

The Impact of Anonymity on Perceptions of Source Credibility and Influence in Computer-Mediated Group Communication

A Test of Two Competing Hypotheses

Stephen A. Rains

University of Arizona, Tucson

As scholars and practitioners have endeavored to develop computer-based tools that foster effective communication and collaboration in groups, anonymity has played a key role. Anonymity purportedly minimizes status differences, liberates team members from a fear of retribution, and makes members feel more comfortable contributing to discussions. Yet these benefits may be outweighed by the impact of anonymity on receiver perceptions and behavior. Two competing hypotheses, drawn from adaptive structuration theory, were tested in this study to determine the impact of anonymity on receiver perceptions of sources and messages in computer-mediated group communication. The results of the multilevel models offer evidence in support of the discounting hypothesis and suggest that anonymity provided by electronic meeting systems may undermine source credibility and influence.

Keywords: *adaptive structuration theory; anonymity; anonymous communication; computer-mediated communication; credibility; decision making; electronic meeting system; group communication; group support system; social influence*

In the United States alone, an estimated 11 to 25 million meetings take place during a typical work day (Hanke, 1998; Sauer, 2004). Despite the plethora of meetings, however, time spent working in groups is often perceived to be unproductive (Clawson & Bostrom, 1996; Romano & Nunamaker, 2001). Romano and Nunamaker (2001) reported that getting off the subject, lacking a goal, taking too much time, poor preparation, disorganization, and ineffective leadership are some of the most common problems faced during meetings. To aid the efficiency and effectiveness of groupwork, electronic meeting systems were developed in the early 1980s. Electronic meeting systems are a broad class of computer-based technologies that support meeting functions such as decision making, idea generation, and problem solving

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(DeSanctis & Gallupe, 1987; Scott, 1999a). Recent meta-analyses indicate that, when used appropriately, electronic meeting systems can democratize group processes (Rains, 2005), reduce project completion time, increase member satisfaction, and improve group effectiveness (Dennis, Wixom, & Vandenberg, 2001)

Anonymity plays a critical role in most contemporary electronic meeting systems. Pinsonneault and Heppel (1997) referred to anonymity as a “fundamental” concept (p. 89), Postmes and Lea (2000) called it a “key tool” (p. 1252), and McLeod (1997) described anonymity as a “cardinal benefit” (p. 223). Anonymity allegedly mitigates status differences, liberates team members from a fear of retribution, and makes it easier for members to resist group pressure (Flanagin, Tiyaamornwong, O’Connor, & Seibold, 2002; Hayne & Rice, 1997; McLeod, 1997; Nunamaker, Briggs, Mittleman, Vogel, & Balthazard, 1996; Pinsonneault & Heppel, 1997; Postmes & Lea, 2000; Valacich, Jessup, Dennis, & Nunamaker, 1992). These effects are critical for an egalitarian communication environment that promotes effective discussion and decision making.

Implicit in the previous claims is a focus on message senders; that is, the benefits of anonymity primarily extend to those sending a message or enacting a behavior. Despite the benefits for message senders, however, the impact of anonymity on message receivers may undermine effective discussion and decision-making processes. Although message senders may feel more comfortable, receivers may perceive an anonymous source as less competent or credible than they would if he or she were identified. Receivers may feel that, because senders are anonymous, they are not willing to be held accountable for their contributions (Dennis, 1996; El-Shinnawy & Vinze, 1997).

To date, little research has examined receiver perceptions of anonymity in computer-mediated group interaction. Although there is evidence that group members make attributions about the identity of anonymous message senders during computer-mediated meetings (Hayne, Pollard, & Rice, 2003; Hayne & Rice, 1997), little is known about the impact of anonymity on a message receiver’s perceptions of arguments and information. A number of important questions remain to be answered, including: How do receivers perceive anonymous message senders? What factors influence perceptions of anonymous message senders and their arguments? How do the previous issues relate to decision-making processes and outcomes?

The purpose of the reported study was to examine perceptions of anonymous sources in computer-mediated group communication. Drawing from adaptive structuration theory (AST; DeSanctis & Poole, 1994; Poole & DeSanctis, 1990), two competing hypotheses were tested to explain the impact of anonymity on perceptions of sources and messages. The discounting hypothesis posits that anonymity will undermine perceptions of group member contributions and decision outcomes, whereas the benevolence hypothesis predicts that anonymity has a slightly positive impact. Testing these hypotheses in a single study makes it possible to rule out confounding factors due to differences in samples, methods, and even electronic meeting systems, and, thus, investigate more effectively the influence of

anonymity on receiver responses. In the following sections, the role of anonymity in computer-mediated group communication is examined, and the two competing hypotheses are described.

Receiver Responses to Anonymity in Computer-Mediated Group Communication

To date, a few scholars have examined the impact of anonymity on receiver perceptions and reached similar conclusions (Hayne et al., 2003; Hayne & Rice, 1997; Scott, Sage, Timmerman, & Quinn, 1997). Drawing from attribution theory (Heider, 1958), the premise of Hayne and his colleagues' work is that people may make attributions about the source(s) of statements in anonymous computer-mediated meetings; however, these attributions may be inaccurate and, thereby, affect subsequent perceptions and judgments. The length, vividness, and evaluative tone of discussion contributions are three sources of clues about a source's identity. Their results indicated that participants in the anonymity condition did indeed make attributions about the identity of other members' comments and that they were frequently inaccurate. Scott et al. (1997) conducted a longitudinal study and uncovered similar findings. Participants perceived other group members to be significantly less anonymous during the three measurement periods and felt significantly more confident in their attributions. Yet there was no difference in the accuracy of their attributions over time. Although the previous research makes it evident that individuals in groups with anonymity make attributions about the source(s) of comments, the nature and ultimate impact of these attributions on perceptions of sources and messages is unclear. Accordingly, AST (DeSanctis & Poole, 1994; Poole & DeSanctis, 1990) was used as a guiding framework to examine the potential impact of anonymity on receiver perceptions and decision-making outcomes.

AST (DeSanctis & Poole, 1994; Poole & DeSanctis, 1990) was developed to explain how groups use and are affected by new technologies.¹ Within this framework, anonymity is considered a structural feature used to aid group collaboration and decision making. Anonymity is a resource that facilitates what Poole and DeSanctis (1990) referred to as the "spirit" or the intended purpose of electronic meeting systems. Anonymity purportedly creates opportunities for all members to participate in discussions (Scott et al., 1997). However, the appropriation of anonymity by groups is a subject for debate. AST suggests two competing ways in which structures such as anonymity may be appropriated in teams (Scott, Quinn, Timmerman, & Garrett, 1998). Consistent with the spirit or intended function of electronic meeting systems, anonymity may be faithfully appropriated. Anonymity may lead group members to focus on the merits of an individual's contribution—as opposed to his or her status or other social cues—and thus, foster more effective discussions (DeSanctis & Gallupe, 1987; Valacich et al., 1992). Conversely, groups may make ironic appropriations of the structure and violate the intended use and/or spirit of the

tool. Anonymity may lead members to question the quality of contributions and motives of other group members, resulting in negative outcomes for individuals and the group (Dennis, 1996; El-Shinnawy & Vinze, 1997).

