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Enactment of one-to-many communication may induce self-focused attention that leads to diminished perspective taking: The case of Facebook

Wen-Bin Chiou* Chun-Chia Lee†

Abstract

Social networking sites (SNSs) provide users with an efficient interface for distributing information, such as photos or wall posts, to many others simultaneously. We demonstrated experimentally that this type of indiscriminate one-to-many (i.e., monologue) communication may induce self-focused attention and thereby impair perspective taking. The present study used multiple paradigms to explore the link between engaging in online one-to-many communication and a decrease in perspective taking. Experiment 1 revealed that Facebookers who published a personal photo to the public or their friends were less likely to adopt another person's visual perspective than were those in the control group. Experiment 2 showed that Facebookers who engaged in indiscriminate one-to-many wall posting were more likely than those in the control group to rely heavily on their own perspectives. A state of self-focus, as measured by greater Stroop interference in naming the color of self-relevant versus neutral words, mediated the detrimental effect of indiscriminate one-to-many communication on cognitive perspective taking. These findings suggest that indiscriminate one-to-many communication on SNSs may promote public self-focus, leading to self-referential processing when making social judgments. Online monologue communication may be more harmful to perspective taking than previously understood.

Keywords: monologue communication, egocentric, perspective taking, social networking sites, the Stroop task.

1 Introduction

In the information age, a system of horizontal communication networks organized around the Internet has introduced radical changes in human communication. For instance, millions of people use social networking sites (SNSs) such as Facebook and Twitter on a daily basis (Manago, Graham, Greenfield, & Salimkhan, 2008). The mechanisms by which SNSs facilitate self-presentation—such as the news feed, photos, and notes on Facebook—provide an easy and efficient method for disseminating personal information to friends or the public. A recent study used a diary-like measure to show that undergraduate students communicated with their friends in a one-to-many style on Facebook (Pempek, Yermolayeva, & Calvert, 2009). However, few studies have investigated the impact of indiscriminate one-to-many communication on self and social judgments. The present study is the first to show that the indiscriminate one-to-many communication that SNSs promote may increase self-focus and impair perspective taking.

Internet-mediated communication tools allow users to post information and communicate with others in an innovative manner (Boyd & Ellison, 2008). A one-to-many communication pattern is exhibited when users share information about their lives and social activities or photographs. This indiscriminate one-to-many communication is quite different from sending private messages in one-to-one communication (Pempek et al., 2009). For example, Facebook is a one-to-many communication platform where the information posted reaches many viewers simultaneously. In a preliminary investigation of the prevalence of one-to-many communication on SNSs, we found that 92.8% of 125 undergraduate Facebookers reported their most frequent method of content distribution was sharing information with the public (29.6%), all their friends (52.8%), or a particular group (10.4%; e.g., family, close friends, or acquaintances) compared with 7.2% who frequently shared information with a specific individual. Moreover, online social networking provides a platform for self-presentation that reaches large audiences (Mehdizadeh, 2010). This one-to-many style shows that the focus of communication is the self and not the many others. A state of self-focus (i.e., self-focused attention) refers to attentional resources directed toward a person's own thoughts and feelings rather than toward those of others or external stimuli (Carver & Scheier,

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*Institute of Education, National Sun Yat-sen University, 70 Lien-Hai Rd., Kaohsiung 80424, Taiwan, ROC. E-mail: wbchiou@mail.nsysu.edu.tw.

†Fooyin University, Kaohsiung, Taiwan.

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1981; Mor & Winquist, 2002). The presence of an audience has been shown to induce a state of self-focused attention (e.g., Carver & Scheier, 1978; Geller & Shaver, 1976; Vorauer & Ross, 1999). Previous studies have shown that computer-mediated communication reduces awareness of others (see Kiesler, Siegal, & McGuire, 1984, for a related review). Thus, we propose that indiscriminate one-to-many communication on SNSs may serve to increase self-focus.

