member is perceived to be powerful.

Predicting compliance

DSIT

DSIT (Nowak et al., 1990) contends that targets' attitudes change as a function of agents' degree of persuasive impact and the targets' degree of social support. The total *persuasive impact* of multiple people on a single target is a function of the number

of sources supporting the agent, the persuasiveness of the agent, and the distance between the agent and the target:

$$\hat{i}_p = \sqrt{N_o} \sum \frac{p_i/d_i^2}{N_o}, \quad (1)$$

where \hat{i}_p is persuasive impact, N_o is the number of sources supporting the agent, p_i is the persuasiveness of the agent, d_i is the standardized distance between the agent and the target, and the summation is taken over all agents. Here we define *standardized distance* as the shortest path (number of steps) between two nodes (i.e., network members) divided by the longest possible path between them (i.e., $N - 1$, where N is the number of nodes in the network); for simplicity, from this point onward standardized distance will simply be referred to as distance.

Nowak et al. tested DSIT by simulating multiple agents influencing the attitudes of a single target. This current study tested DSIT assuming a single influence agent. Therefore, Equation (1) can be simplified to

$$i_p = \frac{p_i}{d_i^2}. \quad (2)$$

Note that Nowak et al. used carets (circumflex accents or “hats”) in their notation; that notation will be used for definitions from their work, but because the relevant symbols are not estimates, in the current article their notation will be used without the carats.

Power and distance parameters in Smith et al.’s study

For the 10-member sociogram reported in Smith et al. (2008), the longest possible path between two network members is nine. The two hypothetical network members (Diane and Heather) who were used as agent and target in the different scenarios in Smith et al. were two links apart; therefore, $d_i = 2/9$. After viewing the sociogram, the participants in that study ($N = 105$) reported that the mean of Diane’s perceived power was 8.08 ($SD = 1.91$), and that the mean of Heather’s perceived power was 5.07 ($SD = 1.73$); the perceived power measures in that study have a maximum value of 10. These perceived power estimates (which were judged before participants learned of an influence attempt between the two hypothetical network members) are divided by 10 so that they scale from 0 to 1. Using Equation (2) and using perceived power as a measure of persuasive impact, Diane’s persuasive impact is calculated to be $.808/(2/9)^2 (= 16.36)$, and Heather’s persuasive impact is calculated to be $.507/(2/9)^2 (= 10.27)$.

Nowak et al. (1990) computed targets’ supportive impact as a function of their surrounding social support:

$$\hat{i}_s = \sqrt{N_s} \sum \frac{s_i/d_i^2}{N_s}, \quad (3)$$

where \hat{i}_s stands for *supportive impact*, N_s is the number of sources supporting the target, s_i is the supportiveness of source i , d_i is the distance between the target and the supportive source, and the summation is taken over all of the target's exclusively connected sources. A source is considered to be *exclusively connected* to the target if the target is connected to the source without going through the agent; the source could be exclusively connected to the target through more than one path as long as the path did not connect to the agent along the way. Using the perceived power of the sources connected exclusively to the target and scaling the power perceptions (as surrogates for supportiveness of source) from 0 to 1, Diane's supportive impact is calculated to be $4^{1/2} * [(.584/.01 + .576/.01 + .545/.01 + .539/.01)/4] = 90.88$, and Heather's supportive impact is calculated to be $2^{1/2} * [(.379/.01 + .314/.05)/2] = 58.04$.

The *relative influence* of the agent over the target is defined here as the agent's persuasive impact minus the target's supportive impact, or $i_p - i_s$. (Note that Nowak et al., 1990, referred to the ratio of these values rather than to their difference.) If relative influence is positive, then $i_p > i_s$; if relative influence is negative, then $i_p < i_s$. In Smith et al. (2008), the relative influence of Diane (as agent) over Heather (as target) = $16.36 - 58.04 = -41.68$, and the relative influence of Heather (as agent) over Diane (as target) = $10.27 - 90.88 = -80.62$. Smith et al. reported that the participants' mean prediction for Diane gaining Heather's compliance was 56.96% ($SD = 23.15$), and participants' mean prediction for Heather gaining Diane's compliance was 35.75% ($SD = 20.37$). Based on Smith et al.'s findings, the two variables from DSIT will be used as structural indicators for modeling the influence process. The following hypotheses are proposed:

H3: The more an agent has persuasive impact, the more the agent is perceived to be successful in gaining compliance.

H4: The more a target has supportive impact, the less the target is perceived to be compliant.

Power and compliance-gaining tactics

As noted earlier, power is expected to provide a means for controlling others' behavior. The tactics agents use to gain compliance also provide information about the relationship between the agent and the target, including the relative power of the parties. The two tactics under consideration in this study are *threatening* and *attempting to persuade*. Threats are counternormative (Marwell & Schmitt, 1967) and powerful (Kaplowitz, Fink, & Lin, 1998) acts that challenge a target's power and value (e.g., Fink et al., 2003; Kaplowitz et al., 1998). In contrast, persuasion is a means to alter another person's behavior without recompense or retaliation. To observers, persuasion may be "perceived to be a fall-back position when agents hold less power than their targets" (Smith et al., 2008, p. 10). Agents, however, may have the means to use more controlling tactics but may elect to exert less than their full power in a particular influence attempt (French & Raven, 1959).

According to language expectancy theory (Burgoon & Miller, 1985), highly credible agents may use normative or counternormative message strategies without consequence. In other words, high-credible agents have a wide range of acceptable message strategies. In contrast, the use of a counternormative message strategy by low-credible agents negatively violates expectations and results in less influence. Although Burgoon and Miller discussed this interaction in terms of credibility and attitude change, this effect has also been found in research on power and perceived compliance (Smith et al., 2008). Specifically, when agents had more power than their targets, participants expected greater target compliance, regardless of tactic, than when agents had less power than their targets. On the other hand, agents who used persuasion rather than threats were perceived to be more successful in gaining compliance from higher power targets. The following hypothesis is proposed:

- H5: (a) If relative influence is positive, the greater the relative influence, the more agents are perceived to be successful in gaining compliance regardless of influence tactic.
(b) If relative influence is negative, agents are perceived to be more successful in gaining compliance with persuasion attempts as compared to threats.

