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Participation Matters: Psychological and Behavioral Consequences of Information Exclusion in Groups

Eric E. Jones
Southern Illinois University Carbondale

Adrienne R. Carter-Sowell
Texas A&M University

Janice R. Kelly
Purdue University

Being out of the loop, or uninformed of information mutually known by others, is a common occurrence with potentially negative consequences. We manipulated whether participants experienced being in or out of the loop during a group problem-solving task. Compared to participants who were in the loop and able to contribute to the task, participants who experienced being out of the loop reported thwarted fundamental needs, decreased mood, reduced competence, and less liking of group members. Additionally, out-of-the-loop group members participated less. Mediation analyses showed that perceived participation accounted for the aforementioned deleterious effects for all dependent measures. Analyses of interaction content demonstrated that out-of-the-loop participants had relatively more positive experiences to the extent that they asked for suggestions and gave opinions and did not need to ask others for information or their opinions. Our results have implications for a variety of group settings and draw attention to even seemingly innocuous forms of everyday ostracism.

Keywords: out of the loop, information sharing, groups, ostracism, exclusion

Imagine entering a meeting room and finding your colleagues conversing about a new policy for which you did not get the memo. Imagine further that later in the day, while having dinner with friends, you hear them discussing unfamiliar news about an acquaintance. How would you feel about being uninformed in these ways and how would these circumstances influence your interactions with your colleagues and friends?

The above examples illustrate how a person may feel "out of the loop" when others discuss information unknown to him or her, such as a new work policy or the latest gossip. Although others may intentionally or maliciously exclude another person from information regarding these topics, sometimes the information exclusion occurs unintentionally, perhaps because of an oversight or circumstances beyond their control (e.g., technology glitch). Episodes of malicious and avoidable information exclusion have been shown to negatively impact out-of-the-loop individuals (Jones & Kelly, 2010). However, even accidental information exclusion may have detrimental effects. As others discuss these topics, an uninformed group member may begin to feel alienated by the group because of an inability to contribute to the discussion. The current research investigated the psychological and behavioral ramifications of an "out-of-the-loop" experience during the discussion of a group problem-solving task. In particular, this research explored these consequences after accidental information exclusion.

Jones, Carter-Sowell, Kelly, and Williams (2009) argued that situations where one is excluded from information, or out of the loop,

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Eric E. Jones, Department of Psychology, Southern Illinois University Carbondale; Adrienne R. Carter-Sowell, Department of Psychology and Africana Studies Program, Texas A&M University; Janice R. Kelly, Department of Psychological Sciences, Purdue University.

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Correspondence concerning this article should be addressed to Eric E. Jones, Department of Psychology, Life Science II, Rm. 281–Mail Code 6502, 1125 Lincoln Drive, Carbondale, IL 62901. E-mail: ericjones@siu.edu

reflect a form of partial ostracism (see Williams, Cheung, & Choi, 2000). Stated formally, an out-of-the-loop individual "perceives being uninformed of information that is mutually known by other group members and that is relevant to social or task activities" (Jones et al., 2009, p. 158). Unlike some forms of ostracism, group members do not completely ignore and exclude an out-of-the-loop individual. Instead, out-of-the-loop individuals generally receive attention from their group members and participate in the activities of the group, but they perceive that they have been excluded from information that their fellow group members all know. The source of exclusion may be a person (e.g., coworker) or circumstances (e.g., spam filter prevents a person from receiving an e-mail message). In fact, out-of-the-loop individuals may be excluded from information (i.e., a new policy, gossip) for any number of reasons, including a devious attempt by others to harm them, an oversight, or a complete accident (e.g., Jones & Kelly, 2010). Lacking information known by others leads to a variety of undesirable effects, including thwarted fundamental needs (belonging, self-esteem, control, meaningful existence), reduced perceived competence, and decreased influence over the group (Jones et al., 2009; Sargis & Larson, 2002).

Research Links Attributions With Responses to Being Out of the Loop

Jones et al. (2009) first demonstrated the deleterious effects of being out of the loop, showing how information exclusion led to negative perceptions about oneself, poorer group dynamics, and thoughts of unfairness. However, in Experiment 2 (Jones et al., 2009), the source of information exclusion varied, and out-of-the-loop participants only experienced thwarted fundamental needs when information was distributed by fellow group members rather than randomly by a computer. Jones and Kelly (2010) replicated these results with a different manipulation of accidental information exclusion (i.e., information exclusion that was both unintentional and unpreventable). When out-of-the-loop individuals assigned responsibility to their group members for their information exclusion, they experienced thwarted fundamental needs because they interpreted their lack of information as a signal of poor group standing. However, when out-of-the-loop participants failed to assign responsibility to their group members, because their group members did not intend the exclusion and could not have prevented it, these participants did not report reduced fulfillment of needs (Figure 1, shaded boxes).

Across Jones et al. (2009) and Jones and Kelly (2010), three experiments consistently demonstrated that out-of-the-loop individuals did not experience reduced fulfillment of needs in situations where fellow group members were believed to lack responsibility for their information exclusion. However, in contrast to these findings, we believed that information exclusion not caused by fellow group members would lead to thwarted needs when it hindered participation in a discussion (Figure 1, white boxes). Wittenbaum, Schulman, and Braz (2010) demonstrated that level of participation in a discussion correlated with need fulfillment for uninformed group members. Moreover, ostracism research has shown a variety of deleterious effects (e.g., thwarted needs) from exclusion when fellow group members impeded participation in group activities (Warburton, Williams, & Cairns, 2006; Williams et al., 2002). Research has even shown deleterious effects of ostracism in situations where exclusion probably should not matter (reviewed in Williams, 2007). For example, participants ostracized during an online ball tossing game experienced thwarted needs even when they were excluded by computer players or told that the behavior of the other players was scripted (Zadro, Williams, & Richardson, 2004). These counterintuitive results show the importance of participating in a group and having shared experiences. Just as fellow group members can impede participation in group activities, being uninformed can affect a group member's ability to participate in a group discussion.

