The Ties That B(l)ind:
How Social Connectedness Diminishes Individual Influence in Group Judgments

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Abstract

In organizations, judgments made by groups benefit from having the input of a wide range of perspectives, but in many cases, judgment outcomes do not reflect them equally. Research on social influence has long established that individual members who hold opinions that deviate from those of their other group members have less influence on a group's judgments. However, to what extent is this effect conditional on the presence or absence of internal social ties among group members? With results from a lab experiment and a field experiment, we show that fewer social ties among group members strengthen the influence of individual members with deviant opinions on the group's ultimate judgment. In the lab experiment, we examine judgments of abstract art, comparing groups of subjects who are 1) strangers, 2) friends, and 3) strangers among whom we introduced affective social ties. In the field experiment, we analyze judgments of wines at a blind tasting event, comparing the judgments of groups with different levels of social interconnectedness. We also conduct several robustness checks to rule out alternative explanations of our results. Our work contributes to research on both group judgments and social networks, providing new insights into how social ties can shape interpersonal influence in collective decisions in organizational contexts.

Keywords: Social Influence, Group Decision-Making, Social Networks, Field Experiment

Introduction

From company boardroom meetings to jury deliberations, vital decisions in organizations are often made by groups, in which we know not every opinion is afforded equal weight (Stasser and Titus 1985, Argote, Gruenfeld, and Naquin 2000, Westphal and Milton 2000, Garg 2014). Specifically, prior research indeed tells us that minority or more deviant opinions have less influence at the decision-making table (Davis, et al 1996, Nemeth 1986). Because incorporating minority opinions can be valuable to group decision-making, much of this work has used laboratory studies to randomly assign previously unacquainted subjects into groups as a way of investigating the conditions under which minority opinions gain more influence in a group judgment (Moscovici and Lage 1976, Nemeth and Goncalo 2004). In organizations, however, rarely are decision-making groups composed of strangers; instead, group members often have some degree of prior social contact with one another. How, then, does the presence of pre-existing social ties among members shape the influence of group members who hold minority or deviant opinions over a group judgment?

In describing a group member's opinion as "more deviant," we mean greater dissimilarity between an individual's opinion and other group members' opinions on a common matter. Our motivation comes from past work on minority influence in group judgments, which has explored how individuals with views that deviate considerably from other group members might exercise greater or lesser influence over their group's collective judgment about a subjective matter (Moscovici and Lage 1976, Nemeth 1986). This past research, however, like the much of the work on group decision-making, relies mainly on evidence gathered from laboratory studies in which individual subjects are convened as strangers into groups, with little attention to groups composed of familiar members (see Sampson [1991]).

We focus on the *internal social ties* between group members because social network perspectives on group outcomes have long emphasized that the structure of relationships between individuals in a group can affect their functioning (Casciaro, et al 2015, Childress and Friedkin 2012, Katz, et al 2004, Cross and Cummings 2004, Cummings 2004, Reagans and McEvily 2003, Reagans and Zuckerman 2001, Rulke and Galaskiewicz 2000). Although the analysis of teams in organizations has revealed how social

ties between group members can enhance coordination in objective problem-solving tasks, researchers have yet to explore how a group's internal ties might shape subjective collective judgment outcomes, with even less attention to their effects on individual members' influence over these judgments. Moreover, existing work on group problem-solving offers mixed insight, suggesting that both familiarity and disconnectedness between group members can enhance the willingness of deviant opinion holders to share information (Gruenfeld, et al 1996, Phillips, et al 2003, Thomas-Hunt, et al 2003).

We conduct two studies, in which we analyze judgments that are quantitative in nature as a way of measuring the extent to which one group member's opinion about a matter deviates from the other group members' opinions. In our first study, we conducted a lab experiment in which subjects were brought together in groups of strangers, friends, or strangers among whom we induced affective social ties. We asked them first to individually make judgments about pieces of abstract art, and then, after a group discussion, to make the same judgments as a collective. In the second study, we conducted a field experiment in which subjects evaluated wine samples at a blind tasting event first individually and then as a group. We randomly assigned participants to groups varying in the number of internal social ties among members – using social network data we collected prior to the event – to study individual influence as a function of the social ties between group members.

This research contributes to prior work by comparing influence across groups that vary in presence of internal social ties among members. By finding that deviant opinions have greater influence in the absence of internal social ties, we shed light on how social ties in groups might suppress rather than enhance the persuasiveness of deviant opinions (Salganik, et al 2006, Aral, et al 2009). Also, whereas past studies of group decision-making and social ties examined objective problem-solving tasks (Stasser and Stewart 1992), we contribute by studying how these ties may influence judgment tasks that lack objective criteria for performance. Finally, our work answers Casciaro, et al's (2015) call to unite network approaches with psychological perspectives as a way of enhancing our understanding of interpersonal organizational phenomena (Casciaro, et al 2014, Mell, et al 2014, Westphal and Milton 2000, Hollenbeck, et al 1998).

Theoretical Considerations on Group Judgments

Group judgments involve reaching a decision that reflects some aggregation of individual members' opinions (Stasser, Taylor, and Hanna 1989). We use "opinion" and "judgment" interchangeably to refer to a group or individual's subjective stance on a given matter. Examples of group judgments include juries ruling on the sentence length for a convicted defendant, management teams determining bonus pay for employees, or investment partners deciding on the valuation of a start-up. Stasser and Stewart (1992: 426) distinguish between problem-solving and judgment tasks by suggesting that in problem-solving tasks, group members "presume that there is a critical set of information that would allow them not only to identify the correct answer, but also to defend it by logical argument." In other words, the key mechanism underlying group functioning for problem-solving tasks is the extent to which members share information relevant to the task. Thus, a group member is influential insofar as she has information that is critical to the problem and is motivated to share it. By contrast, group judgments reflect more the result of individual members persuading other members to agree to a certain opinion, independent of the amount of information they share, making the study of such tasks ideal for isolating the role of social influence in group deliberation (Levine 1989, Wood et al. 1994).

Disagreement and Influence in Group Judgments. Work on minority influence has emphasized how an individual's influence on a group judgment outcome decreases as a function of her dissimilarity to the other group members (Nemeth 1986). Minority influence refers to the influence of a group member who has a salient opinion, attitude, or characteristic that is shared by less than 50% of all group members (Moscovici and Faucheux 1972). And, understanding what empowers minority influence is important because the presence of a minority opinion holder can stimulate divergent thinking in a group (Nemeth 1986, Nemeth and Kwan 1985). Empirical support for the value of minority influence comes from diverse settings, from management teams in Fortune 500 firms to doctors in hospitals (Dooley and Fryxell 1999, Peterson, et al 1998). Since our study focuses on quantitative judgments of a group, the extent to which a group member holds a minority opinion on a matter is reflected in how deviant (or dissimilar) the member's opinion is from the other group members' opinions.

Past research has shown that when minority opinion holders maintain consistent resistance to majority opinions, they exercise greater influence over the group's final judgment (Maas and Clark 1984, Moscovici and Zavalloni 1969). Also, when some commonly shared social feature between minority and majority opinion holders is made salient, minority opinions tend to have greater influence in group judgments because minority members might benefit from in-group biases (Erb, et al 1998, Huo, et al 1996). Westphal and Milton (2000) find similar support in their study of members of boards of directors in Fortune 500 companies. Thus, although the influence of a member in group judgments generally diminishes as her opinion deviates more from the other group members' opinions, minority influence can vary considerably depending on different features of the group itself.

Social Ties in Group Decision-Making. Within work on group decision-making, some empirical research has examined how the presence of pre-existing social relationships between group members conditions their behavior in the group. For example, Gruenfeld, et al (1996) showed that when solving a murder mystery case as a group (Stasser and Stewart 1992), subjects who were each given different relevant clues about the case shared more of their clues with each other when the group was composed of friends rather than strangers. In work on virtual teams, groups of people with more internal social ties also performed better on problem-solving tasks because they shared more information with each other (Kearns, et al 2006). In both studies, social ties made subjects feel more comfortable interacting with each other, increasing the frequency of their communication, which was crucial to completing their task.

Because completing problem-solving tasks hinges on the ability of group members to share objective information, the extent to which any one member has more influence in the group's decisions is arguably a function of the amount of task-relevant information she holds and decides to share (Stasser, Taylor, and Hanna 1989). In subjective group judgment tasks, however, group members must decide on the extent to which they agree with each other's opinions on a common matter with little objective criteria for evaluation, regardless of how much information they share with one another. Thus, the relationship between information sharing and individual influence is less apparent for subjective group judgment tasks.

As such, other research has taken a non-information-centric perspective by arguing that because the presence of social ties between members increases their conformity to the widely shared opinions of a group's members, prior social relationships might suppress the consideration of some members' opinions independent of the extent to which they are shared (Coleman 1988, Oh et al. 2004, Childress and Friedkin 2012, Portes and Sensenbrenner 1993, Reagans and Zuckerman 2001). Coleman (1988) theorized that in a group with greater *network closure* – or more internal social ties – members are more likely to conform to the group's norms because denser social ties multiply the pathways for group members to monitor each other's behavior (Burt 2004, Coleman 1988). In addition, because more social ties in a group also foster a stronger sense of group identification among members (Brewer 1979, Burt 2004), members in such groups are more likely to favor collective judgments that reflect the more widely shared group members' opinions than any one member's more deviant opinion.