Self-focus may affect one's perception of others, particularly assumptions about what others perceive or think (Fenigstein & Abram, 1993). Specifically, under self-focused attention conditions, social judgments are more likely to be made using the self rather than others as a reference (Fenigstein, 1979; Gendolla & Wicklund, 2009; Gilovich, Medvec, & Savitsky, 2000). Marks and Duval (1991) showed that consensus estimates for a person's own choice were higher among participants who were asked to focus on their preferred activity (self-focused condition) than among those who focused on a non-preferred alternative. In a series of five experiments, Fenigstein and Abrams (1993) demonstrated that, as self-focus increased, the egocentric assumption that others thought in the same way as one's self (shared perspectives) increased. Moreover, Stasser and Taylor (1991) demonstrated that as groups become bigger, communication becomes less interactive. Fay, Garrod, and Carletta (2000) showed that communication in large social networks resembled a monologue, whereas the exchange was more of a dialogue in small social networks. Because indiscriminate one-to-many communication on SNSs is at least partially self-focused, other-directed concerns may be less accessible. The aforementioned preliminary study (N = 125) revealed that participants were likely to receive information that did not interest them (M = 5.47, SD = 1.27 on a seven-point scale from *very unlikely* to *very likely*; $t(124) = 12.99$, $p < 0.001$), suggesting that SNS users do not consider the interests of a diverse audience when distributing information. Furthermore, this preliminary study revealed a negative relationship (controlling for participant sex and number of Facebook friends; $B = -0.34$, $SE = 0.06$, $p < 0.001$) between frequency of indiscriminate one-to-many communication on SNSs (1 = *never*, 7 = *very often*) and tendency to engage in everyday perspective taking (assessed using a seven-item scale; $\alpha = 0.81$; see Davis, 1983, pp. 113–114). Therefore, we predicted that indiscriminate one-to-many communication in online social networking would induce a state of self-focus and bias subsequent social judgment. Specifically, we hypothesized that indiscriminate one-to-many communication on SNSs would promote self-focus and impair perspective taking.

The primary advantage of one-to-many communication on SNSs is that any type of self-presentation can be simultaneously distributed to a large audience. We explored the link between this communication style and perspective taking by conducting two experiments that examined whether indiscriminate one-to-many communication on an SNS would undermine perspective taking as reflected by a lack of interest in what other individuals perceive (Experiment 1) and think (Experiment 2). In Experiment 2, the Stroop color-word paradigm (Stroop, 1935) was used to measure the state of self-focus and to test whether self-focused attention would mediate the link between indiscriminate one-to-many communication and cognitive perspective taking.

2 Experiment 1: Photo posting and the visual perspective

The most common form of content sharing on Facebook is uploading photos (Buffardi & Campbell, 2008; Facebook Statistics, 2012). Experiment 1 was designed to examine the effect of photo posting on the tendency to spontaneously adopt another person's visual perspective, an important dimension for understanding other beliefs and intentions (Baron-Cohen, 1995). Hass (1984) developed a procedure where participants were asked to draw an *E* on their foreheads. One method of completing this task is to draw an *E* as if the drawer was reading it (self-oriented direction), which creates a backward and often illegible *E* when seen by others. Another method of approaching the task is to draw the *E* as if another person was reading it (other-oriented direction), which creates an *E* that is backward to the drawer. This study used this procedure to measure the tendency to adopt other visual perspectives.

2.1 Method

Participants included 102 undergraduate Facebook users (48 women, 54 men; mean age = 20.3, SD = 1.1) from an introductory psychology course at a national university in southern Taiwan. Participants received course credit in exchange for participation. The experiment was disguised as a study examining the self-presentation of Facebook users. Participants were asked to bring soft copies of their favorite personal photographs (on flash discs, portable hard discs, or online photo galleries) to the experiment.

At the start of the study, participants received a brief introduction and provided their consent. They were then randomly assigned to one of three groups: public, all friends, or control. Participants in the public group were instructed to publish a personal photo to the public. Participants in the all friends group were instructed to publish a personal photo to all their Facebook friends. Partic-

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Table 1: Other-oriented responses in the drawing an *E* task as a function of experimental manipulation.

	Experimental condition		
	Control	All friends	Public
Self-oriented drawing	23.5	50.0	55.9
Other-oriented drawing	76.5	50.0	44.1

Note: The data are percentages. Each condition involved 34 participants. Drawing an *E* on the forehead in a self-oriented direction refers to a less inclination to adopt another person's visual perspective.

ipants in the control group were informed that the Internet was not working and then asked to help with pilot testing.

After the photo-posting task, participants were asked to test material for a motor-skills study. All participants were asked to perform the following tasks (also see Galinsky, Magee, Inesi, & Gruenfeld, 2006). Task 1—with your dominant hand, snap your fingers five times as quickly as you can. Task 2—with your dominant hand, use the marker provided to draw a capital *E* on your forehead as quickly as you can. Participants were informed that the marker was nontoxic and that it would be removed before they left. At the end of the experiment, participants were probed for suspicions and none guessed the real purpose of the experiment.

2.2 Results and discussion

Binary logistic regression was used to regress the direction of the *E* (0 = self-oriented, 1 = other-oriented) by handedness (0 = right-handed, 1 = left-handed), gender (0 = woman, 1 = man), and experimental manipulation. Dummy variables were used for the manipulation with the control group as the reference group. Handedness and sex were first entered into the equation as control variables. Handedness did not affect the probability of a participant drawing an other-oriented *E* ($B = -0.69$, $SE = 0.63$, $p > 0.27$; right-handed: 58.9%, 53 of 90; left-handed: 41.7%, 5 of 12). Gender (women: 50%, 24 of 48; men: 63%, 34 of 54) did not affect the probability of a participant drawing an other-oriented *E* ($B = 0.53$, $SE = 0.41$, $p > 0.19$). Manipulation conditions (Table 1) significantly affected the probability of a participant drawing an other-oriented *E*. Participants in the all friends group (50%) were also less likely than those in the control group (76.5%) to draw an other-oriented *E* (odds ratio = 0.31, 95% confidence interval [CI]: 0.11–0.90; $B = -1.16$, $SE = 0.54$, $p = 0.031$; Wald = 4.661) and participants in the public group (44.1%) were less likely than those in the control group (76.5%) to draw an other-oriented *E* (odds ratio = 0.27, 95% CI: 0.09–0.82; $B = -1.29$, $SE = 0.53$, $p = 0.02$; Wald = 5.375).