In the following section, two competing hypotheses—drawn from the notion of faithful and ironic appropriations—are proposed to explain perceptions of anonymous sources during computer-mediated meetings. Each hypothesis presents a competing orientation toward anonymous communicators and messages. Following that discussion is a consideration of two factors that may influence the appropriation of anonymity.

Competing Hypotheses Concerning Perceptions of Anonymous Sources

The discounting hypothesis. Although there are a plethora of benefits for message senders during anonymous computer-mediated meetings, they may be offset by the negative implications for message receivers. The discounting hypothesis predicts that anonymity undermines the spirit of the meeting system technology and, consequently, leads to ironic uses and outcomes. The inability to identify a source's identity leads receivers to discount the contributions made during anonymous group interaction.

Because group members depend on one another to succeed and most have a history of face-to-face interaction, anonymity may be problematic. Members may desire and expect others in the group to be identifiable. Knowing the identity of a source allows group members to hold him or her accountable (El-Shinnawy & Vinze, 1997). Members can also rely on information, such as the competence of a particular individual, to evaluate the quality of his or her arguments. When the group members are anonymous, the inability to identify a particular individual may lead members to question the individual's expertise and the validity of his or her claims (Dennis, 1996; Dennis, Hilmer, & Taylor, 1998). Dennis (1996), for example, contended that member anonymity makes the information communicated during discussions "suspect because it [is] difficult to verify the source's credibility" (p. 450). As the previous arguments indicate, the inability to assess the credibility of a source and hold the source accountable may lead members to discount his or her contributions.

A fair amount of research is consistent with the discounting hypothesis. In two studies, Dennis and his colleagues (Dennis, 1996; Dennis et al., 1998) reported that teams using an anonymous electronic meeting system rated information contributed during their discussion as significantly less credible than did those teams meeting face-to-face. Credibility in these studies was a message feature, as opposed to a characteristic of a communicator, and focused on perceptions of the accuracy and believability of the information. In addition, there is evidence that members of anonymous groups are less satisfied or feel that their team's decisions are less effective than members of teams meeting face-to-face (Reinig & Mejias, 2003; Valacich, Dennis, & Nunamaker, 1992). Together, these findings provide support for the discounting

hypotheses and suggest that anonymity may hinder group discussion and decision-making processes.

Drawing from the previous arguments, the discounting hypothesis predicts that anonymity may be appropriated ironically by message receivers and, thus, undermine the spirit of the meeting system technology. Anonymity will have a negative impact on receiver perceptions of messages and sources in computer-mediated group interaction. Those in anonymous groups may judge others to be less credible and find arguments less influential than those participating in identified teams. Furthermore, members of computer-mediated groups with anonymity may report less satisfaction and feel that the team's discussion is less effective than those in identified teams.

Hypothesis 1: Individuals participating in an anonymous computer-mediated team meeting will find their group members (a) less credible and (b) less influential than those participating in an identified computer-mediated meeting.

Hypothesis 2: Individuals participating in an anonymous computer-mediated team meeting will (a) be less satisfied and (b) feel that their group is less effective than those participating in an identified computer-mediated meeting.

The benevolence hypothesis. The benevolence hypothesis stems from what is commonly called the "equalization phenomenon" in research involving electronic meeting systems (DeSanctis & Gallupe, 1987; Dubrovsky, Kiesler, & Sethna, 1991; Flanagan et al., 2002; Rains, 2005; Siegel, Dubrovsky, Kiesler, & McGuire, 1986). Anonymity, from this perspective, is faithfully appropriated as a tool for fostering effective discussions and decisions. The benevolence hypothesis predicts that receivers will give anonymous message senders the benefit of the doubt and focus on the merit of the arguments presented—as opposed to the person making the argument. Consequently, anonymity should have a slightly positive impact on member perceptions and group outcomes.

The equalization phenomenon suggests that electronic meeting systems reduce inequalities between group members and create opportunities for participation and influence (DeSanctis & Gallupe, 1987; Dubrovsky et al., 1991; Rains, 2005; Siegel et al., 1986). This leads to a more egalitarian communication environment in which members feel free to express their ideas and opinions. Anonymity is proposed to play an integral role in this process. Anonymity liberates team members from a fear of retribution or evaluation and makes it easier for them to resist group pressure (Connolly, Jessup, & Valacich, 1990; Hayne & Rice, 1997; McLeod, 1997; Nunamaker, Briggs, Mittleman, Vogel, & Balthazard, 1996; Postmes & Lea, 2000; Scott, 1999b).

The benevolence hypothesis suggests that group members will accept anonymity as a means to foster more effective decision-making processes and appropriate the technology faithfully. Group members presumably recognize the merits of anonymity for senders and give those who are anonymous the benefit of the doubt in regard to their motivations and intentions. Individuals, as Valacich et al. (1992) explained,

“judge the worth of contributions based solely on the merit of the contributions, and not the author” (p. 222). Thus, factors that may undermine positive perceptions of the sender, such as his or her rank in the group or the quality of previous interactions, should not be operative and, therefore, cannot have a negative affect on receivers. Through removing concerns about the identity of the message sender and allowing a greater focus on ideas and arguments, the impact of anonymity should also lead to positive perceptions of the decision-making process.

There is some evidence relevant to message receivers that is consistent with the benevolence hypothesis. Team members using anonymous electronic meeting systems have reported significantly less dominance by other members (Lim, Raman, & Wei 1994; Reinig & Mejias, 2003), reduced normative influence (Dennis et al., 1998; Huang & Wei, 2000), and fewer worries about other members’ opinions (Massey & Clapper, 1995) than those in groups meeting face-to-face. Furthermore, a number of scholars have reported equivalent or more positive perceptions of decision satisfaction or quality in anonymous teams using an electronic meeting system (Connolly et al., 1990; Dennis et al., 1997; George, Easton, Nunamaker, & Northcraft, 1990; Mejias et al., 1996; Tan, Raman, & Wei, 1994; Valacich & Schwenk, 1995). Although these studies examine anonymity as a feature of electronic meeting systems and not as a distinct variable, the reduced impact of a team on its individual members and reports of greater satisfaction in groups using an anonymous meeting system does provide some evidence in line with the benevolence hypothesis.