Here, Shore, et al (2015) offers evidence from an experiment on virtual teams completing a task in which group members contributed by sharing their subjective opinions on information relevant to the task. The authors found that although members in groups with higher network closure shared more information overall, they used a proportionally narrower range of the shared information when developing a solution. This is because in groups with more internal ties, group members were more likely to only advocate solutions that had broader support from group members. Thus, for group tasks that primarily entail the combination of subjective opinions to reach a consensus, the amount of information shared does not uniformly bear directly on the group's judgment. This suggests that although pre-existing social ties between members of a group can facilitate information sharing, this increased exchange of knowledge does not necessarily make any one member more influential in the group's final collective judgment.

Hypotheses

We develop two hypotheses about how the social ties among group members affect the influence of deviant opinions in shaping a group judgment outcome. To do so, we draw from the Davis, et al's (1996) Social Judgment Scheme (SJS) model, in which less individual influence manifests itself with

greater distance between a focal group member's individual judgment and the group's ultimate judgment. We use the SJS model because it is designed for modeling group judgment tasks involving continuously-valued quantitative judgments, as is the case in our setting.

Consistent with prior research, we expect that a group member's influence over a group judgment diminishes the more her opinion deviates from those of her other group members (Davis, et al 1996); however, we further predict that her influence will be comparatively stronger (1) if she is part of a group with fewer internal ties among members overall and (2) if she has fewer social ties to other members of her group. Consequently, we identify two possible mechanisms – that in the absence of social ties, (1) the other group members are more susceptible to the influence of deviant opinions, and (2) deviant opinion holders behave more persuasively. Our first hypothesis relates to the first mechanism, which suggests that a group-level feature alters the extent to which other group members are subject to influence by a deviant opinion holder. Our second hypothesis relates more to the second mechanism, wherein an individual-level feature of the deviant opinion holder alters her persuasiveness.

For our first hypothesis, we argue that more internal social ties encourage group members to conform to the subjective opinions that are most commonly shared by group members regardless of how varied the set of expressed opinions is. Thus, deviant individual opinions tend to have less influence on a group's judgment when there are more internal social ties within a group. For quantitative judgments, the most commonly shared opinion in a group is represented by an opinion that deviates the least from all other members' opinions – one might think of this as the most 'central' individual judgment (Kameda, et al 1997). Thus, *if* there are more internal social ties among group members, a group is more likely to arrive at a judgment that is closer to the group's most central individual judgment. Conversely, *if* there are fewer internal social ties among group members, the group judgment will likely be more distant from the group's most central individual judgment.

Our reasoning comes from the observation that greater social connectedness among group members signals greater interpersonal affinity between them (Gruenfeld, et al 1996). In such groups, individual members value their social relationships with one another, making them less inclined to engage

in conflict over divergent opinions out of fear that such confrontation would violate their mutual commitment to one another (Battilana and Casciaro 2013, Shah and Jehn 1993). Therefore, highly interconnected groups tend to avoid conflicts by reaching a judgment that strongly reflects the opinions that are most widely shared by group members, which is consistent with research on groupthink (Janis 1982, Schacter 1951). As such, because groups with more internal ties among members are more likely to privilege the preservation of those very relationships, "members are likely to suppress conflict and dismiss information that could incite it" even after it has been shared (Gruenfeld, et al 1996: 3).

In addition, compared to groups composed of strangers, groups of individuals that share social ties exhibit a stronger group identity (Coleman 1988) and consequently, are more likely to adjust their own opinions in accordance with that identity (Tajfel and Turner 1979). In particular, an opinion is most emblematic of a group identity when the opinion is widely shared among group members or is most similar to other group members' opinions (Cialdini, Kallgren, and Reno, 1991). Thus, in rendering a group judgment, more social ties in a group increase the weighting of those members' opinions that are most similar to the other group members' opinions. We therefore expect that a deviant opinion has *even less* influence on a group judgment if there are more social ties among a group's members.

Importantly, we argue that social ties among group members further weaken the influence of deviant opinions in group judgment tasks while acknowledging that the same pattern might not hold for objective problem-solving tasks (Phillips, et al 2004, Gruenfeld, et al 1996). Reaching decisions for such problem-solving tasks requires group members to share objective information about the problem (Stasser and Titus 1985). It is therefore possible that when the information that is objectively critical to solving a problem is also the most dissimilar from the information held by other group members, social ties might facilitate the sharing of such information. In other words, for objective problem-solving tasks, group norms are less important, which weakens the pressure that social ties exert on enforcing normative conformity. However, for subjective group judgments tasks, even though social ties might encourage group members to share deviant opinions, because there exist few objective criteria to evaluate their views, social ties arguably play a greater role in enforcing conformity to a more commonly held opinion.

> *Hypothesis 1:* An individual with a more deviant opinion has greater influence over a group judgment in a socially disconnected group than in a socially interconnected group.

For our second hypothesis, we argue that individual members with more deviant opinions have greater influence over group judgment outcomes when they themselves have fewer social ties to other group members. We build on past work that has suggested that deviant opinions are considered more seriously by group members when such opinions come from members who are social isolates or have out-group identities. Much of the reasoning is grounded in Kameda, et al.'s (1997) finding that members participate more actively in group discussion if their "cognitive centrality" (i.e., the extent to which their individual judgments are shared by other group members) is aligned with their "social centrality" (i.e., the number of other members to whom they have social ties). Thus, group members who have the most (or least) deviant opinions were most active in discussion when they are also the least (or most) connected.

Phillips (2003) offered further support in a study of a problem-solving task completed by a three-member group, in which two shared a pre-existing social tie and one was a social isolate. Results showed that when the social isolate possessed unique information, she was more comfortable with sharing it than a socially connected member who was given the same information. According to Williams and Sommers (1997), this occurs because social isolates are motivated to gain acceptance into the group through sharing divergent information because it highlights the value of their outsider status. Similarly, in other studies, group members reacted more positively to unique information shared by members with minority identities because sharing unique information was in line with the expectation that a minority member would have more divergent views (Mannix and Neale 2005, Lau and Murnighan 1998). Finally, by sharing unique and possibly contradictory information, a socially connected member might be put into conflict with those with whom she shares social ties (Jehn 1995, Jehn, et al 1999).

Extending this research, Thomas-Hunt, et al (2003) found that a group is more likely to consider the unique information shared by social isolates than the same information shared by socially connected members. In particular, group members mentioned the unique piece of information more in their discussion when it was contributed by social isolates than when it was offered by socially connected

members. Together, these findings suggest that social disconnectedness potentially intensifies the influence of group members holding deviant opinions in group judgment. Thus, because deviant opinions are taken more seriously when they are expressed by group members with fewer social ties, these same deviant opinions will also be more strongly reflected in the group's final judgment.

> *Hypothesis 2:* An individual with a deviant opinion has greater influence over a group judgment if the individual has fewer social ties to other group members.

Study 1: Lab Experiment on Abstract Art

To test Hypothesis 1, we first conducted a lab experiment on individuals' and groups' judgments about a question related to four abstract expressionist paintings. In particular, we manipulated the presence of social ties among groups of four individuals and examined how individual judgments of each painting influenced group judgments across three experimental conditions.

Participants. 132 students (*Mean Age* = 22.5 years, *SD Age* = 4.0, 53.8% female) from a large northeastern university in the U.S. participated in our experiment. 37.1% self-identified as Asian, 34.1% White/Caucasian, 8.3% Black/African American, 8.3% Hispanic, and the rest as Other.

Materials. We examine individual and group judgments of four abstract expressionist paintings because their interpretation and evaluation criteria are highly subjective. For example, Snapper, et al (2015: 159-160) showed that although people were only marginally able to distinguish between abstract expressionist paintings by professional artists and visually similar artwork by children, their ratings of professional paintings were significantly higher along just two of six major dimensions of abstract expressionism. In our study, participants viewed and evaluated four abstract expressionist paintings: two by well-known artists and two by four-year-old toddlers (Figure 1). We adopted the four paintings from an experiment reported in a news program on a U.S. television network about abstract art and subsequently used in other published studies, in which a random sample of passers-by favored the two paintings by toddlers more than the two by the well-known artists ("You Call That Art?" 2005; see also Hawley-Dolan and Winner 2011 and Snapper, et al 2015).

Design. Because we are interested in observing group deliberation outcomes, we randomly assigned participants to one of three conditions that varied in the presence of social ties among group members. In the *real friends* condition, group members were already friends prior to the study; specifically, we requested participants in this condition to come to the lab in groups of four friends. In the *strangers* condition, group members were not acquainted with one another prior to the study. In the *contrived friends* condition, group members were not acquainted with one another prior to the study either, but became acquainted through an icebreaker interaction that we introduced. We included the *contrived friends* condition because although social ties are present between group members in both the *real friends* and *contrived friends* conditions, differences in results between the *real friends* and *strangers* conditions could be due to either the presence of social ties or to the effort participants put forth to coordinate arriving as a group.

Experimental Procedures. Two groups of four people participated in a study session, each of which consisted of three stages. In the first stage, each participant individually formed judgments in the form of an answer to a question related to the four abstract paintings. In the second stage, participants engaged in dyadic icebreaker interactions with individuals from either their assigned group or the other group in the session, depending on the experimental condition. In the third stage, participants discussed the same paintings in their group and formed group answers to the same question they all answered individually. Our objective was to compare the individual judgments (i.e., their answers to the question) to the group judgment of each painting across the three conditions.

