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Attributions in Virtual Groups

Distances and Behavioral Variations in Computer-Mediated Discussions

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Communication technology facilitates group interaction among members who collaborate from disparate locations, but dispersion among locations may trigger biased attributions for remote members' behaviors. Despite the frequent discussion of attributions in virtual groups, empirical verification of the relationships between distance and attributions has been lacking. This experiment focuses on several specific factors that affect attribution patterns: (a) how geographic collocation and distribution highlight perceived similarity or dissimilarity of partners' situational constraints, and (b) how perceived variations in the quality of partners' performances affect causal judgments about their behaviors. Procedures employed groups using asynchronous computer conferencing in a decision-making task over a 2-week period. Group members were collocated, distributed, or geographically mixed. Dispositional attributions were greater in collocated groups than in distributed groups. Situational attributions differed as a result of an interaction between collocation/distribution and whether there was greater or lesser variation in the behavioral performances of group members.

Keywords: *virtual groups; attribution; distances*

Groups use computer-mediated communication (CMC) to work across varying degrees of geographic dispersion. Virtual groups can differ in their geographic distribution, in the degree of face-to-face (FtF) contact they employ, or both (Fiol & O'Connor, 2005; Gibson & Gibbs, 2006; Hinds & Bailey, 2003; Hinds & Mortensen, 2005; Mortensen & Hinds, 2001). Characteristics of their communication media and their dispersion affect group members' participation and bias the interpretations and judgments they generate for their own behavior (Walther & Bazarova, 2007). Dispersion and mediation are also likely to affect members' judgments about their partners in complex ways. As Olson and Olson (2000) suggested, differences in local physical context, time zones, culture, and language all have consequences for mutual awareness (i.e., members' understanding of partners' situations and their interpretation of events). Virtual group members often do not have complete information about why their partners do what they do, or fail to do, with respect to group activities, and this disparity has been suggested to affect the attributions participants make for their partners' problematic behavior.

When a virtual group partner fails to contribute effectively, how do partners cope? If a delinquent partner from New York is remote from the rest of the group, do partners in Ohio and California think (a) that he is a slacker or (b) that something must be happening in New York that is not happening elsewhere? If a member from Texas fails to meet a group deadline, will another Texan (a) have a good idea what her colleague's situational impediment was or, (b) since she herself met the deadline, resent her colleague's relative lack of commitment? Existing virtual groups research suggests one set of answers to these questions. New perspectives in attribution theory that can be applied to virtual groups suggest that the opposite set of answers may be more correct.

Research has suggested that attribution theory can explain how the lack of a common location leads virtual group members to bias their judgments about partners toward dispositional, personality-based factors and disregard the situational causes that may truly underlie their performance problems. Cramton (2001, 2002) adapted the fundamental attribution error and actor–observer attribution bias to virtual groups, as it had been established in previous psychological research. This framework was initially applied post hoc as an interpretive explanation of partially distributed student groups' dynamics that appeared in the transcripts and members' reports of conflict episodes (Cramton, 2001).

Indeed, biased attributions can impede effective communication and collaboration in a variety of settings. Their consequences include reduced liking for and trust in partners as well as effects on persuasiveness, reciprocity, and

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conflict strategies and outcomes (for review, see Kelley & Michela, 1980; Manusov, 2002; Sillars, 1980). With specific regard to virtual groups, unwarranted dispositional judgments have been conceptually linked to relational damage and inferior task performance (Walther, Boos, & Jonas, 2002). Mortensen and Hinds (2001) argue that within distributed virtual groups, interpersonal conflict increases when problems are attributed to members' intentional actions as opposed to their situational constraints. According to Cramton (2001), when group members erroneously focus on partners' dispositions as the cause of their behavior, it can distract them from "full diagnosis of problems and modification of practices to prevent reoccurrences" (p. 366). Similarly, holding distant partners responsible for one's own faults, instead of accepting responsibility and recognizing situational impediments of virtual work, was suggested to curb self-learning and improvement in virtual groups (see Walther & Bazarova, 2007).

Attribution has become a frequently cited factor affecting dispersed team dynamics. It is frequently put forth as a key mechanism through which distribution affects intragroup interpersonal interaction. Despite being used to explain a wide range of outcomes in numerous studies, our understanding of this phenomenon is quite limited. There is very little empirical research directly investigating attributions in virtual groups, and none that has deductively tested propositions about the effect of differences in geographic location on attribution patterns.

In addition to a substantial gap in data-based research, there is reason to expect that the fundamental attribution error framework may not provide a valid account of attributions in distributed virtual groups. A number of modifications and empirically based revisions now exist in attribution theory with regard to the actor–observer bias, raising questions for the application of traditional predictions to virtual group settings, as elsewhere. As attribution theory has recognized and incorporated new factors reflecting social interaction processes, new predictions about attributions in groups arise that even suggest, in some cases, a reversal of previous predictions about the conditions under which situational versus dispositional attributions are likely to arise as explanations for remote partners' versus geographically collocated partners' behaviors. One such factor is having multiple targets for comparisons and how comparisons against base-rate behavior affect attributions. Another factor is whether perceivers share a common situation with their attributional target or not. These factors reflect central characteristics of virtual groups, yet they have not been applied in virtual group analyses. For these reasons, this study sought to reexamine the premises and refine the applications of attributions in virtual groups by means of a field experiment involving collocated, distributed, and geographically mixed groups.

Attributions in Virtual Groups

In one of the first applications of attribution theory to virtual group dynamics, Cramton (2001) suggested that members of geographically distributed groups who communicate via electronic media face considerable difficulty in accessing, communicating, and retaining information about remote partners' local contexts. This relative lack of others' situational knowledge, she argued, leads members to overestimate dispositional over situational explanations for remote partners' behavior. According to Cramton, virtual group members in conflict blame their remote partners' personalities for performance issues (e.g., communication and performance deficits), deservedly or not.