Overview of the Current Research

In the task used by Jones et al. (2009) and Jones and Kelly (2010), out-of-the-loop group members' information exclusion did not prevent them from participating in the task. Being uninformed increased the difficulty of obtaining the correct answer, but it did not affect their ability to complete the task. As a result, being excluded from information by a computer or

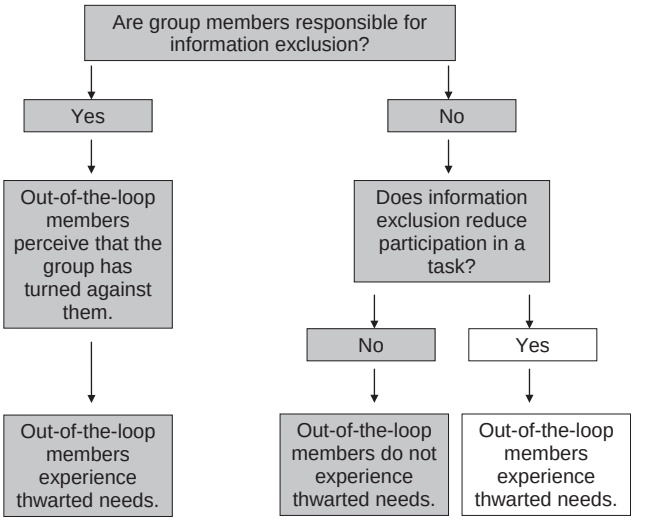

Figure 1. Expected impact of information exclusion on fulfillment of fundamental needs as a function of group member responsibility and task participation. *Note*. Shaded boxes in the flowchart are based on research evidence by Jones et al. (2009) and Jones and Kelly (2010). The current research aimed to provide evidence for the white boxes in the flowchart by showing that reduced participation level from accidental information exclusion accounted for variation in need fulfillment.

accidentally by fellow group members did not lead to reduced fulfillment of fundamental needs. The current research investigated people's experiences of being out of the loop when their information exclusion hindered their ability to participate in a group interaction. To accomplish this objective, we used a task based on the board game *Clue*, which has been used in previous research (Jones et al., 2009; Jones & Kelly, 2010). In this task, a participant's two group members (actually confederates or computer simulators) always receive all information needed to solve an aspect of a crime (e.g., in which room the murder took place). However, naïve participants either receive all the information (in the loop) or none of the information (out of the loop). In the current experiment, we added an extra component to the procedure by having naïve participants discuss the information with their group members. In-the-loop participants possessed the information needed to contribute to the discussion, whereas out-of-the-loop participants did not.

In the context of the *Clue* task, we examined several dependent variables from past out-of-the-loop research. To begin with, we investigated the four fundamental needs. Jones et al. (2009) and Jones and Kelly (2010) showed that information exclusion attributed to fellow group members impacted participants' fulfillment of these needs. As explained, we believed that accidental (i.e., unintentional and unpreventable) information exclusion would reduce fulfillment of fundamental needs when a discussion component was part of the procedure, and lacking information increased the difficulty of participating in the discussion. Consequently, we tested the following hypothesis:

> *Hypothesis 1:* Compared to in-the-loop group members, out-of-the-loop group members will report reduced fulfillment of fundamental needs.

We also investigated the effect of being out of the loop during a discussion on liking for group members, because cohesion is an important group property. Similar to fundamental needs, existing research has shown that liking of group members is only affected when fellow group members are perceived as responsible for information exclusion (Jones et al., 2009; Jones & Kelly, 2010). Nevertheless, even accidental information exclusion may

decrease a person's liking for their group members. When group members know information in common, the process of mutual enhancement occurs and group members evaluate each other more positively (Wittenbaum, Hubbell, & Zuckerman, 1999). Shared information also provides a common ground (Clark & Brennan, 1991), which can facilitate smooth interactions. Out-of-the-loop group members may not benefit from mutual enhancement or a common starting point. As a result, we predicted that out-of-the-loop participants would like their group members less when their information exclusion inhibited their ability to participate in the task.

> *Hypothesis 2:* Compared to in-the-loop group members, out-of-the-loop group members will report less liking of group members.

In addition to the primary objective of establishing that need fulfillment and liking of group members may be affected under conditions of accidental information exclusion, we also examined mood and perceived competence. In past research, out-of-the-loop participants experienced reduced mood and felt less competent regardless of who was responsible for their information exclusion (Jones et al., 2009). We wished to test how robust these effects were by assessing them in the context of a group discussion. Even though out-of-the-loop participants would be learning new information, we made the following prediction:

> *Hypothesis 3:* Compared to in-the-loop group members, out-of-the-loop group members will report reduced feelings of competence.

In regards to mood, research has shown that group interaction often leads to positive feelings and reactions (Hinsz & Nickell, 2004; Hinsz, Park, & Sjomeling, 2004). However, research has also demonstrated that people are especially attuned to even the slightest hint of exclusion (Jones et al., 2009; Spoor & Williams, 2007). Believing that the negative experiences of being out of the loop would outweigh the positive feelings of group interaction, we tested the following hypothesis:

> *Hypothesis 4:* Compared to in-the-loop group members, out-of-the-loop group members will report decreased mood.

Wittenbaum et al. (2010) previously showed lower participation levels by out-of-the-loop group members. They also established a relationship between uninformed group members' involvement and their reported need fulfillment and mood. To the extent that uninformed group members participated less, they reported thwarted needs and reduced mood to a greater degree. Therefore, these predictions were tested:

> *Hypothesis 5a:* Compared to in-the-loop participants, out-of-the-loop participants will actually participate less in the discussion.
>
> *Hypothesis 5b:* Compared to in-the-loop participants, out-of-the-loop participants will perceive participating less in the discussion.

However, we wished to expand on these findings in several ways. First, we tested whether participation differences between in-the-loop and out-of-the-loop participants accounted for differences in psychological experiences (e.g., need fulfillment). Second, in order to strengthen the evidence for participation as the mediating process, we decided to test several mediation models, examining both actual and perceived participation as mediators. Finally, for uninformed group members, we aimed to expand on the relationship between participation and need fulfillment that Wittenbaum et al. (2010) demonstrated by understanding which types of participation were associated with more positive psychological experiences. We used Bales' (1970) Interaction Process Analysis coding scheme to distinguish between different kinds of participation and to explore their connection to out-of-the-loop group members' reported need fulfillment, perceived competence, mood, and liking of group members. These analyses were exploratory in nature, and therefore we did not make specific predictions.

Method

Participants and Design

Sixty-eight undergraduates from a large Midwestern university participated to partially ful-

fill a course requirement. Participants were randomly assigned to complete one of three conditions (control, in-the-loop, out-of-the-loop).

Procedure and Materials

The experimental procedure borrowed from the *Clue* task used by Jones et al. (2009) and Jones and Kelly (2010). Specifically, we started with the unintentional-unpreventable condition from Jones and Kelly (2010). In this condition, participants experienced information exclusion that was not intended by their group members and that could not have been prevented. In past research, being uninformed under these circumstances did not reduce fulfillment of needs for out-of-the-loop group members. Therefore, starting with a paradigm that did not produce deleterious effects for out-of-the-loop group members allowed us to better account for the impact of adding a discussion component to the procedure.

