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Understanding the Influential People and Social Structures Shaping Compliance

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Abstract

This study integrated efforts to identify influential people and to extend theories of structural predictors of compliance. Adults (N = 195) were shown a sociogram of 11 people who were connected by friendships. Participants were asked to imagine themselves in this group, identify a position for themselves, select another member for an interaction, and predict their likelihood of complying with the member's request. Connectors (those wanting to link others) identified with more central positions for themselves and selected more central interaction partners. Agents with greater persuasive impact were more successful in gaining compliance from participants; for connectors, targets' supportive impact also reduced their likelihood of compliance. Findings have implications for diffusion efforts that depend on interpersonal compliance, and for theories of social influence.

Keywords

Compliance, social networks, network preferences, opinion leadership, diffusion

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Introduction

> *We know, since Plato, that personal influence is persuasive.*
> —Katz & Lazarsfeld, 1955, p. xxiv

In early studies of social influence (e.g., Katz & Lazarsfeld, 1955; Tarde, 1903) and in reviews of decades of diffusion research (Rogers, 2003), scholars have argued that certain types of influential people embedded in particular social structures are better able to change others' beliefs and behaviors, and ultimately change the community's beliefs and behaviors via diffusion. Campaigns based on these dynamics (referred to as popular opinion-leader campaigns, Kelly, 2004; and seeding campaigns, Kozinets, de Valck, Wojnicki, & Wilner, 2010) promise efficiency: By identifying and persuading influential people to be agents of change, we can accelerate the diffusion of new ideas, the reach of social movements, and the likelihood of compliance to advocacy messages.

The success of campaigns attempting to harness these dynamics are mixed (Rogers, 2003; Southwell, 2013). Part of the difficulty in this process comes from the challenge of identifying influential people (Boster, Carpenter, & Kotowski, 2014; Boster, Kotowski, Andrew, & Serota, 2011; Valente, 2010). A second difficulty is that there has been relatively little effort to theorize how social structure influences the likelihood of person-to-person compliance, in which an influential person attempts to persuade a particular target (Smith & Fink, 2010). These two difficulties are critical to address a basic mechanism of diffusion: "In order for diffusion to take place between any two individuals, the transmission of an object of diffusion must be accepted by the person who does not already have it" (Lave & March, 1993, p. 349).

Recent efforts to solve these two difficulties have provided promising new insights: Boster and colleagues (2011) have developed measures to identify influential people, and Smith and Fink's (2010; Fink, High, & Smith, 2014) extension of dynamic social impact theory (DSIT; Nowak, Szamrej, & Latané, 1990) employed features of network structure to enhance the understanding of agents' and targets' suasory power as well as targets' reactions to influence attempts. These insights have implications for theory and practice. Theoretically, understanding the attributes of influential people and the network features that predict their success at gaining the compliance of others represents a critical step forward in theory development. Pragmatically, studies often identify people who fit the criteria of influence agents. For example, in Boster et al.'s 2010 study, 1%-5% of their samples were categorized as superdiffusers. Superdiffusers' network position combined with their personal characteristics may enable them to effect compliance, making diffusion campaigns and influence attempts more effective.

These new ideas require additional research. Although influential people should be drawn to central network positions (Boster et al., 2011), the scales developed by Boster et al. have never been tested against network measures. In addition, Smith and Fink's (2010) study was limited by their procedures. Participants were asked to imagine being in a particular location in a social network as well as to imagine their response to a hypothetical other also in that same network who was attempting to influence them. However, participants may have had difficultly imagining some interactions, because the network positions of the target, for example, may not be the position that they would choose for themselves.

This study extends the work on influential attributes and DSIT by providing an integration of these efforts. It investigates the position that participants identify with and would choose within a network of friends; the group members with whom they would choose to interact; the extent to which DSIT variables explain participants' anticipated compliance with a group member's attempt to persuade them; and the influence of trait connectivity (Boster et al., 2010) on these compliance dynamics.