The results support the hypothesis. Participants provided with the opportunity to spontaneously adopt another person's visual perspective were less likely to do so if they had performed an indiscriminate one-to-many communication act on an SNS than the control participants. Monologue communication undermined visual perspective taking whether personal photos were shared with the public or friends.

3 Experiment 2: Wall posting and adjusting perspectives

In this experiment, based on Keysar (1994), participants were given a message and asked to interpret how a friend of the speaker may perceive the message. The message seemed sincere, but prior knowledge of the speaker's intentions implied a sarcastic interpretation. We predicted that participants engaging in indiscriminate one-to-many communication on an SNS may be more likely than control participants to assume that the friend would understand the sarcasm, even though a sarcastic interpretation would depend on privileged knowledge that the friend did not possess.

To test whether the detrimental effect of monologue communication on perspective taking is driven by self-focus, the Stroop paradigm was used to measure self-focus tendency (Fenigstein & Carver, 1978; Geller & Shaver, 1976). In a typical Stroop task (Stroop, 1935), a color word is displayed in a font color that is either congruent (e.g., the word "red" in a red font) or incongruent (e.g., the word "red" in a blue font) with the word. When responding to font color, the semantic meaning of a color word may interfere (i.e., Stroop interference) with naming its color, increasing reaction time (RT), because semantic processing disrupts color naming. Similarly, when the usual color words are replaced with self-relevant words, slowed color-naming RTs are expected for respondents in a self-focused state. Attentional bias toward self-relevant words draws attention from the relevant font color stimulus dimension, increasing the RT required to name the font color (Logan, 1980, 1988). Hence, indiscriminate one-to-many communication may induce heightened self-focus, reflected by greater Stroop interference between self-relevant and neutral words. In addition, participants were asked to post the same content (i.e., their experiment participation) to exclude the possible confounding effects of photo selection in Experiment 1.

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Table 2: Means, SD's and correlations of the measures in Experiment 2 (N = 87).

Measures	M	SD	1	2	3
1. mean RT to neutral words (ms)	718.14	188.55			
2. mean RT to self-relevant words (ms)	776.85	221.19	0.89∗		
3. Self-focus (ms)	58.71	98.40	0.10	0.53∗	
4. Sarcastic attribution (1–7)	3.52	1.58	0.07	0.38∗	0.72∗

Note: RT = reaction time. Units of the measure are given in parentheses. Self-focus was manifested by the mean difference in time taken to identify the color of self-relevant versus neutral words. Higher scores for ratings of sarcastic attribution indicate that participants rely more on their privileged knowledge, indicating a reduced tendency toward perspective taking.

* $p < 0.001$.

3.1 Method

To make the findings more generalizable, participants were recruited from the community using flyers and posters placed at 11 district offices in Kaohsiung, Taiwan. Eighty-seven Facebookers (42 women, 45 men, mean age = 29.1 years, SD = 6.2, age range: 19 to 45 years) participated in this experiment. An experimenter greeted participants in the laboratory and explained that they would engage in several unrelated tasks. Each participant was randomly assigned to one of the three study groups: public, all friends, or control. Participants in the public group were asked to publish a public post on their experiment participation. Participants in the all friends group were asked to publish an experiment-participation post to all their Facebook friends. Participants in the control group were only asked to perform the remaining two tasks (i.e., the Stroop color-naming task and the message interpretation task) after providing their consent.

Participants were then asked to complete the computerized Stroop Task, which required approximately 5 minutes. Participants were shown words in a blue or red font and asked to press the key corresponding to the correct color as quickly and accurately as possible. Following Eichstaedt and Silvia (2003), the self-focus Stroop task included five self-relevant words (me, myself, self, face, and mine) and five neutral words (up, theory, walk, drop, and they), which were matched by length and frequency (Kučera & Francis, 1967). After four practice trials with neutral words, participants performed 20 trials with randomized font color and words. Greater Stroop interference when responding to self-relevant words than to neutral words reflected high self-focus. Incorrect trials (i.e., where font color was identified incorrectly; < 0.9%) were excluded.