We did, however, make a few adjustments to the procedure, including the use of instant messenger (see discussion of instant messenger below), in order to test our primary research question: would out-of-the-loop participants experience thwarted needs and other deleterious effects when their information exclusion prevented full participation in a discussion? As in previous research, participants ostensibly worked in a three-person group via computer-mediation, participating first in a get-to-know-you session and then in a *Clue* task adapted from the popular board game. Participants' group members were actually simulated by the computer for the get-to-know-you session and by two confederates for the *Clue* task.

Get-to-know-you session. Following the procedure in previous research (Jones et al., 2009; Jones & Kelly, 2010), group members took turns selecting a getting-to-know-you question to pose to the entire group (e.g., "If you won the Superball lottery, what would you do with the money?"). All group members provided answers and then their responses were revealed to the entire group. This activity simply facilitated the sense of being in a group.

Clue task. With their same group members, participants learned that they would be solving part of a murder mystery. Specifically, they would use clues to determine the murder location. Task instructions informed participants that one purpose of the experiment was to compare the performances of interacting and noninteracting groups using computer-mediation. They learned that in the interacting condition, group members would work together and earn a single score based on their group performance; in the noninteracting condition, group members learned that they would work alone but that their individual performance scores would be averaged together to provide a group score. In reality, this cover story provided a justification for why participants worked alone or with their group. We were actually interested in examining the group experiences of in-the-loop and out-of-the-loop group members.

In-the-loop condition. In this condition, participants discovered that their group had been assigned to the interacting condition and that they would work via instant messenger to solve the crime. Similar to Jones et al. (2009) and Jones and Kelly (2010), participants in our study learned that members of their group would receive clues via a random process. On the computer, participants saw four blue boxes labeled "Box A," "Box B," "Box C," and "Box D," each supposedly with a hidden number of clues. Group members chose a box for one group member, and then saw four new boxes and selected a box for their other group member. In this way, group members had no control over how many clues their task partners received, and vice versa. Depending upon the boxes chosen, participants learned that each person could receive no information, half of the information, or all of the information needed to solve the murder location. While participants were choosing boxes, their group members were ostensibly making these decisions as well. In reality, the distribution of clues was rigged. Participants' group members always received all possible information. Likewise, participants in this condition also received all necessary information, causing them to be in the loop.

Following the selection of boxes for group members, the *Clue* task began. A series of changing images simulated a computer program. The *Clue* task appeared to load as participants saw messages such as "waiting for other players" and "please wait." Soon after, a *Clue*-themed image popped up on the screen that showed how much information everyone in their group had received. After 20 seconds, the image changed and provided the following in-

structions: "The murder took place in one of the rooms listed below. You will have a short time to memorize these leads." Participants viewed six room names (billiards room, study, ballroom, lounge, library, kitchen). After viewing this image for 45 seconds, the image changed and displayed the following instructions: "In which room did the murder take place? Use the clues below to eliminate possible rooms. You will have a short time to review these clues." In-the-loop participants received all four clues to eliminate rooms (don't count your steps with a partner, don't rack your brain . . . or the white ball, three courses will not satisfy, not where you might do homework). After 50 seconds, the image automatically changed. Participants saw instant messenger pop up and instructions for inviting their group members to a conference. Two confederates who were logged onto instant messenger in a different room accepted the participant's conference invitation and followed a scripted discussion (see Appendix 1). The order of the scripted lines changed depending upon the contributions of the participant, but the content was consistent across participants. Scripted lines that were redundant with a participant's message were omitted. During the discussion, confederates tried to recall clues and rooms, and they discussed which room each clue eliminated. Pauses between exchanges by confederates allowed all participants an opportunity to contribute to the discussion. By the end of the discussion, the group reached a decision about the correct answer. Following the instant messenger session, group members logged off and completed a questionnaire about their group experience.

Out-of-the-loop condition. Participants in this condition experienced the same procedure as in-the-loop participants, except that they did not receive any information to help solve the task, leaving them out of the loop. Instead of reading the six leads and four clues, they simply saw the words "Access Denied" where each piece of information would have been.

Control condition. The experiences of control participants mirrored those of in-the-loop participants with one major point of departure. Participants in the control condition learned that their group would complete the noninteracting condition. As a result, they did not read anything about instant messenger, nor did they discuss the *Clue* task with their group members via instant messenger. Instead, after viewing the leads and clues, these participants submitted their guess about the murder's location and completed the same questionnaire as the other participants.

Manipulation Checks

Two questions checked the manipulation of information between group members ("I received the same number of clues as my other group members," "I felt 'out of the loop' during the *Clue* game"). Both items used 7-point scales (1 = *strongly disagree*, 7 = *strongly agree*).

Dependent Measures

Unless otherwise noted, all dependent measures used 7-point scales (1 = *strongly disagree*, 7 = *strongly agree*).

Index of needs. Three questions measured the extent to which participants experienced fulfillment of each of four fundamental needs (belonging, self-esteem, control, meaningful existence) during the *Clue* game. These questions were the same as those used by Jones et al. (2009). Consistent with recent research (e.g., Jones et al., 2009; Wesselmann, Bagg, & Williams, 2009), these items were combined into a single index ($\alpha = .93$).[1]

Perceived competence. Three questions ($\alpha = .64$) taken from Jones et al. (2009) measured participants' perceived competence (e.g., "I felt competent") during the *Clue* game.

Mood. Using 5-point scales (1 = *Not at all*, 2 = *A little*, 3 = *Moderately*, 4 = *Quite a lot*, 5 = *Extremely*), participants indicated the extent to which they felt happy and pleased during the *Clue* task. These ratings were combined into a single index ($\alpha = .77$) such that higher numbers indicated more positive feelings.

Liking of group members. Three questions ($\alpha = .85$) used by Jones et al. (2009) gauged how much participants liked their group members (e.g., "I liked my group members").

Participation. Two measures assessed participants' involvement during the *Clue* task. To gauge actual participation, a character count

[1] Separate analyses of the needs consistently showed the same effects.

(with spaces) of participants' instant messages measured the key strokes of their submitted entries. This measure was not relevant to participants in the control condition. As a measure of perceived participation, participants responded to the following question on a 7-point scale: "I felt like I contributed to the group."