Dynamic Social Impact Theory

DSIT (Nowak et al., 1990) states that targets' attitudes change as a function of two competing forces: the agent's degree of persuasive impact and the target's degree of supportive impact. Smith and Fink (2010) extended DSIT to compliance in dyadic encounters (one agent and one target); this extension is the focus of the present study. In both the original (Nowak et al., 1990) and the extended versions of DSIT (Smith & Fink, 2010), influence is explicitly considered within a social network. Agents and targets are connected to other members of a network, and the network influences persuasive processes for both the agent and the target. Based on DSIT, target compliance is hypothesized to be positively predicted by the agent's *persuasive impact* (agents' power and sociometric closeness to their targets) but negatively predicted by the target's *supportive impact* (targets' level of support from other members of the network); these predictions were empirically supported in Smith and Fink's (2010) study. To clarify the network influences, it was found that more powerful agents find it easier to gain compliance from their own friends than from friends of friends (affecting agent's persuasive impact) and from those targets who have few members of their social network available to support them if they choose to resist compliance (affecting target's supportive impact).

In dyadic compliance encounters, the agent's persuasive impact is a function of the agent's persuasiveness and the social distance between the agent and the target. Smith and Fink (2010) conceptualized persuasiveness as power, specifically drawing on French and Raven's (1959) and Raven's (1965) conception of power in small groups. Agents with more central positions within a network were hypothesized and found to be perceived as more powerful. Furthermore, Smith and Fink's results provided empirical support for the hypothesis that agents with more persuasive impact were more likely to gain a target's compliance. These hypotheses are tested in this study, in which, unlike the prior study, participants are able to choose their location in a hypothetical social network.

In dyadic compliance encounters, targets' supportive impact is a function of their location in the social network. Smith and Fink (2010) found that targets with more exclusive ties to other network members (i.e., ties not shared with the agent) were found to be less compliant and more actively resistant. It is expected that the more a target has supportive impact, the less the target is willing to comply with the agent's request.

Opinion Leader Attributes and Networks: Investigating Connectivity

The complement to a structural explanation for interpersonal influence is a personalistic one: Some kinds of people may be more attracted to more central positions, may be more compliant, or may be more willing to seek or accept the support of others. Boster et al. (2011) integrated the work regarding influential people and developed scales to represent three attributes of such people: connectivity, persuasiveness, and expertise (referred to as connectors, persuaders, and mavens). *Connectivity* is directly relevant to the discussion of networks and persuasion. People with higher levels of connectivity should "occupy more pivotal connecting positions in social networks" (p. 193). Boster et al. (2012, 2014) have emphasized that connectors have an interest in meeting new people and connecting groups that are distant in social or physical space, making them likely to share new information with other members of their social networks. Empirically, connectivity has been associated with less social anxiety and more argumentativeness (Boster et al., 2011), and spreading health information (Boster et al., 2012). Connectors' description emphasizes how centrality in a social network plays a key role in the influence process, distinguishing those who are connected to popular people and those who serve as bridges to different parts of a social network.

Two forms of centrality are examined in this paper: eigenvector centrality and betweenness centrality. *Eigenvector centrality* captures strategic popularity: People who are connected to more well-connected others are more active and important within a network (Bonacich, 1972; Borgatti, Everett, & Freeman, 1999). People with more direct ties to others in the network who are themselves directly tied to more people have higher eigenvector centrality. In contrast, *betweenness centrality* reflects efficient flow, which, in a social network, could be the flow of information, status, obligation, or other types of social resources (see Cai, Fink, & Xie, 2012; Foa & Foa, 1972). In any network, we can examine all of the paths between different network members. Some members may be part of a higher percentage of those paths than others (i.e., they have higher betweenness centrality); this type of centrality provides them with an opportunity to glean information, to control the flow of resources (Freeman, 1979), and to be actively involved with different sectors of the network (e.g., Burt, 1992). Boster et al. (2014) have called for additional research to demonstrate that connectedness is related to being well known and to bridging groups. Those with stronger connectedness are expected to identify more with those network members who are more in central network positions, as measured by eigenvector centrality and betweenness centrality.

Trait Connectivity and Compliance

Connectivity (Boster et al., 2011) may shape people's attraction to more central network positions and their interest in communicating with people who are structurally closer to them in their social network. For these reasons, people with stronger connectivity may be picked as opinion leaders in diffusion efforts, but it is unclear whether agents of change (Rogers, 2003) will be able to gain their compliance. DSIT provides a way to understand why connectivity may be associated with compliance: we hypothesize that connectors may identify with personal positions and select interaction partners which lead to Connectors complying with a request made by their selected interactant, a fellow network member. Trait connectivity may also predict the extent to which DSIT explains compliance. DSIT variables—which are structural—may be more salient to connectors. Connectors may be particularly aware of social connections (Gladwell, 2000) and of their own and others' positions within their social network (Boster et al., 2011). Consequently, we hypothesize that DSIT variables may be more likely to predict targets' compliance for those with stronger levels of trait connectivity.