Stage 1: Individual judgment. Participants were randomly seated around their group's table and for ten minutes individually viewed hard-copy prints of the four paintings in silence. While viewing, participants filled out a paper-and-pencil survey in which they took notes and answered the following question for each painting: "In your opinion, what percentage of the total participants *in this study* (i.e., not just in your session) would consider this painting their favorite?" We refer to the participant's response to this question—a number between 0 and 100—as the participant's *individual judgment* for a

given painting. Later, these participants would be asked to form a consensus about an answer to the same question as a group.

We chose this question to capture a quantitative subjective judgment as a conservative test of our hypotheses because we expect group members to be especially resistant to the influence of a more deviant response to this question. The question asks a participant to assign an estimate of the aggregate favorability of the other participants in the study toward a given painting. However, many participants likely base their perception of others' favorability toward a painting on their own. When participants reveal their answers in group deliberation, they gain information about how a larger sample of other participants in the study might individually feel about a given painting. Therefore, a group member with a more deviant opinion has a stronger reason to defer to the other group members' answers since they offer evidence that her deviant opinion might be an outlier among how all participants in the study would feel about a painting. By contrast, a group member with a less deviant opinion gains information that her answer is more representative of how other participants feel about a painting, making her more resistant to the influence of members with more deviant opinions.

Also, a participant's answer for one painting affects her answers for the other three paintings because the percentages in her answers across all four paintings must add to 100. As such, if a group member has a deviant opinion about one painting, she likely has deviant opinions about the other three. Thus, a group is arguably less susceptible to persuasion by a group member with a deviant opinion because agreeing to that group member's opinion for one painting means that the group must likely defer to the group member's more deviant answers for the other three paintings.

Stage 2: Icebreaker interaction. After submitting the individual survey, all participants interacted with three other participants in the study. In the *real friends* condition, each participant only interacted with each of his or her three assigned group members (i.e., the three actual friends with whom the participant arrived at the study). In the *contrived friends* condition, each participant also only interacted with his or her three assigned group members. Finally, in the *strangers* condition, each participant only interacted with each member of *the other group* who were simultaneously taking part in the study. We

applied an icebreaker exercise across all conditions to rule out the possibility that the mere act of social interaction before group discussion affects a subject's influence over the group's judgment.

An interaction between two participants involved asking each other five icebreaker questions drawn from Aron, et al's (1997) "fast friends" procedure, which has been shown (Davies, et al 2011, Page-Gould, et al 2008) to induce meaningful social ties between previously unacquainted individuals within a short period of time (e.g., "Given the choice of anyone in the world, whom would you want as a dinner guest?" See Aron, et al (1997) for a complete list of questions). Each participant engaged in three rounds of the icebreaker interaction with three different partners. To assess the efficacy of the icebreaker questions, we asked participants to indicate how close they felt to their partner on a Likert scale (1 = not close at all, 7 = extremely close) immediately after each dyadic interaction.

Stage 3: Group judgment. After the icebreaker interactions, participants returned to their original tables (i.e., in their original groups) to begin the third stage of the study session, during which the two groups were separated by a mobile wall to minimize inter-group influence. Each group had ten minutes to view and discuss the same four paintings together, take notes, and answer as a group the same question that they had each answered individually: "In your group's opinion, what percentage of the participants *in this study* (i.e., not just in your session) would consider this painting their favorite?" We refer to this response as the *group judgment*. After both groups submitted their group answers, we asked all participants to fill out an exit survey and debriefed them on the study's background and purpose.

Measures. According to the SJS model (Davis, et al 1996), the "weight given to any member decreases exponentially as an increasing function of the discrepancy of that member's preferences from the other members of the group" (Kerr and Tindale 2004, p. 633). We operationalize individual member and group judgments as their answers to the question we asked for each painting. Based on the SJS model, we expect that the more deviant a focal member's individual answer is from the other three group members' answers, the more distant the focal member's individual answer will be from the group answer.

Our main unit of analysis is subject-painting (n = 132 subjects × 4 paintings = 528 subject-paintings). We measure the deviance of a group member's opinion from the other group members'

opinions as the standardized distance of an individual member's judgment of a painting from the other group members' individual judgments of the same painting. We refer to this measure in shorthand as the *judgment distance to other members* (*Mean* = 0.50, *SD* = 0.15). To develop a measure that generalizes across groups—that is, a measure that accounts for the variability in the range of individual judgments of a given painting across groups—we adapt the formula from Davis, et al (1996):

$$d_i = \frac{\sum_{m=1,i\neq m}^{n} |j_i - j_m|}{\sum_{m=1}^{n} \sum_{k=1,k>m}^{n} |r_m - r_k|} \qquad (1)$$

In equation 1, d_i is the standardized distance of member i's judgment of a given painting from the other n - 1 members' judgments. d_i is equal to the sum of the distances between i's judgment and the n - 1 other members' judgments divided by the sum of the distances between all member-pairs' judgments. Calculated this way, d_i is scaled to the range [0, 1], which allows for comparison across groups. For example, consider the following hypothetical set of judgments from four subjects $\{j_1 = 10, j_2 = 20, j_3 = 30, j_4 = 50\}$. The sum of all judgment distances among member pairs is equal to 130, and the sum of the judgment distances between member 1 and members 2, 3, and 4 is equal to 70. Therefore, d_1 in this example is equal to 70/130 = 0.54 (likewise, $d_2 = 0.38$, $d_3 = 0.38$, $d_4 = 0.69$).

The dependent variable for our study is the standardized distance of an individual member's judgment of a painting to the group judgment of the same painting, which we refer to in shorthand as the *judgment distance to group* (*Mean* = 1.00, *SD* = 0.96). Here, we argue that the greater this distance, the less influence the individual had on the outcome of the group's opinion formation about the painting. To ensure comparability across groups, we standardize the group judgment of a painting by taking the raw group judgment, which ranges from 0 to 100, subtracting the mean of the raw individual judgments of that painting (of the four group members), and dividing the result by the standard deviation of the raw individual judgments of the group's members.

Descriptive Results. After the icebreaker interaction, subjects in the *strangers* condition reported an average closeness of 4.63 with the other subjects with whom they interacted, but who would *not* be members of their discussion group, subjects in the *contrived friends* condition reported an average

closeness of 4.32 with the other subjects who would be members of their discussion group, and subjects in the *real friends* condition reported an average closeness of 5.37 with their friends who would be members of their discussion group. As expected, the average closeness reported by subjects in the *real friends* condition was significantly higher than the average closeness reported by subjects in each of the two other conditions at the $p < .001$ level. By contrast, no significant difference in average closeness ($p > .05$) was found between the *contrived friends* and *strangers* conditions. Thus, we have some assurance that the icebreaker exercise was applied without bias across the *contrived* and *strangers* conditions.

[Table 1 – Mean Individual Ratings and Within-Group SDs of Paintings]

Table 1 reports the average individual rating of each of our four paintings across our three conditions. A one-way ANOVA revealed no significant differences in mean individual ratings across our conditions within each painting ($p = 0.26$ for painting 1, $p = 0.22$ for painting 2, $p = .39$ for painting 3, and $p = .64$ for painting 4). Furthermore, Table 1 showed no systematic pattern in the average within-group standard deviation of individual ratings across conditions. One potential source of bias in our results is that in the *real friends* condition, group members might have more convergent individual judgments than in the *stranger* or *contrived friends* condition because people who share a social ties tend to be more similar to each other (Aral, et al 2009, McPherson, et al 2001). This might reduce the extent to which a deviant opinion in a *real friends* group would be considered actually deviant. As such, we would expect a smaller range of individual ratings within groups in the *real friends* condition than in the other two conditions. Table 1's summary, however, shows that this is not the case in our data.

The Influence of Distant Members. Our first task is to ascertain a positive relationship between judgment distance to other members and judgment distance to group. Evidence supporting Hypothesis 1 would show that this positive relationship intensifies for subjects in the *real friends* and *contrived friends* conditions compared with subjects in the *strangers* condition. Figure 2 offers descriptive evidence via a scatterplot of judgment distance to other members and judgment distance to group, along with a line of best fit estimated by ordinary least squares. The slope of the line is positive ($\beta = 2.363$) and statistically significant ($p < .001$), which is consistent with the prediction of the SJS model.

[Figure 2 – Scatterplot for All Subjects in Study 1]

We also evaluated the relationship between judgment distance to other members and judgment distance to group with a linear regression model, allowing us to control for several factors. Specifically, we estimated models that accounted for each subject's age, gender, race, whether the subject was the group member who did the writing in answering the group judgment question, the position at the table where the subject sat during group deliberation, the date on which the subject participated in the experiment (we ran the experiment on six dates in the span of three months), and the length of the subject's notes on each painting during the first stage of the experiment. We also included dummy variables for each painting as well as the mean and standard deviation of the within-group individual judgments about each painting (see Table 2 for summary statistics). Table 3 reports the results of our models for our 528 subject-paintings, which also shows a positive and significant effect of judgment distance to other members on judgment distance to group while controlling for other variables ($p < .001$, Model 1, Table 3).