Drawing from the equalization phenomenon, the benevolence hypothesis predicts that group members will engage in faithful appropriation of anonymity. Receivers should focus on senders’ ideas and give senders the benefit of the doubt in regard to their intentions and motivations. As a result, those in groups with anonymity may judge others to be more credible and arguments to be more influential than those participating in identified teams. The impact of anonymity should also extend to perceptions of the decision-making process. Those in anonymous groups should find the discussion to be more effective and be more satisfied with the process and final decision than if the group was identified.

Hypothesis 3: Individuals participating in an anonymous computer-mediated team meeting will find their group members more (a) credible and (b) influential than those participating in an identified computer-mediated meeting.

Hypothesis 4: Individuals participating in an anonymous computer-mediated team meeting will (a) be more satisfied and (b) feel that their group is more effective than those participating in an identified computer-mediated meeting.

Factors Influencing the Appropriation of Anonymity

DeSanctis and Poole (1994) noted that a number of factors may potentially affect the appropriation of structures such as anonymity in computer-mediated meetings

ranging from a member's style of interacting to the degree of knowledge and experience with the structure. Existing literature concerning anonymity in electronic meetings systems and decision making in small groups suggests two factors in particular that may affect the appropriation of anonymity by message receivers: perceptions of the degree to which a source is anonymous and the quality of arguments advocated by group members.

Perceived anonymity. Although an electronic meeting system may strip one's name from one's contributions (and, thus, provide technical anonymity), members may not perceive one another to be completely anonymous (Anonymous, 1998; Hayne & Rice, 1997; Pinsonneault & Heppel, 1997; Valacich et al., 1992). "People," as Hayne and Rice (2003) explained, "are seldom unidentified in every way" (p. 431). One's style of writing, idiosyncratic jargon, the length of contributions, and repeatedly stating a position one has advocated outside the meeting are just some of the cues that may provide information about a member's identity (Hayne et al., 2003). In two studies, Scott and his colleagues (Scott et al., 1998; Scott et al., 1997) reported that increased familiarity among group members and carryover from face-to-face meetings reduced perceptions of member anonymity during computer-mediated meetings. The degree to which receivers actually perceive a source to be anonymous may influence the way in which technical anonymity provided by the electronic meeting system is appropriated.

Perceptions of source anonymity may have a positive or negative impact on receiver responses. Receivers who do not find a source to be anonymous may have a positive response. Receivers may desire to know the identity of the source and, because they feel that they can determine it, be confident in evaluating his or her contribution. On the other hand, a lack of perceived anonymity may also lead to a negative response. Receivers may feel that an anonymous group member is engaging in objectionable behavior—he or she is not willing to take responsibility for his or her contribution. The effect of perceived anonymity may extend to perceptions of the group's effectiveness and satisfaction with the team's decision. The following research questions relate this issue:

Research Question 1: In group meetings with technical anonymity, how does perceived anonymity affect perceptions of (a) communicator credibility and (b) influence?

Research Question 2: In group meetings with technical anonymity, how does perceived anonymity affect perceptions of group (a) effectiveness and (b) satisfaction?

Argument quality. Although the discounting and benevolence hypotheses are concerned with a group member's orientation toward anonymity, it seems likely that the messages advanced during discussions may also influence member perceptions and group outcomes. Previous research involving decision making in groups demonstrates the importance of argument quality (Garlick & Mongeau, 1992, 1993; Gordijn,

De Vries, & De Dreu, 2002; Kerr, 2002; Limon & Boster, 2001). During computer-mediated meetings, reduced social cues (such as vocal and visual cues) may make the content of contributions especially salient. Consequently, the quality of the arguments presented during discussions should affect member perceptions and, ultimately, discussion outcomes.

The impact of argument quality is unclear. With little else to go by, a high-quality argument may serve as evidence that an anonymous source is informed and competent. Yet it also seems possible that lingering doubts about the source's identity may undermine the potential impact of even a strong argument. Although the argument may contain specific facts and credible evidence, receivers may not feel confident about the information because they are unable to determine the source's identity. The influence of argument quality may also extend to perceptions of group outcomes. Group members may feel more or less satisfied with the group's decision-making process and find the outcome to be more or less effective depending on the quality of arguments communicated. Determining the impact of the quality of arguments entailed the following research questions:

Research Question 3: How does quality of argument affect the relationship between anonymity and perceptions of (a) communicator credibility and (b) influence?

Research Question 4: How does quality of argument affect the relationship between anonymity and perceptions of group (a) effectiveness and (b) satisfaction?

Method

Participants

The participants were 82 members of intact project teams from multiple sections of an undergraduate course in small group communication. In the course, students are in semester-long teams and perform a series of assignments. Sixteen groups, comprising 4 to 7 students, were involved. At the time of the experiment, the teams had been working together for between 4 and 14 weeks. All teams were previously trained to use the electronic meeting system and had taken part in a previous meeting using the tool.

Design

The study entailed a 2×2 between-participants design. Anonymity (anonymous/identified) and argument quality (strong/weak) were the independent variables. Table 1 displays the study design and lists the respective sample size for each of the four conditions.

Table 1
Means (and Standard Deviations) for All Dependent Variables
as a Function of the Experimental Conditions

	Identified		Anonymous	
	Weak (<i>n</i> = 18)	Strong (<i>n</i> = 20)	Weak (<i>n</i> = 17)	Strong (<i>n</i> = 19)
Decision shift	.61 (1.50)	.70 (1.17)	.47 (.87)	.32 (.75)
Decision quality	7.47 (2.02)	8.35 (1.52)	8.06 (1.53)	8.19 (1.35)
Process satisfaction	7.17 (2.33)	7.96 (1.65)	7.98 (1.84)	7.66 (1.78)
Decision satisfaction	9.51 (.76)	9.15 (1.26)	9.00 (1.99)	8.16 (2.96)
Competence	7.50 (1.61)	7.45 (2.14)	7.23 (1.37)	6.94 (1.63)
Goodwill	6.59 (1.42)	5.94 (2.44)	6.10 (1.62)	5.22 (1.90)
Trustworthiness	7.10 (1.71)	7.03 (2.16)	6.55 (2.09)	6.11 (1.47)
Persuasiveness	5.30 (2.51)	5.61 (2.96)	5.41 (2.22)	5.38 (2.66)
Impact	4.38 (2.76)	3.86 (2.67)	4.79 (2.14)	4.67 (2.40)
Positive-relevant thoughts	1.27 (1.10)	2.26 (1.48)	1.53 (1.37)	2.00 (1.29)
Positive-irrelevant thoughts	.33 (.62)	.26 (.56)	.47 (.72)	.26 (.56)
Negative-relevant thoughts	1.07 (1.03)	.53 (.77)	.94 (1.14)	.89 (.81)
Negative-irrelevant thoughts	.33 (.49)	.26 (.56)	.12 (.33)	.47 (.90)

Note: Larger scores on each of the measures indicate a greater amount of the variable.