Method

Participants

Participants (N = 195; 53% female) were adults who were recruited through Amazon's Mechanical Turk. They were paid $5.00 to complete a survey[1]; most completed it in less than 30 minutes. Participants on average were 40 years old (SD = 13.98, Mdn = 37, $Minimum$ = 20, $Maximum$ = 71; skewness and kurtosis < |1|). Participants identified themselves as White (82%), Asian (11%), African American (4%), American Indian or Alaska Native (2%), and Native Hawaiian or Pacific Islander (1%). Six percent identified their ethnicity as Hispanic.

[1] The survey (a 9-page .pdf) is appended following the list of references.

Design

The study employed a posttest-only design. All participants answered questions in reference to a sociogram (see Figure 1, adapted from Smith & Fink, 2010). The most complex of the present study's hypotheses includes two predictors in a regression: With 195 participants and a p value = .05, power = .95, we can detect effect sizes (R^2) = .08, which is a much smaller effect size than that reported by Smith and Fink (2010).

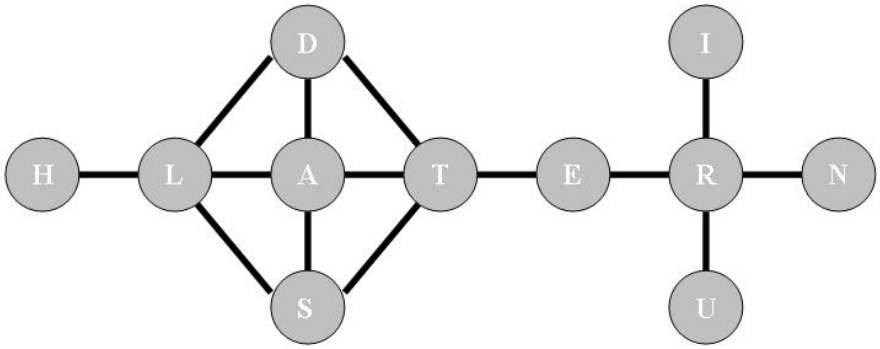

Figure 1. The sociogram (adapted from Smith & Fink, 2010) presented to participants.

Note: Participants were told that the sociogram represents 11 people (labeled with letters), and the lines connecting people represent mutual friendships.

Procedures

A university's Institutional Review Board approved this study, and participants gave their informed consent to participate. As in Smith and Fink (2010), participants were shown a sociogram consisting of 11 circles connected with lines (see Figure 1). The participants were given instructions that explained that this sociogram represents 11 people (labeled with letters) and that the lines connecting people represent mutual friendships. Participants were then asked to "imagine that this sociogram represents a club or organization in which you participate, such as a book club, a birding club, running group, or a bible study group." The participants were told that the sociogram was composed of his or her 10 friends, represented by circles, and that the lines represented friendships in the group. Participants were asked to imagine that we, the experimenters, had gathered this information, and that one of those circles was, in fact, the participant. Participants were then asked to identify which letter they think represents them.

On the next page, participants were shown the sociogram again and asked to imagine that they were going to interact with someone else in the group. They were told that they could select anyone in the group, whether they had a friendship connection with him or her. Participants were reminded to select a letter that differed from the one they identified for themselves, and they were reminded of their selection.

On the next page, participants were shown the sociogram again and were asked to imagine that the selected group member attempted to persuade them to do something. "Imagine the following situation: [selected interactant in sociogram] attempted to persuade you [self-identified circle in sociogram]. Please estimate the probability (from 0 to 100% success) that [selected interactant] got what he/she wanted from you by persuasion." The information in brackets was automatically populated with the letter that represented participants' answers on previous webpages, thus reminding the participants of the sociogram circle they selected for their interaction partners and for themselves. The influence attempt was similar to that employed in Smith and Fink's (2010) experiment.