Target resistance

Although it is compelling to focus on compliance as the primary outcome of an influence attempt, it is not the only alternative. According to Bochner and Insko (1966), targets of influence attempts may respond to influence attempts in the following ways: (a) “conformity with the communicator’s point of view” (here, comply with the agent’s request); (b) “disparagement of the communicator” (here, disparage the agent); (c) “persuasion of the communicator that he is incorrect” (here, persuade the agent not to want what the agent wants); and (d) obtain “social support from other like-minded individuals” (p. 614). In addition, (e) doing nothing is always a possibility. Options (b)–(e) are ways by which a target may resist the agent’s influence attempt.

Threats are more counternormative than persuasion attempts, and they implicitly disparage the target and forcibly limit the target’s freedom. Thus, people may respond to threats with psychological reactance (Brehm, 1966; Wright, Greenberg, & Brehm, 2004), which, in turn, leads to resistance. This idea leads to the following hypothesis:

- H6: Threats, as compared to persuasion attempts, result in a greater perceived probability of target resistance.

When relative influence is negative, targets may be perceived as more likely to engage in resistance than compliance. Resistance is a riskier option than compliance because it may cause or aggravate conflict between the target and the agent. Power encourages risk-taking, in part because those with power have more optimistic perceptions of the future regardless of whether the future is perceived to be within or outside of their control (Anderson & Galinsky, 2006). Further, according to Jost, Banaji, and Nosek (2004), people defend, justify, and bolster the legitimacy of existing

power hierarchies. Although all group members may support a hierarchical power structure, those with greater power are motivated to maintain their higher status and power positions (Georgesen & Harris, 2006). Resisting another's influence provides an observable means by which targets may establish or reestablish interpersonal power in relation to the agent, thus establishing or reestablishing their personal autonomy and control. Therefore, it is hypothesized that

H7: If relative influence is negative, target resistance is perceived to be more likely than compliance. If relative influence is positive, target compliance is perceived to be more likely than resistance.

Agents' responses to noncompliant targets

If targets do not comply, how do agents respond? Agents may increase the force of their influence by trying again to influence the target, by disparaging the target, or by seeking social support from their network members to gain the target's compliance. In addition, agents may just give up. As noted earlier, resisting influence attempts directly challenges an agent's power over the target. For high-power agents, such a challenge is likely to escalate the influence attempt, particularly if these agents have more influence than the resisting targets. Such positive relative influence leads to predictions of target compliance. For those who expect the targets to comply, noncompliance should come as a negative violation and a direct, unexpected challenge to the agent's power. This unexpected challenge should lead observers to expect agents to escalate their influence attempts. The following hypotheses are proposed:

H8: After learning that the target was noncompliant, prior expectations of target compliance are (a) positively related to subsequent agent escalation, and (b) negatively related to subsequent agent acquiescence.

On the other hand, agents may relinquish their request and capitulate to the target's resistance. In addition, low-power agents may anticipate their target's resistance. As suggested by Jost et al. (2004), those with and without power engage in behaviors that reinforce the status quo (see also Mumby, 1987, and structuration theorists such as Giddens, 1986). By acquiescing to targets' resistance, agents (perhaps inadvertently) socially construct targets' power. Thus,

H9: Target resistance is (a) negatively related to subsequent agent escalation and (b) positively related to subsequent agent acquiescence.

In the current study, some agents were reported to have threatened the target as part of their initial influence attempt. This behavior probably biases perceptions of the agents' reactions to noncompliance. Threatening is a strong display of dominance that may be attributed to a stronger motivation to effect compliance. Thus, agents who use threats may be perceived to have a greater need for compliance (Youngs, 1986). Targets who resist threats may be seen as challenging their agent's power and thereby providing a justification for agent escalation. The reverse attributional process may appear for the use of persuasion: Agents who attempt to persuade their

targets may not have a great need for compliance and may cease attempting to influence rather than creating a conflict with the target. The following hypothesis is proposed:

H10: Threats, as compared to persuasion attempts, result in (a) a higher perceived probability of subsequent agent escalation and (b) a lower probability of subsequent agent acquiescence.

The compliance system

The theoretical system presented above can be summarized as a three-step process (see Figure 2). In the first step, the structure (i.e., the sociogram) creates attributions of power, which observers can use to estimate an agent's persuasive impact and a target's supportive impact. Second, perceptions of target compliance and target resistance are a function of relative influence as well as the tactic used to gain compliance. Third, if targets do not comply, expected target compliance and resistance, as well as the original influence tactic, generate expectations of the agent's subsequent escalation or acquiescence.

After this three-step process, the structure in which the agent and the target are embedded may change. This feedback means that compliance dynamics cause structural dynamics, which will determine the processes employed in the next round of influence attempts between agents and targets. Although these structural dynamics are compelling, this study focuses on the first three steps in the context of friendship, which has been investigated in previous studies of compliance-gaining (e.g., Boster, Rodriguez, Cruz, & Marshall, 1995; Turner, Tamborini, Limon, & Zuckerman-Hyman, 2007).

Method

Participants

Participants were 458 undergraduate students from a variety of majors at a large Northeastern U.S. university (286 males, 171 females, and 1 with gender unreported).

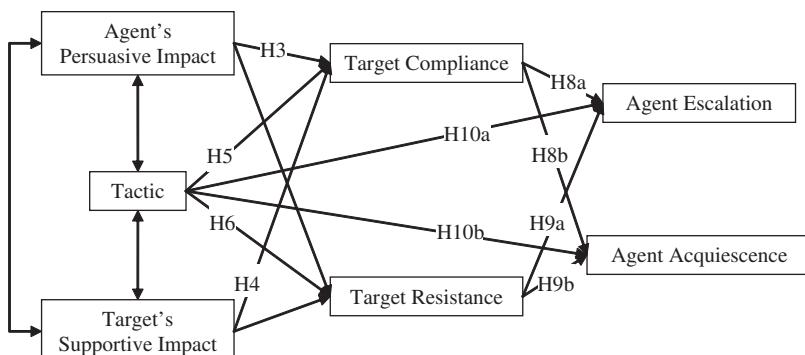


Figure 2 Theoretical model of compliance dynamics.

They were recruited from basic communication courses and received extra course credit for their participation. Their mean age was 20.21 ($Mdn = 20.00$, $SD = 1.85$, age range 18–44). Participants identified themselves as Caucasian (87%), Asian (6%), African American (2%), Hispanic (2%), Native American (1%), or they did not indicate a racial or ethnic membership (2%).

Procedures

Based on the procedures from Smith et al. (2008), participants were asked to complete an online survey from any convenient computer terminal.