The theoretical principle on which this position drew is the fundamental attribution error, which, as Cramton (2002) reflected, derives from a presumed actor–observer bias in people's perceptions of the causes for their own versus another person's behavior. The actor–observer bias suggests that individuals make more situational and fewer dispositional attributions about their own behavior and, in contrast, people make more dispositional and fewer situational attributions about others. The main basis for this asymmetry is that there are differences in the amount of information an individual has in drawing conclusions about oneself versus others: We know more about the external events that affected ourselves than we know about externalities that affected others (especially strangers). As a consequence, there may be less error when we judge our own rather than someone else's behavior (Jones & Nisbett, 1971).

Cramton (2001) connected this information asymmetry to the context of virtual groups by arguing that distance and restricted communication media severely limit the amount of information one has about the causes for the behavior of partners who work in an entirely different location. When one's partners work in different places and institutions, one is less likely to be aware of differences in local holiday schedules, incentive structures, and other aspects of the situation that affect group-related behavior. The situational constraints that exist within each location, and may account for collocated partners, are so tacitly well understood by their inhabitants that they are unlikely to be mentioned to distant partners. These discrepancies may lead to different levels of members' responsiveness and work quality across locations. Rather than excuse these differences to local constraints—of which geographically remote partners are unaware—distributed group members have been predicted to make more dispositional attributions for their partners and relatively fewer situational attributions about them. In contrast, according to Cramton, members of collocated groups, whose situations are geographically and contextually more apparent to one another, render situational attributions for differences in colleagues' group performance.

Although the attribution framework offers a potentially elegant approach to understanding the problems of distributed virtual groups, several factors suggest caution in accepting this explanation as it has been posited so far. First, although Cramton (2001) acknowledged that the tentative application of attribution to geographically distributed groups requires deductive empirical confirmation, there have been no such studies to date. Second, although the framework has been suggested to explain the problems of distributed groups, the original study that inspired the application of attribution theory to conflict in virtual groups employed only partially distributed groups. Recent research indicates that partially and completely distributed groups may occupy distinctive points on a continuum with respect to conflict patterns. Recent work on configural dispersion in virtual groups (i.e., the proportion of members spread out among *n* locations and the resulting number of subgroups in each site) suggests that virtual groups that are distributed to different degrees may experience different kinds of dynamics than completely collocated or completely distributed groups do (O'Leary & Cummings, 2007). Specifically, Polzer, Crisp, Jarvenpaa, and Kim (2006) found that completely distributed virtual groups (six members in six locations) generated significantly less conflict compared with six-member groups dispersed across three locations or two locations. However, the field study that inspired the original application of attribution theory to virtual groups involved partially distributed groups, whereas its propositions regarded completely distributed groups. The inclusion of collocated, distributed, and mixed groups may be required for basic comparisons, at least to assess confounds due to configural dispersion, in addition to testing the original propositions.

Third, studies on virtual groups that considered the fundamental attribution error as a conceptual possibility have produced inconsistent results. One study comparing collocated and distributed groups (Mortensen & Hinds, 2001) did not find greater levels of conflict in distributed than in collocated groups, as predicted by the fundamental attribution error framework. Another study focusing directly on attributions among online dyads (Cramton, Orvis, & Wilson, 2007) showed more dispositional attributions when partners were invisible to one another (i.e., worked in different rooms) than when dyads worked on different computers in the same room, but only when remote/invisible partners were not provided an explicit situationally based explanation about their partners' behavior by the researchers. Although not seeing one's partners may be part of virtual groups, the experimental procedures in that study do not address the gaps in mutual knowledge across locations and institutions that Cramton (2001) previously argued to be the primary cause of members' conflicts and misattributions, e.g., how collocated partners differ from remote partners with respect to holidays and schedules, "work responsibilities, time allocations to a project, and supervisor backing" (Cramton et al., 2007, p. 530). Moreover, its results are inconsistent with previous proposals (Cramton, 2002) that virtual colleagues from the same geographical and institutional home should be immune to dispositional attribution biases. In sum, the fundamental attribution error approach to distributed groups, although stimulating, does not currently stand on abundant empirical footing.

Fourth, the classical actor–observer bias on which that application drew, although well established in psychology for several decades, has been challenged in recent attribution research. Replications of the actor–observer bias have been inconsistent, and a meta-analysis (Malle, 2006) does not support a robust actor–observer bias effect, in particular with regard to the knowledge difference phenomenon (on which the previous application to virtual groups is premised). However, new attribution studies suggest other factors that may interact with distance on attributional judgments. These include effects of perceivers' involvement in social interaction with another person and targets' behavioral deviations from base-rate behaviors (see McGill, 1989, 1991; Robins, Mendelsohn, & Spranca, 1996). Both these factors fit closely to characteristics of collocated versus distributed virtual groups. They have been shown to affect attributions in ways that distinguish interacting partners—as is the case in groups—from perceivers who do not interact with people whose behavior they judge. We now turn to a more detailed review of these factors and, through their application to virtual group variables, derive new predictions about attributional judgments in distributed and collocated virtual groups.

Situational Backgrounds and Variations Across Partners' Behaviors

To review, previous thinking about attributions in distributed virtual groups has been premised on the actor–observer attribution bias framework. This framework assumes that there is a difference in the amount of knowledge one has with which to explain one's own behavior compared with others' behaviors. Greater access to information about the causes of their own actions leads people to explain their own behavior as being due to situational factors, whereas less information about others' behaviors leads to an inference of dispositional causes (Jones & Nisbett, 1971). Applied to virtual groups, members of geographically distributed groups might be expected to make more dispositional and fewer situational attributions about one another than would members of collocated groups. This is due to the disparity that distributed group members experience in contextual knowledge or mutual awareness as a result of their being embedded in different locations.