Participants were asked to estimate the probability that they would comply with the request, and to describe examples of complying or engaging in some form of resistance (resistance was not analyzed in this study). Participants were then asked to judge every group member's (all 11 positions, including their own) social power, to complete opinion leadership scales, and to provide demographic information. On average, participants took a little over 25 minutes to complete the survey (M = 25:40, *Median* = 23:06, SD = 14:25).

Measurement

Responses to the influence attempt. After reading the influence statement, participants were asked to estimate the probability (on a scale ranging from 0% to 100%) that the agent (the person they selected as the interactant) got what the agent wanted from the target (the participant) by persuasion.

Perceived power. Participants reported their perceptions of each hypothetical network member's power using five statements (reported in Smith & Fink, 2010): one (*power*) as a global assessment and four others adapted from four of French and Raven's (1959) types of power in small groups: *punishment*, *reward*, *admiration*, and *ability to enforce appropriate behavior*. Responses were marked on 11-point scales (0 = *least amount* to 10 = *highest amount*). An overall perceived power score was created for the network member that each participant selected for interaction (Cronbach's α = .94-.96 for network members in different positions in the sociogram), with higher scores indicating more power. The scores had moderate skewness (< |1|) and kurtosis (< |1|) and were not transformed.

Distance. The distance between participants' self-identified network position and that of their selected interactant was calculated as the geodesic distance (i.e., the shortest number of ties) between them (Smith & Fink, 2010).

Agent's persuasive impact. As in our earlier work (Smith & Fink, 2010), 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 after the influence attempt, and d_i is the distance between the agent and the target (Nowak et al., 1990).

Target's supportive impact. As in our earlier work (Smith & Fink, 2010), 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 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 (Nowak et al., 1990).

Relative influence. This variable equals $i_p - i_s$ (Nowak et al., 1990).

Connectivity. Five items from Boster et al.'s (2011) scale were used to assess the participant's identification with attributes of connectors. Example items include "I'm often the link between friends in different groups," "I often find myself introducing people to each other," and "I try to bring people I know together when I think they would find each other interesting." Responses were marked on 7-point scales (1 = *strongly disagree* to 7 = *strongly agree*). A confirmatory factor analysis using maximum likelihood estimation showed good fit with a single-factor structure, $\chi^2(5, N = 189) = 5.33$, $p = .38$; NFI = 1.00, CFI = 1.00, RMSEA = .02, 90% CI [.00, .11]. The responses were averaged into one score (Cronbach's α =.96; Boster et al., 2011, reported α = .93 for an adult sample); higher scores indicate stronger connectivity. The scores showed low levels skewness (-0.25, SE = 0.17) and kurtosis (-1.10, SE = 0.35) and were not transformed.

Results

Descriptive Statistics

Table 1. Descriptive Statistics and Correlations Between Variables (*N* = 195)

	M	*SD*	1.	2.	3.	4.	5.	6.	7.	8.
1. Connectivity	4.00	1.64	--							
2. Self EC	41.89	26.96	.35*	--						
3. Self BC	26.69	23.83	.10	.04	--					
4. Other EC	43.03	26.88	.22*	.22*	.11	--				
5. Other BC	26.82	23.11	-.09	.05	-.19*	-.11	--			
6. Distance	1.73	1.05	-.12	-.25*	.02	-.26*	-.28*	--		
7. Agent persuasive impact	3.55	3.12	.18*	.24*	-.05	.31*	.17*	-.65*	--	
8. Target supportive impact	3.75	3.23	.28*	.36*	.47*	-.07	.06	.02	-.05	--
9. Likelihood of compliance	53.39	23.14	.16*	.05	-.06	.16*	.00	-.26*	.38*	-.07

* $p < .05$

Note: "EC" is eigenvector centrality; "BC" is betweenness centrality.

Descriptive statistics for the variables appear in Table 1. On average, participants' connectivity scores were at the middle of the scale. Sixteen percent of participants had high levels of connectivity (6 or higher on the 1-7 scale).

Personal position. The two positions picked most frequently as participants' own position in the network were *T* (21%) and *A* (21%), followed by *R* (11%), *H* (9%), *E* (9%), *L* (7%), *S* (6%), *N* (6%), *D* (4%), and *I* (4%); the least popular position was *U* (3%). If all positions were equally likely, each would be chosen about 9% of the time.