[Table 2 – Summary Statistics and Correlations for Study 1 Variables]

[Table 3 – Regression Results for Study 1 Variables]

Real Friends vs. Strangers. Figure 3 presents scatterplots of judgment distance to other members and judgment distance to group for subsets of subjects in the *strangers*, *real friends*, and *contrived friends* conditions. Whereas the slope of the line-of-best-fit for subjects in the *strangers* condition is 1.869, the slope of the same line for the *real friends* condition is 2.871, which is significantly larger ($p < .001$). In other words, although holding a more deviant opinion diminishes a group member's influence over a group judgment overall, holding a more deviant opinion renders a group member *even less* influential in groups in which members have pre-existing social ties than in groups wherein members have no such ties.

[Figure 3 – Scatterplot for Three Conditions in Study 1]

The results of Model 2 in Table 3 offer further support to Hypothesis 1. Model 2 includes an interaction term between judgment distance to other members and a dummy variable for a subject being in the *real friends* condition. Controlling for other variables, we find that the positive effect of judgment

distance to other members on judgment distance to group is significantly stronger for subjects in the *real friends* condition than in the *strangers* condition. Whereas for subjects in the *strangers* condition, a one standard deviation increase in judgment distance to other members increases judgment distance to group by 0.246 ($\beta = 0.246$, $p < .01$, Model 2, Table 3), for subjects in the *real friends* condition, it increases judgment distance to group by 0.409 ($\beta = 0.246 + 0.163 = 0.409$, $p < .05$, Model 2, Table 3).

Contrived Friends vs. Strangers. One issue in comparing results from groups of strangers and groups of friends is that because we cannot observe the factors that led to the creation of those social ties between members in the *real friends* condition, it is possible that these unobserved factors might in fact be responsible for the differences in individual influence between the *real friends* and *strangers* conditions rather than the actual presence of social ties. To rule out this explanation, we compare our results for the *strangers* and *contrived friends* conditions.

The right-most panel in Figure 3 displays a scatterplot of judgment distance to other members and judgment distance to group for individual subjects in the *contrived friends* condition. The slope of the line-of-best-fit for the *contrived friends* condition scatterplot is equal to 2.678 ($p < .001$), which is slightly smaller than the slope of the same line for the *real friends* condition scatterplot, but considerably larger than the slope for the *strangers* condition. Furthermore, Model 2 in Table 3 reports that the interaction effect between the *contrived friends* condition dummy variable and the judgment distance to other members variable is significantly positive ($p < .01$, Table 3). In other words, the effect of judgment distance to other members on judgment distance to group is stronger for subjects in the *contrived friends* condition than in the *strangers* condition. Together, these results support the notion that the existence of social ties between a group's members weakens the influence of deviant opinions in group judgment.

Study 2: Field Experiment on Wine Tasting

To assess the generalizability of Study 1's support for Hypothesis 1 and to test Hypothesis 2, we designed a field experiment to compare individual and group judgments of a cultural product more common in everyday life—wine. Our field experiment in Study 2 has several advantages that complement

the design of our lab experiment in Study 1. First, a field experiment allows us to test our hypotheses in a more natural group decision-making venue, which offers greater external validity Importantly, participants in Study 2 were not aware that they were part of a study until after they participated. Second, in our lab experiment, we only examined the groups of members who were all strangers, all had pre-existing social ties, or all had contrived social ties. Thus, we could not isolate the effect of a group member's internal social ties to other members because the number of group members' internal ties perfectly corresponded to their experimental condition. Our field experiment allowed us to examine the more common real-world phenomenon in which the *number* of internal social ties among members varies across groups, and the number of member-level internal ties to other members varies within groups.

Third, the type of judgment we measured in our lab experiment represents an estimation task. In our field experiment, we measure individual and group evaluations of wine, a type of judgment that represents a taste-based rating task, in which participants must develop an opinion based on subjective opinion alone. Both types of tasks share two key features of judgment tasks: (1) they depend largely on participants' subjective views, and (2) there is considerable uncertainty about reaching a "correct" decision (Stasser and Stewart 1992). Studying both taste-based and estimation judgment tasks allows us to generalize across different types of group judgment decisions.

Participants. 89 MBA students of a business school in the northeast United States took part in our field experiment as part of two wine tasting events hosted by the MBA Wine Club. The first event involved 47 students (51% female), and the second involved 42 students (71% female). Participants were volunteers selected on a first-come, first-serve basis in response to the event advertisements.

Materials. In each event, we used two Californian and two French Cabernet Sauvignon wines (price: $27.99 to $69.96; vintage: 2010 to 2012). We chose Cabernet Sauvignon because to attract attendees, we advertised each blind tasting event as a simulation of the well-known Judgment of Paris event in 1976, where expert wine tasters rated a set of French-origin wines to be lower quality than a set of California wines, which at the time, were considered to be inferior (Taber 2005).

Like abstract expressionist paintings, wine tasting is notoriously subjective in that there is little evidence of any meaningful differences in the evaluations of wines between so-called experts and amateurs (Hughson and Boakes 2002). Moreover, because there are limited objective criteria for evaluating a wine, past work has shown that taster evaluations are highly sensitive to social influence. In one experiment, providing positive or negative information about others' evaluations of a wine prior to tasting had a significant influence on a subject's own ratings, regardless of the production quality of the wine (Siegrist and Cousin 2009). Our procedure also simulates the small group discussion process by which published wine ratings are determined for magazines. In other words, the published rating of a given wine – which significantly impacts consumer demand – often reflects a group's collective opinion.

Procedures. One week prior to each event, we required all registrants to complete a three-question survey. First, from a list of all registrants, each participant was instructed to select up to ten other participants with whom they had interacted the most in their time at the business school. Second, participants indicated how knowledgeable they were about wine tasting (Likert scale: 1 = "not at all", 5 = "extremely"). Lastly, they reported the number of years of experience they had with wine tasting.

Based on responses to the first question, we generated a social network of the participants for each event. We considered two participants as sharing a social tie if they nominated each other in the first survey question. We then randomly generated a set of 12 groups of four participants to capture random variation in group-level social connectedness, which we measure by counting the number of social ties in a group and dividing it by the number of possible ties in the group. This measure is commonly referred to as the *density* of a social network. Greater density indicates greater social connectedness. Evidence consistent with Hypothesis 1 would show that members with more deviant opinions have less influence on the outcome of their group's judgment if their groups have greater density.

To ensure that all participants shared a basic understanding of wine tasting, we invited a wine expert to deliver a 15-minute lecture. After the lecture, each participant had 15 minutes to taste the four wines placed in front of them, labeled only with the numbers "1" through "4". While tasting, participants

filled out a paper-and-pencil survey in which they individually rated the quality of each wine (on a scale, 1 to 100) and took notes, all without interacting with other participants.

After participants completed their individual ratings, we collected the individual surveys and directed participants to different rooms to taste and discuss the same four labeled wines in their pre-assigned groups. Similar to study 1, each group engaged in a 20-minute discussion to complete one group survey. In particular, they took notes and rated the quality of each wine (on a scale of 1 to 100) as a group. After collecting the group surveys, we revealed the identity and origin of each wine, making public several expert ratings and the retail prices of each wine.

Measures. The main independent and dependent variables in Study 2 are almost identical to what we used in Study 1. Specifically, we used participants' individual ratings to calculate *judgment distance to other members* using the same equation adapted from Davis, et al (1996) as in Study 1. For our dependent variable, we used individual and group ratings of wines along the same scale (1-100) to calculate *judgment distance to group*.

Our randomized group assignment offers a way to test the moderating effect of more internal social ties stated in Hypothesis 1 by interacting our judgment distance to other members variable with our *network density of the group* variable (*Mean* = 0.18, *SD* = 0.20). To test Hypothesis 2, we measured the *number of reciprocated ties a member had with other members* (*Mean* = 0.54, *SD* = 0.71), which we interact with our judgment distance to other members variable in our models. Other researchers sometimes refer to the number of meaningful social ties an individual has with other people in a given setting as the individual's network embeddedness (Granovetter 1985, Uzzi and Spiro 2005).

In our regression analysis, we control for a number of other factors that could confound the results of our ultimate regression analysis. At the individual level, we control for the gender of the participant. In addition, we also account for the participant's self-reported knowledge about wine tasting (Likert scale: 1 = "None at all", 5 = "Very much"; *Mean* = 1.43, *SD* = 0.83). We also control for the participant's relative popularity among all other participants in the event using a participant's prestige centrality (see Wasserman and Faust 1994), which is a count of the number of all other student

participants in a given event who nominated a focal participant as a friend in the pre-event survey (*Mean* = 4.17, *SD* = 2.71). Figure 5 visualizes each event's participant social network, in which each participant is represented by a node and an arrow from one node to another that signals the direction of the social tie nomination. Nodes closer to the center of each plot tend to be more popular. The network visualizations in Figure 5 also color each node such that darker nodes represent participants who have more self-reported wine knowledge. A visual examination of both plots suggests that there is little correlation between a participant's wine expertise and popularity in each study.

[Figure 4 – Network Visualizations]

At the group level, we control for the number of group members, as three of our groups contained only three members due to unanticipated attrition. Lastly, we include the standard deviation of the number of reciprocated ties a given member has to other members of the group (*Mean* = 0.43, *SD* = 0.36). Here, we are sensitive to the notion that although two groups might be equivalent in network closure, there might be inequality in the distribution of ties within the group. Table 4 reports summary statistics and correlations used in our regression analysis for Study 2.