Although these contentions appear consistent with original thinking about the actor–observer bias, recent re-analyses and new studies in attribution research have challenged some of the core assumptions underlying the actor–observer bias, including the knowledge differences account. A comprehensive meta-analysis (Malle, 2006) of actor–observer studies revealed that actors and observers did not differ on their likelihood of making dispositional or situational attributions across studies, on average. Furthermore, having more knowledge about partners, as in the case of making attributions about intimates versus strangers, has produced an opposite effect from that which the actor–observer bias predicts: Observers made fewer situational attributions for partners whom they knew well than they did for strangers, with no significant differences in dispositional attributions.

Gaining more situational knowledge through visual copresence does not seem to account for attribution differences either. An experiment by Malle, Knobe, and Nelson (2007) resembles virtual collaboration research in its focus on visual access to partners. The researchers asked participants to recall and explain another person's puzzling action, which they either saw (copresence) or merely heard (no copresence). Copresence had no effect on attributions: There were no fewer dispositional and no more situational attributions for another person's action when observers had visual access to the partner than without (cf. Cramton et al., 2007, which included observation of obvious situational influences in the copresence condition). These findings raise questions about the simple effect of distance alone on situational versus dispositional judgments in distributed versus collocated virtual groups. Other factors, however, may interact with distance on judgments.

Traditional attribution research tended to involve a perceiver who did not interact with the target. In contrast, recent research has incorporated several more interaction-based characteristics, which have had significant effects on attribution patterns. One such factor is having multiple targets for comparisons and how comparisons against base-rate behavior affect attributions. This factor reflects a characteristic that is central to groups, as groups in general, and virtual groups, are interactive, social settings that involve several participants.

Social interaction among group members and the involvement of other people in a group are each potent factors that affect attributions, which may be applied to virtual group situations but have not fully been done so before.

By interacting with several people in a group, a perceiver observes multiple sources of behavior. This creates a base-rate against which the behavior of any individual target member can be compared. This situation resembles the multiple-observation case, in which a perceiver has information about the behavior of multiple actors or the same person on multiple occasions (Kelley, 1967). The attribution process in the multiple-observation case is different from the single-observation case, in which a perceiver has information about the behavior of a single person on a single occasion. By evaluating multiple targets instead of one, a perceiver gets consensus information about what is normal behavior across individuals, and causal judgments are based on covariation between causes and behaviors in aggregate. According to the covariation principle, only causes that covary with behaviors will be seen as relevant explanations (Kelley, 1967). In contrast, causes that do not covary with behaviors cannot account for variations in behavior. Thus, when one individual in a similar situation as others acts differently from the others, the situation will not be perceived as having caused the behavior because it does not covary with the individual's behavior.

An illustration of the covariation principle in an interactive setting is Robins et al.'s (1996) actor–observer study, in which participants communicated with three different interaction partners in three successive conversations. Although partners and their behaviors varied across the situation, external factors remained constant across the conversational partners. The findings showed that the factor that varied along with changes in behavior—the partners, not the situation—received more weight in the attributions people made. McGill's (1989, 1991) research on context effects in judgments of causation likewise indicates that individuals make attributions about the causal factors that contrast with a common causal background. Similarly, Malle's (2006) meta-analysis demonstrates that having the base-rate information about the target's behavior being substantially different from the behavior of other people within the same situation leads to more dispositional and fewer situational judgments.

These dynamics may be applied to virtual groups as follows. Although members of virtual teams may share team level goals, a group identity, and workgroup norms, their behaviors and performances may differ from one another, and judgments are aroused. Following Cramton (2001), collocated virtual group members share a relatively similar situational background (e.g., common calendar, local culture, incentives). Departing from Cramton, when the situation holds relatively constant but the behavior of people in the situation varies, the distinctive and explanatory features are traits of individuals rather than the situation. As a result, in collocated groups, behavior differences among members should stimulate dispositional rather than situational attributions.

Whereas collocated members should discount their common situational characteristics, distributed virtual group members, in contrast, lack a single situational baseline (Olson & Olson, 2000), at least one that is due to locations and institutional factors. When remote members' behaviors differ from other group members' behaviors, other members cannot discount the influence of different situational factors that result from different locations' requirements. As a result, nonspecific situational factors comprise viable explanations for behavioral differences in distributed groups. Therefore, situational causes should be given more weight when a perceiver generates attributions for a remote partner. These relatively straightforward predictions differ from previous applications of actor–observer biases in virtual groups.

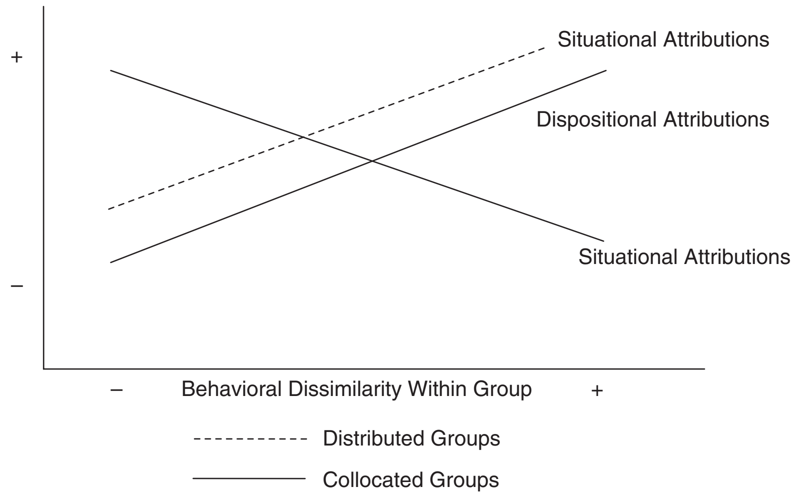
Hypothesis 1: Collocated virtual group members make more dispositional attributions than do members of distributed virtual groups.