Participants were then given the message-interpretation task adapted from the study by Yang, Yang, and Chiou (2010). They were asked to read a scenario. In the scenario they went with a colleague to a fancy restaurant recommended in a wall post by the colleague's friend and had a particularly poor dining experience. The next day, the colleague replied to the friend's post stating that, "About your recommended restaurant, it was marvelous, just marvelous." Participants were asked to respond to the question, "How do you think the colleague's friend will interpret the comment?" on a seven-point scale (1 = *very sincere*, 7 = *very sarcastic*). If participants relied on their prior knowledge of the speaker's intention, they may think that the friend would interpret the message as sarcastic. Therefore, higher sarcastic attribution scores indicated that participants were more affected by their prior knowledge and failed to adopt other perspectives. No participants expressed any suspicion on how the tasks were related.

3.2 Results and discussion

Descriptive statistics of the measures in Experiment 2 were shown in Table 2. Gender was not associated with experimental groups (χ^2 (2) = 0.28, $p > 0.87$) and age did not differ among the three experimental groups (F(2, 84) = 1.09, $p > 0.34$). Neither Age (r = –0.14, $p > 0.18$) nor gender (r = 0.13, $p > 0.23$; women: M = 3.31, SD = 1.62; men: M = 3.71, SD = 1.53) were related to sarcastic attribution scores. Therefore, these factors were not used as control variables in subsequent analyses.

As hypothesized, sarcastic attribution was related to experimental condition (F(2, 84) = 4.123, p = 0.02; η^2_p = 0.09). Planned contrasts showed that participants in the public (M = 3.93, SD = 1.69; t(84) = 2.674, p = 0.009; Cohen's d = 0.29) and all friends (M = 3.76, SD = 1.48; t(84) = 2.243, p = 0.028; Cohen's d = 0.25) groups thought that the message would be perceived as more sarcastic than those in the control group (M = 2.86, SD = 1.38). Sarcastic attribution did not differ between the public and all

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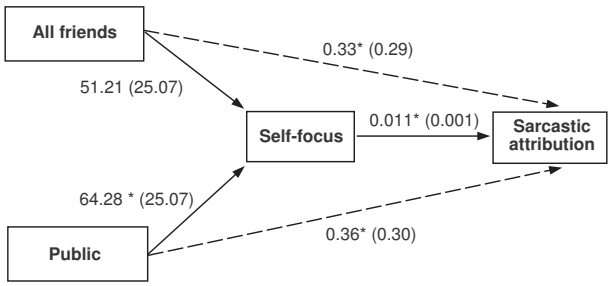
Table 3: Mean response times for self-relevant versus neutral words in the Stroop task and the tendency of self-focus in Experiment 2.

Condition	Self-relevant	Neutral	Self-focus
Control	733.72 (241.36)	713.52 (211.48)	20.21 (75.86)
All friends	790.48 (203.31)	719.03 (178.16)	71.45 (97.18)
Public	806.34 (218.32)	721.86 (180.79)	84.48 (108.57)

Note: Each study condition included 29 participants. Reaction times are given in milliseconds. Standard deviations are presented in parentheses. Self-focus was manifested by mean difference in reaction time taken to name the font color of self-relevant versus neutral words (i.e., Stroop interference). Greater Stroop interference indicates high self-focus.

Figure 1: The mediation model for Experiment 2. Mediation effect reflects indirect effects of two dummy variables on influence through the mediator (self-focus). Dashed-line arrows indicate direct effects. High self-focus which was manifested by greater Stroop interference (ms) between self-relevant words and neutral words. Higher scores of ratings on sarcastic attribution (range: 1–7) indicate that participants are more anchored on their privileged knowledge, indicating perspective not taken. Numbers inside parentheses are the standard errors of coefficients. Asterisks indicate significant results ($p < 0.05$).



friends groups ($t(84) = 0.43$, $p > 0.66$).

In terms of self-focus, a repeated-measures analysis of variance on RTs in self-relevant versus neutral words revealed an interaction with experimental condition ($F(2, 84) = 3.674$, $p = 0.03$; $\eta^2_p = 0.08$; see Table 3). Participants in the public group showed more Stroop interference when responding to self-relevant words ($M = 806.34$ ms) than neutral words ($M = 721.86$ ms; $F(1, 28) = 17.56$, $p < 0.001$; $\eta^2_p = 0.384$). Participants in the all friends group also showed a similar Stroop interference pattern (self-relevant words: $M = 790.48$ ms, neutral words: $M = 719.03$ ms; $F(1, 28) = 15.115$, $p = 0.001$; $\eta^2_p = 0.35$). Mean RT did not differ between self-relevant words ($M = 733.72$ ms) and neutral words ($M = 713.52$ ms; $F(1, 28) = 2.057$, $p = 0.163$; $\eta^2_p = 0.068$) among control participants.