Interactant's position. The most popular positions for participants' interaction partners was *A* (22%), followed by *T* (17%), *R* (15%), *L* (9%), *E* (8%), *H* (7%), *D* (6%), *S* (5%), *U* (4%), and *N* (4%); the least popular was *I* (3%). If all remaining positions were equally likely, each would be chosen 10% of the time.

Notably, *T* and *A* were the two positions designed to have the highest eigenvector centrality (Smith & Fink, 2010); *T* also was highest in betweenness centrality. *U* and *N* have the lowest eigenvector centrality and betweenness centrality. The sociogram confounded degree centrality (number of connections) with both eigenvector ($r = .71$) and betweenness centrality ($r = .49$).

DSIT Hypotheses

Position and power. Agents in more central network positions were predicted to be perceived as more powerful. To test this directional hypothesis, the agent's perceived power was regressed on the agent's betweenness and eigenvector centrality. The regression was statistically significant, $F(2, 192) = 15.39$, $p < .001$, $R^2 = .14$. As predicted, agents' perceived power was positively related to eigenvector centrality ($\beta = .37$, unstandardized $b = 0.04$, $SE = 0.01$, $p < .001$) and betweenness centrality ($\beta = .12$, unstandardized $b = 0.02$, $SE = 0.01$, $p = .07$). Betweenness centrality was statistically significant by a one-tailed test, $p = .035$.

In a post hoc analysis, the previous regression was performed again with the participants in the age group represented in Smith and Fink's (2010) study (35 and younger, $n = 90$). The regression was statistically significant, $F(2, 87) = 11.64$, $p < .001$, $R^2 = .21$. As predicted, agents' perceived power was positively related to eigenvector centrality ($\beta = .43$, unstandardized $b = 0.05$, $SE = 0.01$, $p < .001$) and betweenness centrality ($\beta = .20$, unstandardized $b = 0.03$, $SE = 0.01$, $p < .05$). Thus, Smith and Fink's (2010) findings were replicated with the subsample of young adults. For participants aged 36 and older ($n = 105$), agents' perceived power was positively related to eigenvector centrality ($\beta = .30$, unstandardized $b = 0.03$, $SE = 0.01$, $p < .001$) but not betweenness centrality ($\beta = .05$, unstandardized $b = 0.01$, $SE = 0.01$, $p = .61$).

Compliance. On average, participants perceived that there was a 53% chance that agents would get what they wanted from them. Estimates varied across the spectrum, ranging from 9% to 100%. Based on DSIT, target compliance was hypothesized to be positively predicted by the agent's persuasive impact but negatively predicted by the target's supportive impact. To test this hypothesis, target compliance was regressed on the agent's persuasive impact and the target's supportive impact. The regression was statistically significant, $F(2, 192) = 16.99$, $p < .001$, $R^2 = .15$. As predicted, agents were perceived to be more successful in gaining compliance when the agents had greater persuasive impact ($\beta = .38$, unstandardized $b = 2.84$, $SE = 0.49$, $p < .001$). Contrary to prediction, compliance was unrelated to target's supportive impact ($\beta = -.05$, unstandardized $b = -0.37$, $SE = 0.48$, $p = .44$).

To test whether connectivity positively contributed to explaining compliance, a second regression was performed in which target compliance was regressed on agent's persuasive impact, target's supportive impact, and connectivity. The regression was statistically significant, $F(3, 191) = 12.52$, $p < .001$, $R^2 = .16$. Connectivity was weakly related to target compliance ($\beta = .13$, unstandardized $b = 1.77$, $SE = 0.99$, one-tailed test $p = .04$).

Connectivity and Networks

It was hypothesized that those with stronger trait connectivity would identify with more central network positions in the sociogram, as measured by eigenvector centrality and betweenness centrality. The correlation between connectivity and the eigenvector centrality of the network position that participants chose for themselves was statistically significant, $r(193) = .35$, $p < .05$, but the correlation between connectivity and betweenness centrality was not statistically significant, $r(193) = .10$, $p = .15$. In a post hoc analysis, we reviewed the most popular position self-identified by those with average scores of 6 to 7 on the connectivity scale ($n = 31$). Over half ($n = 16$) self-identified with *A*, which is the position designed to have high eigenvector centrality but low betweenness centrality (Smith & Fink, 2010). These findings suggest that people with higher levels of connectivity are drawn to positions that are central because of their connections to well-connected others rather than because of their connections to different parts of the network.