Hypothesis 2: Distributed virtual group members make more situational attributions than members of collocated virtual groups.

These general patterns, however, are expected to be stimulated by the degree of similarity or difference among group members' behaviors. In addition to variations in situational backgrounds among collocated and distributed partners, another critical factor for attributional dynamics is a degree of difference among group members' behaviors. When collocated group members behave differently from one another, their behavior cannot be explained by reference to the situation, because the situation is a common factor among them. The more that behaviors vary among members of collocated virtual groups, the more salient is the causal role of collocated partners' dispositions against the backdrop of situational similarity. In contrast, the more that members of a distributed group behave differently, the more that situational factors will be identified as the features that account for members' divergent behavior. On this basis, an interaction effect is predicted in the following hypothesis, which incorporates behavioral differences in addition to differences in situational backgrounds:

Hypothesis 3: The greater the perceived behavioral differences are in collocated virtual groups, (a) the greater the dispositional attributions and (b) the fewer the situational attributions they generate, but the greater the perceived behavioral differences are in distributed virtual groups, (c) the greater the situational attributions they generate.

Figure 1
Predicted Directions of Attributions Due to Distribution and Behavior Differentiation



A graphical abstraction of these predictions appears in Figure 1.

There is no parallel subhypothesis with regard to dispositional attributions in distributed groups. Unlike in collocated groups that have dispositions as distinctive characteristics, both dispositions and situations are distinctive among distributed members. Whereas differences in behavior are expected to raise awareness of situational influences, no inverse effect on dispositional attributions is expected in distributed groups.

Method

Research Participants

Ninety-six individuals were assigned to 24 groups of four members each for decision-making discussions via the Internet. The participants were recruited from six different colleges in North America and were given partial course credit for their participation, along with the chance to win an iPod as an incentive to discern the optimal decision.

One of the strengths of previous research on attributions in distributed groups was that it involved a field study in which group members resided in different geographical locations and attended different universities (Cramton, 2001). These variations gave rise to the differences in local customs, calendars, and institutional incentives that participants experienced as they worked in virtual groups, which were theorized to prompt variations in common knowledge leading to attribution effects. This study attempted to replicate the bona fide nature of that interinstitutional arrangement, and it also created experimental conditions involving more specific contrasts with respect to group composition across locations. Specifically, three types of groups were composed, drawing on participants from six different institutions, randomized across conditions as completely as the baseline participation rates from the respective institutions allowed. In the collocated condition, all of the group members were from the same university. In the fully distributed condition, each of the group members was from a different school. The third condition resembled that seen in previous research, in which locations were geographically mixed, with two of the group members from one school and the remaining two members from two different schools. Of the 22 groups retained for analyses, there were 5 collocated, 8 distributed, and 9 geographically mixed groups.[1]

Due to attrition, some groups contained three or fewer members; one group with two remaining members was excluded from further analyses, as was another group that experienced problems with respect to distribution criteria. The final number was 21 groups of four members and 1 group of three members, of which 85 individuals completed postdiscussion attribution measures. The final sample included participants from introductory communication or public speaking courses at The Ohio State University (n = 30), Cornell University (n = 27), Rensselaer Polytechnic Institute (n = 14), and Merritt Community College (n = 4); from technical writing courses at Texas Tech (n = 8); and from an introductory psychology course at McMaster University in Canada (n = 2). With the exception of the McMaster subsample, efforts to distribute participants from different schools fairly evenly across experimental conditions were successful. Fifty-nine percent of the participants were female; 17% were seniors, 31% were juniors, 30% were sophomores, 20% were freshmen, and 2% were master's students. Participants' ages ranged from 17 to 32 years, with a mean and mode of 20. The sex, age, and year in school characteristics had no significant effects on attributions. Seventy-four percent of the participants were Caucasians, 14% Asians, 3.5% African Americans, 3.5% Hispanics, 1% Europeans, 1% Native Americans, and 3% identified themselves as others or did not indicate ethnicity.[2]

Procedures

Communication medium. All participants communicated via an asynchronous discussion board in the Blackboard Web-based courseware system. Every group had a separate discussion board, which was only accessible to its members. The opening page of the discussion board presented the names and college logos of each member of their group. College logos served as indicators of group members' geographical differences. Each group had 2 weeks to arrive at the decision, during which the group discussion board was available 24 hours a day. Participants were instructed to do all their electronic communication via the group discussion board. Participants reported no interactions outside the system on a self-report question, and close inspection of the transcripts by several research assistants found no indication that outside conversations had taken place. Three days prior to the deadline, groups received a deadline reminder and instructions on how to complete the discussion. Upon completion or the accrual of their deadline, participants were directed to a questionnaire administered via the Internet.

Task. The decision-making task required a consensus ranking of three community development proposals competing for limited funding. To generate a meaningful and involving discussion, each member received information describing positive and negative attributes of each proposal. To increase the generalizability of the group decision task, many of the information items were distributed to some but not all of the members of the same group, following a hidden-profile (see Stasser & Titus, 1985) paradigm in which different people have different information about a problem. Participants were instructed that there was an objectively best decision to be made and that each member did not necessarily have all the information relevant to the decision but that each group as a whole had sufficient information to derive the best solution.