Procedure

Students in the course signed up as teams for a 90-minute time slot in taking part in the study. All meetings took place during the evening and followed the same procedure: When they arrived at the meeting site, they received information concerning the purpose of the experiment and completed informed-consent documents. Teams were informed that the purpose of the meeting was to gain hands-on experience using an electronic meeting system—a tool they would likely encounter on entering the workforce—and test a decision-making activity to be integrated into the course during the following semester. Then, each team took part in a brief training exercise to familiarize the members with the meeting software. Next, the groups received information about the experimental task (explained below) and, subsequently, sent to separate rooms to perform it. Participants had 4 minutes to read the problem they were to address. Each individual made an initial selection of the most appropriate solution. The groups then had 15 minutes to discuss the topic and reach consensus. A voting tool was used to arrive at the group's final decision. When everyone saw the group's solution, each member received a questionnaire containing measures of the dependent variables. Finally, all participants were fully debriefed and thanked for their participation.

Prior to the meeting, teams were randomly assigned to one of the four conditions corresponding to the anonymity and argument quality manipulations.² To manipulate anonymity, participants in the anonymous condition had their legal name concealed and were identified during the experimental task only by a user number (e.g., User 55,

User 30). As such, group members were anonymous, in that they were unspecified (Anonymous, 1998). Although message receivers knew all members of the group (except the confederate), they were unable to link any specific contribution to a particular group member's legal identity in an objectively correct manner. In the identified condition, each participant's first name appeared next to his or her contributions.

To manipulate argument quality, a trained confederate participated in each group in place of one team member. One member of each group was randomly selected and, when the team members went to their separate rooms, asked not to participate. This individual received full extra credit and was fully debriefed. The confederate took the excluded member's place in the study and acted on his or her behalf (i.e., the confederate pretended to be the group member). The confederate had a word-processing document containing the strong and weak arguments (described below). During each meeting, she cut and pasted entries from the appropriate argument directly into the group's discussion at 2-minute intervals. The confederate did not participate in the discussion beyond pasting in the seven entries for the strong or weak argument.

Experimental Task

All groups completed a preference task (McGrath, 1984). The "Manager in a Bind" task, based on a case study by Eckel (1968), was adapted for the current study. The task required participants to make an ethical decision regarding a dilemma created by a dishonest team leader. Although there is no objective, correct solution for the problem, the participants had four possible options to debate and select one for their group.³ This task has been used in previous research involving group decision making (Yellen, Winniford, & Sanford, 1995).

Materials

The weak and strong arguments were constructed for the current study. A set of arguments was developed by the researcher, pretested, and refined. Following Johnson (1991), the strong argument referenced credible sources (in the context of the current study), specific information, and facts; the weak argument contained specious information and referenced less credible sources. The final strong and weak arguments each had seven unique entries totaling 287 words. The following are two sample entries from the strong argument condition:

Actually, in one of the classes I took last semester we read a case study like this. In it some of the employees at a manufacturing firm named Taos found out that their manager was stealing money. They didn't turn him in and they—not him—ended up getting fired. He later blamed the whole thing on them.

We also talked about the Sarbanes-Oxley (sp?) act. It's a federal law passed in 2002 about reporting wrongdoing in organizations and basically requires us to tell management. If we don't tell on the manager we can be held legally responsible.

The following are the two parallel entries from the weak argument condition:

I think I remember hearing about something like this before. Some people at some company found out that someone at their office was stealing. The people didn't turn him in and I think that they—not the thief—might have ended up getting in some sort of trouble. I think the thief might have blamed the whole thing on them.

I think there could be a law or something about this. I think that there might be some kind of rule or law that says we are basically required to tell management. If we don't tell we might be the ones to get in trouble legally.

Dependent Variables

The dependent variables for the current study included communicator credibility, influence, perceived anonymity, group effectiveness, and satisfaction. Unless otherwise noted, all measures were rated on a 10-point scale with the anchors *strongly disagree* and *strongly agree*.

Communicator credibility. McCroskey's (1966; McCroskey & Teven, 1999) measure was used to assess communicator credibility. Source credibility has three dimensions: competence, trustworthiness, and goodwill. Each measure comprised six items rated on a 10-point semantic differential scale.

Influence. The participants completed perceptual, behavioral, and cognitive measures of influence. For perceptual measures, they completed an index developed by Dennis (1996) that focused on whether or not information contributed by the confederate affected their decision. They also rated the persuasiveness of the confederate's arguments on an index created for the current study. They rated the degree to which the message communicated by the confederate was persuasive, influential, convincing, compelling, and unconvincing (this item was reflected).

For the behavioral measure of influence, the amount of shift in each participant's decision resulting from the meeting served as the index. Participants individually ranked the four solutions prior to the group's discussion and then once again at the conclusion of the meeting. The researcher computed the difference between the rankings at the beginning and end of the meeting. This measure indicated whether participants were (or were not) influenced by their team's interaction.

An assisted thought-listing procedure (Hovland, Janis, & Kelley, 1953; Petty, Ostrom, & Brock, 1981) was also included to reveal more clearly how anonymity and argument strength might have affected perceptions of source influence and credibility. Thought listing provided a supplementary means for assessing the cognitive processes underlying participant perceptions. In the questionnaire, participants were presented with the statements the confederate made along with a series of blank

lines. They listed the thoughts they had during the meeting, if any, in response to each of the confederate's seven statements. After listing their thoughts, the participants went back through the list and indicated whether each thought was positive or negative. Finally, they read their thoughts one final time and noted whether each thought was relevant to the confederate's argument or irrelevant.⁴ The researcher created tallies for the combinations of negative-relevant ($M = .84, SD = .94$), negative-irrelevant ($M = .30, SD = .62$), positive-relevant ($M = 1.80, SD = 1.33$), and positive-irrelevant ($M = .33, SD = .61$) thoughts.

Group outcomes. The participants' perceptions of the group's effectiveness and their satisfaction were outcome variables. There was no single correct solution to the task. The participants completed a scale developed by Gouran, Brown, and Henry (1978) assessing the quality of the group's decision. To assess satisfaction, participants completed two measures developed by Reinig (2003) tapping their satisfaction with (a) the team's discussion and (b) the final solution selected by the group.

Perceived anonymity. To reveal their perceptions of the relative anonymity of the confederate, the participants completed a four-item measure developed for the current study on which they indicated the extent to which the confederate was anonymous, unknown, unidentified, and identified (this item was reflected).

Manipulation check(s). Measures were also included to determine the effectiveness of the anonymity and argument quality manipulations. Both were constructed specifically for the current study. To determine whether the anonymity manipulation was effective, the participants indicated their agreement with the statements that other group members' real names were posted during the discussion, were not posted during the discussion, were hidden, and were identified (the first and fourth items were reflected). Argument quality was measured with six items. The participants rated the degree to which the confederate's argument contained specific facts, cited sources, listed concrete information, included detailed information, did not include specific facts, and contained vague information. The final two items were reverse coded.