We examined whether self-focus mediated the effect of indiscriminate one-to-many communication on sarcastic attribution (Baron & Kenny, 1986). RT differences between self-relevant and neutral words were used as a self-focus indicator (Table 3). Two dummy variables were created (the first for the all friends condition and the second for the public condition) for the three-group independent variable, with the control group as the reference category. We found that participants in both the all friends condition ($\beta = 0.247$, $t = 2.042$, $p = .044$) and public condition ($\beta = 0.31$, $t = 2.563$, $p = .012$) showed greater self-focus than control participants. This greater self-focus predicted higher scores of sarcastic attribution ($\beta = 0.689$, $t = 8.755$, $p < 0.001$). As expected, the direct effects were no longer significant (dummy variable for the all friends condition: changed from $\beta = 0.27$, $t = 2.243$, $p = .028$ to $\beta = 0.10$, $t = 1.114$, $p = .269$; dummy variable for the public condition: changed from $\beta = 0.322$, $t = 2.674$, $p = .009$ to $\beta = 0.108$, $t = 1.192$, $p = .237$) when the self-focus measure was included in the equation. Based on Hayes and Preacher (2012), the indirect effects of the two dummy variables on sarcastic ratings, mediated by the self-focus measure (Figure 1), were tested using bootstrapping and were both significant at the 95% confidence level with 5000 bootstrap resamples (dummy variable for the all friends group: $B = 0.57$, $SE = 0.27$, CI: 0.06–1.13; dummy variable for the pubic group: $B = 0.71$, $SE = 0.3$, CI: 0.13–1.34).

The second experiment demonstrated that participants engaging in indiscriminate one-to-many communication (i.e., publishing an experiment-participation post to the public or all their Facebook friends) were less likely to understand how other people think than control participants. Theoretically, people initially anchor to their own perspective and then adjust this to other perspectives (Epley, Keysar, Van Boven, & Gilovich, 2004). People with prior knowledge of a speaker's intentions often have difficulty recognizing and adjusting to the fact that other listeners do not share this privileged perspective (Keysar,

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1994). Experiment 2 suggests that self-focus induced by performing a monologue communication act on an SNS may lead to insufficient adjustment to another person's perspective.

4 General discussion

Our results show that participants who engaged in indiscriminate one-to-many communication on a SNS were less likely than were controls to adopt another person's visual perspective (Experiment 1) and consider that another person did not possess privileged prior knowledge (Experiment 2). The two social judgment tasks revealed an association between indiscriminate one-to-many communication and reduced accuracy in perspective taking. Participants were not aware of the connection between the act of communication and the perspective-taking tasks; thus, ignoring others' perspectives was not the result of a conscious decision but rather a psychological state produced by indiscriminate one-to-many communication that decreased the likelihood of perspective taking. These results suggest that indiscriminate one-to-many communication leads to self-referential processing when making social judgments. Our study, which may be the first to examine the unexpected psychological consequences of SNS communication, provides experimental evidence that shows how indiscriminate one-to-many communication may reduce perspective taking.

Experiment 2 showed that indiscriminate one-to-many communication temporarily increased self-focus and decreased the tendency to adopt others' perspectives. These findings demonstrate a particular behavior-induced alteration in self that corresponds to the active-self-account framework of prime-to-behavior effects (Wheeler, DeMarree, & Petty, 2007). The active-self account proposes that the activated self mediates the link between perception and behavior. Extant studies have shown that activation of a certain stereotype was associated with people behaving in a way consistent with that stereotype (Bargh, 1997; Wheeler & Petty, 2001). Similarly, the results of Experiment 2 indicate that indiscriminate one-to-many communication may make self-schema more accessible, increasing the intrusion of the one's own thinking when judging others' thoughts (Fenigstein & Abrams, 1993; Vorauer & Ross, 1999) and reducing the ability to perform perspective-taking behaviors.

Mediation analysis supports the role of self-focus in the association between indiscriminate online one-to-many communication and subsequent poor performance on perspective-taking tasks and is consistent with the findings of Fenigstein and Abrams (1993). Across five experiments, Fenigstein and Abrams found that people with high public self-focus perceived others in an egocentric manner, and the authors interpreted their findings as evidence that self-focus enhances egocentrism in a false consensus paradigm (pp. 288 and 289). Similarly, three studies conducted by Vorauer and Ross (1999) showed that increased dispositional or state self-awareness was associated with increased "feelings of transparency" (Gilovich, Savitsky, & Medvec, 1988), which refers to a tendency for people to overestimate the extent to which others can discern their internal states. Trommsdorff and John (1992) found that self-focused individuals performed poorly in decoding the emotions experienced by their partner during a discussion, suggesting that self-focus may reduce empathic accuracy. Our findings support the link between induced self-focus and a tendency toward egocentrism.