Coding of Instant Messenger Chat

Two research assistants who were blind to hypotheses independently coded statements made by participants during the instant messenger chat. Coders received a guide that explained each category in detail and that provided examples. During a training session, this guide was reviewed and coders practiced categorizing sample statements using this coding scheme. After the training session, research assistants categorized each of the participants' statements into one of Bales' (1970) Interaction Process Analysis categories: seems friendly, dramatizes, agrees, gives suggestion, gives opinion, gives information, asks for information, asks for opinion, asks for suggestion, disagrees, shows tension, and seems unfriendly. Coders provided a code for each instant messenger entry made by a participant, although some of the entries were split into smaller statements, because they contained more than one idea. The two research assistants provided reliable ratings ($\kappa = .88$), and they resolved discrepancies through discussion. No statements were coded as "shows tension" or "seems unfriendly."

Results

In order to test our hypotheses, separate one-way ANOVAs were used to investigate the impact of condition on the dependent measures. See Table 1 for correlations between dependent measures and Table 2 for descriptive statistics. The subscripts in Table 2 provide information about the significance of pairwise comparisons using Tukey's honestly significant difference (HSD) test to control for multiple comparisons.

Manipulation Checks

Participants' belief that they received the same number of clues as their group members differed as a function of condition, $F(2, 65) = 101.50$, $p < .001$. Compared to participants completing either the in-the-loop ($M = 6.04$, $SD = 1.58$) or control ($M = 5.77$, $SD = 1.31$) conditions, participants in the out-of-the-loop condition disagreed that they received the same number of clues as their group members ($M = 1.30$, $SD = .76$), $F(1, 65) = 161.91$, $p < .001$ and $F(1, 65) = 140.74$, $p < .001$, respectively. Beliefs of control and in-the-loop participants did not differ significantly, $F(1, 65) = .52$, $p = .47$. Similarly, participants' feelings of being out of the loop differed by condition, $F(2, 65) = 16.36$, $p < .001$. Out-of-the-loop participants reported feeling significantly more "out of the loop" ($M = 4.30$, $SD = 1.99$) than either in-the-loop ($M = 1.48$, $SD = 1.16$) or control participants did ($M = 2.45$, $SD = 1.84$), $F(1, 65) = 31.75$, $p < .001$ and $F(1, 65) = 13.30$, $p < .001$, respectively. These feelings only differed marginally between in-the-loop and control participants, $F(1, 65) = 3.70$, $p = .06$.

Dependent Measures

Index of needs. A main effect for condition occurred, $F(2, 65) = 16.61$, $p < .001$. Compared to in-the-loop ($M = 5.97$, $SD = .98$) and control participants ($M = 5.34$, $SD = .91$),

Table 1
Correlation Matrix of Dependent Measures

Variable	1	2	3	4	5	6
1. Index of Needs	—					
2. Liking of Group Members	.51***	—				
3. Perceived Competence	.80***	.30*	—			
4. Mood	.50***	.41***	.38**	—		
5. Actual Participation	.55***	.13	.42**	.39**	—	
6. Perceived Participation	.78***	.32**	.68***	.44***	.67***	—

Note. $N = 68$, except for correlations with actual participation ($N = 46$).
* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 2
Means for Manipulation Checks and Dependent Measures

	In the Loop	Control	Out of the Loop
Received Same Number of Clues	6.04 (1.58)$_a$	5.77 (1.31)$_a$	1.30 (.76)$_b$
Felt Out of the Loop	1.48 (1.16)$_a$	2.45 (1.84)$_a$	4.30 (1.99)$_b$
Index of Needs	5.97 (.98)$_a$	5.34 (.91)$_a$	4.13 (1.36)$_b$
Perceived Competence	5.61 (1.10)$_a$	5.50 (.92)$_a$	4.32 (1.32)$_b$
Mood	3.33 (.92)$_a$	2.70 (1.07)$_{a,b}$	2.52 (.90)$_b$
Liking of Group Members	5.54 (1.21)$_a$	4.26 (1.16)$_b$	4.46 (1.28)$_b$

Note. $N = 68$. Standard deviations are in parentheses. Means in the same row with different subscripts are significantly different using Tukey's HSD test ($p < .05$).

out-of-the-loop participants ($M = 4.13$, $SD = 1.36$) experienced reduced fulfillment of needs, $F(1, 65) = 32.19$, $p < .001$ and $F(1, 65) = 13.59$, $p < .001$, respectively. Fulfillment of needs marginally differed between in-the-loop and control participants, $F(1, 65) = 3.70$, $p = .06$. It is most important to note that the significant difference between the out-of-the-loop and in-the-loop conditions confirmed Hypothesis 1.

Liking of group members. Participants' reports about how much they liked their group members differed as a function of condition as well, $F(2, 65) = 7.20$, $p < .01$. Compared to participants in the control ($M = 4.26$, $SD = 1.16$) and out-of-the-loop conditions ($M = 4.46$, $SD = 1.28$), in-the-loop participants liked their group members more ($M = 5.54$, $SD = 1.21$), $F(1, 65) = 12.35$, $p < .001$ and $F(1, 65) = 8.89$, $p < .01$, respectively. Liking of group members did not differ significantly between the control and out-of-the-loop conditions, $F(1, 65) = .32$, $p = .57$. Notably, the significant difference between the in-the-loop and out-of-the-loop conditions substantiated Hypothesis 2.

Perceived competence. Perceptions of one's own competence also varied by condition, $F(2, 65) = 9.13$, $p < .001$. Relative to in-the-loop ($M = 5.61$, $SD = 1.10$) and control participants ($M = 5.50$, $SD = .92$), out-of-the-loop participants ($M = 4.32$, $SD = 1.32$) felt less competent, $F(1, 65) = 14.93$, $p < .001$ and $F(1, 65) = 12.24$, $p < .001$, respectively. Perceptions of competence did not differ significantly between the in-the-loop and control conditions, $F(1, 65) = .10$, $p = .75$. Of greatest importance, the significant difference between the in-the-loop and out-of-the-loop conditions supported Hypothesis 3.

Mood. Following suit, participants' mood differed as a function of condition, $F(2, 65) = 4.39$, $p < .05$. Participants who experienced the in-the-loop condition ($M = 3.33$, $SD = .92$) reported feeling more positive feelings than participants who completed the out-of-the-loop condition ($M = 2.52$, $SD = .90$) or control condition ($M = 2.70$, $SD = 1.07$), $F(1, 65) = 8.01$, $p < .01$ and $F(1, 65) = 4.68$, $p < .05$, respectively. Means from the control and out-of-the-loop conditions did not differ significantly, $F(1, 65) = .40$, $p = .53$. As for Hypothesis 4, the significant difference between the in-the-loop and out-of-the-loop conditions validated it.