The correlations in Table 1 show that participants with stronger trait connectivity choose as their interaction partner others who have greater eigenvector centrality, $r(193) = .22$, $p < .05$, but not betweenness centrality, $r(193) = -.09$, *ns*. In a post hoc analysis, we reviewed the most popular position identified as interaction partners by those with average scores of 6 to 7 on the connectivity scale ($n = 31$). The two most popular interaction partners were *T* ($n = 7$) and *A* (n = 7), which are the two positions designed to have high eigenvector centrality (Smith & Fink, 2010); *T* is high in betweenness centrality, whereas *A* is low in betweenness centrality. Trait connectivity and the distance between the participant's chosen position and the interaction partner's network position were not significantly correlated, $r(193) = -.12$. The relationship between trait connectivity and the their relative power over their interaction partner (i.e., perceived power of the position that participants chose for themselves minus the perceived power of their interaction partner) was positively correlated, $r(193) = .24$, $p < .05$: Those with greater connectivity picked interaction partners with relatively less power than themselves.

Moderation Test

Connectivity was hypothesized to shape how strongly agents' persuasive impact and targets' supportive impact predict the likelihood of target compliance. To test this hypothesis, the sample was divided into thirds based on connectivity scores (scores within groups ranged from 1 to 2.999, 3 to 4.999, and 5 to 7; approximate $n = 65$ per group). These three groups represent qualitative differences in having the connectivity trait, no particular relation to it, and not having the trait. Although people with the connectivity trait may be particularly attuned to social relationships, those who do not have it may weigh other information as more important, and those in the middle group may be somewhere in between. The mean levels for the three groups reflect *disagree*, *neither agree nor disagree*, and *agree* on the 7-point scale, which we will refer to as not-connectors ($M_{\text{Not-connectors}} = 2.07$, $SD_1 = 0.69$), neutrals ($M_{\text{Neutrals}} = 4.26$, $SD_2 = 0.58$), and connectors ($M_{\text{Connectors}} = 5.80$, $SD_3 = 0.46$). The groups' means were compared using independent samples *t* tests; the means differed from each other at $p < .05$.

Target compliance was regressed on agent's persuasive impact and target's supportive impact for each group (see Table 2, below). Recall that, based on DSIT, target compliance was hypothesized to be positively predicted by the agent's persuasive impact but negatively predicted by the target's supportive impact. All three models were statistically significant (see Table 2). For connectors, the beta weights showed that agents were perceived to be more successful in gaining compliance when the agents had greater persuasive impact and targets had less supportive impact. For neutrals and not-connectors, the beta weights showed that agents were perceived to be more successful in gaining compliance when the agents had greater persuasive impact, but compliance was unrelated to target's supportive impact. The DSIT prediction was supported for the connectors, but not for neutrals or not-connectors.

Furthermore, the base level of compliance differed between groups. Connectors, on average, were more likely to believe that they would give their interaction partner what was wanted from them (intercept = 58.61, $SE = 5.73$) than neutrals (intercept = 40.56, $SE = 5.46$), $t(126) = 2.28$, $p < .05$, or not-connectors (intercept = 40.24, $SE = 4.68$), $t(127) = 2.50$, $p < .05$.

In summary, the results indicate that neutrals and not-connectors were, on average, less likely to comply than connectors. Furthermore, only agent's persuasive impact predicted neutrals' and not-connectors' likelihood of compliance with the agent, whereas the agent's persuasive impact and the target's (participant's) supportive impact both predicted connector's likelihood of compliance with the agent.

Table 2. Regression Estimates for the Likelihood of Compliance by Agent's Persuasive Impact and Target's Supportive Impact for the Three Connectivity Groups

	b	*se*	*β*
	Connectors (*n* = 62)		
Intercept	58.61*	5.73	
Agent's persuasive impact	2.30*	0.83	0.32*
Target's supportive impact	-2.60*	0.85	-0.35*
	Neutrals (*n* = 66)		
Intercept	40.56*	5.46	
Agent's persuasive impact	3.63*	0.80	0.51*
Target's supportive impact	0.70	0.87	0.09
	Not-connectors (*n* = 67)		
Intercept	40.24*	4.68	
Agent's persuasive impact	2.58*	0.94	0.33*
Target's supportive impact	0.15	0.82	0.02

* $p < .05$

Note: All three models were statistically significant: $F(2, 59) = 8.06$, $p < .01$, $R^2 = .22$ for connectors; $F(2, 63) = 10.23$, $p < .001$, $R^2 = .25$ for neutrals; and $F(2, 64) = 3.74$, $p < .05$, $R^2 = .11$ for not-connectors.