[Table 4 – Summary Statistics for Variables Used in Study 2 Regression Analysis]

Descriptive Results. In each event, participants tasted four different wines. Table 3 reports the average overall individual rating of each wine as well as the average individual rating for groups above and below the median group density (= 0.33). For the first event, average individual ratings ranged from 88.11 to 91.70, and for the second event, overall average individual ratings ranged from 84.10 to 91.62. By comparison, expert ratings for a given wine in both studies ranged from 88 to 93 depending on the wine publication. Furthermore, no statistically meaningful differences exist in the average individual rating between groups with high and low density.

Similar to Study 1, Table 5 shows that no clear relationship exists between group network density and the within-group standard deviation of individual ratings within a group. This lends credence to the quality of our random assignment insofar as there is no evidence that groups of strangers exhibited greater

variation in their individual ratings of a given wine compared with groups of participants who were familiar with one another.

[Table 5 – Mean Individual Ratings and Within-Group SDs of Wines]

Regression Analysis: Participant-Wine Level. We estimate linear regression models with judgment distance to group as our dependent variable and participant-wine as the unit of analysis. Because the distribution of our dependent variable was heavily skewed to the right, we take its natural logarithm before entering it into our models. Therefore, we discuss our results in terms of the effect of a unit change in a given independent variable on the percentage change in judgment distance to group.

[Table 6 – Regression Results for Study 2, Individual-Level]

In Table 6, Model 1 includes control variables as well as judgment distance to other members. Model 2 adds the interaction between judgment distance to other members and group network density to test Hypothesis 1. To test Hypothesis 2, Model 3 includes the interaction with judgment distance to other members and a group member's internal ties. We also estimated models with group fixed-effects, which led to similar results. In addition, we obtained similar results using only groups that had a network density greater than 0 (the minimum value in our data) and also only groups with a network density of less than .67 (the maximum value) to confirm that our results are not driven by outlier values in network density.

Model 1 shows that as judgment distance to other members increases by one standard deviation, the judgment distance to group increases by 68% ($exp(0.517) = 1.677$, Model 1, Table 6, $p < .001$). For example, consider two members of a given group, *A* and *B*. Suppose member *A*'s individual judgment were 1 standard deviation more distant from the other members' judgments than member *B*'s individual judgment. According to our model, we would then expect that member *A*'s individual judgment to be 68% more distant from the group's judgment than member *B*'s individual judgment.

Hypothesis 1 receives support from the results in Table 6. Specifically, the positive and statistically significant coefficient of the interaction term in Model 2 suggests that greater social connectedness in a member's group, as measured by network density, positively moderates the effect of judgment distance to other members on judgment distance to group ($p < .01$, Model 2, Table 6). In other

words, if a group were densely interconnected, having a more distant individual judgment pushes a member even farther from the group's judgment than if the group were only sparsely interconnected. Stated otherwise, group members with more deviant opinions tend to have greater influence on a group judgment when group members are less interconnected.

Specifically, according to Model 2, if a four-person group's members had no internal ties (i.e., network density = 0), increasing a member's judgment distance to other members by one standard deviation increases the member's judgment distance to group by just 33% ($exp([1.355 \times 0] + 0.285) = 1.331$, Model 2, Table 6, $p < .01$). However, if the group's members had two mutual ties (i.e., network density = .33), a standard deviation increase in a member's judgment distance to other members more than doubles the member's judgment distance to group ($exp([1.355 \times .33] + 0.285) = 2.080$, Model 2, Table 6, $p < .01$). Figure 6 visualizes predicted values of judgment distance to group as it relates to judgment distance to other members at different levels of a group's network density.

[Figure 5 – Visualization of Regression Results in Model 2, Table 6]

One implication of our evidence supporting Hypothesis 1 is that because individuals with more deviant opinions have less influence over group judgment if a group's members are more interconnected, such a group is more likely to reach a judgment that is more cognitively central (Kameda, et al 1997). In a separate analysis, we aggregated our key measures to the group-wine unit-of-analysis, and found that increasing a group's network density leads to an increase in the distance between a group rating of a wine and the group's median individual rating. Thus, less interconnected groups issue group judgments that are more distant from the most cognitively central opinion of their members whereas greater interconnectedness among group members pushes their ultimate group judgments closer to the most central individual members' opinions.

Model 3's results also support Hypothesis 2, which states that having more internal social ties to other members diminishes the influence of a member holding more divergent views (Table 6). Specifically, the positive and significant coefficient for the interaction between judgment distance to other members and a member's internal social ties signals that being more connected to other members

suppresses the member's influence over a group's judgment of a wine (Model 3, Table 6, $p < .001$). According to Model 3, a standard deviation increase judgment distance to other members increases judgment distance to group by just 38% when a group member lacks any social ties to other members ($exp([0.429 \times 0] + 0.321) = 1.379$, Model 3, Table 6, $p < .001$). In contrast, the same standard deviation increase leads to a 111% increase in judgment distance to group when a group member has one social tie with another member ($exp([0.429 \times 1] + 0.321) = 2.117$, Model 3, Table 6 $p < .001$).

Robustness Checks

Disentangling the influence of less distant judgments. Consider the alternative hypothesis that outlier judgments are weighted more heavily than more central judgments in groups of friends than in groups of strangers. This would be contrary to Hypothesis 1. Suppose a group included the following individual judgments: $P_1 = 0$, $P_2 = 30$, $P_3 = 50$, and $P_4 = 100$. P_1 and P_4 represent two outlier judgments at opposite extremes, and P_2 and P_3 represent the two most central judgments. If this alternative hypothesis were to hold, in the group of strangers, P_1 and P_4's judgments might simply be discarded as outliers. As such, the outcome of the group judgment in this group of strangers would likely be the median of P_2 and P_3's judgments: $40 = (30 + 50)/2$. In this group of strangers, P_1's distance – one of the outliers – from this group judgment would be equal to 40 (i.e., 40 - 0 = 40). By contrast, in the group of friends, the weighting would be just the opposite: P_2 and P_3, as more central judgments, would be discarded instead. Here, the group outcome would likely be the median of P_1 and P_4's judgments: $50 = (0 + 100)/2$. P_1's distance from this group judgment in the group of strangers is therefore equal to 50 (i.e., $50 – 0 = 50$). Thus, P_1's distance from the ultimate group judgment in the group of friends appears to be greater than P_1's distance from the group judgment in the group of strangers, which is evidence that is consistent with Hypothesis 1, but also consistent with the argument under the alternative hypothesis that outliers have more influence in groups of friends than in groups of strangers.

How, then, can we rule out this alternative hypothesis, which might lead to the same empirical pattern consistent with Hypothesis 1 at the individual level? The key assumption in the alternative

hypothesis is that the most central individual judgments –P_2 and P_3 in the example above – carry greater weight in groups of strangers than in groups of friends whereas the most outlier individual judgments –P_1 and P_4 in the example above – carry greater weight in groups of friends than in groups of strangers. If this alternative hypothesis were to hold, then we should observe that at the *group-object level*, the distance between the group judgment and the median of the two most central judgments is *greater* in groups of friends than in groups of strangers (since outlier judgments in groups of friends would have more influence than in groups of strangers). If Hypothesis 1 were to hold, then we should observe the opposite: at the group-object level, the distance between the group judgment and the median of the two most central judgments would be *lesser* in groups of friends than in groups of strangers, since central judgments in groups of friends would have more influence than in groups of strangers..

To test this alternative hypothesis in Study 2, we aggregated our data at the group-wine level and regressed the distance of the group judgment from the median of the two most central individual judgments on the group's network density. Our models show that greater group network density decreases the distance between the group judgment and the median of the two most central individual judgments, providing support for Hypothesis 1 and not the alternative hypothesis (Model 2, Table 7). We also analyzed our data from Study 1 also the group-painting level similarly shows that the distance between the group judgment and median of the two most central individual judgment is lesser in groups of real friends than in groups of strangers (Model 1, Table 7). However, there was no significant difference between groups of contrived friends and groups of strangers, which suggests that the fast-friends treatment might be fairly weak.

[Table 7 – Regression Results at Group-Object Level]

Disentangling symmetrical individual judgments. Another scenario in which it is difficult to disentangle the influence of outliers occurs when individual judgment scores for a given painting or wine in Studies 1 and 2 are symmetrically distributed. For example, suppose in a group, individual judgments are distributed in the following way: $P_1 = 0$, $P_2 = 20$, $P_3 = 40$, and $P_4 = 80$. Because P_1 and P_4 are equally distant from the other individual judgments, it would be difficult to tell whether P_1 or P_4 had more

influence or whether their influence at opposite extremes would cancel each other out. We re-analyzed our data across both studies, removing those cases in which a group had symmetrically distributed individual judgments. Our models using these subsamples confirmed that our findings are largely unchanged (Table 8).

[Table 8 – Regression Results Removing Symmetrically Distributed Individual Ratings]

Discussion and Conclusion

Using a lab experiment and a field experiment, we examined how the influence of deviant opinions in a subjective group judgment task is conditional on the presence of internal social ties between a group's members. In our lab experiment, we compared evaluations of abstract art among groups composed of strangers, real friends, and contrived friends. Here, we found that members holding more deviant opinions had less influence in their groups' collective evaluations in groups of real and contrived friends than in groups of strangers. Our results for groups of contrived friends were similar to those for groups of real friends, suggesting that it is the presence of social ties that generated this difference with groups of strangers rather than unobserved factors that led to the creation of friendship ties. In our field experiment on wine tasting, we further revealed that the influence of deviant opinions on a group's decision weakens not only with the *presence* of social ties, but also with the *number* of social ties between members. In addition, we found that individual members with more deviant opinions also had less influence on their group's judgment when they had fewer social ties to other members.