Participation. Comparing just the two conditions where participants used instant messenger, out-of-the-loop group members ($M = 211.0$, $SD = 176.3$) participated significantly less than in-the-loop participants ($M = 423.4$, $SD = 140.2$), $F(1, 44) = 20.45$, $p < .001$. This difference confirmed Hypothesis 5a. Painting a similar picture, perceived participation differed as a function of condition, $F(2, 65) = 21.55$, $p < .001$. Out-of-the-loop participants ($M = 3.39$, $SD = 1.95$) perceived that they contributed less to the group as compared to in-the-loop ($M = 6.00$, $SD = 1.00$) or control participants ($M = 5.45$, $SD = 1.10$), $F(1, 65) = 38.85$, $p < .001$ and $F(1, 65) = 23.76$, $p < .001$, respectively. Perceived participation did not significantly differ between the control and in-the-loop conditions, $F(1, 65) = 1.66$, $p = .20$. Notably, the significant difference between the in-the-loop and out-of-the-loop conditions supported Hypothesis 5b.

Mediation Analyses

Using the recommendations of Baron and Kenny (1986), we tested whether our measures of actual and perceived participation accounted

for the observed differences between in-the-loop and out-of-the-loop participants on each of our dependent variables. To establish mediation using these recommendations, four relationships should be examined. First, the independent variable should be related to the dependent variable (c path). Second, the independent variable should correlate with the mediator (a path). Third, the mediator should be significantly associated with the dependent variable, even with the independent variable in the model (b path). Finally, when both the independent variable and mediator are included in the model, the relationship between the independent and dependent variables should be nonsignificant (c' path).

Index of needs. With index of needs as the dependent variable and actual participation as the mediator, significant a ($b = 106.2$, $p < .001$), b ($b = .002$, $p < .05$), and c paths ($b = .924$, $p < .001$) occurred. Although the c' path was not reduced to nonsignificance ($b = .674$, $p < .01$), the significance level did decrease. A Sobel (1982) test provided evidence for a significant indirect effect through the mediator of actual participation, $z = 1.96$, $p < .05$. When perceived participation was used as the mediator, analyses yielded significant a ($b = 1.30$, $p < .001$), b ($b = .503$, $p < .001$), and c paths ($b = .924$, $p < .001$). The c' path was nonsignificant ($b = .27$, $p = .14$). The Sobel (1982) test confirmed a significant indirect effect through perceived participation, $z = 4.03$, $p < .001$.

Liking of group members. The above analyses were repeated with liking of group members as the dependent variable. With actual participation as the mediator, analyses produced significant a ($b = 106.2$, $p < .001$) and c paths ($b = .536$, $p < .01$), but not a significant b path ($b = -.001$, $p = .41$). Therefore, not all criteria were met, and the c' path remained significant ($b = .641$, $p < .01$). With perceived participation as the mediator, significant a ($b = 1.30$, $p < .001$), b ($b = .248$, $p < .05$), and c paths ($b = .536$, $p < .01$) occurred. The c' path was also nonsignificant ($b = .213$, $p = .37$). Confirming the mediation, the Sobel (1982) test was significant, $z = 1.99$, $p < .05$.

Perceived competence. With perceived competence inserted as the dependent variable and actual participation as the mediator, analyses revealed significant a ($b = 106.2$, $p < .001$) and c paths ($b = .645$, $p < .001$). However, the b path did not achieve significance ($b = .002$, $p = .17$). As a result, no evidence of mediation was found, and the c' path remained significant ($b = .475$, $p < .05$). With perceived participation as the mediator, the a ($b = 1.30$, $p < .001$), b ($b = .387$, $p < .001$), and c paths ($b = .645$, $p < .001$) achieved significance. Supporting perceived participation as a mediator, the c' path was nonsignificant ($b = .140$, $p = .51$) and the Sobel (1982) test was significant ($z = 3.11$, $p < .01$).

Mood. For mood, analyses with actual participation as the mediator produced significant a ($b = 106.2$, $p < .001$) and c ($b = .402$, $p < .01$) paths. Although c' was nonsignificant ($b = .276$, $p = .09$), the b path was not either ($b = .001$, $p = .17$). Consequently, results did not support actual participation as a mediator. With perceived participation as the mediator, the a ($b = 1.30$, $p < .001$), b ($b = .192$, $p < .05$), and c paths ($b = .402$, $p < .01$) in the mediation analyses achieved significance. The c' path did not reach significance ($b = .151$, $p = .38$) and the Sobel (1982) test was significant ($z = 2.11$, $p < .05$). Therefore, results supported perceived participation as a mediator.

In addition to the reported mediation analyses, we tested other mediation models, but they did not work as well. As reported above, perceived participation fully mediated the effects of condition on needs, mood, perceived competence, and liking of group members. However, needs, perceived competence, mood, and liking of group members did not fully mediate effects of condition on perceived or actual participation.

Instant Messenger Chat

Means and standard deviations for the interaction content from the instant messenger chat are provided in Table 3. As evident in the table, many of the means were small. In fact, for many participants, the frequency for most types of interaction content was zero, especially for out-of-the-loop participants, who did not receive clues to help solve the crime. The skewness in this data violated the statistical assumption of normality. As a result, prior to computing correlations, the data for many of the interaction content categories were dichotomized. With a few exceptions (discussed below), participants received a 0 for an interaction category if they

Table 3
Descriptive Statistics for Interaction Content by Condition

	In the Loop		Out of the Loop	
	$n = 23$		$n = 23$	
Interaction content	*M*	*SD*	*M*	*SD*
Seems Friendly	.39	.58	.65	.83
Dramatizes	.48	.59	.26	.62
Agrees	2.87	1.60	2.57	2.25
Gives Suggestion	3.00	2.47	1.83	1.67
Gives Opinion	2.17	1.53	.74	1.05
Gives Information	5.65	2.79	2.48	2.13
Asks for Information	1.26	1.76	1.17	1.47
Asks for Opinion	.65	.88	.26	.45
Asks for Suggestion	.30	.56	.39	.78
Disagrees	.17	.39	.17	.49

did not make any applicable statements. In contrast, they received a 1 if they made one or more statements relevant to the category. Although MacCallum, Zhang, Preacher, and Rucker (2002) cautioned against the practice of dichotomization, they suggested that it could be an acceptable practice for highly skewed data (i.e., when many participants responded at one of the extremes).