The sociograms

The sociograms represented friendships between 11 hypothetical individuals who were described as being in the same university class. These alleged classmates were identified in the sociograms by letters. Participants were not given any other information about these classmates. In the sociogram, the classmates were the nodes and their friendships were the links. The links appeared as undirected lines; therefore, the friendships were implicitly defined as symmetric.

The letters used to identify classmates were selected because they were the most common letters used in the English language. In a pilot study ($N = 20$), participants were asked to evaluate the power they associated with the different letters using the power measure from the main study, described below. A paired-sample t test indicated that participants associated equivalent, neutral amounts of power with the letters T ($M = 4.67$, $SD = 2.98$) and R ($M = 5.00$, $SD = 2.68$), paired-sample $t(19) = -0.74$, ns. For this reason, the two hypothetical actors (i.e., the agent and the target) were designated by the letters T and R . In this study, six sociograms were used, and T and R were in different locations in these sociograms. Figure 1 shows the four locations used for the two nodes identified as agents and targets. The sociograms depicted T and R in one of the six combinations of positions: 1-2, 1-3, 1-4, 2-3, 2-4, and 3-4. Thus, in four sociograms (1-3, 1-4, 2-3, and 2-4) the agent and target nodes were not pictured as linked directly via a tie, which means that they were not considered to be friends. Two variations of each combination pair were generated so that each agent–target order was represented (e.g., T in position 1 as the agent and R in position 2 as the target vs. T in position 1 as the target and R in position 2 as the agent).

The positions of agents and targets vary in their centrality (see Table 1): Position 1 has high eigenvector centrality but low betweenness centrality; position 2 has high eigenvector centrality and high betweenness centrality; position 3 has low eigenvector centrality but high betweenness centrality; and position 4 has low eigenvector centrality and low betweenness centrality. Normalized eigenvector and betweenness centrality scores for the different conditions, calculated with UCINET (Borgatti et al., 1999), appear in Table 1. In some analyses, the manipulated centrality score (i.e., the dichotomous high vs. low) is employed and is so labeled.

Table 1 Actor's Centrality Scores, by Manipulated Eigenvector Centrality and Manipulated Betweenness Centrality

Manipulated Betweenness Centrality	Manipulated Eigenvector Centrality	
	High	Low
Eigenvector centrality score		
High	61.64	8.49
Low	70.81	2.53
Betweenness centrality score		
High	56.30	53.33
Low	9.63	0.00

Note: The cell means are normalized centralities that have been multiplied by 100 to represent percentages. The sociogram positions 1–4 correspond to the following manipulated conditions: Position 1 is the high eigenvector and low betweenness centrality condition; position 2 is the high eigenvector and high betweenness centrality condition; position 3 is the low eigenvector and high betweenness centrality condition; and position 4 is the low eigenvector and low betweenness centrality condition.

Experimental design

Each participant answered questions about one sociogram. After evaluating all network members in the sociogram, participants were asked to consider an influence attempt between two classmates, *T* and *R*. Participants were provided with one of four conditions, which varied in both order and tactic: *Classmate T threatened Classmate R*; *Classmate T attempted to persuade Classmate R*; *Classmate R threatened Classmate T*; or *Classmate R attempted to persuade Classmate T*. The experimental design was a 6 (number of sociograms) × 2 (threaten vs. attempt to persuade) × 2 (agent = *R* vs. agent = *T*), which generated 24 experimental conditions.

Scenario realism

At the end of the survey, participants were asked via an open-ended question to comment about their experiences with this experiment. Over half (57%) of the participants provided comments. Participants had critiques about the survey, such as wanting more room to explain the rationale for their predictions. However, none of the participants indicated any confusion about the sociogram or about making predictions about what would happen between the two classmates.

Several participants wrote that the survey questionnaire gave them an interesting opportunity to consider their social relations and the social decisions they face on a regular basis. These comments suggest that this scenario had both mundane and experimental realism (Aronson & Carlsmith, 1968). In addition, prior research with similar manipulations (Smith et al., 2008) also indicated that these scenarios were realistic to participants.

Instrumentation

Probability of successful influence attempt

After reading the influence statement, participants were asked to estimate the probability (on a scale ranging from 0 to 100% success) that the agent got what the agent wanted from the target.

Responses by the target to the influence attempt

On the next Web page, participants were asked to consider that the target had at least five different ways (strategies) to react to the influence attempt: (a) *to comply with the agent's request*; (b) *to disparage (ridicule, discredit, or criticize) the agent*; (c) *to persuade the agent to not want what the agent wants*; (d) *to obtain social support from similar others*; and (e) *to do nothing*. Participants were asked to provide examples, in their own words, of each of these options. These open-ended answers were evaluated to determine if the participants understood the five different strategies; in all cases their answers were consistent with the categories.

Next, participants were asked to indicate the probability from 0 to 100% that the target would engage in each of the five different options. Participants were then asked to provide their predictions as to which strategy the target was likely to attempt first. In this latter case the sum of the probabilities of selecting each option should sum to 100%; if any participant's responses to this list of options did not sum to 100%, the responses were modified by dividing each answer by the participant's total and multiplying that number by 100.

Participants were asked if the target would do something that was not listed, and if so, to indicate what that would be. Participants were given an opportunity to write in as many such responses that they wanted to list. Most participants (78% of respondents) noted that the five options covered the target's options well or they provided no additional responses. The most common write-in responses were (a) to fight with the agent (by 4% of respondents); (b) to seek an outside authority, such as a teacher or parent (by 4% of respondents); (c) to attempt to negotiate a deal with the agent (by 3% of respondents); (d) to use their allies to gang up on the agent or kick him or her out of the friendship network (by 2% of respondents); (e) to withdraw from the friendship network (by 2% of respondents); and (f) to get someone else to do what the agent wanted (by 1% of respondents).

The perceived probability of the target ever engaging in each of the five responses (i.e., not the question about just the first response) was analyzed using a principal-components analysis without rotation. The analysis generated a two-component solution. (b) *Disparage* (loading = .79), (c) *counterpersuasion* (loading = .81), and (d) *social support* (loading = .82) loaded strongly on the first component, which accounted for 42% of the explained variance. (a) *Compliance* (loading = .97) loaded strongly on the second component, which accounted for an additional 20% of the explained variance. (e) *Doing nothing* did not load strongly on either component (loadings of .32 and -.03, respectively). This analysis suggests that the responses to influence attempts are two dimensional: One dimension reflects compliance and

the other dimension reflects resistance. *Resistance* was calculated by averaging the probability of engaging in disparagement, counterpersuasion, and social support (Cronbach's $\alpha = .75$). Doing nothing was eliminated from further analysis.