Data Analysis

Multilevel modeling was used to analyze the data (Kashy & Kenny, 2000; Kenny, Kashy, & Bolger, 1998; Kenny, Mannetti, Pierro, Livi, & Kashy, 2002). Multilevel modeling is a procedure for analyzing data nested in a hierarchical structure—such as individuals nested in teams. This approach makes it possible to account for nonindependence among group members and thus avoid violating the independence assumption in ANOVA and regression analyses.

Results

Preliminary Analyses

The data were initially screened according to the guidelines recommended by Tabachnick and Fidell (2001). Univariate descriptive statistics were inspected for all variables to identify and correct out-of-range values. Outliers were also examined. One outlier was identified for the decision shift measure and was addressed following Tabachnick and Fidell's recommendations. The outlier was reassigned a value of 5, which is approximately one unit greater than the upper-bound limit of the 95% confidence interval for the decision shift measure. Means, standard deviations, and correlations for key variables in the current study appear in Table 2.

Next, a confirmatory factor analysis (CFA) was conducted for each measure in the study using Equations (EQS; Bentler, 1995). The model chi-square test served as a primary indicator of model fit along with the comparative fit index (CFI) and the standardized root mean-square residual (SRMR) as alternate fit indices. The criteria established by Hu and Bentler (1999) were used to evaluate the alternate fit indices ($CFI > .96$ and $SRMR < .10$). The results of the CFAs indicated that all but one of the measures was unidimensional. One item from Reinig's (2003) measure of satisfaction with the decision outcome was problematic. The item, "I am unsatisfied with the group's solution" was removed, and a CFA was conducted on the remaining four items. The chi-square test for the revised measure indicated that it was unidimensional, $\chi^2(1, N = 72) = .69, p = .41$. Thus, the revised four item measure was retained. The estimated reliability coefficients for all measures used in the study were acceptable (see Table 2).

As to manipulation checks for anonymity and argument quality, a one-way ANOVA showed participants as reporting that member names were more concealed in the anonymity condition ($M = 9.39, SD = 1.25$) than in the identified condition ($M = 1.00, SD = 0.00$), $F(1, 72) = 1705.23, p < .01, \eta^2 = .96$. In addition, a one-way ANOVA indicated that participants in the strong argument condition perceived the argument to be more effective ($M = 7.89, SD = 1.70$) than in the weak argument condition ($M = 5.16, SD = 2.26$), $F(1, 60) = 29.43, p < .01, \eta^2 = .33$. The results of the checks, then, indicated that the manipulations were effective.

Tests for the Research Hypotheses and Questions

Multilevel modeling provided a means for formally testing the hypotheses and answering the research questions. In line with the procedure outlined by Kenny, Kashy, and their colleagues (Campbell & Kashy, 2002; Kenny et al., 2002), the PROC MIXED procedure in SAS treated each individual's score as a repeated measure within his or her respective group and compound symmetry was implied (REPEATED/TYPE = CS). As such, the degree of nonindependence among group

Table 2
Reliability Coefficients, Means, Standard Deviations, and
Correlations for Key Measures Included in the Study

Variable	α	M	SD	1	2	3	4	5	6	7	8	9	10
Decision shift		.53	1.10										
Decision quality	.74	8.03	1.62	.00									
Process satisfaction	.88	7.69	1.90	.08	.66**								
Decision satisfaction	.96	8.95	1.96	-.02	.36**	.29*							
Competence	.85	7.28	1.71	.12	.02	.19*	.15						
Goodwill	.84	5.95	1.93	.04	-.01	.25*	.11	.71**					
Trustworthiness	.82	6.70	1.88	-.07	-.06	.11	.09	.72**	.77**				
Persuasiveness	.94	5.43	2.57	-.07	-.16	-.08	.02	.50**	.32**	.50**			
Impact	.90	4.41	2.49	.10	-.16	.03	-.09	.37**	.31*	.37*	.65**		
Perceived anonymity	.98	4.44	3.53	-.13	.08	.17	-.22	-.01	.00	.01	.08	.17	

* $p < .05$. ** $p < .01$.

members was considered equal, and nonindependence was estimated as a correlation as opposed to a variance. Group was specified as the classification variable, and the default restricted likelihood estimation procedure was used. The Satterthwaite approximation was used to calculate the degrees of freedom. Finally, the measure of perceived anonymity was centered on its grand mean to aid interpretation of interaction effects (Aiken & West, 1991; Campbell & Kashy, 2002).

The data analysis proceeded in three steps. In the first step, the main effect for anonymity was examined to address Hypotheses 1 through 4. The factors influencing responses to anonymity were analyzed in the second and third steps to address the four research questions. (Refer to Table 1 for the means and standard deviations for each dependent variable as a function of the experimental conditions.)

Hypotheses 1-4: The benevolence and discounting hypotheses. Hypotheses 1 through 4 made predictions concerning the impact of technical anonymity during computer-mediated group interaction. To address these hypotheses, the anonymity variable (with the identified condition coded as 0 and the anonymous condition coded as 1) was the only factor included in the model. The results of the analyses for each of the dependent variables appear in Table 3. None of the differences between the anonymous and identified conditions for any of the dependent variables was statistically significant at the .05 level of confidence. However, before drawing any conclusions about which of the hypotheses were and were not supported, one must consider the results in light of potential moderating factors addressed in the following paragraphs.

Research Questions 1 and 2: The impact of perceived anonymity. The first research question concerned the effect of perceived anonymity during computer-mediated

Table 3
Summary of Analyses for Anonymity-Required
and Identified Conditions

Predictor	Criterion	<i>b</i>	<i>SE</i>	<i>df</i>	<i>t</i>	<i>p</i>
Anonymity	Decision shift	-.25	.21	10	-1.21	.26
	Decision quality	.19	.44	13.2	.43	.68
	Process satisfaction	.21	.47	14.8	.43	.67
	Decision satisfaction	-.75	.52	14.4	-1.43	.17
	Confederate competence	-.40	.36	13.5	-1.09	.29
	Confederate goodwill	-.60	.53	14.9	-1.13	.28
	Confederate trustworthiness	-.74	.40	14.2	-1.83	.09
	Confederate persuasiveness	.03	.44	12.8	.08	.94
	Confederate impact	.83	.38	7.42	2.16	.07
	Positive-relevant thoughts	-.06	.36	12.5	-.17	.87
	Positive-irrelevant thoughts	.07	.13	13.8	.49	.63
	Negative-relevant thoughts	.17	.25	11.5	.67	.52
	Negative-irrelevant thoughts	.01	.15	13.8	.0	.95