Because in-the-loop group members possessed more knowledge about the task, some of their interaction data exhibited less skewness. For these categories (agrees, gives suggestion, gives opinion, gives information), bivariate correlations were calculated. For the other categories, point-biserial correlations were computed using the dichotomization procedure previously described. For out-of-the-loop group members, all interaction content data displayed high levels of skewness, because zero was a common frequency for the coded behaviors. Therefore, point-biserial correlations were calculated between each type of interaction content and each dependent measure. However, data for one category (gives information) was dichotomized differently than described earlier. Because all out-of-the-loop participants informed their group members that they did not receive any information, all participants gave information at least once. Consequently, when dichotomizing the data, out-of-the-loop participants who gave information once received a 0, whereas participants who contributed information more than once received a 1.

For each dependent measure, significant variation existed in the experiences of both in-the-loop and out-of-the-loop group members. Although out-of-the-loop group members generally participated less than in-the-loop participants, some out-of-the-loop participants did find ways to become involved. To understand which types of interaction were associated with more positive psychological experiences for out-of-the-loop participants, correlations between each type of interaction and each dependent measure were calculated. To examine whether these relationships were unique to out-of-the-loop group members, correlations were computed for in-the-loop group members as well. Correlations are reported in Table 4 (in-the-loop group members) and Table 5 (out-of-the-loop group members). For out-of-the-loop participants, fulfillment of needs, liking of group members, and perceived competence all related to specific behaviors. Higher fulfillment of needs correlated significantly with giving opinions ($r = .45$, $p < .05$), giving information ($r = .47$, $p < .05$), and asking for suggestions ($r = .48$, $p < .05$) and marginally with giving suggestions ($r = .39$, $p = .07$). Liking of group members was negatively associated with asking for opinions ($r = -.48$, $p < .05$) and information ($r = -.42$, $p < .05$). Additionally, higher perceived competence related significantly to asking for suggestions ($r = .49$, $p < .05$) and marginally to giving information ($r = .37$, $p = .08$). For in-the-loop participants, their behavior related less to their responses on dependent measures. Giving suggestions correlated both with need fulfillment ($r = .52$, $p < .05$) and perceived competence ($r = .43$, $p < .05$). Moreover, giving information related to a more positive mood ($r = .54$, $p < .01$).

Discussion

This research illustrates that even accidental information exclusion has deleterious effects for out-of-the-loop group members. Although three previous experiments showed that unintentional-unpreventable information exclusion did not lead to thwarted fundamental needs or less liking of group members (Jones et al., 2009; Jones & Kelly, 2010), this experiment demonstrated that, in an interactional context, unintentional-unpreventable information exclusion results in decreased fulfillment of fundamental

Table 4
Interrelationships Between Dependent Measures and Interaction Content Types for In-the-Loop Participants

Interaction content	Needs	Liking	Competence	Mood	Actual participation	Perceived participation
Seems Friendly[a]	.06	.05	.07	−.01	.43*	.19
Dramatizes[a]	.20	.07	.13	.22	.11	.09
Agrees	.00	−.11	.05	.05	.35	.17
Gives Suggestion	.52*	.23	.43*	.21	.39+	.35
Gives Opinion	−.06	−.27	.18	−.19	.47*	.36+
Gives Information	.29	.11	.26+	.54**	.49*	.42*
Asks for Information[a]	−.11	.08	−.16	.03	−.01	−.27
Asks for Opinion[a]	.31	.07	.10	.27	.53**	.36+
Asks for Suggestion[a]	−.14	−.13	−.15	.00	.19	.10
Disagrees[a]	.00	−.01	.10	−.17	.31	.00

Note. $N = 23$.
[a] Point-biserial correlation (0 = no statements coded in this category, 1 = one or more statements coded in this category).
$^{+}p < .10$. $^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

needs, perceived competence, liking of group members, and mood. Moreover, out-of-the-loop participants perceived participating less in the discussion, and these perceptions accounted for the aforementioned responses. Furthermore, the control condition established the direction of effects. For mood and liking of group members, means did not differ between the control and out-of-the-loop conditions. However, in-the-loop participants did report liking their group members more than control participants, which suggests that discussing common information enhances cohesion. This finding complements past research showing the benefits of possessing information in common with others (Sargis & Larson, 2002; Wittenbaum et al., 1999). Yet, the current research adds to these findings by also demonstrating negative consequences of being unable to discuss commonly known information with fellow group members. Compared to control participants, out-of-the-loop participants felt decreased fulfillment of needs and competence.

The current research extends prior work on being out of the loop (Jones et al., 2009; Jones & Kelly, 2010; Wittenbaum et al., 2010) by

Table 5
Interrelationships Between Dependent Measures and Interaction Content Types for Out-of-the-Loop Participants

Interaction content	Needs	Liking	Competence	Mood	Actual participation	Perceived participation
Seems Friendly[a]	.08	−.19	−.08	.17	.49*	.49*
Dramatizes[a]	.07	.26	.09	.12	.15	.33
Agrees[a]	.18	−.09	.00	−.17	.26	.39+
Gives Suggestion[a]	.39+	.11	.30	−.21	.43*	.38+
Gives Opinion[a]	.45*	.09	.30	.17	.65***	.35+
Gives Information[b]	.47*	.25	.37+	.02	.37+	.18
Asks for Information[a]	.10	−.42*	.03	−.12	.45*	.12
Asks for Opinion[a]	−.09	−.48*	.03	−.07	.52*	.19
Asks for Suggestion[a]	.48*	−.06	.49*	−.07	.71***	.61**
Disagrees[a]	.21	−.01	.04	−.01	.46*	.26

Note. $N = 23$.
[a] Point-biserial correlation (0 = no statements coded in this category, 1 = one or more statements coded in this category). [b] Point-biserial correlation (0 = one statement coded in this category, 1 = two or more statements coded in this category).
$^{+}p < .10$. $^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

providing evidence for another process through which the effects of information exclusion occur. In past research (Jones & Kelly, 2010), when group members perceived that fellow members were responsible for their information exclusion, whether through devious intent or an ability to prevent the exclusion, they experienced the deleterious effects (e.g., thwarted needs) of being out of the loop. In these circumstances, group members interpreted their information exclusion as a signal of falling out of favor with their group. In the same research, when group members believed that fellow members were free from fault, they did not experience negative effects (e.g., thwarted needs) from being out of the loop. Even so, the current research shows that accidental information exclusion negatively affects out-of-the-loop group members to the extent that their lack of information impacts their task participation. It is interesting to note that perceived participation mediated the results for all dependent measures, whereas actual participation did not. Some research has pointed to the importance of perceptions in reactions to exclusion, which might explain these results. For instance, when participants were actually only ostracized by one of two confederates, participants perceived that both people had excluded them and reported thwarted needs at similar levels as participants who were truly ostracized by both confederates (Chernyak & Zayas, 2010). Nevertheless, perceived participation, fulfillment of needs, perceived competence, mood, and liking of group members were assessed using the same methodology (i.e., self-reports), which might have contributed to the more consistent results.