Response by the agent to the target's noncompliance

On the next Web page, participants were asked to consider how the agent would react if the target did not comply, using the five kinds of responses as those previously used to describe the target's response: (a) *to try to influence again*, (b) *to disparage the target*, (c) *to seek social support*, (d) *to comply with the target's request to cease the influence attempt*, and (e) *to do nothing*. Participants were asked to provide examples, in their own words, of the five responses available to the agent. These open-ended answers were evaluated to determine if the participants understood the five different responses; all their answers were found to be consistent with the categories. Next, participants were asked to indicate the probability from 0 to 100% that the agent would engage in each of the five different options. Then participants were asked to provide their predictions as to which strategy the agent was likely to attempt first. In this latter case the sum of the probabilities of selecting each option should sum to 100%; if any participant's responses to this list of options did not sum to 100%, the responses were modified by dividing each answer by the participant's total and multiplying that number by 100.

Participants were provided an opportunity to write in responses that were not listed among the response options concerning how they thought the agent would react if the target did not comply. Most participants (87% of respondents) noted that the five options covered the agent's options well or they provided no additional response. The most common write-in responses were: (a) to fight with the target (by 4% of respondents); (b) to get someone else to do what the agent wanted (by 2% of respondents); (c) to seek an outside authority, such as a teacher or parent (by 2% of respondents); and (d) to use their allies to gang up on the target or kick him or her out of the friendship network (by 1% of respondents).

The probability estimates asking if the agent would ever use each of the response alternatives in response to noncompliance by the target (i.e., not the question about just the first response) were analyzed using a principal-components analysis without rotation. The analysis generated a two-component solution. (a) Trying to influence again (loading = .71), (b) disparagement (loading = .57), and (c) social support (loading = .81) loaded strongly on the first component, which accounted for 37% of the explained variance. (d) Compliance (loading = .72) and (e) doing nothing (loading = .76) loaded strongly on the second component, which accounted for an additional 29% of the explained variance. This analysis suggests two components that are similar to those shown for targets: one for acquiescence and one for escalation. The measure of *escalation* was created by averaging the probability of trying to influence the target again, disparaging the target, and seeking social support (Cronbach's $\alpha = .64$). A measure for *acquiescence* was generated by averaging the probability of

accepting the target's counterpersuasion and doing nothing in response to the target's noncompliance (r of these two items = .47).

Perceived power

Participants reported their perceptions of each hypothetical network member's power using five different statements with response alternatives (i.e., ratings not rankings) ranging from 0 (least amount) to 10 (highest amount). The five statements corresponded to French and Raven's (1959) conception of reward, coercive, referent, and legitimate power in small groups: *power*, *reward*, *punishment*, *admiration*, and *ability to enforce appropriate behavior*. Confirmatory factor analyses, using maximum likelihood estimation, were conducted for each hypothetical classmate's power. All the solutions produced acceptable model fits. For example, the power assessments for the two main characters, *Classmate T*: $\chi^2(5, N = 456) = 8.82, p = .12, NFI = .99, CFI = 1.00, RMSEA = .04$ (90% CI: .00, .08), and *R*: $\chi^2(4, N = 458) = 5.56, p = .35, NFI = 1.00, CFI = 1.00, RMSEA = .02$ (90% CI: .00, .07), fit well. Two overall power scores were created by averaging the five responses for the agent ($\alpha = .84$) and the target ($\alpha = .81$), with higher scores indicating more power.

Agent's persuasive impact

The agent's persuasive impact was calculated as $i_p = p_i/d_i^2$, where i_p stands for persuasive impact, p_i is the agent's perceived power before the influence attempt, and d_i is the distance between the agent and the target.

Target's supportive impact

The target's supportive impact was calculated as $i_s = N_s^{1/2} [\sum (s_i/d_i^2)/N_s]$, where i_s is the supportive impact, N_s is the number of sources with exclusive connections to the target, s_i is the perceived power of the source, and d_i is the distance between the target and the support source.

Relative influence

This variable equals $i_p - i_s$.

Other measures

In addition to the questions described above, participants were asked which classmate the target might employ for social support following the agent's influence attempt and which classmate the agent might seek for support following the target's noncompliance. Results incorporating these variables are not presented here.

Results

Structural power

After reviewing the simulated friendship network but before receiving information about the influence attempt, participants estimated each fictitious network member's power. Two analyses of variance (ANOVAs) were conducted. The first ANOVA had

Table 2 Mean (and SD) Perceived Power Before the Influence Attempt, by Manipulated Eigenvector Centrality and Manipulated Betweenness Centrality

Manipulated Betweenness Centrality	Manipulated Eigenvector Centrality	
	High	Low
Agent		
High	6.58 (1.98) ^a	6.80 (1.87) ^a
Low	8.42 (1.50)	2.38 (1.60)
Target		
High	6.95 (1.71) ^a	6.79 (1.79) ^a
Low	8.15 (1.88)	2.39 (1.70)

Note: The corresponding cell means for agents and targets differed from each other at $p < .05$ with one exception. For both agents and targets, the cell means for the high betweenness centrality + low eigenvector centrality and the high betweenness centrality + high eigenvector centrality were within sampling error; these cell means have been marked with the superscript a.

the perceived power of the agent as the dependent variable, and the second ANOVA had the target's perceived power as the dependent variable. These separate ANOVAs were justified in part because the perceived power of the agent and the target were not significantly correlated, $r(458) = -.09$.

The independent variables for both ANOVAs were manipulated eigenvector centrality and manipulated betweenness centrality of the relevant network member (i.e., for the agent if the agent's perceived power was being predicted or for the target if the target's perceived power was being predicted). Means and standard deviations from these analyses appear in Table 2. The agent model was statistically significant, $F(3, 454) = 249.72, p < .001, R^2 = .62$. For the agent, the main effects for both manipulated eigenvector centrality and manipulated betweenness centrality were statistically significant, $F(1, 454) = 317.58, p < .001$, partial $\eta^2 = .41$, and $F(1, 454) = 62.16, p < .001$, partial $\eta^2 = .12$, respectively. Agents in the high-manipulated eigenvector centrality conditions were perceived as more powerful ($M = 7.50, SD = 1.98$) than agents in the low-manipulated eigenvector centrality conditions ($M = 4.61, SD = 2.81$). Similarly, agents in the high-manipulated betweenness centrality conditions were perceived as more powerful ($M = 6.69, SD = 1.92$) than agents in the low-manipulated betweenness centrality conditions ($M = 5.35, SD = 3.40$). The interaction of these two predictors was also statistically significant, $F(1, 454) = 366.73, p < .001$, partial $\eta^2 = .47$.