Dependent Variables

Attributional ratings. Following the group discussion, participants completed a number of scales to measure attributional judgments. Attributions were measured via twelve 7-point Likert-type scales. Following Weiner (1983), items reflected several causal factors that might pertain to dispositional characteristics and four types of situational factors, in a manner that did not make dispositional and situational causes mutually exclusive (see also Miller, Smith, & Uleman, 1981). Scales were developed and tested in a pilot study and contained the following items: disposition (e.g., "Person

Table 1
Attributional Ratings

Attribution Type	Item
Dispositional	Person A's role in the discussion was determined by his or her personal nature.
	Person A's behavior was consistent with his or her personality.
	Person A's behavior was determined by his or her disposition.
	Person A's conduct was typical for people with his or her personality.
Situational	
Generic situation	Person A's behavior was mostly shaped by the situation.
	Person A's conduct can be explained by the situation.
Distance	Person A's behavior was largely determined by his or her geographical distance from other partners.
	Person A's behavior was influenced by how physically close the discussion partners were to one another.
Other members	Person A's behavior was determined by the way his or her partners acted.
	Person A's behavior in the group was mainly influenced by other group members.
Computer use	Person A behaved the way he or she did mainly because of having to discuss things over a computer.
	Person A's behavior was largely shaped by the computer-based communication system.

A's role in the discussion was determined by his or her personal nature"), generic situation (e.g., "Person A's behavior was mostly shaped by the situation"), distance (e.g., "Person A's behavior was largely determined by his or her geographical distance from other partners"), other members' influence as situational factors (e.g., "Person A's behavior was determined by the way his or her partners acted"), and computer use (e.g., "Person A behaved the way he or she did mainly because of having to discuss things over a computer"). See Table 1 for all items.

The pilot data were subjected to principal components analysis with Varimax rotation with criteria for primary factor loadings greater than .6, and secondary loadings lower than .4. Analysis extracted the anticipated five factors, and the solution accounted for 76.3% of variance. Reliability for each scale from the subsequent study was assessed using Cronbach's *alpha* with the following results: dispositional attributions, .84; generic situational attributions, .72; distance attributions, .78; attributions to other members' influence, .68; and computer attributions, .90.

Behavioral differences within groups. To derive an index of difference among partners' behaviors, a measure was created with which to assess participants' evaluations of each partner's performance on the group task. From these scores, intermember differences could be calculated, which yielded a coefficient of members' perceived behavioral variation.

Each participant assessed each other member's performance, in a round-robin administration, using bipolar scales ranging from 1 (*very poor*) to 7 (*excellent*). These items included, "Evaluate Person A's contribution to the project," and "Overall, as a group member, Person A was . . ." (interitem *alpha* = .97). A measure of perceived behavioral variation was achieved by calculating standard deviations among each individual's ratings of his or her partners. If an individual rated behavior of all group members uniformly, then he or she perceived no behavioral variation within a group, and the score for perceived behavioral variation would equal 0. In contrast, if a member perceived some partners as good contributors and others as free riders or delinquents, the deviation would be greater. The range of observed deviation scores was from 0 to 3.54, with a median of 1.29. There was no main effect of group distribution condition on perceived behavioral variation, $F(2, 83) = .21$, $p = .81$. To confirm that the perceptual measure of partner evaluation from which the index of members' perceived behavioral variation was derived corresponded with actual behavioral deviations, we examined its correlation with a crude behavioral indicator, members' frequency of participation during the discussion. Perceived partner evaluation correlated with the number of posts partners produced, $r(244) = .29$, $p < .001$, and number of days partners participated, $r(244) = .38$, $p < .001$.

Results

The hypothesis tests employed hierarchical, multilevel analyses of variance to protect for potential effects of nonindependent observations due (a) to multiple ratings from the same participant (each participant rated each group member) and (b) to participants nested within groups (Kenny, 1995, 1996; Malloy & Albright, 2001). They were carried out using the SPSS MIXED procedure, which also simplifies the analysis of interactions among categorical and continuous variables, reflecting the three levels of groups' geographic dispersion and the continuous measure of behavioral differentiation.

Table 2
Means and Standard Errors for Effects of Geographical Distribution on Attributions

	Group Distribution Condition					
	Collocated		Distributed		Mixed	
Attribution	*M*	*SE*	*M*	*SE*	*M*	*SE*
Dispositional	4.87[a]	.17	4.26[b]	.14	4.56	.13
Situational						
Generic situation	4.67	.20	4.50	.17	4.34	.15
Distance	3.43	.28	3.66	.23	3.12	.21
Computer use	4.38	.23	4.36	.19	3.94	.17
Other members	4.28	.20	3.89	.16	4.09	.15

Note: Different superscripts indicate significant difference across rows.

Dispositional Attributions

We hypothesized that collocated group members make more dispositional attributions—as a result of a common situational background—than distributed group members do. This stood in contrast to previous predictions based on actor–observer differences in information accessibility that suggested more dispositional attributions for distributed groups. Analysis tested for differences in dispositional attributions by comparing scores from collocated, distributed, and mixed dispersion groups. Significant differences were obtained, $F(2, 82) = 3.78$, $p = .027$. See Table 2 for means and standard errors. Dispositional attributions in collocated groups were significantly greater than dispositional attributions in distributed groups. Attributions made by members of geographically mixed groups were not significantly different from either collocated ($p = .14$) or distributed groups ($p = .13$). Results supported Hypothesis 1.

Situational Attributions

Hypothesis 2 predicted that distributed group members make situational attributions to account for the behavior of (remote) partners more than collocated group partners do. Analysis focused on the various situational attribution scores and differences among them as a result of whether groups were distributed, collocated, or mixed. No significant effects due to group distribution condition emerged on the four types of situational attributions: for generic situation, $F(2, 82) = .86$, $p = .43$; for the distance situation factor, $F(2, 82) = 1.56$, $p = .22$; for computer use, $F(2, 83) = 1.76$, $p = .18$; and for other members' influence, $F(2, 83) = 1.15$, $p = .32$ (see Table 2). Situational attributions did not differ between collocated and distributed groups. Hypothesis 2 was not supported. However, as further analyses demonstrated, the effect of group distribution type influenced situational attributions as an interaction between distribution and the degree of differences among members' behaviors within a group.

