

Overattribution of Liking in Computer-Mediated Communication: Partners Infer the Results of Their Own Influence as Their Partners' Affection

Communication Research
2016, Vol. 43(3) 372–390
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DOI: 10.1177/0093650214565898
crx.sagepub.com



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Abstract

Previous research found that computer-mediated communication (CMC) users affectively compensate for partners when they believe their partners' negative demeanor to be malleable, but unlike in other media, they discount their own influence on their partner. This research examined attributions that chat users make when they influence their partners but do not recognize their own causal influence. Dyads conducted either online text-based conversations or audio interactions. Each male dyad member was told that his female partner (who was actually naïve) was in a bad mood or had an unpleasant personality. Although they had rated their ability to influence others' demeanors as lesser when using CMC compared with those who anticipated telephone (audio), males acted more pleasantly when expecting a bad mood, and rated the partner as behaving more pleasantly, in CMC. In CMC, males filled the attributional gap by inferring that partners' behavior reflected partners' liking toward them. These findings extend the hyperpersonal model of CMC to explain how illusions about partners' affection may come to influence the sociability of online interaction and vice versa.

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Keywords

CMC, attribution, affection, behavioral disconfirmation

Numerous studies have documented the hyperpersonal effect in computer-mediated communication (CMC), that is, a greater degree of intimacy in CMC than in comparable offline settings (Walther, 1996). A number of factors have been identified that facilitate hyperpersonal relations such as time, anticipated interaction, and editing. Less clear is what kinds of initial events trigger the spark of attraction between online partners that may motivate the idealization, selective self-presentation, and channel exploitation that further stimulate and ultimately exaggerate relational intimacy in developing online relations. In an appraisal and re-articulation of the hyperpersonal model, Walther (2006) observed, “the model is less specific about (when) hyperpersonal processes should be expected to adhere, drawing on other theories to create contexts in which these dynamics emerge” (p. 466).

Several new approaches have shed light on the potential inception of hyperpersonal effects. One approach focused on attributions leading to increases in intimacy that differ between online versus offline interactions. Research has found that CMC triggers not only more self-disclosures than face-to-face (FtF) communication (Jiang, Bazarova, & Hancock, 2013) but also more relational attributions for a partner’s disclosures and greater intimacy as a result of these attributions and disclosures. The channel, disclosures, and attributions form a chain reaction leading to comparatively greater intimacy in CMC than FtF interaction (Jiang, Bazarova, & Hancock, 2011). Another recent approach to the hyperpersonal dynamics of online relations explored behavioral disconfirmation. Behavioral disconfirmation in non-electronic encounters describes how individuals who anticipate an unpleasant encounter with a partner lead that partner to behave more pleasantly (Ickes, Patterson, Rajcecki, & Tanford, 1982). Recent research using CMC found that CMC users also influence their partners’ behavior in this way. Unlike offline communicators, however, CMC users do not recognize that they were in fact the cause of their partners’ behavior, even though objective measures indicate that they did, in fact, influence their partners (Tong & Walther, 2014).

The present study brings these two lines of research together to ask the question, if CMC users perceive positive behavioral changes in their partners, but they do not believe that they themselves affected their partners’ demeanor, what attributions might CMC users make for their partners’ apparently unexpected pleasant behavior, and what is the effect of these attributions on the perceiver’s subsequent liking for that partner? Do they attribute their partners’ pleasant demeanor to the partners’ affection for them? Although such an attribution may be falsely based, at least at first, it may become the basis for the reciprocation of affection, and become a logical candidate to be the genesis of unexpectedly affectionate, hyperpersonal relations online.

The present research reviews literature on the hyperpersonal model of CMC, including recent extensions and questions about the origin of the effect. It details the attributional extension to the model and explores broadening the attributional foci

individuals might make for a partner's interpersonal demeanor, such as attributing it to the partner's affection toward the perceiver. It discusses findings from recent work on online behavioral disconfirmation that reveal how CMC users change their partners' moods but remain unaware that they themselves caused the partners' change. It asks what the attributional consequences of these dynamics may be and how they affect users' interpersonal inferences as a result. An original experiment compares conditions where partners' demeanors were perceived to be malleable to conditions where partners' demeanors were perceived to be stable, in CMC versus voice-based communication systems. While previous studies have reported self-report measures in order to address similar questions (Tong & Walther, 2014), the present study adds behavioral measures to provide stronger evidence for its hypothesis tests. The findings generally support these contentions, and limitations of the current investigation suggest future research in this line of inquiry.