However, Hass (1979, 1984) found that participants who focused their attention on the self (induced by a video camera or a tape recorder) performed better on a visual perspective-taking task than did the control participants. We reasoned that traditional experimental self-focus manipulations, such as looking into a mirror image (Carver & Scheier, 1981), facing a video camera (Hass, 1984) or hearing one's own tape-recorded voice (Wicklund & Duval, 1971), induced "private" self-focus (also see Gendolla & Wicklund, 2009, for a similar viewpoint). In contrast, our findings indicate that the act of one-to-many online posting induced "public" self-focus because the aspects of self are publicly observable on a SNS. The manipulations we used to induce self-focus are similar to those reported in the self-awareness or self-consciousness literature (see Wicklund & Gollwitzer, 1987, for a related review). For example, in the self-consciousness model proposed by Buss (1980), writing in a diary and looking into a small mirror are supposed to create a private state, whereas audiences are supposed to generate a public state. The present findings, together with previous research showing that private self-focus fosters perspective taking (e.g., Hass, 1984; Gendolla & Wicklund, 2009; Scaffidi Abbate, Isgrò, Wicklund, & Boca, 2006; Stephenson & Wicklund, 1983), suggest that induced public self-focus may impair perspective taking, whereas induced private self-focus may enhance perspective taking.

Although the present study supports a causal link between indiscriminate one-to-many communication on SNSs and impaired perspective taking, this finding is not conclusive. Our study has several limitations. First, our one-to-many manipulation was limited to sharing with the public or friends. A study investigating sharing within a small circle of recipients, such as close friends or family, would offer insights into whether perceived closeness to the recipient alters the effect of one-to-many communication on perspective taking. In addition, it is possible that one-to-many communication with strangers or dis-

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liked others does not result in a similar diminution in perspective taking. In Experiment 2, the content of the communication message remained constant (i.e., experiment participation). However, an understanding of the moderating effect of personal involvement (Celsi & Olson, 1988) on shared messages could provide a holistic picture of the type of content that would enhance or diminish perspective taking. Moreover, we employed a control group (baseline) of behavior without any preceding Facebook communication. In order to truly show that the mode of communication per se triggers the reported effects, the effect of one-to-many communication should be compared with another form of communication (e.g., one-to-one communication) in a study where the message content (what participants communicate) and recipient relationship (with whom participants communicate) are kept constant. Finally, the generalizability of our findings is limited because we did not investigate the effect of other types of one-to-many communication, such as mass emails, posting flyers on a bulletin board, or giving a public lecture, on self-focus and perspective-taking performance. These questions merit further study.

Our findings suggest several avenues for future research on the relationships among communication style, self-focused attention, and the accuracy of social judgment. The observed link between monologue-type communication (i.e., indiscriminate one-to-many communication) and self-focus suggests that they are intimately intertwined. The effect of induced other-focus on the tendency to engage in egocentric communication warrants further investigation. It is not clear whether individuals with high dispositional self-focus or self-consciousness (Cramer, 2000; Fenigstein, 1984; Fenigstein, Scheier, & Buss, 1975) would be more likely to use monologue communication than are those with low high dispositional self-focus. Our findings suggest that monologue communication reduces accurate understanding of what other people see (Experiment 1) and think (Experiment 2). Future studies are needed to test whether engaging in monologue communication decreases accurate detection of other people's feelings (e.g., emotional expressions) or enhances other forms of egocentric expression such as "the spotlight effect" (the tendency of people to overestimate the extent to which their actions and appearance are noted by others; Gilovich et al., 2000) and "the false consensus effect" (the general and often unrealistic tendency to assume that others have beliefs, attitudes, and experiences that are similar to ourselves; Mullen et al., 1985; Ross, Greene, & House, 1977).

People engage in information-sharing to pursue interpersonal goals via Internet-mediated communication tools. The SNS is widely believed to have changed communication patterns among the Net Generation (Jones, Blackey, Fitzgibbon, & Chew, 2010). However, our findings indicate that indiscriminate one-to-many communication often fails to consider diverse receiver interests and diminishes perspective taking. Online social networking is a gateway to self-promotion and vanity given that self-focused postings may be associated with narcissism (Buffardi & Campbell, 2008), which is closely related to egocentrism (Penney, Moretti, & Da Silva, 2008). The present findings suggest that participation in indiscriminate one-to-many communication (i.e., monologue communication) increases self-focus and reduces perspective taking. Social interaction in the age of information fosters large-scale information sharing that may underlie a shift toward egocentric self-focus—the cultivation of a "me generation" (Twenge, Konrath, Foster, Campbell, & Bushman, 2008). Although one-to-many communication may allow people to initiate and maintain social relationships by disseminating information to a wide audience, our findings indicate that indiscriminate one-to-many communication on a SNS weaken the perspective-taking nature of interactive dialogue. Piaget (1926) used the term "collective monologue" to describe an aspect of egocentrism. This type of communication involves two or more people expressing their own thoughts or feelings without referring to others. In this way, one-to-many communication on the Internet, such as SNSs, may have a more profound effect on the drift toward self-focus than previously assumed, reinforcing a curse of more sharing and less perspective taking.