The findings for the targets were similar. For the ANOVA model, $F(3, 454) = 235.10, p < .001, R^2 = .61$. The main effect for manipulated eigenvector centrality, $F(1, 454) = 319.32, p < .001$, partial $\eta^2 = .41$; the main effect for manipulated betweenness centrality, $F(1, 454) = 93.06, p < .001$, partial $\eta^2 = .17$; and the interaction, $F(1, 454) = 286.08, p < .001$, partial $\eta^2 = .39$; were all statistically significant. Targets in the high-manipulated eigenvector centrality conditions were perceived

as more powerful ($M = 7.55$, $SD = 1.89$) than targets in the low-manipulated eigenvector centrality conditions ($M = 4.56$, $SD = 2.81$). Similarly, targets in the high-manipulated betweenness centrality conditions were perceived as more powerful ($M = 6.87$, $SD = 1.74$) than targets in the low-manipulated betweenness centrality conditions ($M = 5.26$, $SD = 3.40$). This set of findings supports H1 and H2: Actors with greater eigenvector centrality and betweenness centrality were perceived to be more powerful. Although the main effects appeared as predicted, there was also a disordinal interaction between the two types of centrality on perceived power.

Predicting target's compliance and resistance

Target compliance

On average, agents were perceived to have less than a 50% chance (45.89%, $SD = 25.29$) of gaining the target's compliance. H3 and H4 predicted that the more an agent has persuasive impact, the more the agent is perceived to be successful in gaining compliance; and the more a target has supportive impact, the less the target is perceived to be compliant. A regression analysis investigated these hypotheses. The independent variables were the agent's persuasive impact and the target's supportive impact, and the dependent variable was the perceived probability of target compliance. The regression was statistically significant, $F(2, 453) = 54.06$, $p < .001$, $R^2 = .19$. As predicted, agents were perceived to be more successful in gaining compliance when the agents had greater persuasive impact ($\beta = .34$, unstandardized $b = 0.03$, $SE = 0.004$, $p < .001$) and their targets had lesser supportive impact ($\beta = -.21$, unstandardized $b = -0.01$, $SE = 0.003$, $p < .001$).

In a second analysis, target compliance was regressed on relative influence. The model was statistically significant, $F(1, 456) = 92.37$, $p < .001$, $R^2 = .17$. The finding that the relative influence regression worked about as well as the regression in which the two variables that constitute relative influence were used separately is consistent with the notion that relative influence was the mechanism causing perceived compliance. These findings support H3 and H4.

H5 predicted that if relative influence is positive, agents are perceived to be more successful in gaining compliance than if relative influence is negative, regardless of influence tactic; if relative influence is negative, agents are perceived to be more successful in gaining compliance with persuasion as compared to threats. An ANOVA was conducted with contrast coefficients for the predicted interaction: Both positive relative influence conditions (persuasion and threaten) were coded as 1, negative relative influence and persuasion were coded as 0, and negative relative influence and threaten were coded as -2. The model was statistically significant, $F(2, 453) = 22.22$, $p < .001$, $R^2 = .10$.

The observed pattern of means is consistent with the predicted interaction (see Figure 3): Positive relative influence resulted in agents being perceived to be more successful in gaining compliance ($M = 56.95$, $SD = 24.41$) than negative relative influence ($M = 37.55$, $SD = 22.65$), $t(454) = 8.76$, $p < .001$, $r = .38$. When relative influence was positive, predictions of compliance success did not vary by tactic

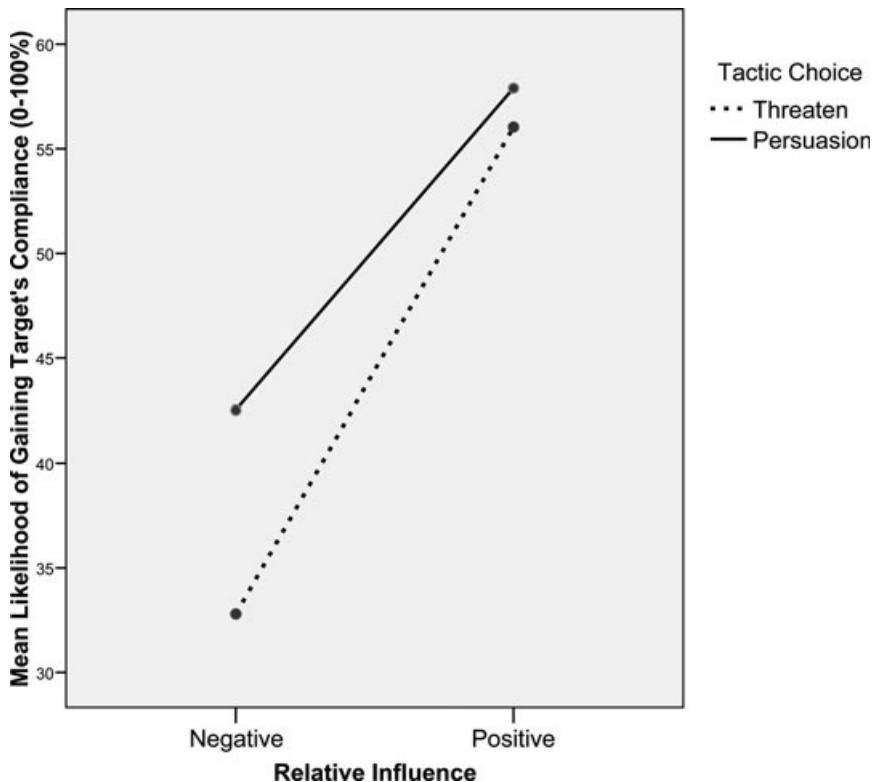


Figure 3 Perceived probability of gaining target's compliance, by valence of relative influence and tactic.

choice ($M = 56.04$, $SD = 23.74$ for threats; $M = 57.90$, $SD = 25.17$ for persuasion), $t(194) = 0.53$, ns , $r = .04$. When relative influence was negative, agents using persuasion were perceived to be more successful ($M = 42.53$, $SD = 22.57$) than those who used threats ($M = 32.80$, $SD = 21.76$), $t(258) = 3.53$, $p = .001$, $r = .22$. H5 is supported.