Note: For the anonymity variable, the identified condition was coded as 0 and the anonymity condition as 1. Beta coefficients are unstandardized.

group interaction. In addressing this question, the anonymity variable (with the identified condition coded as 0 and the anonymous condition coded as 1) and the participant's perception of confederate anonymity were entered into the model as criterion variables. The results indicated that, when controlling for perceived anonymity, there were a number of significant differences for the anonymity variable, including: perceptions of the confederate's trustworthiness, $t(13.5) = -2.54$, $p = .01$, goodwill, $t(13.8) = -3.06$, $p = .02$, and persuasiveness, $t(13.5) = -2.13$, $p = .04$, as well as the number of negative-irrelevant thoughts reported by participants, $t(8.09) = 2.85$, $p = .02$.⁵ Furthermore, the difference in the number of negative-relevant thoughts was suggestive, $t(9.86) = 2.13$, $p = .059$. Participants perceived the anonymous confederate to be less trustworthy, less persuasive, and to have less goodwill toward the group than the identified confederate. In addition, those in the anonymous condition reported having more negative-irrelevant thoughts and marginally more negative-relevant thoughts about the confederate's argument than those in the identified condition.

There was also a statistically significant main effect for perceived anonymity. When controlling for the anonymity manipulation, participant perceptions of confederate anonymity were positively related to perceptions of confederate trustworthiness, $t(68.6) = 2.30$, $p = .02$.

The two-way interaction between the anonymity variable and perceived anonymity was also examined. The main effects were included in the model first, and the interaction term was entered in the second step. The results revealed significant interactions

for two of the dependent variables. The interaction between the anonymity manipulation and perceived anonymity was significant for both decision shifts, $t(55.8) = -2.07, p = .04$, and perceptions of confederate competence, $t(61.8) = -2.02, p = .05$. To aid in the interpretation of these interactions, separate coefficients were computed for the anonymous and identified conditions (Hardy, 1993). In the identified condition, perceived anonymity was positively associated with the magnitude of decision shifts ($b = .27$) and perceptions of the confederate's competence ($b = .53$). In contrast, the relationships between perceived anonymity and both decision shifts ($b = -.16$) and confederate competence ($b = -.15$) were negative in the anonymous condition. Table 4 includes a summary of the main effects and two-way interaction for all of the dependent variables.

Research Questions 3 and 4: The impact of argument quality. The third and fourth research questions involved the effect of argument quality. To answer these questions, anonymity (with the identified condition coded as 0 and the anonymous condition coded as 1) and argument quality (with the weak argument coded as 0 and the strong argument coded as 1) were entered into the model along with the interaction term. There were no significant main effects for the argument quality manipulation. In addition, the interaction between the two factors was not significant for any of the dependent measures. Argument quality does not appear to affect the relationships between anonymity and any of the dependent measures. The results of the multilevel models for the interaction term appear in Table 5.

Discussion

The purpose of the current study was to examine the implications of anonymity for message receivers in computer-mediated group communication. Two competing hypotheses concerning the effects of anonymity on perceptions of sources, information, and decision outcomes were tested. In the following sections, the results of the current study are reviewed, implications for practitioners are considered, limitations are identified, and directions for future research are offered.

Discussion of Key Findings

The discounting and benevolence hypotheses. Drawing from AST (DeSanctis & Poole, 1994; Poole & DeSanctis, 1990), the discounting and benevolence hypotheses offer competing predictions about the effect of anonymity on source credibility and influence during decision making in computer-mediated groups. Consistent with a faithful appropriation of anonymity, the benevolence hypothesis predicts that anonymous sources will be more credible and influential than identified sources. The

Table 4
Summary of Anonymity, Perceived Anonymity, and Their Interaction

Predictor	Criterion	<i>b</i>	<i>SE</i>	<i>df</i>	<i>t</i>	<i>p</i>
Anonymity	Decision shift	.18	.54	9.7	.33	.74
	Decision effectiveness	.48	1.16	12.4	.41	.69
	Process satisfaction	-.48	1.23	13.8	-.39	.70
	Decision quality	.93	1.29	13.3	.72	.48
	Confederate competence	-1.55	.88	12.9	-1.76	.10
	Confederate goodwill	-3.06	1.17	13.8	-2.61	.02*
	Confederate trustworthiness	-2.54	.91	13.5	-2.80	.01*
	Confederate persuasiveness	-2.13	.95	13.5	-2.25	.04*
	Confederate impact	-.78	.90	11.4	-.86	.41
	Positive-relevant thoughts	-.93	.92	10.9	-1.01	.33
	Positive-irrelevant thoughts	.15	.35	11.9	.44	.67
	Negative-relevant thoughts	1.20	.56	9.9	2.13	.06
	Negative-irrelevant thoughts	.81	.28	8.1	2.85	.02*
Perceived anonymity	Decision shift	-.02	.07	67.5	-.38	.71
	Decision quality	.05	.09	68.6	.54	.59
	Process satisfaction	.19	.10	69.8	1.79	.08
	Decision satisfaction	-.08	.11	69.5	-.72	.47
	Confederate competence	.10	.09	68.8	1.07	.29
	Confederate goodwill	.16	.10	70	1.57	.12
	Confederate trustworthiness	.23	.10	68.6	2.30	.02*
	Confederate persuasiveness	.15	.14	65.1	1.06	.29
	Confederate impact	.10	.14	63.7	.72	.47
	Positive-relevant thoughts	.11	.08	65.6	1.49	.14
	Positive-irrelevant thoughts	-.03	.03	65.6	-.84	.41
	Negative-relevant thoughts	-.04	.05	65.9	-.71	.48
	Negative-irrelevant thoughts	.01	.03	62.9	.41	.69
Anonymity × Perceived Anonymity	Decision shift	-.43	.21	55.8	-2.07	.04*
	Decision quality	-.05	.34	62.7	-.15	.88
	Process satisfaction	-.30	.40	62.1	-.76	.45
	Decision satisfaction	.24	.41	63.6	.60	.55
	Confederate competence	-.68	.34	61.8	-2.02	.05*
	Confederate goodwill	.37	.37	62	1.00	.32
	Confederate trustworthiness	.08	.36	61.1	.23	.82
	Confederate persuasiveness	-.34	.49	55.6	-.70	.49
	Confederate impact	-.89	.47	55.6	-1.89	.06
	Positive-relevant thoughts	-.46	.29	59.7	-1.60	.11
	Positive-irrelevant thoughts	-.08	.13	57.6	-.66	.51
	Negative-relevant thoughts	.33	.19	57.6	1.75	.09
	Negative-irrelevant thoughts	.09	.11	39.9	.87	.39

Note. For the anonymity variable, the identified condition was coded as 0 and the anonymity condition as 1. Beta coefficients are unstandardized.