Theoretical Contributions. Our study contributes to research on social networks and social influence in three important ways. First, whereas social network research has long established that more social ties in a group can accelerate behavioral and attitudinal contagion through social influence (Salganik, Dodds and Watts 2006, Aral, et al 2009), it has not addressed how social ties among individuals might *differentially* affect their ability to influence a collective decision within a group. Our study reveals that individuals holding more deviant opinions have disproportionately less influence over group judgments when they are part of groups that are more densely interconnected.

Second, by creating social ties among strangers, our lab experiment allows us to isolate the effect of social ties on interpersonal influence from the effects of other processes, such as homophily, which is often conflated with the presence of social ties. This answers a call from Katz, et al (2004), who observe that in group research, we cannot be sure whether it is the presence of social ties between people that leads to greater (or lesser) social influence or their similarity that simultaneously increases the probability that people share social ties and adopt similar attitudes (Shalizi and Thomas 2011). Finally, we contribute to research on how the social isolation of members through minority categorization can make them more active participants in groups (Phillips 2003, Thomas-Hunt 2003), but have yet to show that they actually have greater influence in a group's judgment outcome. We address this issue directly by measuring the extent to which individual members' opinions are reflected in a group judgment.

Practical Implications. Our findings shed light on the dynamics of many consequential judgment tasks that are routinely charged to teams in organizations. Many activities in organizations, such as strategic planning and budget drafting, involve group judgments that rely on the subjective input of group members. Because such tasks can benefit from the consideration of diverse perspectives (see Kouchaki, et al [2015] for an alternative view), it is important to understand how certain features of a group might enhance or suppress the influence of members who hold deviant opinions (Nemeth 1986). We focus on a group's internal social ties as a key feature that might affect the consideration of deviant opinions, because although most groups in organizations are composed of members who have some familiarity with one another (Hollenbeck, et al 1998, Mell, et al 2014, Westphal and Milton 2000), scholarship has not thoroughly investigated how these ties might alter the dynamics of their group judgments.

Moreover, managers frequently face decisions about how to put together teams, committees, and other groups to achieve important organizational goals. Although familiarity between group members is generally seen as beneficial for coordination, the presence of pre-existing social ties in the group may also deter deviant opinion holders from defending their positions on subjective matters, which can potentially lead to groupthink. In other words, although we might think that friendships are "the ties that bind," which can facilitate collaboration in groups, our finding that social ties between group members can

discourage the influence of deviant opinions also suggests that such relationships might also be considered "the ties that blind" (Grabher 1993: 24).

Boundary Conditions. We interpret our findings with several boundary conditions in mind. First, our studies did not explicitly test the specific mechanisms that might govern the moderating effect of social ties on the relationship between deviant opinions and group judgment outcomes. In this investigation, we do not observe directly whether social ties between group members make deviant opinion holders less motivated to defend their outlier positions or whether they make other group members less susceptible to the influence of deviant opinion holders. Furthermore, we only study the effects of *pre-existing affective* social ties, broadly construed as friendship relationships; however, we invite further inquiry into how interpersonal influence might be differently shaped by romantic, coworker, or familial relationships, among others. Also, because our work focused on quantitative judgments as a group decision outcome to facilitate the measurement of individual and group judgments, we are also cautious about generalizing our results to discrete choice judgments.

While we acknowledge that the group judgment tasks used in our studies carry relatively low stakes, it is nevertheless clear that in organizations today, individuals navigate situations in which opinions and social connectedness vary more frequently than ever before. Given the increasing emphasis in organizational culture on seeking and including diverse opinions, it seems particularly important to examine the factors affecting minority opinion-holders' level of influence if we are to better understand the effects of their presence and under what conditions they are likelier to flourish.

In sum, our investigation sheds light on group judgment dynamics by approaching the situation from a social networks perspective. In two experiments that attempt to answer the question of when deviant opinions have the most power to shape the opinions of others, we find evidence that contravenes the lay perception that our greatest influence is over friends and acquaintances who know us best. We may instinctively believe that our most ardent supporters will wear familiar faces, but our findings suggest that our most receptive and willing converts may be those whom we greet for the first time.

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Table 1. Comparison of individual rating means and SDs by condition

	All Subjects (n = 132)	Strangers (n = 48)	Real Friends (n = 44)	Contrived Friends (n = 40)	All Subjects (n = 132)	Strangers (n = 48)	Real Friends (n = 44)	Contrived Friends (n = 40)
	Mean individual rating				Within-group SD of individual ratings			
Painting 1	35.91	38.90	34.21	34.65	7.17	8.21	6.96	6.29
Painting 2	22.14	20.57	21.56	24.58	6.36	6.55	6.13	6.54
Painting 3	25.46	24.25	25.13	27.19	5.98	6.60	3.98	7.12
Painting 4	17.53	17.14	19.15	16.01	4.54	3.70	5.85	3.04

Table 2. Summary Statistics and Correlations for Variables used in Regression Analysis (n = 538 subject paintings)

Label	Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	Rating Distance to Group	1.000	0.958																		
2	Rating Distance to Other Members	0.500	0.153	0.377																	
3	Condition = Strangers	0.364	0.482	-0.068	0.000																
4	Condition = Contrived Friends	0.333	0.472	0.154	0.000	-0.535															
5	Condition = Real Friends	0.303	0.460	-0.087	0.000	-0.498	-0.466														
6	Age	22.538	3.999	0.066	0.019	0.174	0.154	-0.340													
7	Gender = Female	0.538	0.499	0.026	-0.034	0.069	0.269	-0.348	-0.073												
8	Gender = Male	0.439	0.497	-0.007	0.055	-0.098	-0.237	0.346	0.106	-0.955											
9	Gender = Other	0.023	0.149	-0.066	-0.070	0.096	-0.108	0.010	-0.110	-0.165	-0.135										
10	Race = Asian	0.379	0.486	0.018	0.028	-0.038	0.077	-0.039	0.145	0.003	0.032	-0.119									
11	Race = Black	0.083	0.277	0.019	-0.001	0.114	-0.155	0.040	-0.164	0.115	-0.156	0.138	-0.235								
12	Race = Hispanic	0.083	0.277	-0.043	-0.017	0.057	-0.039	-0.020	0.049	-0.050	0.064	-0.046	-0.235	-0.091							
13	Race = White	0.341	0.474	0.028	0.023	0.021	0.034	-0.057	0.059	-0.039	0.040	-0.002	-0.562	-0.217	-0.217						
14	Race = Multiracial	0.106	0.308	-0.105	-0.066	-0.107	-0.035	0.148	-0.200	-0.026	-0.008	0.113	-0.269	-0.104	-0.104	-0.248					
15	Race = Did not identify	0.008	0.087	0.198	0.004	-0.066	0.124	-0.058	-0.056	0.081	-0.077	-0.013	-0.068	-0.026	-0.026	-0.063	-0.030				
16	Wrote Group Survey	0.258	0.438	-0.073	-0.075	-0.013	0.024	-0.011	-0.092	0.164	-0.172	0.026	0.040	0.073	0.010	-0.131	0.078	-0.051			
17	Length of Notes	73.958	41.666	0.039	0.043	-0.069	0.229	-0.163	0.106	0.136	-0.115	-0.071	-0.021	-0.065	-0.007	0.099	-0.049	-0.021	0.053		
18	Within-Group Standard Deviation of Individual Ratings	13.197	6.553	-0.202	0.000	0.016	-0.010	-0.006	-0.084	-0.003	0.000	0.011	0.047	-0.004	-0.029	0.002	-0.030	-0.067	-0.009	-0.066	
19	Within-Group Mean of Individual Ratings	25.227	10.123	-0.013	0.000	-0.017	-0.006	0.024	-0.017	-0.002	0.003	-0.003	0.000	0.003	-0.002	-0.006	0.005	0.012	0.000	-0.020	0.571

Table 3. Unstandardized Coefficients from OLS Models of Judgment Distance to Group on Selected Variables with Group Dummy Variables

Variable	Model 1	Model 2
Intercept	0.876***	0.924***
	(0.324)	(0.340)
Age	0.006	0.007
	(0.011)	(0.011)
Gender = Male	-0.007	-0.018
	(0.092)	(0.091)
Gender = Other	-0.144	-0.162
	(0.260)	(0.259)
Race = Black	0.166	0.193
	(0.154)	(0.154)
Race = Hispanic	-0.114	-0.134
	(0.143)	(0.143)
Race = White	0.022	0.026
	(0.088)	(0.088)
Race = Multiracial	-0.139	-0.148
	(0.137)	(0.136)
Race = Other	1.539***	1.521***
	(0.437)	(0.435)
Wrote Group Survey	-0.077	-0.066
	(0.087)	(0.087)
Length of Notes	-0.026	-0.034
	(0.039)	(0.039)
Within-Group Standard Deviation of Individual Judgments	-0.046***	-0.047***
	(0.007)	(0.007)
Within-Group Mean of Individual Judgments	0.020***	0.020***
	(0.006)	(0.006)
Judgments Distance to Other Members	0.346***	0.246***
	(0.037)	(0.055)
Condition = Real Friends	-0.099	-0.093
	(0.242)	(0.241)
Condition = Contrived Friends	<0.001	-0.058
	(0.001)	(0.147)
(Judgment Distance to Other Members) × (Condition = Contrived Friends)		0.163*
		(0.085)
(Judgment Distance to Other Members) × (Condition = Real Friends)		0.201**
		(0.092)
R-squared	0.300	0.308
N (individual-wine)	528	528
Session Date and Seat Position Dummies	Yes	Yes

***$p < 0.001$, **$p < 0.01$, *$p < 0.05$ (two-tailed tests)

Note: In Models 1 and 2, the reference category for the Condition Dummy Variables is "Condition = Strangers". The reference category for Race is "Asian", and the reference category for Gender is "Female".