Behavioral Variation and Attributions

Hypothesis 3 predicted an interaction effect based on the extent of behavioral variations within a group and the group's distribution characteristic. The more that group members act differently, different kinds of attributions should arise, but the nature of the attributions should differ depending on what type of virtual group—collocated or distributed—it is. We predicted that behavioral variation generates more dispositional and fewer situational attributions in collocated virtual groups but that behavioral variation generates more situational attributions in distributed virtual groups.

Examining only dispositional attributions first, the interaction of group distribution condition and behavioral variation within the group was not significant, $F(2, 80) = .59$, $p = .56$. Thus, members of collocated groups made more dispositional attributions than members of distributed groups regardless of the degree of behavior differences within their groups. This finding lets stand the results of Hypothesis 1.

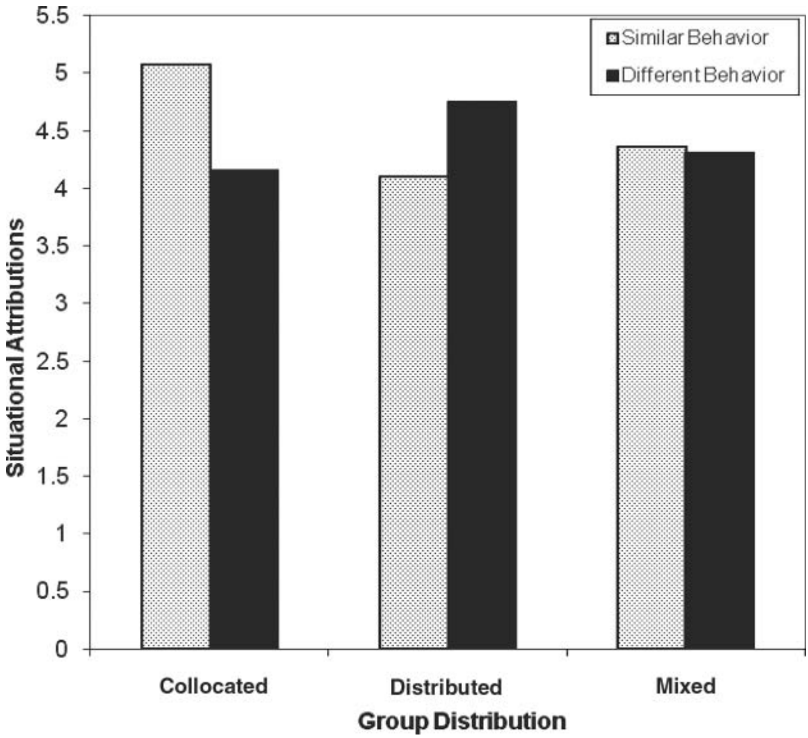
With regard to situational attributions, Hypothesis 3 also predicted that variations in the behavior of group members arouse different effects on situational attributions, depending on whether the group is collocated versus distributed. Analyses were performed on all situational attributions (general situation, channel effects, geography, and other group members) to test the interaction effect of group distribution condition by perceived behavioral variation within a group. The interactions were significant ($p < .10$ when results appeared consistent with directional predictions) on the following: for generic situational factors, $F(2, 68) = 2.47$, $p = .09$; for channel effects, $F(2, 63) = 3.38$, $p = .04$; and for other members' influence as a situational factor, $F(2, 81) = 4.60$, $p = .01$. The interaction of group distribution condition and behavioral variations within the group was not significant for the distance situational factor, $F(2, 78) = 1.18$, $p = .31$.

Specific comparisons were conducted among scores to confirm the directional nature of the interaction effects. To do so, the continuous measure of behavioral variation was subjected to a median split, creating a categorical variable describing small versus large perceived behavioral variations within the group (with means denoted as $M_{\text{different}}$ or as M_{similar}, below). With regard to attributions to generic situational factors, as predicted, distributed group members attributed greater behavioral differences within a group to situational factors more than they did for smaller behavioral differences within a group, $M_{\text{distributed different}} = 4.75$, $SE = .23$, and $M_{\text{distributed similar}} = 4.11$, $SE = .26$. In contrast, collocated group members rendered situational attributions less for greater behavioral differences within a group than for smaller behavioral differences within a group, $M_{\text{collated different}} = 4.16$, $SE = .31$, and $M_{\text{collated similar}} = 5.08$, $SE = .29$. In mixed groups, which had both collocated and remote group members, there was no significant difference based on perceived behavior dis/similarity within a group, $M_{\text{mixed different}} = 4.31$, $SE = .24$, and $M_{\text{mixed similar}} = 4.36$, $SE = .21$ (see Figure 2).

An analogous pattern was obtained for attributions to the computer-mediated channel. Collocated members made fewer channel attributions for greater behavioral differences within a group than they did for smaller behavioral differences within a group, $M_{\text{collocated different}} = 3.87$, $SE = .33$, and $M_{\text{collocated similar}} = 4.79$, $SE = .30$. In contrast, distributed members rendered greater channel attributions when behaviors were perceived as different than when they were perceived as similar within a group, $M_{\text{distributed different}} = 4.79$, $SE = .24$, and $M_{\text{distributed similar}} = 3.77$, $SE = .28$. As before, the scores in mixed groups were not significantly different based on behavioral variations within a group, $M_{\text{mixed different}} = 3.74$, $SE = .26$, and $M_{\text{mixed similar}} = 4.08$, $SE = .22$ (see Figure 3).

The interaction of group distribution condition and perceived behavioral variation within a group also generated significant differences in attributions to other group members (i.e., the extent to which other group members were seen as responsible for a target group member's behavior; see Figure 4). As with other types of situational attributions, when behaviors were more similar within a collocated group, it accentuated shared situational factors. Collocated members made more attributions to their partners' mutual influence when behaviors were perceived as more similar than when they were perceived as more different within a group, $M_{\text{collocated similar}} = 4.82$, $SE = .25$, and $M_{\text{collocated different}} = 3.61$, $SE = .28$. However, no differences for similar versus different behaviors within a group emerged in either distributed or mixed groups, $M_{\text{distributed different}} = 3.95$, $SE = .21$, and $M_{\text{distributed similar}} = 3.83$, $SE = .24$; $M_{\text{mixed different}} = 4.21$, $SE = .22$, and $M_{\text{mixed similar}} = 4.01$, $SE = .18$.