Target responses

H6 and H7 investigated how targets were perceived to respond to the influence attempts. As predicted by H6, target resistance was perceived to be more likely after agents used threats ($M = 37.61$, $SD = 20.01$) as opposed to persuasion ($M = 32.02$, $SD = 20.82$), $t(456) = 2.93$, $p < .001$, $r = .14$. The pattern of means supported the predictions of H7 as well: In the scenarios in which relative influence was negative, target resistance ($M = 39.03$, $SD = 20.71$) was perceived to be more likely than compliance ($M = 29.10$, $SD = 20.70$), paired-sample $t(261) = 5.49$, $p < .001$, $r = .34$. In scenarios in which relative influence was positive, target compliance ($M = 49.56$, $SD = 24.80$) was perceived to be more likely than resistance ($M = 29.38$, $SD = 19.11$), paired-sample $t(197) = 9.04$, $p < .001$, $r = .64$.

Agent responses to noncompliance

Participants were asked to evaluate the agent's likely response if the target did not comply. H8 to H10 predicted that agent escalation and agent acquiescence were a function of target compliance, target resistance, and tactic. Regression analyses tested these hypotheses. The independent variables were estimates of the probability of target compliance and target resistance, and tactic.

The regression model for agent escalation as the dependent variable was statistically significant, $F(3, 454) = 49.42, p < .001, R^2 = .25$. As predicted by H8, agents were perceived as more likely to escalate their influence attempt after learning of targets' noncompliance when prior expectations of target compliance were higher ($\beta = .38$, unstandardized $b = 0.31, SE = 0.03, p < .001$). Contrary to H9, agent escalation was positively related to prior expectations of target resistance ($\beta = .35$, unstandardized $b = 0.35, SE = 0.04, p < .001$). The coefficient for tactic was not statistically significant ($\beta = -.05$, unstandardized $b = -1.05, SE = 0.85$), which is not consistent with H10.

The regression model for agent acquiescence was also statistically significant, $F(3, 454) = 22.30, p < .001, R^2 = .13$. Agents were perceived as more likely to cease their influence attempt as expectations of target resistance ($\beta = .35$, unstandardized $b = 0.35, SE = 0.05, p < .001$) increased and if persuasion was used ($\beta = .13$, unstandardized $b = 2.68, SE = 0.92, p < .005$), which supported H9 and H10, respectively. Agent acquiescence was not significantly related to prior expectations of target compliance ($\beta = -.03$, unstandardized $b = -0.03, SE = 0.04$), which is not consistent with H8.

The compliance system

Based on Figure 2, a structural equation model using full-information maximum likelihood estimation was used to analyze the covariance matrix of the relevant variables. Errors in the equations were not allowed to covary. The criteria for model fit suggested by Hu and Bentler (1999) were used. The descriptive statistics and correlations for the variables in the model appear in Table 3.

The model fit the data well: $\chi^2(6, N = 458) = 9.95, p = .13, CFI = .99, RMSEA = .04$. Not all of the parameter estimates were statistically significant, including the relationship between the agent's persuasive impact and target resistance (unstandardized coefficient = 0.003, $SE = 0.003$), target compliance and agent acquiescence (unstandardized coefficient = -0.03, $SE = -0.03$), and tactic and agent escalation (unstandardized coefficient = -1.05, $SE = 0.85$). The standardized and unstandardized parameter estimates appear in Figure 4. If the paths for the nonsignificant coefficients are removed, the model still fits: $\chi^2(9, N = 458) = 12.91, p = .17, CFI = .99, RMSEA = .03$. The more restrictive model (i.e., the model with 9 *dfs*) is not significantly worse than the less restrictive model, $\chi^2(3, N = 458) = 2.96, ns$.

The hypothesized model indicated that targets were perceived to be more likely to comply when agents had more persuasive impact, targets had less social support,

Table 3 Descriptive Statistics and Correlations Among the Variables Appearing in the Structural Equation Model ($N = 458$)

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6
1. Agent's persuasive impact	260.55	299.62	—					
2. Target's social support	471.78	386.49	-.24**	—				
3. Tactic	-.02	1.00	.00	.03	—			
4. Target compliance	37.90	24.71	.34**	-.33**	.15**	—		
5. Target resistance	34.88	20.58	-.04	.33**	-.14**	-.09*	—	
6. Agent escalation	41.49	20.44	.16**	-.09*	-.04	.34**	.32**	—
7. Agent acquiescence	25.22	20.73	-.03	.20**	.08	-.05	.33**	.09*

** $p < 0.01$, two-tailed. * $p < 0.05$, two-tailed.

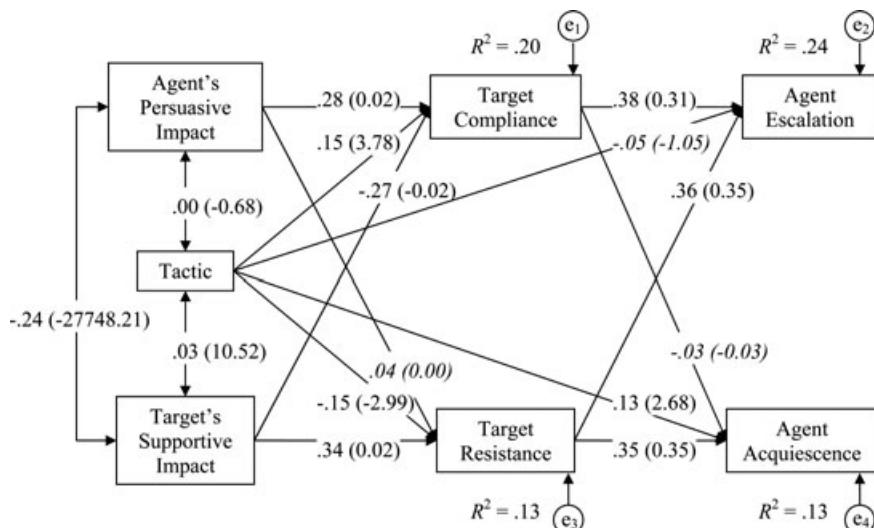


Figure 4 Structural equation model with standardized (and unstandardized) parameter estimates. The circles with es depict the errors in the equations, which are uncorrelated. The parameters in italics are not statistically significant at $p < .05$. For this model, $\chi^2(6, N = 458) = 9.95$, $p = .13$, $CFI = .99$, $RMSEA = .04$.

and agents used persuasion instead of threats. In contrast, targets were perceived to be more likely to resist an influence attempt when targets had more social support and agents used threats rather than persuasion. After being informed that the target was noncompliant, agents were perceived to be more likely to escalate their influence attempt as prior expectations of both target compliance and resistance increased. In contrast, agents were perceived to be more likely to acquiesce to the targets' noncompliance when prior expectations of target resistance increased and agents used persuasion rather than threats. These findings generally supported the

hypotheses for target outcomes; the predictions for agent responses to noncompliance received less support.