Discussion

This study investigated how well DSIT predicted the likelihood of complying with the request of another network member and the predictive power of a measurable attribute of opinion leaders: connectivity. Adults were asked to imagine that a sociogram represented a group of 11 people who were connected by mutual friendships, which was represented in a sociogram. They were then asked to indicate the position with which they identified, to whom they might communicate, and how likely they were to comply with a request made by an interactant whom they selected. Results showed that the average level of expected compliance was related to connectivity: those with more connectivity were more likely to comply. Connectors believed that there was a 59% likelihood of their giving their interaction partners what was wanted from them, whereas neutrals and not-connectors believed there was only about a 40% likelihood that they would comply. In addition, there was a moderation effect: whereas agent's persuasive impact predicted the target's (participant's) likelihood of compliance regardless of their connectivity, target's supportive impact only predicted the likelihood of compliance for connectors and not for neutrals or not-connectors.

DSIT

This study replicated and extended Smith and Fink's (2010) study. Like Smith and Fink (2010), eigenvector centrality and betweenness centrality predicted perceived power. Thus, although the sociogram was the same as that used in the earlier study, this set of adults (in comparison to the young adults—college students—in the Smith & Fink study) made somewhat different attributions of power based on the members' network centrality. In both studies, eigenvector centrality was a much stronger predictor of perceived power than was betweenness centrality. It is possible that the current study did not have enough statistical power for the small effect of betweenness centrality to be significant; however, it is also possible that betweenness centrality is most associated with power among younger adults, as seen in our post hoc analysis, or that power perceptions differ because of the region from which our student sample resided. We did not ask participants for the location of their residence, so this alternative explanation could not be tested.

Connectivity

Boster et al. (2011) proposed that influential people may have three traits that could be measured and used to identify them for persuasive efforts: connectivity, persuasiveness, and mavenness (i.e., expertise). The current study focused on connectivity; connectors should be drawn to central network positions that allow them access to different sectors of a network. This proposed attribute of opinion leaders has never been tested against network measures, such as betweenness centrality. This type of centrality is in contrast to network positions that are central via connections to well-connected others (i.e., eigenvector centrality). In Figure 1, there are four positions varying in eigenvector and betweenness centrality, with the strongest differences between the position labeled *A* (high eigenvector centrality, low betweenness centrality) and *R* (low eigenvector centrality, high betweenness centrality). Those with higher connectivity should have identified *R* as their network location. Although the sociogram separated positions that are high and low in betweenness and eigenvector centrality, it confounded degree centrality (number of connections) with both eigenvector (r = .71) and betweenness centrality (r = .49).

However, we found that those with stronger connectivity identified with network positions with high eigenvector centrality and low betweenness centrality; the majority of those with the highest levels of trait connectivity identified with position *A*. This result does not support the idea of connectors as gleaning information from different groups and taking advantage of the strength of weak ties (Granovetter, 1973). Indeed, the positions high in eigenvector centrality in this sociogram are likely to receive redundant information (Burt, 1992; Grannovetter, 1973). This finding resonates, however, with Rogers's (2003) observation that change agents (influential people encouraged to promote the diffusion of innovations to others) communicate relatively infrequently with lower-status persons.

This study found that structural determinants of persuasion, such as an agent's persuasive impact, affected anticipated compliance more for people with stronger connectivity. This finding suggests that people for whom social network position—their own and others—is salient may weigh structural power more heavily so that power more strongly affects their decisions about compliance. Alternatively, Richmond (1977) found that people who self-identify as opinion leaders, versus those who do not, retain more information from stimuli to which they are exposed. It is possible that the moderation effect that we found (i.e., more likely compliance from connectors, versus neutrals or non-connectors, and predictive influence of both agent's persuasive impact and target's supportive impact on compliance for only connectors) may result from differential information processing or from differential weighting of that information; these alternative explanations should be studied in future research. In addition, the context of this experiment was that of persuasion in a friendship network in which the object of persuasion may

be unlimited (e.g., an agent getting information from a target by persuasion). Different social contexts, such as trade partners and limited resources, may shift power perceptions of power to focus on network positions with exclusion ability as predicted by network exchange theory (e.g., Willer & Emanuelson, 2008).