References

Bargh, J. A. (1997). The automaticity of everyday life. In R. S. Wyer, Jr. (Ed.), *Advances in social cognition* (Vol. 10, pp. 1–61). Mahwah, NJ: Erlbaum.

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*, *51*, 1173–1182.

Baron-Cohen, S. (1995). *Mindblindness*. Cambridge, MA: MIT Press.

Boyd, D. M., & Ellison, N. B. (2008). Social network sites: Definition, history, and scholarship. *Journal of Computer-Mediated Communication*, *13*, 210–230.

Buffardi, L. E., & Campbell, W. K. (2008). Narcissism and social networking sites. *Personality and Social Psychology Bulletin*, *34*, 1303–1314.

Buss, A. H. (1980). *Self-consciousness and social anxiety*. San Francisco, CA: Freeman.

Carver, C. S., & Scheier, M. F. (1978). Self-focusing effects of dispositional self-consciousness, mirror presence, and audience presence. *Journal of Personality and Social Psychology*, *36*, 324–332.

https://doi.org/10.1017/S1930297500006033 Published online by Cambridge University Press

Carver, C. S., & Scheier, M. F. (1981). *Attention and self-regulation: A control theory approach to human behavior*. New York: Springer.

Celsi, R. L., & Olson, J. C. (1988). The role of involvement in attention and comprehension processes. *Journal of Consumer Research*, *15*, 210–224.

Cramer, K. M. (2000). Comparing the relative fit of various factor models of the Self-Consciousness Scale in two independent samples. *Journal of Personality Assessment*, *75*, 295–307.

Davis, M. H. (1983). Measuring individual differences in empathy: Evidence for a multidimensional approach. *Journal of Personality and Social Psychology*, *44*, 113–126.

Eichstaedt, J., & Silvia, P. J. (2003). Noticing the self: Implicit assessment of self-focused attention using word recognition latencies. *Social Cognition*, *21*, 349–361.

Epley, N., Keysar, B., Van Boven, L., & Gilovich, T. (2004). Perspective taking as egocentric anchoring and adjustment. *Journal of Personality and Social Psychology*, *87*, 327–339.

Facebook Statistics (2012). Retrieved from http://www.facebook.com/press/info.php?statistics.

Fay, N., Garrod, S., & Carletta, J. (2000). Group discussion as interactive dialogue or as serial monologue: The influence of group size. *Psychological Science*, *11*, 481–486.

Fenigstein, A. (1979). Self-consciousness, self-attention, and social interaction. *Journal of Personality and Social Psychology*, *37*, 75–86.

Fenigstein, A. (1984). Self-consciousness and the overperception of self as a target. *Journal of Personality and Social Psychology*, *47*, 860–870.

Fenigstein, A., & Abrams, D. (1993). Self-attention and the egocentric assumption of shared perspective. *Journal of Experimental Social Psychology*, *29*, 287–303.

Fenigstein, A., & Carver, C. S. (1978). Self-focusing effects of heartbeat feedback. *Journal of Personality and Social Psychology, 11*, 1241–1250.

Fenigstein, A., Scheier, M. F., & Buss, A. H. (1975). Public and private self-consciousness: Assessment and theory. *Journal of Consulting and Clinical Psychology*, *43*, 522–527.

Galinsky, A. D., Magee, J. C., Inesi, M. E., & Gruenfeld, D. H. (2006). Power and perspectives not taken. *Psychological Science*, *17*, 1068–1074.

Gendolla, G. H. E., & Wicklund, R. A. (2009). Self-focused attention, perspective-Taking, and false consensus. *Social Psychology*, *40*, 66–72.

Geller, V., & Shaver, P. (1976). Cognitive consequences of self-awareness. *Journal of Experimental Social Psychology*, *12*, 99–108.

Gilovich, T., Medvec, V. H., & Savitsky, K. (2000). The spotlight effect in social judgment: An egocentric bias in estimates of the salience of one's own actions and appearance. *Journal of Personality and Social Psychology*, *78*, 211–222.

Gilovich, T., Savitsky, K., & Medvec, V. H. (1998). The illusion of transparency: Biased assessments of others ability to read our emotional states. *Journal of Personality and Social Psychology*, *75*, 332–346.

Hass, R. G. (1979). *A test of the bidirectional focus of attention assumption of the theory of objective self-awareness.* Paper presented at the annual meeting of the Eastern Psychological Association, Philadelphia.

Hass, R. G. (1984). Perspective taking and self-awareness: Drawing an E on your forehead. *Journal of Personality and Social Psychology*, *46*, 788–798.

Hayes, A. F., & Preacher, K. J. (2012). Statistical mediation analysis with a multicategorical independent variable. *Manuscript submitted for publication*.

Jones, N., Blackey, H., Fitzgibbon, K., & Chew, E. (2010). Get out of MySpace! *Computers & Education*, *55*, 776–782.