Table 4. Summary Statistics and Correlations for Variables used in Regression Analysis for Study2 (n = 356 participant-wines)

Label	Variable	Mean	SD	1	2	3	4	5	6	7	8
1	Judgment Distance to Group (logged)	-0.796	1.823								
2	Judgment Distance to Other Members	0.517	0.170	0.289							
3	Group Network Density	0.184	0.197	-0.072	-0.037						
4	Internal Ties to Other Members	0.539	0.705	-0.060	-0.074	0.826					
5	Gender = Female	0.607	0.489	-0.021	-0.071	-0.106	-0.069				
6	Wine Knowledge	1.427	0.834	-0.068	0.033	0.047	0.163	-0.112			
7	Prestige Centrality	4.169	2.711	-0.032	-0.120	0.307	0.412	0.025	-0.221		
8	Three-Member Group	0.101	0.302	0.111	0.296	-0.123	-0.151	-0.035	-0.082	-0.076	
9	Standard Deviation of Group Member Ties	0.435	0.362	0.021	-0.076	0.222	0.185	0.062	-0.056	0.170	-0.258

Table 5. Comparison of individual rating means and SDs by group network density

	All groups	Low density groups	High density groups	All Groups	Low density groups	High density groups
Event 1	Mean individual rating			Within-group SD of individual ratings		
Wine 1	88.11	88.41	87.70	4.97	3.86	6.25
Wine 2	90.32	90.96	89.45	4.49	5.11	3.41
Wine 3	90.55	91.37	89.45	4.99	5.35	4.36
Wine 4	91.70	92.67	90.40	4.60	3.71	5.40
Event 2	Mean individual rating			Within-group SD of individual ratings		
Wine 6	84.10	85.19	81.00	9.77	3.41	18.49
Wine 7	87.79	89.35	83.36	8.19	4.43	13.67
Wine 8	90.69	90.55	91.09	5.42	5.34	5.87
Wine 9	91.62	92.58	88.91	6.06	3.04	10.59

Note: Low density groups have network density less than .33, and high density groups have a network density of .33 or higher.

Table 6. Coefficients from OLS Models of Standardized Distance Between Individual Judgment and Group Judgment on Selected Independent Variables

Variable	Model 1	Model 2	Model 3
Intercept	-0.180	-0.124	-0.136
	(0.413)	(0.410)	(0.410)
Gender = Female	-0.044	-0.040	-0.061
	(0.196)	(0.194)	(0.194)
Wine Knowledge	-0.197	-0.209	-0.214
	(0.122)	(0.122)	(0.122)
Prestige Centrality	0.220	0.300	0.350
	(0.336)	(0.335)	(0.337)
Three-Member Group	-0.013	-0.019	-0.020
	(0.040)	(0.040)	(0.040)
Standard Deviation of Group Member Ties	0.359	0.338	0.399
	(0.275)	(0.273)	(0.273)
Internal Ties to Other Members	0.220	0.284	0.345
	(0.258)	(0.257)	(0.260)
Group Network Density	-1.401	-1.531	-1.661
	(0.875)	(0.870)	(0.873)
Judgment Distance to Other Members	0.522***	0.286**	0.321**
	(0.098)	(0.134)	(0.123)
(Judgment Distance to Other Members) × (Group Network Density)		1.355**	
		(0.530)	
(Judgment Distance to Other Members) × (Internal Ties to Other Members)			0.429**
			(0.162)
R-squared	0.125	0.142	0.143
N (participant-wine)	356	356	356
Wine and Event Dummies	Yes	Yes	Yes

***$p < 0.001$, **$p < 0.01$, *$p < 0.05$ (two-tailed tests).

Table 7. Estimated coefficients of OLS Models at Group-Painting or Group-Wine level

Coefficient	Model 1 DV: Distance between Group Judgment and Median of Two Most Central Individual Judgments (Study 1 Data)	Model 2 DV: Distance between Group Judgment and Median of Two Most Central Individual Judgments (Study 2 Data)
Intercept	13.631 (11.197)	20.995** (8.401)
Three-member Group		0.978 (0.832)
Within-Group Variance of Prestige Centrality		0.812 (1.091)
Average Age	-0.239 (0.415)	
Number of Races	-0.231 (0.929)	
Number of Women in Group	-0.756 (0.905)	-0.104 (0.284)
Median of Individual Judgments	0.207** (0.091)	-0.203** (0.095)
Group composed of all contrived friends[a]	0.978 (1.940)	
Group composed of all real friends[a]	-4.078* (2.417)	
Group network density		-3.601* (1.881)
Painting or Wine dummies	Yes	Yes
R-squared	0.158	0.090
N	132 Group-Paintings	92 Group-Wines

***$p < 0.001$, **$p < 0.01$, *$p < 0.05$ (two-tailed tests).
[a] Reference group is "Group composed of all strangers."

Table 8. Estimated Coefficients from OLS Models of Judgment Distance to Group with Study 1 and 2 Data, excluding observations for group-objects with symmetrically distributed individual judgments

	Model 1 (Study 1 Data on Paintings)	Model 1 (Study 2 Data on Wine)
Judgment Distance to Other Members	0.246***	0.361**
	(0.055)	(0.145)
Condition = Contrived Friends	-0.093	
	(0.241)	
Condition = Real Friends	-0.058	
	(0.147)	
(Judgment Distance to Other Members) × (Condition = Contrived Friends)	0.164*	
	(0.085)	
(Judgment Distance to Other Members) × (Condition = Real Friends)	0.193*	
	(0.103)	
Group Network Density		-0.846
		(0.972)
(Judgment Distance to Other Members) × (Group Network Density)		1.036*
		(0.597)
Painting or Wine dummies	Yes	Yes
Other Control Variables	Yes	Yes
R-squared	0.158	0.090
N	404 Subject-Paintings	300 Participant-Wines

***p < 0.001, **p < 0.01, *p < 0.05.

Note: In Model 1, the reference category for the Condition Dummy Variables is "Condition = Strangers." Model specification for Model 1 matches that for Model 2 in Table 3, and model specification for Model 2 matches that for Model 2 in Table 6. Control variables are included in models but omitted from table to conserve space.

(1) (2) (3) (4)

Figure 1. The four abstract paintings used in Study 1. Painting 1 was made by an anonymous 4-year-old. Painting 2 is *A Tree in Naples* by artist Willem de Kooning. Painting 3 was *Laburnum* by artist Hans Hoffman (reprinted by permission of the Renate Hoffman and Maria Hoffman Trust and the Artists Rights Society). Painting 4 was made by the 4-year-old Jack Pezanosky (reprinted by permission of the parents of Jack Pezanosky).

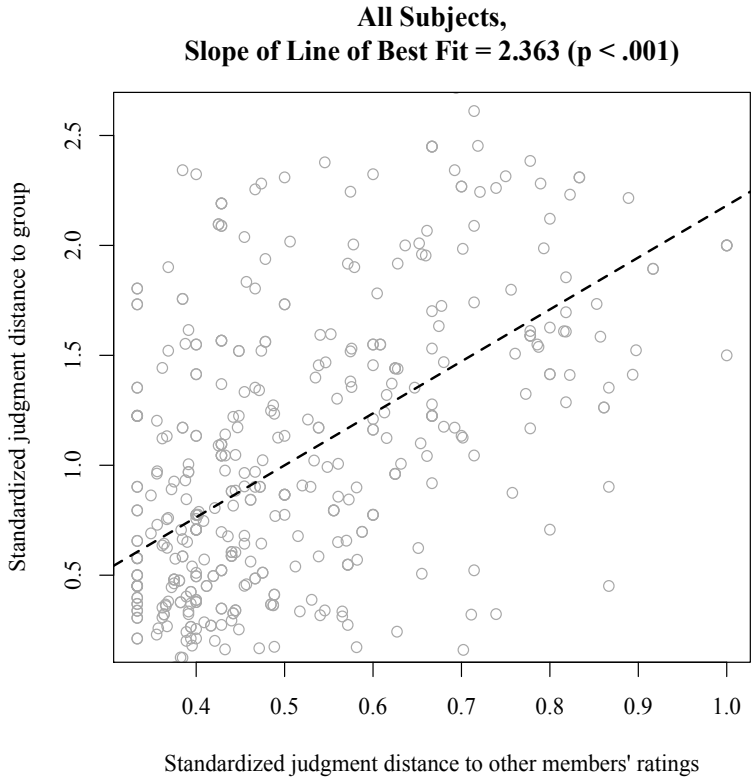

Figure 2. Scatterplot of judgment distance to other members (x-axis) and judgment distance to group (y-axis) for all subjects in Study 1.