* $p < .05$.

Table 5
Summary of Analyses for Anonymity \times Argument Quality Interaction

Predictor	Criterion	<i>b</i>	<i>SE</i>	<i>df</i>	<i>t</i>	<i>p</i>
Anonymity \times Argument Quality	Decision shift	-.22	.47	9.5	-.47	.65
	Decision quality	-.76	.88	11.4	-.86	.41
	Process satisfaction	-1.08	.95	11.8	-1.14	.28
	Decision satisfaction	-.50	1.07	12.6	-.47	.65
	Confederate competence	-.24	.78	11.9	-.31	.77
	Confederate goodwill	-.25	1.05	12.8	-.23	.82
	Confederate trustworthiness	-.37	.84	11.9	-.45	.66
	Confederate persuasiveness	-.47	.94	10.6	-.50	.63
	Confederate impact	.41	.81	6.57	.51	.63
	Positive-relevant thoughts	-.52	.66	12.3	-.79	.45
	Positive-irrelevant thoughts	-.15	.27	10.9	-.57	.58
	Negative-relevant thoughts	.47	.49	9.17	.96	.36
	Negative-irrelevant thoughts	.43	.30	12.9	1.41	.18

Note: For the anonymity variable, the identified condition was coded as 0 and the anonymity condition as 1. For argument quality, the weak argument was coded as 0 and the strong argument was coded as 1. Beta coefficients are unstandardized.

discounting hypothesis, consistent with the notion of ironic appropriation, predicts that anonymous sources will be less credible and influential than identified sources during computer-mediated group interaction. Perceived anonymity and the quality of the source's argument may affect the appropriation of anonymity.

The initial analysis of the anonymous and identified conditions revealed no differences for any of the dependent variables. The source in the anonymous condition was as credible and influential as in the identified condition. Yet, when controlling for participant perceptions of confederate anonymity, a number of significant differences emerged that were consistent with the discounting hypothesis. The anonymous confederate reportedly was less trustworthy, less persuasive, and had less goodwill toward the group. Anonymity also had a systematic impact on participant cognitions. Participants reported a greater number of negative-irrelevant thoughts in the anonymity condition. The two-way interactions offer further support for the discounting hypothesis. In the anonymous condition, perceived anonymity of the confederate was related negatively to decision shifts and perceptions of the confederate's competence. Anonymity, however, did not differentially affect members' satisfaction with either decisions or perceptions of decision quality.⁶

The constellation of significant findings provides a reasonable amount of evidence in support of the discounting hypothesis. In the context of decision making in small groups, sharing one's ideas anonymously (even though anonymity is a required feature of the technology) may seem duplicitous to members. Given that team members know one another and have been working together in the past, sharing ideas

anonymously may appear as if one has something to hide or is unwilling to be accountable for his or her contributions (El-Shinnawy & Vinze, 1997). The anonymous source in the current study was rated as less trustworthy and as having less goodwill toward the team than the identified source. Furthermore, Dennis and his associates (Dennis, 1996; Dennis et al., 1998) contend that the inability to identify a source leads receivers to question the source's expertise. Consistent with this idea, the results of the current study also indicated that, in the anonymous condition, perceived anonymity was negatively associated with perceptions of source competence. Questions about the source's motives and competence, in turn, appear possibly to undermine the anonymous source's ability to influence his or her team members. Participants in the current study rated the anonymous source as less influential and reported a marginally greater number of negative-relevant thoughts about the anonymous source's argument. Moreover, a greater amount of perceived anonymity was associated with reduced decision shifts in the anonymous condition.⁷

Although anonymity allegedly mitigates status differences, removes fears of retribution, and makes it easier to resist group pressure (Flanagin et al., 2002; Hayne & Rice, 1997; McLeod, 1997; Nunamaker et al., 1996; Pinsonneault & Heppel, 1997; Postmes & Lea, 2000; Rains, 2005), its possible negative impact on message receivers may outweigh these benefits. In the current study, the participants discounted the contributions of an anonymous source. Such findings should serve as a caution to scholars studying anonymity in computer-mediated group communication. The plethora of benefits anonymity allegedly affords message senders might be offset by the detrimental impact it has on receiver perceptions and behavior.

Perceived anonymity. Perceived anonymity played an important role in the current study. When perceptions of the confederate's level of anonymity were controlled, a number of significant differences between the identified and technically anonymous conditions emerged. In addition, the two-way interactions between technical and perceived anonymity were informative in suggesting that participants desired source accountability. Those participants in the anonymity condition who perceived the source to be more anonymous responded more negatively to the source in rating the person as less competent and reporting reduced decision shifts. These findings also echo the refrain from previous research that withholding an individual's name during computer-mediated interaction does not ensure that the individual will be perceived to be completely anonymous (Anonymous, 1998; Hayne & Rice, 1997; Pinsonneault & Heppel, 1997; Valacich et al., 1992). Group members rely on alternate information as to provide clues about a source's identity.

Argument quality. Argument quality was a factor that presumably could influence the ways in which anonymity is appropriated in computer-mediated group interaction. However, the interaction between anonymity and argument quality was not

significant for any of the dependent measures. One explanation for these results is the number of claims made in the argument manipulation. In the weak and strong conditions, the argument contained seven distinct posts totaling 287 words. Although the strong argument clearly contained more specific details and evidence than the weak argument, the sheer number of posts in the weak argument condition may have affected receiver perceptions; that is, even though the quality of the content was weak, the number of posts may have functioned as a heuristic and made the argument appear to be better than it actually was. However, it was essential to control the length of the argument and number of posts made by the confederate. An intellectual task with a clear, correct solution might help to overcome this limitation in future studies. This type of task conceivably could make the discrepancy between a weak and strong argument more evident to participants.

Implications for Practitioners

The results of the current study suggest a few key recommendations for implementing and using anonymity in computer-mediated group interaction. Given the number of findings consistent with the discounting hypothesis, practitioners should be wary of simply imposing anonymity on members of intact teams. At the very least, practitioners should discuss the use of anonymity with the team prior to the meeting. Anonymity should be a consensual decision made by the entire team. If the team members support its use, they will be more likely to appropriate anonymity faithfully. If not, receiver perceptions could undermine many of the presumed benefits anonymity affords to communicators in computer-mediated groups. Practitioners should also train members in how to use anonymity effectively. Training should include explaining the intended purpose of anonymity in electronic meeting systems, and the team should complete a practice task anonymously. The purpose of training is to set member expectations about anonymity to ensure that it is faithfully appropriated. A final recommendation is to use anonymity strategically as one component of a larger decision-making process. It is possible, for example, to use anonymity for brainstorming and then conduct a discussion of the brainstormed ideas in which everyone is identified. This process may offer group members the chance to share ideas anonymously, while also being able to hold others accountable during the discussion when all members are identified. As such, it may be possible to capitalize on the benefits of anonymity and avoid the effects associated with the discounting hypothesis.