Furthermore, this experiment also adds to the findings of Wittenbaum et al. (2010) regarding the correlations between involvement, need fulfillment, and mood in three ways. First, mediation analyses showed that variations in perceived participation level accounted for the observed differences between in-the-loop and out-of-the-loop group members for all of our dependent measures. In contrast, a mediation analysis demonstrated that actual participation might only partially mediate the effect of being out of the loop on need fulfillment. Second, this study established that in addition to decreased need fulfillment and mood, perceiving less involvement in the group leads to decreased feelings of competence and prevents out-of-the-loop group members from fully bonding with their fellow group members. Finally, analyses of interaction content showed a number of interesting relationships. Giving opinions, supplying information, and asking for suggestions provide ways for out-of-the-loop participants to become involved in the group and experience greater need fulfillment. Out-of-the-loop group members who give suggestions experience somewhat more need fulfillment, and giving suggestions positively relates to their perceived competence. Moreover, the less that out-of-the-loop group members feel compelled to ask their group members for information and their opinions, the more they like them. It is interesting that many of these relationships occurred for out-of-the-loop but not in-the-loop participants, suggesting that many of these associations uniquely hold for out-of-the-loop group members. The implications of these relationships for future research are discussed later.

In addition to expanding on the extant out of-the-loop literature, the current research extends ostracism research that has explored exclusion in other discussion paradigms. Williams et al. (2002) investigated the effects of being included or excluded in a chat room or face-to-face discussion. In the inclusion condition, two confederates asked participants questions and acknowledged their comments. However, in the ostracism condition, two confederates stopped asking questions of participants and ignored participants' inquiries. In other words, the behavior of the confederates varied between the ostracism and inclusion conditions. In contrast, in our research, the script and behavior of the confederates remained constant across the in-the-loop and out-of-the-loop conditions; it was the participants' behavior that changed. These results show that innocuously caused information exclusion leads group members to the periphery of discussions, which has similar effects as being alienated during conversations for devious reasons (e.g., group members purposely ignoring target of ostracism). Put differently, out-of-the-loop group members can experience the same deleterious effects of ostracism even when others do not try to exclude them.

Despite the information gained from these experiments, the current research does possess limitations. First, the participants in our studies were all undergraduate students who completed a relatively artificial task. Although older adults

certainly may feel out of the loop in a variety of situations as well, it will be important to replicate these findings in other situations (e.g., actual social interactions, organizations) in order to maximize the generalizability of this research. Second, although this research included a behavioral measure of participation, it did not track subsequent actions that may have more profound effects. For example, employees who constantly feel unable to contribute to the group may ultimately engage in withdrawal behaviors or leave a company. Moreover, as compared to in-the-loop group members, out-of-the-loop members reported liking their fellow group members less. Reduced cohesion has implications for group and team performance (Carron, Colman, Wheeler, & Stevens, 2002; Craig & Kelly, 1999). In addition, when people try to fortify threatened needs (e.g., belonging), they may respond in either positive or negative ways (e.g., working harder vs. exhibiting aggression; Williams, 2009), which can have profound implications for organizations and groups (e.g., Neuman & Baron, 1998).

Future Directions

The current research can be followed up in many ways, especially in regard to the interaction content results. First, need fulfillment and liking of group members each tended to be associated with different types of interaction content. The origin of these differences should be explored. Asking for opinions and information may negatively relate to liking of group members, because out-of-the-loop group members do not benefit from mutual enhancement processes (Wittenbaum et al., 1999), common ground (Clark & Brennan, 1991), or agreement (Sargis & Larson, 2002). Furthermore, giving information and opinions and asking for suggestions may relate to need fulfillment, because of the functions they serve. According to the model of Wittenbaum et al. (2010), being uninformed leads to decreased fulfillment of needs because of reduced involvement in the group. The aforementioned behaviors are a direct way of contributing more to the group, either by providing discussion material (e.g., giving opinions and information) or by orienting the group in the decision-making process (e.g., asking for suggestions).

Second, the interaction content results suggest ways to counteract the negative effects of being out of the loop. As demonstrated, out-of-the-loop members who help orient the group by asking for suggestions experience greater fulfillment of needs. Consequently, taking a leadership role may help involve out-of-the-loop participants. Furthermore, in-the-loop group members may facilitate group cohesion to the extent that they volunteer information and opinions, thus overriding the need for out-of-the-loop group members to ask for these statements. However, part of the solution may require accounting for personal or situational factors that make the aforementioned behaviors less likely. For example, Wittenbaum et al. (2010) suggested that external factors like time pressure may lessen the efforts of in-the-loop group members to help out-of-the-loop members. Alternatively, out-of-the-loop group members may feel too embarrassed to publicize their lack of knowledge.

Third, to the extent that out-of-the-loop group members engage in particular behaviors in a motivated attempt to fortify threatened needs, future research should examine the impact that these behaviors have on group processes and performance. For instance, out-of-the-loop group members experienced greater fulfillment of needs to the extent that they gave information. Although they did not receive any information to help with the *Clue* task, some participants attempted to help the group by providing outside information. Anecdotally, in response to one of the scripted questions ("what rooms are left?"), some out-of-the-loop participants used their knowledge of the board game to inform their group members that the conservatory and dining room still remained as possibilities. However, this information was incorrect, because these rooms were not included in the *Clue* task. This behavior highlights how out-of-the-loop group members may unknowingly introduce inaccurate information in an attempt to become involved in the group, and ultimately mislead the group toward a suboptimal decision. Moreover, out-of-the-loop group members reported greater fulfillment of needs when they gave more opinions. To the extent that these individuals become opinionated and irritate other group members, dysfunctional group dynamics might ensue.

Conclusions

People may be uninformed during social or task conversations. As demonstrated by this research, being out of the loop can reduce people's fulfillment of needs, perceived competence, mood, and liking of group members, even if the information exclusion occurs accidentally. Uninformed group members are less able to contribute to the group and perceptions of reduced participation account for the deleterious effects experienced by out-of-the-loop group members. Nevertheless, discussion behaviors, such as giving opinions and asking for suggestions, may attenuate these negative experiences for out-of-the-loop group members, because these behaviors increase a sense of involvement in the group. Consequently, in order to promote more solidarity in their groups, group members should be aware of the deleterious outcomes experienced by those who are out of the loop and take steps to involve them in the group task.

References

Bales, R. F. (1970). *Personality and interpersonal behavior*. New York, NY: Holt, Rinehart, and Winston.