Discussion

This study investigated if different levels of structural power conveyed via a sociogram influence network members' perceived power. It also examined if DSIT helped in modeling predictions of target compliance after an influence attempt. Finally, a dynamic model of perceived influence was proposed that included considerations of agents' and targets' relative impact, the tactic used in the influence attempt, targets' reactions (compliance or resistance), and agents' subsequent reactions to targets' noncompliance. The hypotheses and a model incorporating the hypotheses generally received empirical support.

Response to influence, compliance, and noncompliance

This study's participants found the list of responses to influence attempts and noncompliance to be relatively exhaustive. Bochner and Insko (1966) argued that all these response options were not available to typical experimental participants, including participants in their own research. Additional options were solicited in the current investigation, and although most seemed to be options within the response alternatives that were offered to the participants, some might be fruitfully considered for future research. For example, a target may attempt to get another network member to be the target's surrogate and do what the agent asks; an agent may try to influence another network member if the first target is noncompliant; an agent may seek to create coalitions with other network members to enhance power and, presumably, compliance (e.g., see Caplow, 1968; Simmel, 1922/1955). These options were categorized as seeking social support, but a more nuanced investigation of these options may be useful. Future research is needed to identify (a) the structural positions that are used to garner social support, (b) the changes that occur over the course of an influence episode regarding the nodes that are chosen for support or for surrogacy, (c) the behavior of the actors located at these nodes, and (d) the changes that occur to the network structure as a result of these transformations.

Responses to influence attempts should be revisited in future studies with other types of participants and in different contexts. This study used the context of friendship, which, like other close relationships, has been described as a communal relationship (Clark & Mills, 1979). Communal relationships, in contrast to exchange relationships (e.g., relations between strangers), are believed to entail fewer expectations of reciprocity (but see Baumeister & Vohs, 2004; Sprecher, 1998; Van de Rijt & Macy, 2006). If so, other contexts for compliance may elicit different responses. For example, targets may resist influence by leaving the situation altogether (Hirschman, 1970; Lewin, 1951). This option may not have appeared in this study because leaving may be more likely among strangers than among friends. In addition, observers, bystanders, or those only loosely connected to the network of actors may reinforce or

suppress actors' responses as a result of their mere presence; the role of this influence audience may also provide significant information about how influence attempts are ultimately resolved.

Sociograms and power perceptions

The results indicated that location in a sociogram communicates power. Structural positions with greater eigenvector centrality and betweenness centrality generated greater perceived power. The improved design in this study, as compared to Smith et al. (2008), allowed for a clearer test of the relationship between betweenness centrality and power perceptions: A location with either high betweenness centrality or high eigenvector centrality communicated more power than a position low in both centralities. Employing the same measures, the estimates for perceived power were markedly similar to those found in Smith et al. for those in analogous positions to the high eigenvector centrality or low betweenness centrality condition ($M = 8.08$, $SD = 1.91$ in Smith et al., 2008), the high betweenness centrality or low eigenvector centrality condition ($M = 5.07$, $SD = 1.73$ in Smith et al., 2008), and the low eigenvector centrality or low betweenness centrality condition ($M = 3.14$, $SD = 2.61$ in Smith et al., 2008). These cross-study results are consistent in showing that attributions of power arise from actors having particular locations in a network.

Sociogram aesthetics have been investigated for some time (Blythe, McGrath, & Krackhardt, 1996). These aesthetics, however, have focused largely on readability and user preference without considering the attributions that observers may make about network members. The few studies that have been conducted on this topic show that observers perceive those with more structural centrality as playing more prominent roles in teams, as being more important as bridges (Blythe et al., 1996), and as being more powerful (Smith et al., 2008). In addition, sociogram users prefer to place important nodes on the top or center of a sociogram (Huang, Hong, & Eades, 2005). Readability and user preferences, however, may not generate sociograms that more effectively communicate the relations among network members, such as their relative power and predicted interactions (Huang et al., 2005). More attention to the attributions made about sociograms is merited.

DSIT and target compliance

Using DSIT (Nowak et al., 1990) as a guide, a model for a single agent attempting to gain a single target's compliance was created. As predicted, the more an agent had persuasive impact, a function of perceived power and distance to the target, the more the agent was perceived to be successful in gaining compliance. In addition, the more a target had supportive impact, a function of the number of powerful, close sources to the target, the less the target was perceived to be compliant.

The predicted interaction between relative influence and tactic is consistent with language expectancy theory (Burgoon & Miller, 1985). With positive relative influence (i.e., the agent's persuasive impact is larger than the target's supportive

impact), agents with greater relative influence were perceived to be more successful in gaining compliance regardless of the tactic used in the influence attempt. With negative relative influence, an agent's success was perceived to be greater when the agent used persuasion than when he or she used threats. These findings at first seem to conflict with Van Kleef, De Dreu, Pietroni, and Manstead's (2006) study, using written messages, which showed that low-power targets are more compliant when high-power agents display anger. They argued that high-power people may gain an advantage in negotiations if they get angry, which may seem to be associated with threatening behavior. However, threatening behavior should not be automatically linked to anger. Future studies can examine the role of a broad class of verbal and nonverbal influence activities (e.g., other-directed anger, self-directed anger, schadenfreude, conflict, sadness) and the responses to them. Fink et al. (2003) also made this point.