Limitations

The study is limited by the sample, design, and the sociogram. The sample, although it was diverse in age, was not very diverse in ethnicity or race. Our findings should be tested with more diverse samples to investigate the study's generalizability.

The present experiment included a hypothetical compliance gaining task and fictitious sociogram, based on the rationale that people have expectations for social behaviors and apply them to novel and hypothetical situations (Fink et al., 2003; Heider, 1958; Kelley, 1992). Although this study allowed participants to choose their own position and interaction partner, which improves aspects of external and experimental validity, the sociogram presents only one form of group structure, with 11 people connected by mutual friendships. The study should be replicated with other sociograms that include other kinds of centralization and subgroups and which allow for isolates (i.e., those who are completely unconnected to others in the group). Future studies should also investigate what predicts the position identified for one's own position and selected for one's interaction partner. We wish to learn if Connectors typically pick adjacent nodes (thanks to an anonymous reviewer for this suggestion). In addition, for diffusion efforts related to buying new products, Anik and Norton (2012) showed that different types of products may prime the salience and importance of social networks associated with them; for example, home products (e.g., a refrigerator) may bring to mind family-based networks. It would be important to assess whether the type of network (e.g., friendship) moderates the predictiveness of network-based influence theories. Future studies should include compliance gaining behaviors as well. In addition, it is well known that people overestimate their popularity in groups (Lewinsohn, Mischel, Chaplin, & Barton, 1980). Before using self-identification with a position in a network to select change agents for diffusion-based campaigns, it would be important to identify differences between self-identified, perceived, and actual position within the targeted network.

Although this study contributes to our theoretical models predicting the interpersonal compliance between agents and targets that is fundamental to diffusion, this study did not ensure that agents were trying to persuade targets to do something that targets did not already do or to believe something new. Novelty is a critical assumption in diffusion models of innovations (Lave & March, 1993). Future research should specifically test compliance to messages advocating innovative and conventional behaviors and beliefs.

The findings from this study have direct implications for popular-opinion leader (Kelly, 2004) and for seeding-campaigns (Kozinets et al., 2010) that focus more on existing behaviors or beliefs, such as increasing compliance with recommended health behaviors or increasing the perceived utility of one product in comparison to others. In addition, these findings provide potential caveats. Connectors' likelihood of compliance was increased when they were the targets of powerful, sociometrically close agents, but it also decreased based on their connections to others without direct connections to the agents. This finding may explain why some changes stop diffusing through a social network.

Conclusion

Scholars contend that the study of diffusion of innovations theory (Rogers, 2003) and related empirical investigations has focused on predicting adoption of innovations by individual social actors (e.g., people, organizations; Rice, 2009; Valente, 2005); however, creating effective diffusion-based campaigns remains elusive (Southwell, 2013). Two difficulties reside in the challenge of identifying influential people (Boster et al., 2014; Valente, 2010) and understanding how social structure influences the likelihood of compliance (Smith & Fink, 2010).

This study integrates two lines of research on the influential people (Boster et al., 2011) and the social context (Smith & Fink, 2010) in which influence attempts occur. We are the first to investigate the position in a sociogram with which people self-identify and the position of their preferred interaction partner, even though research on influence (e.g., Nowak et al., 1990; Smith & Fink, 2010), diffusion (Coleman, Katz, & Menzel, 1957; Rogers, 2003), and opinion leadership among humans (Boster et al., 2011; Katz & Lazarsfeld, 1970) and other species (Dugatkin & Hasenjager, 2015) has focused on the role of networks and centrality. This study showed how an individual attribute can influence potential network-based power, and how compliance is predicted by agents' persuasive impact, which is network based. Efforts to develop multiple methods to identify influential members, such as Boster and colleagues' efforts to create measures of relevant traits, and to further network-based theories of influence, such as Smith and Fink (2010), advance understanding the dynamics of interpersonal compliance and designing effective campaigns to promote diffusion based on these dynamics. Integrating these approaches is a critical advancement in the understanding of interpersonal influence underlying word-of-mouth diffusion of innovations.

Authors' Note

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