Limitations

A key limitation that warrants consideration in evaluating the results of the current study involves the nature of the sample. The participants were all undergraduates

and did not have a formal stake in the outcome of the decision-making task. As such, the nature of the sample may raise concerns about the ecological validity of the current study. However, there were efforts to address this matter. First, although the participants were undergraduate students, they were all members of an intact project team that had been working together between 4 and 15 weeks. Furthermore, each team was had four to seven members; these larger teams are better representative of actual work teams and more realistic than the three-person groups commonly found in the literature on this topic. Second, the task completed in the current study was selected because it is especially relevant to students majoring in communication studies and completing a course in small group communication. The task required participants to consider an issue similar to one they may have faced in their project teams. Finally, the participants had previous experience using the electronic meeting systems. They were familiar with the meeting tool and had used it for a team meeting earlier in the semester.

A second limitation of the current study involves the nature of the task. A preference task with no single, correct solution was used to promote discussion among group members. As such, it was impossible to include any objective measures of group performance, beyond participants' perceptions. Although there were no differences in participants' perceptions of the group's decision, objective differences in the group's performance may exist.

A final limitation of the current study stems from the use of a confederate. The confederate was necessary to manipulate the argument quality variable; yet the confederate's arguments may have deviated from what the participants had come to expect in the arguments typically made by other members of their group. It is noteworthy that the arguments were pretested to make them sound as realistic as possible within the constraints of the current study. Furthermore, because the confederate served in the identified and anonymous conditions, it is reasonable to expect that the differences detected in the current study were not spurious ones stemming from the confederate or her arguments, but rather were a result of anonymity.

Directions for Future Research

Drawing from the key findings of the current study, two issues should be explored in future research on anonymity in computer-mediated group interaction. First, given that the findings were largely consistent with the discounting hypothesis and an ironic appropriation of anonymity, it is important to try to determine why people engage in ironic appropriation of anonymity and to develop strategies for fostering faithful appropriation. In addition to the explanations provided earlier, it seems possible that the discounting hypothesis could result from the release of group tension. As group members build up tensions throughout the course or their interactions, an anonymous source may be a safe target at which members may release this tension.

Rather than directly confronting other group members, taking one's aggravation out on an anonymous group member is a relatively safer means to deal with one's frustration. In addition, considering the benefits of anonymity for message senders, identifying strategies to ensure faithful appropriation by receivers would be a useful endeavor. To this end, a first step would be to explore those cues that are most essential for fostering anonymity perceptions. Hayne et al. (2003) discussed a number of such cues, including the length, vividness, and evaluative tone of comments. A second step involves examining the reasons for discounting others' contributions when members are required to be anonymous. Building from these findings, a final step would be to develop message strategies to promote faithful appropriation. One possibility is actively attempting to persuade electronic meeting system users of the merits and intended purpose of anonymity prior to the meeting. By informing group members during training about the utility of anonymity, meeting facilitators might be able to influence users to appropriate the feature faithfully.

Second, despite several reconceptualizations of anonymity as a dynamic phenomenon based on people's perceptions (Anonymous, 1998; Hayne & Rice, 1997; Pinsonneault & Heppel, 1997), a majority of the research concerning the topic focuses on anonymity from the perspective of an individual group member. The impact of anonymity on the perceptions or behavior of a single individual member is examined, without considering the potential influence of the team. Yet the team may play an important role in shaping an individual group member's perceptions of anonymity and his or her commensurate behavior. It seems likely that the actions and perceptions of the team would influence each individual member's response to anonymity. Future research should incorporate approaches such as the actor-partner interdependence model or social relations model (for a review of these approaches, see Bonito, 2002; Kashy & Kenny, 2000; Kenny et al., 2002) to help clarify the dynamic and socially constructed nature of anonymity in computer-mediated group communication.

Conclusion

If the past is any guide, anonymity is likely to play an important role in the continuing development of computer-based tools to support group communication and collaboration. Yet, as the findings from the current study suggest, the consequences of anonymity may not be what the systems designers intend. Although anonymity may make one more comfortable participating in the group's discussion, it may also undermine perceptions of one's contributions. As such, the results of the current study present a challenge and opportunity for scholars and practitioners. Through continued research, it will be possible to develop a better understanding of the social implications of anonymous communication in technology-assisted groups.

Notes

1. Poole and DeSanctis (1990) noted that adaptive structuration theory (AST) is a useful tool to explain the appropriation of new technologies at different levels of analysis. Most relevant to the current study, AST can be used to explain appropriation “as it occurs in the give-and-take of micro-level interaction” (p. 184).

2. An additional level was originally included for the anonymity variable (making the original study a 3×2 design); however, is not reported in this article.

3. The ethical nature of the task made it possible for the confederate to introduce a strong/weak argument and generate discussion. The groups had to consider the merits and limitations of the confederate’s argument without the guide of any objective, external standards. The confederate in the current study advocated for a solution that would not be considered the most ethical. This was done to encourage participants to engage in a debate, instead of simply acquiescing to the confederate’s or other members’ arguments.

4. Although this approach does not tap participant thoughts as they occurred in real time during the meeting, it does help to identify those thoughts that were most salient. In listing the thoughts they recall having, it is presumed that participants are listing those thoughts that were most important in influencing their perceptions of the source’s credibility and influence. In addition, Cacioppo, Harkins, and Petty (1981) noted the participant-as-coder technique produces results highly similar to outside coder ratings, while overcoming problems with low intercoder reliability and rater misinterpretation of participant responses.

5. The decimals in the degrees of freedom are a result of using the Satterthwaite approximation. This approach for computing degrees of freedom in multilevel modeling is recommended by Kenny, Kashy, and their colleagues (Campbell & Kashy, 2002; Kenny et al., 2002).

6. It should be noted that the measures of satisfaction and decision quality were based on participants’ perceptions. As such, it remains possible that anonymity may influence the objective outcomes of group decision-making effectiveness (as it influenced decision shifts). Through influencing perceptions of other members’ arguments, anonymity may affect the objective quality of a team’s decision. This issue is further explored in the section addressing the study’s limitations.

7. It is important to note that the attribution processes detailed are speculative and warrant testing in future research. Key to such an endeavor will be to explore participants’ affective responses to an anonymous source and their perceptions of the source’s motives.

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Stephen A. Rains (PhD, 2005, University of Texas at Austin) is an assistant professor in the Department of Communication at the University of Arizona. This study was derived from the author's doctoral dissertation, which was directed by Craig R. Scott. His research focuses on the use and implications of new communication technologies and social influence. He is particularly interested in issues at the intersection of these two areas.