The compliance system

A dynamic model predicting how people presume influence attempts progress was proposed. The three-step process (Figure 2) was largely supported empirically (see Figure 4). In the first step, the structure creates power attributions, which are then used to estimate an agent's persuasive impact and a target's supportive impact. Second, the relative influence of the agent and target as well as the influence tactic used affect perceptions of target compliance and target resistance. Third, after learning that the target did not comply with the influence attempt, expected target compliance, and resistance, as well as the original influence tactic, generate expectations of the agent's subsequent escalation or acquiescence.

The model fit the data very well, and most of the model's predictions were supported. For example, target compliance was perceived to be more likely when an agent had greater persuasive impact, the target had less supportive impact, and the agent used persuasion. This finding is consistent with previous studies (Fink et al., 2003; Smith et al., 2008). Furthermore, this model accounted for 20% of the variance in expected target compliance.

Not all of the model predictions were supported. First, expectations of target resistance were not related to the agent's persuasive impact. Target resistance was perceived to be more likely when the target had more supportive impact and the agent used threats instead of persuasion. These results suggest that expectations of target resistance rely heavily on perceptions of the target's power and the challenges made to a target's power, which is how threats operate (e.g., Fink et al., 2003; Kaplowitz et al., 1998). Reactance theory (Brehm, 1966) can also explain why targets react to threats with resistance. On the other hand, current theories of persuasion make little reference to a target's power or a target's supportive impact when considering resistance. Based on the current study, a target's power needs to be taken into account in theories of compliance and social influence, and future research should investigate both sides of an influence attempt: The agent's persuasive impact and the target's supportive impact.

Regardless of influence tactic, agents were perceived as likely to escalate their influence attempts after learning that the target was not compliant, whether the target was previously predicted to be likely to comply or likely to resist. These results suggest that both unexpected noncompliance and expected resistance challenge an agent's power and thereby generate the expectation that agents will need to intensify their influence attempts. Threats to power are common (Georgesen & Harris, 2006), but powerholders have been viewed as likely to punish those who differ with them on important issues rather than on trivial ones (Berdahl & Martorana, 2006). Thus, noncompliance may cause escalation, even if the influence attempts were not forceful. Alternatively, unexpected noncompliance and expected resistance may be seen as forms of social rejection, which has been predictive of aggressive behavior (Twenge et al., 2007).

Agents were predicted to be more likely to cease their influence attempts when targets were expected to resist them and if agents used persuasion rather than threats. Observers' prior expectations of target compliance did not influence their predictions of agent acquiescence. These findings suggest that some influence attempts may be expected to end quickly: When targets are expected to resist compliance and do so, agents may be expected to leave the target alone, especially if the agent had initially employed persuasion. An agent–target conflict may result when a weaker agent attempts to influence a more powerful target. As suggested by Smith et al. (2008), persuasion may be viewed as a fallback position for agents with less power than their targets. Agents attempting to gain influence from fallback positions may be expected to cease their influence attempt after noncompliance instead of tempting possible retaliation from their noncompliant targets. Cessation of influence attempts has received almost no attention in current studies of persuasion, but it is significant for understanding compliance dynamics. The alternative to cessation may be escalation, which clearly can lead to conflict and even violence; specifying the conditions under which potential hostilities can be avoided can contribute to the conflict management literature in addition to the literature on social influence.

Limitations

A few issues limit this study's findings. First, a convenience sample of university students was employed. Although this sample does not appear to create problems of internal validity, external validity requires subsequent research sample from other populations (but see Shapiro, 2002). Second, this study focused on observers' attributions and predictions about how a social influence scenario would unfold. This information is important because people use such information to guide their own decision making; develop, maintain, change, and evaluate influence attempts and their consequences; and evaluate agents and targets. For example, because power is relational, revolutions—of states, of organizations, or of dyads—occur when observers decide that those in positions of power no longer have that power (e.g., elite defection in McAdam, Tarrow, & Tilly, 2001), and revolutions fail when others

perceive that those in power are, indeed, powerful. Nevertheless, the current research is not a substitute for observing actual communication over time between agents and targets in existing social networks.

Third, the network configuration employed in this study was undirected (i.e., the links were implicitly reciprocal). However, friendship nominations can be nonreciprocal. Thus, the ties could have been directional. The use of arrows, including nonreciprocal arrows, could influence power attributions and compliance predictions.

Fourth, the interaction between manipulated betweenness centrality and manipulated eigenvector centrality on perceived power may be, in part, because of differences in degree centrality (i.e., the number of direct links to other nodes; see, e.g., Freeman, 1979). Positions 1, 2, and 3 all have a degree centrality equal to 4 (i.e., they have four ties to other classmates), whereas position 4 has a degree centrality equal to 1 (F. E. Tutzauer, personal communication, July 17, 2009). Position 4 has very low scores for perceived power (2.38 for agents and 2.39 for targets). Although degree centrality does not explain the differences in perceived power for positions 1, 2, and 3, it deserves attention in future research.

Fifth, it is possible that agents' and targets' positions within their social networks change as a result of influence attempts. Powerholders pay more attention to cues of threats to power if their power is unstable (Georgesen & Harris, 2006). The relationship of the stability of power and the stability of the network structure requires investigation, as does how people make sense of the expected and observed compliance dynamics. Thus, the model presented here is a start at representing this process, but it may oversimplify it.

Sixth, and as mentioned above, future research should pay attention to contextual and communicator factors. These factors include norms for power and persuasion that differ by context and culture, and observers' attention to power and persuasion dynamics in various contexts (e.g., newcomers to a network may attend more to these issues than existing network members; our thanks to an anonymous reviewer for commenting on these considerations). In addition, power may flow from a formal network as well as a corresponding informal network (Cai & Fink, 2009).

Conclusion

This study showed that two variables—power and communication—play critical roles in how observers make sense of the way that influence attempts unfold. The goal of this study has been to understand how people draw conclusions about power and compliance within a social network and the subsequent effects that these conclusions have. Our results show some progress toward this goal.

For some time researchers have written about the benefit of developing network ties strategically, such as connecting to well-connected others or linking different network sectors (e.g., Burt & Ronchi, 2007). This study suggests that observers appreciate

the representations of such structural positions. Social networking tools, such as Twitter and Facebook, have applications that allow users to generate their friendship sociograms. Attributions made about network members and sociograms—in all their forms (e.g., organization charts, family trees, and citation maps)—deserve attention because people may strategically use these attributions in future interpersonal encounters. Although Mao (1954, p. 272) said “political power grows out of the barrel of a gun,” in this study it is clear that, in everyday life, power grows out of communication in social networks.

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