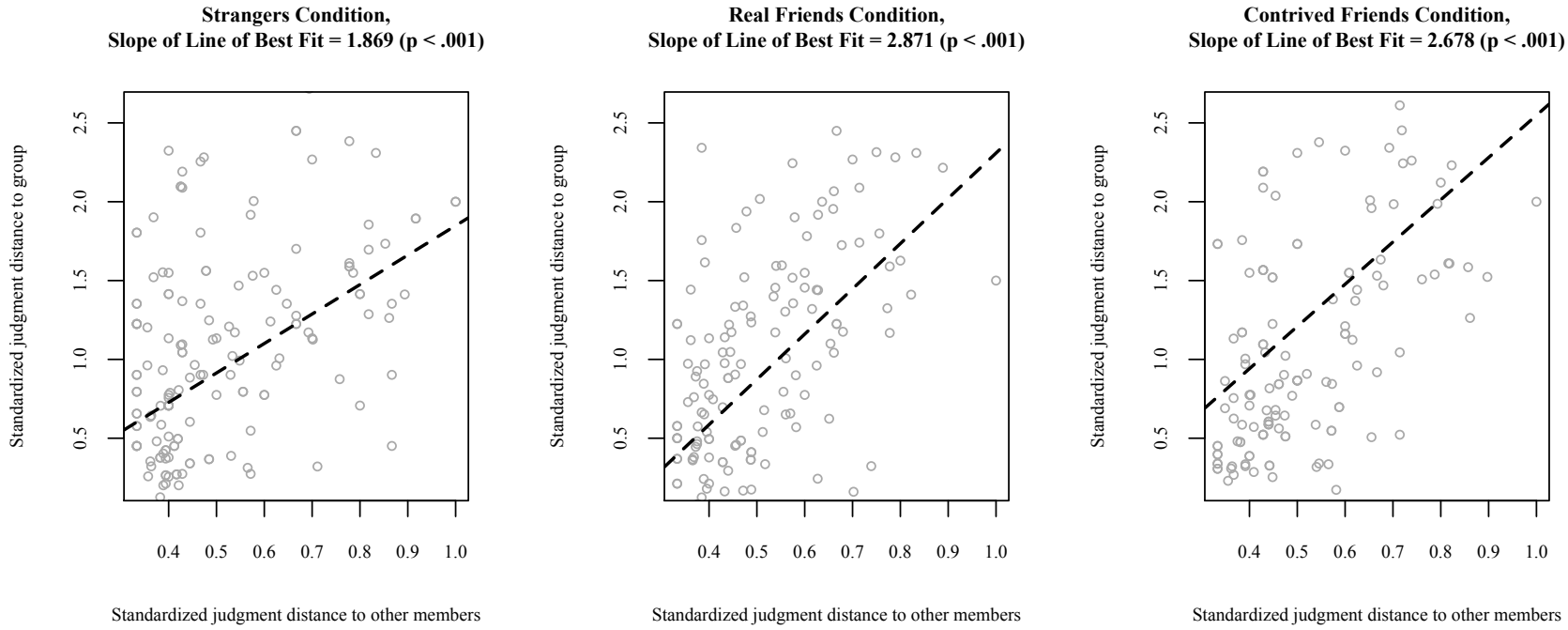

Figure 3. Scatterplot of judgment distance to other members (x-axis) and judgment distance to group (y-axis) for subjects in Study 1 by condition.

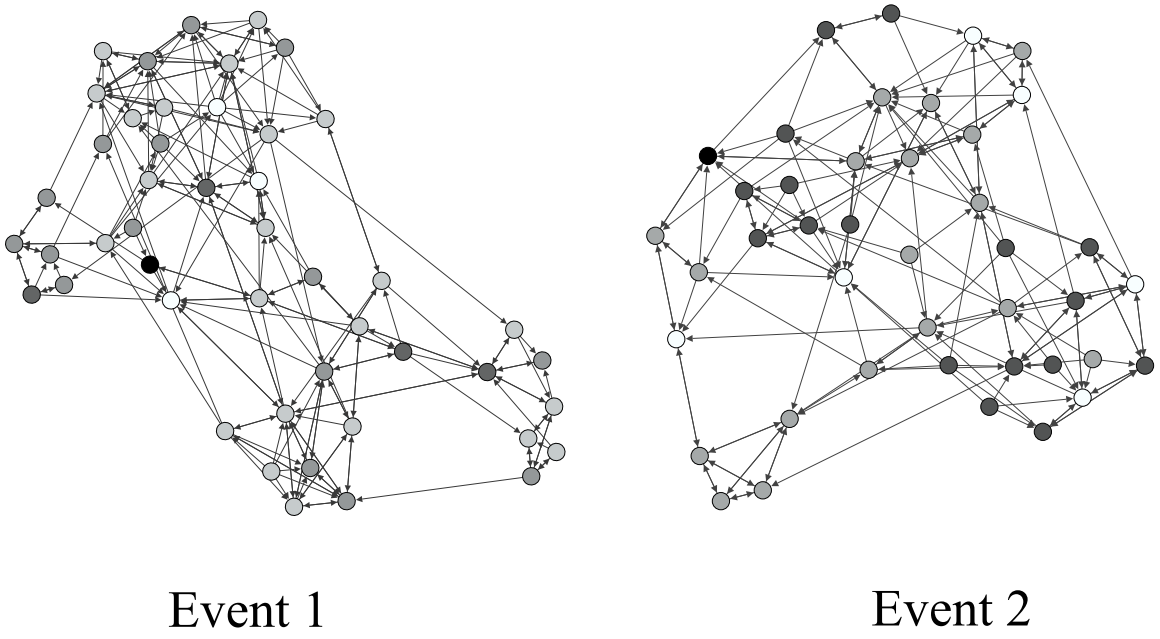

Figure 4. Visualization of social network between participants for each of the two events in Study 2.

Note: Nodes represent individual participants. An arrow from one node to another signals that the first node nominated the second as a friend in our pre-study sociometric survey. Darker nodes signal higher levels of self-reported wine knowledge.

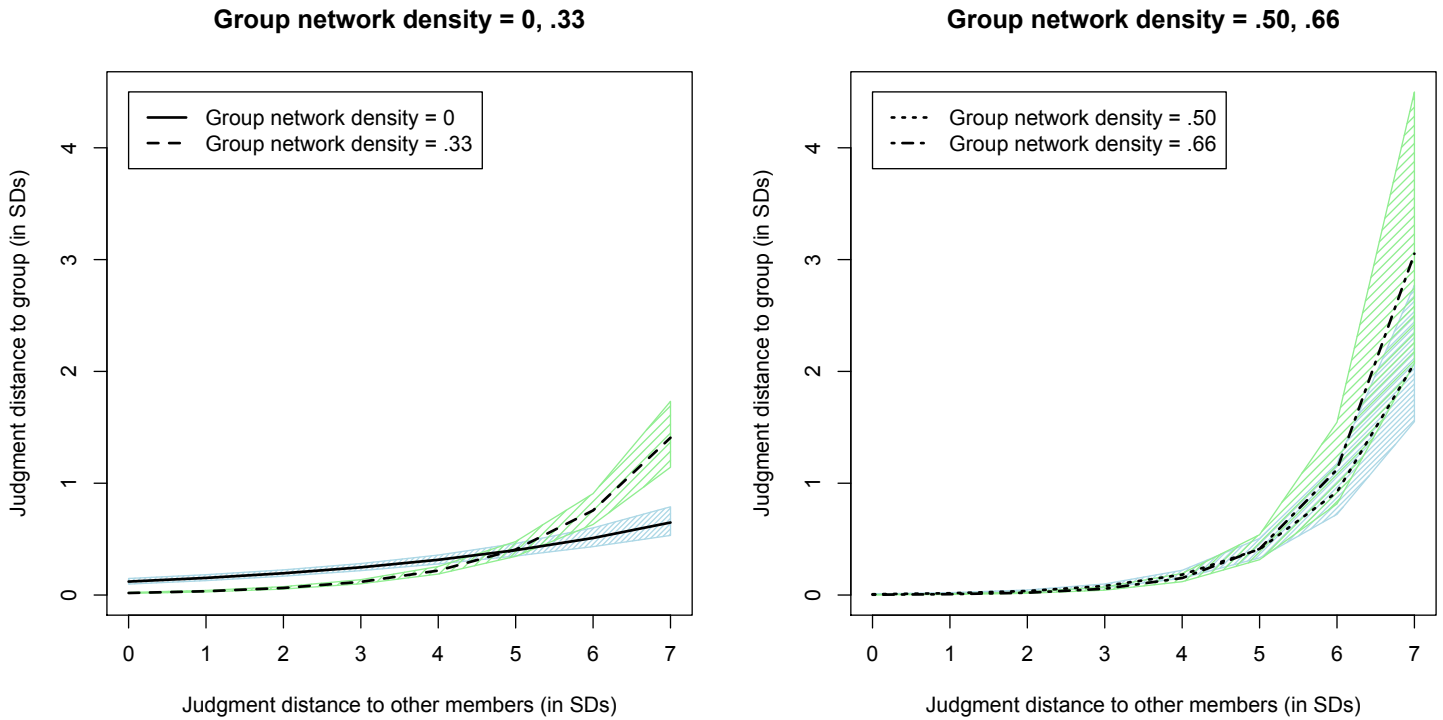

Figure 5. Visualization of interaction effects from Model 2 in Table 4.