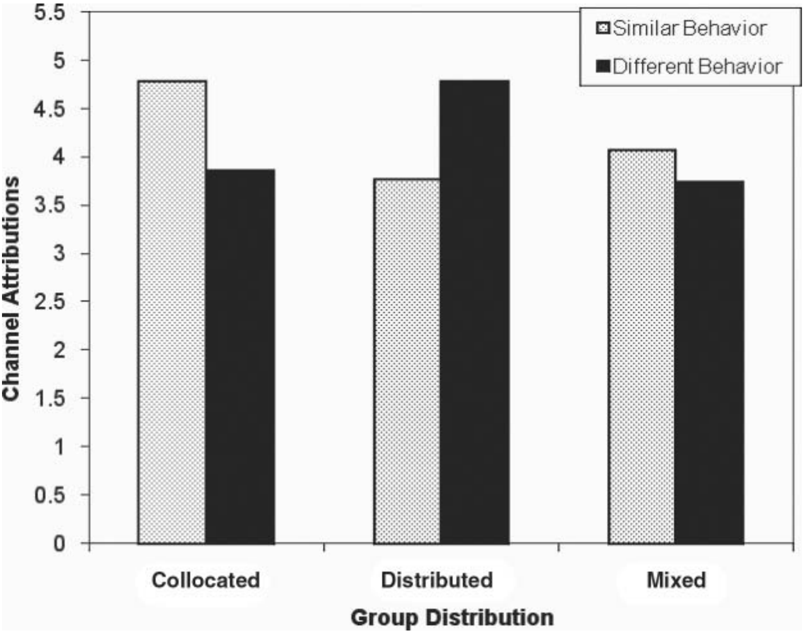
Figure 2
Generic Situational Attributions as a Function of Group Distribution and Perceived Behavioral Variations Within a Group



Discussion

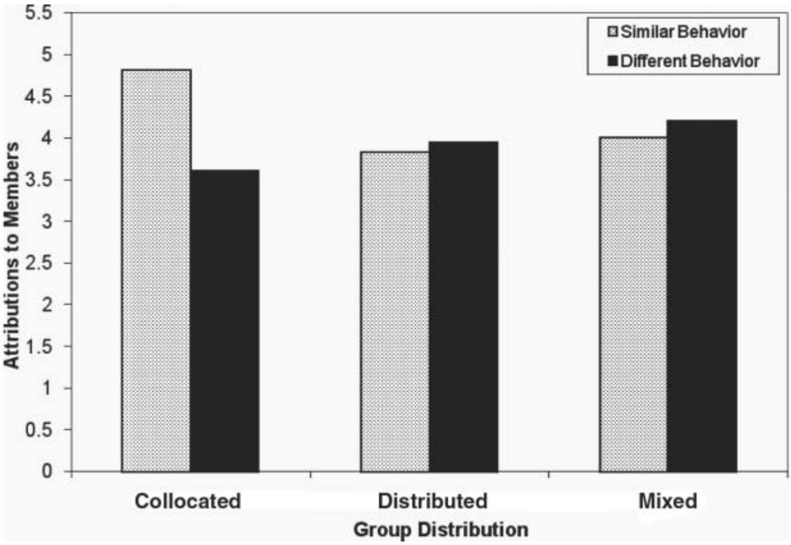
This research examined collocated, geographically mixed, and distributed virtual groups and found several systematic effects on participants' judgments about the causes of their partners' behaviors. In a nutshell, collocated group members blamed each other more, dispositionally, for poor contributions to the groups, whereas distributed group members assumed that differences in remote conditions accounted for behavioral discrepancies, when there was significant variation among partners' group behaviors.

Figure 3
Channel Attributions as a Function of Group Distribution and Perceived Behavioral Variations Within a Group



Dispositional attributions did differ as a function of whether group members shared a similar location and institution. Situational attributions, on the other hand, appear to be triggered due to the product of two factors. First is the tacit perception that there is a greater likelihood for there to be situational variations across different locations than there are among people who share a single location. The second factor is that group interaction provides perceptions of normative, base-rate behavior, against which the behavior of an individual differs to a greater or lesser extent. These factors provide the bases from which individuals generate explanations for their partners' group behavior. Situational attributions differed as a result of an interaction between collocation/distribution and whether there was greater or lesser variation in the behavioral performances of groups' respective members. When collocated members behaved differently, attributions to factors

Figure 4
Attributions to Other Members as a Function of Group Distribution and Perceived Behavioral Variations Within a Group



commonly shared among group members—generic situations, technology, and other partners in a group—decreased. When distributed members behaved differently, they made more attributions to factors that varied between them: generic situational factors and intermediary technology. These results generally support the contention that only distinct factors, and not factors that are commonly shared among group members, become prominent explanations for different behaviors across group members.

This research did not find discernable effects due to dispersion and/or behavior variation among mixed-location virtual groups. With two members together and another two apart, it may be difficult for anyone to achieve a stable perception of who has situational commonality. Moreover, when there is greater behavioral variation in a mixed-distribution group—collocated partners and isolated partners all seem to perform differently—cognizance of a partially shared location within the group confuses matters: The common situational backdrop may make salient a dispositional basis for differences between the collocated partners' behaviors, but situational factors remain salient within the group as well. The ability to discount one causal influence in favor of another is complicated in the mixed setting, and it may be hard for members of such groups to determine whether behavioral variations are prompted by dispositional or situational factors. The nascent research on configural dispersion in virtual groups—how many subgroup members reside among *n* locations—already tells us that different proportions yield different perceptions and processes. Findings indicate that conflict is worse in a virtual group when a geographic subgroup appears to be more homogeneous on certain characteristics (Polzer et al., 2006). If collocated subgroup members are presumably similar to one another, do outsiders discount dispositions as explanations for their performance variations? Or, due to their situational similarity, must dispositions pertain? That members of a collocated subgroup perceive their situation to be similar has been a cornerstone of research on attributions in virtual teams, both in previous work and in this study. The extent to which outsiders in mixed groups see collocated members as situationally similar should have much to do with their attribution decisions and should be the focus of further research.