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 6,* 1173–1182. doi:10.1037/0022-3514.51.6.1173

Carron, A. V., Colman, M. M., Wheeler, J., & Stevens, D. (2002). Cohesion and performance in sport: A meta analysis. *Journal of Sport and Exercise Psychology, 24,* 168–188.

Chernyak, N., & Zayas, V. (2010). Being excluded by one means being excluded by all: Perceiving exclusion from inclusive others during one-person social exclusion. *Journal of Experimental Social Psychology, 46,* 582–585. doi:10.1016/j.jesp.2010.01.004

Clark, H. H., & Brennan, S. E. (1991). Grounding in communication. In L. Resnick, J. Levine, & S. D. Teasley (Eds.), *Perspectives on socially shared cognition* (pp. 127–149). Washington, DC: American Psychological Association. doi:10.1037/10096-006

Craig, T. Y., & Kelly, J. R. (1999). Group cohesiveness and creative performance. *Group Dynamics: Theory, Research, and Practice, 3,* 243–256. doi:10.1037/1089-2699.3.4.243

Hinsz, V. B., & Nickell, G. S. (2004). Positive reactions to working in groups in a study of group and individual goal decision making. *Group Dynamics: Theory, Research, and Practice, 8,* 253–264. doi:10.1037/1089-2699.8.4.253

Hinsz, V. B., Park, E. S., & Sjomeling, M. (2004, May). *Group interaction sustains positive mood and diminishes negative mood.* Paper presented at the meeting of the Midwestern Psychological Association, Chicago, IL.

Jones, E. E., Carter-Sowell, A. R., Kelly, J. R., & Williams, K. D. (2009). "I'm out of the loop": Ostracism through information exclusion. *Group Processes & Intergroup Relations, 12,* 157–174. doi:10.1177/1368430208101054

Jones, E. E., & Kelly, J. R. (2010)."Why am I out of the loop?: Attributions influence responses to information exclusion." *Personality and Social Psychology Bulletin, 36,* 1186–1201. doi:10.1177/0146167210380406

MacCallum, R. C., Zhang, S., Preacher, K. J., & Rucker, D. D. (2002). On the practice of dichotomization of quantitative variables. *Psychological Methods, 7,* 19–40. doi:10.1037/1082-989X.7.1.19

Neuman, J. H., & Baron, R. A. (1998). Workplace violence and workplace aggression: Evidence concerning specific forms, potential causes, and preferred targets. *Journal of Management, 24,* 391–419. doi:10.1016/S0149-2063(99)80066-X

Sargis, E. G., & Larson, J. R. (2002). Informational centrality and member participation during group decision making. *Group Processes & Intergroup Relations, 5,* 333–347. doi:10.1177/1368430202005004005

Sobel, M. E. (1982). Asymptomatic intervals for indirect effects in structural equations models. In S. Leinhart (Ed.), *Sociological methodology* (pp. 290–312). San Francisco, CA: Jossey-Bass. doi:10.2307/270723

Spoor, J., & Williams, K. D. (2007). The evolution of an ostracism detection system. In J. P. Forgas, M. Haselton, & W. von Hippel (Eds.), *The evolution of the social mind: Evolutionary psychology and social cognition* (pp. 279–292). New York, NY: Psychology Press.

Warburton, W. A., Williams, K. D., & Cairns, D. R. (2006). When ostracism leads to aggression: The moderating effects of control deprivation. *Journal of Experimental Social Psychology, 42,* 213–220. doi:10.1016/j.jesp.2005.03.005

Wesselmann, E. D., Bagg, D., & Williams, K. D. (2009). "I feel your pain": The effects of observing ostracism on the ostracism detection system. *Journal of Experimental Social Psychology, 45,* 1308–1311. doi:10.1016/j.jesp.2009.08.003

Williams, K. D. (2007). Ostracism. *Annual Review of Psychology, 58,* 425–452. doi:10.1146/annurev.psych.58.110405.085641

Williams, K. D. (2009). Ostracism: A temporal need-threat model. In M. Zanna (Ed.), *Advances in experimental social psychology* (pp. 275–314). New York, NY: Elsevier.

Williams, K. D., Cheung, C. K. T., & Choi, W. (2000). Cyberostracism: Effects of being ignored over the Internet. *Journal of Personality and Social Psychology, 79,* 748–762. doi:10.1037/0022-3514.79.5.748

Williams, K. D., Govan, C. L., Croker, V., Tynan, D., Cruickshank, M., & Lam, A. (2002). Investigations into differences between social and cyberostracism. *Group Dynamics: Theory, Research, and Practice, 6,* 65–77. doi:10.1037/1089-2699.6.1.65

Wittenbaum, G. M., Hubbell, A. P., & Zuckerman, C. (1999). Mutual enhancement: Toward an understanding of the collective preference for shared information. *Journal of Personality and Social Psychology, 77,* 967–978. doi:10.1037/0022-3514.77.5.967

Wittenbaum, G. M., Schulman, H. C., & Braz, M. E. (2010). Social ostracism in task groups: The effects of group composition. *Small Group Research, 41,* 330–353. doi:10.1177/1046496410363914

Zadro, L., Williams, K. D., & Richardson, R. (2004). How low can you go? Ostracism by a computer is sufficient to lower self-reported levels of belonging, control, self-esteem, and meaningful existence. *Journal of Experimental Social Psychology, 40,* 560–567. doi:10.1016/j.jesp.2003.11.006

Appendix 1

Instant Messenger Scripted Dialogue

GM1: what clues did you get?
GM2: one that said don't rack your brain or the white ball
GM1: got that one too
GM2: there was a ballroom right? [new message] ball could refer to a dance
GM1: I think that's the billiards room
GM2: good call. I forgot about that room [new message] I have a bad memory
GM1: . . . one was about not counting your steps [new message] this eliminates the ballroom
GM1: the ballroom and the billiards room are gone
GM2: another was three courses is not enough [new message] does that mean courses like classes?
GM2: oh, it's the kitchen [new message] like a three course meal
GM1: I got that clue too . . . the kitchen's out [new message] there was one more . . .
GM2: what rooms are left?
GM1: the lounge . . .
GM2: study
GM2: oh the library
GM1: ok was there another clue?
GM2: oh something about homework
GM1: right like a place for homework
GM2: I think it said not a place to do homework [new message] it's not the study
GM1: but couldn't that mean the library too?
GM2: I agree. probably not the library either [new message] that leaves the lounge
GM1: should we answer with the lounge?
GM2: yeah let's do it . . . Clue rules!

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