Keysar, B. (1994). The illusory transparency of intention: Linguistic perspective taking in text. *Cognitive Psychology*, *23*, 165–208.

Kiesler, S, Siegal, J, & McGuire, T. W. (1984). Social psychological aspects of computer-mediated communication. *American Psychologist*, *39*, 1123–1134.

Kučera, H., & Francis, W. (1967). *Computational analysis of present-day American English*. Providence, RI: Brown University Press.

Logan, G. D. (1980). Attention and automaticity in Stroop and priming tasks: Theory and data. *Cognitive Psychology*, *12*, 523–553.

Logan, G. D. (1988). Toward an instance theory of automatization. *Psychological Review*, *95*, 492–527.

Manago, A. M., Graham, M. B., Greenfield, P. M., & Salimkhan, G. (2008). Self-presentation and gender on MySpace. *Journal of Applied Developmental Psychology*, *29*, 446–458.

Marks, G., & Duval, S. (1991). Availability of alternative positions and estimates of consensus. *British Journal of Social Psychology*, *30*, 179–183.

Mehdizadeh, S. (2010). Self-presentation 2.0: Narcissism and self-esteem on Facebook. *Cyberpsychology, Behavior, and Social Networking*, *13*, 357–364.

Mor, N., & Winquist, J. (2002). Self-focused attention and negative affect: A meta-analysis. *Psychological Bulletin*, *128*, 638–662.

Mullen, B., Atkins, J. L., Champion, D. S., Edwards, C., Hardy, D., Story, J. E., & Vanderklok, M. (1985). The false consensus effect: A meta-analysis of 115 hypothesis tests. *Journal of Experimental Social Psychology*, *21*, 262–283.

https://doi.org/10.1017/S1930297500006033 Published online by Cambridge University Press

Pempek, T. A., Yermolayeva, Y. A., & Calvert, S. L. (2009). College students' social networking experiences on Facebook. *Journal of Applied Developmental Psychology*, *30*, 227–238.

Penney, S. R., Moretti, M. M., & Da Silva, K. S. (2008). Structural validity of the MACI Psychopathy and Narcissism Scales: Evidence of multidimensionality and implications for use in research and screening. *Journal of Clinical Child and Adolescent Psychology*, *37*, 422–433.

Piaget J. (1926). *The language and thought of the child*. New York: Harcourt Brace.

Ross, L., Greene, D., & House, P. (1977). The false consensus phenomenon: An attributional bias in self-perception and social-perception processes. *Journal of Experimental Social Psychology*, *13*, 279–301.

Scaffidi Abate, C., Isgrò, A.,Wicklund, R. A., & Boca, S. (2006). A field experiment on perspective-taking, helping, and self-awareness. *Basic and Applied Social Psychology*, *28*, 283–287.

Stasser, G., & Taylor, L. A. (1991). Speaking turns in face-to-face discussion. *Journal of Personality and Social Psychology*, *60*, 675–684.

Stephenson, B., & Wicklund, R. A. (1983). Self-directed attention and taking the other's perspective. *Journal of Experimental Social Psychology*, *19*, 58–77.

Stroop, J. R. (1935). Studies of interference in serial verbal reactions. *Journal of Experimental Psychology*, *18*, 643–662.

Trommsdorf, G., & John, H. (1992). Decoding affective communication in intimate relationships. *European Journal of Social Psychology*, *22*, 41–54.

Twenge, J. M., Konrath, S., Foster, J. D., Campbell, W. K., & Bushman, B. J. (2008). Egos inflating over time: A cross-temporal meta-analysis of the Narcissistic Personality Inventory. *Journal of Personality*, *76*, 875–901.

Vorauer, J. D., & Ross, M. (1999). Self-awareness and feeling transparent: Failing to suppress one's Self. *Journal of Experimental Social Psychology*, *35*, 415–440

Wheeler, S. C., DeMarree, K. G., & Petty, R. E. (2007). Understanding the role of the self in prime to behavior effects: The active-self account. *Personality and Social Psychological Review*, *11*, 234–261.

Wheeler, S. C., & Petty, R. E. (2001). The effects of stereotype activation on behavior: A review of possible mechanisms. *Psychological Bulletin*, *127*, 797–826.

Wicklund, R. A., & Duval, S. (1971). Opinion change and performance facilitation as a result of objective self-awareness. *Journal of Experimental Social Psychology*, *7*, 319–342.

Wicklund, R. A., & Gollwitzer, P. M. (1987). The fallacy of the private-public self-focus distinction. *Journal of Personality*, *55*, 491–523.

Yang, M.-L., Yang, C.-C., & UChiou, W.-B. (2010). When guilt leads to other orientation and shame leads to egocentric self-focus: Effects of differential priming of negative affects on perspective taking. *Social Behavior and Personality*, *38*, 605–614.

https://doi.org/10.1017/S1930297500006033 Published online by Cambridge University Press