Unique Contributions and Departures From Previous Findings

The findings about greater dispositional attributions for collocated than distributed groups challenge the application of attribution to virtual groups that has dominated the literature (Cramton, 2001, 2002). There can be several explanations for the different conclusions. Several are methodological, as detailed earlier in this article: no direct test of the previous framework to date, and the use of geographically mixed groups to infer propositions concerning distributed versus collocated groups. Other contrasts are more conceptual. The previous research on attributions in virtual groups relied on traditional actor–observer principles to make predictions, whereas general attribution research has challenged the utility of these principles. Alternatively, this study took into account important factors such as the influence of social interaction and having multiple conversation partners as targets for comparison. Social cognition research indicates that these factors, which seem to have a strong conceptual match with characteristics of virtual groups, have potent influences on attribution processes. Thus, one contribution of this study to virtual group dynamics is that it embeds predictions and explanations about attributions in virtual groups within these social dynamics, as reflected in intermember behavioral variations as well as information disparities across locations. In doing so, empirical results were obtained that reverse the previous conceptual predictions in this domain.

Despite this reversal, we raise again the observation that recent research on configural dispersion of virtual groups suggests that there may be certain conditions within which the previous predictions about cross-site attributions may yet occur: When a virtual group is split among two or three geographical subgroups, with several members at each location, greater conflict occurs than in completely distributed or collocated groups (and especially, according to Polzer et al., 2006, when participants perceive greater homogeneity among the members at another site). Conflict between members of geographic subgroups aptly describes the conditions, and reactions of groups, in Cramton's (2001) study that led to her original formulation. Research replicating the Polzer et al. conditions, using attribution measures, may be especially helpful in detecting the boundary conditions of each theoretical approach.

In addition to its contribution to virtual groups research, this study extends attribution research in general by incorporating interindividual assessments as factors that predict dispositional and situational accounts. Although previous research has examined how explanations for group behavior are distinct from explanations of individual behavior, it has only considered attributions for groups as a whole (e.g., O'Laughlin & Malle, 2002). This research suggests how behavioral explanations made for individuals in a group are different from behavioral explanations made for a single individual: Having multiple targets to observe and compare in a group creates a base-rate against which the behavior of a target person can be judged.

These results should reopen examination of attributions in virtual groups. It is important to know what attribution processes are taking place in virtual groups for those who explore the utility of attributional redirection as a remedy to virtual groups' problems (e.g., Walther & Bazarova, 2007; Walther et al., 2002). There is apparent agreement in the literature that scapegoating of some kind may be a frequent and disruptive aspect of virtual group encounters. What compels virtual group members to blame something external and whether they do so more than other groups are questions that have been overlooked while trying to determine in what directions the blame may go.

At the same time, this research, like that of the past, is based on a limited view of virtual groups and members' familiarity with one another. Both approaches are premised on an assumption that virtual group members do not know each other individually. Without direct observation, members must make attributions not based on known dispositional (or situational) characteristics of specific partners but on the logical comparison among presumed factor(s) in order to derive which one is the most likely and plausible explanation for another's behavior. This basic assumption is precisely what Cramton et al.'s (2007) more recent research reflects: When members can visually see or are told specifically what (situational) influence affects their partners' success or failure, they make the obvious (situational) explanation, and when they cannot, they do not make this explanation. But the virtual groups literature is primarily about people who work together and do not see one another, are presumed not to know each other, and have no obvious explanation for others' performances. They must guess, and because their guesses are susceptible to systematic influences that may be logically true but factually incorrect, the dynamics of attribution theory are potentially informative. Ultimately, however, successful virtual groups garner more than just guesses. An expanded view of virtual groups recognizes that many virtual groups, especially those in which members are interdependent over successive tasks and engage in frequent interaction, develop shared identities at the group level (Mortensen & Hinds, 2001) and/or interpersonal acquaintance and affinity at the interindividual level (Jarvenpaa & Leidner, 1998; Walther, 1997).

Research on attributions in virtual groups has so far looked at how attributions may affect relationships and, therefore, output quality. If this linkage is valid, then successful virtual groups must experience different attribution processes than unsuccessful groups do; what are these like? It is also plausible that the linkage works in reverse: Generating useful output affects member relationships, and relationships affect attributions, a dynamic that ongoing research should address.

Notes

1. The inequality between the number of collocated and distributed groups is partly attributable to the attrition noted below. When one collocated member of a mixed group did not participate, the group was reclassified as a completely distributed group. A larger number of mixed groups was created to examine effects of the ratios of unique or common information items among group isolates on information exchange and decision making (see Stasser & Titus, 1985), the results of which are reported elsewhere (Bazarova, Walther, McLeod, & Shami, 2007). The effects of common/unique information ratios were examined in the hypothesis tests for this study and did not significantly affect attribution results.

2. A separate analysis determined that inclusion or exclusion of ethnic minority member data from the analysis did not incur any changes in observed attribution patterns. The absence of an ethnicity effect is consistent with the results of a meta-analysis of attributions across cultures (Mezulis, Abramson, Hyde, & Hankin, 2004): Whereas ethnicity effects were found among non-Western cultures living outside the United States, within the U.S. samples, there were no significant differences in attribution patterns across diverse ethnic groups.

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