Hyperpersonal CMC and Behavioral (Dis)Confirmation

The hyperpersonal model of CMC predicts more intense intimacy effects in CMC than in comparable FtF communication (Walther, 1996, 2006). The model describes four elements: senders' selective self-presentation, receivers' idealization, channel optimization through editing and attention shifts, and feedback among these elements that accentuates their effects. In CMC, senders are able to select only desirable attributes to present to partners due to senders' ability to plan and edit their messages. Receivers may over-interpret and idealize senders' messages and inflate senders' attractiveness. The CMC channel further allows senders to enhance message desirability through contemplation, control, and revision in message composition, and the CMC channel frees senders' cognitive resources that would otherwise be used to coordinate the FtF interaction, to craft selective messages. The feedback loop between sender and receiver can enhance the exaggeration of impressions that result from these strategic messages. CMC users, theoretically, reciprocate the *projected* qualities of their partners based on cues those partners emit that suggest the plausible likelihood of those characteristics. Behavioral confirmation was theorized to be the "glue" that catalyzes the reciprocal effects of selective self-presentation, idealization, and channel optimization.

Behavioral confirmation is a process in which an individual (perceiver) holds certain expectations about the characteristics of a conversation partner and behaves in such a way that leads the partner to enact behaviors that reflect expectations (Snyder, Tanke, & Berscheid, 1977). Whether the perceiver deliberately tries to shape the target's behavior or whether he signals it in his effort to test his naïve hypothesis about the target's nature, the perceiver's kinder or more involving conversational behavior (or, conversely, his cold and disinterested demeanor) triggers reciprocal responses from the target, confirming the perceiver's belief (Snyder & Haugen, 1994). Numerous studies using telephone-like systems have confirmed this effect. The hyperpersonal model suggests that this kind of dynamic occurs in CMC as well, even if only through text (without voice and physical cues), and can transform relationships based on idealized perceptions to relatively more intimate levels.

Recent experiments confirmed and extended the role of confirmation and disconfirmation in hyperpersonal interaction. Tong and Walther (2015) found that behavioral confirmation occurred in CMC when perceivers believed that their partners had a pleasant personality or were in a good mood. When perceivers believed that their partners had an unpleasant personality, behavioral confirmation, again, took place: Perceivers led targets to communicate in the unpleasant ways that they had expected. These findings establish that behavioral confirmation occurs in text-based CMC, defying conventional predictions that nonverbal cues provide the necessary mechanism that convey this influence (Ickes et al., 1982).

More novel were the findings that when a perceiver believed that a partner was in a bad mood, an alternative pattern of influence took place, known as *behavioral disconfirmation*. Disconfirmation is predicted when the perceiver believes that the target will be unappealing but the unappealing aspect can be changed. Tong and Walther (2015) found this to be the case when a perceiver expected that his partner's demeanor was unpleasant but malleable, that is, it was due to a partner's bad *mood*, compared to a partner's unpleasant *personality*.

CMC perceivers, on the other hand, reported a significantly lower partner influence self-efficacy (PISE) score than did voice users; they seemed generally skeptical about their ability to change a partner's mood via CMC. Despite this, objective data through coder analysis showed that CMC perceivers' behavior toward partners was in fact quite positive and indeed affected targets' responses just as the phone perceivers affected theirs. CMC perceivers also rated their partners' terminal demeanor positively. In CMC, however, there was no correlation between perceivers' PISE and their positive perceptions of their partners' terminal demeanor. In other words, even though CMC perceivers influenced their partners' demeanor, and recognized their partners' pleasantness, they appear not to have attributed this effect to their own influence. A major question arising from these findings is, if CMC perceivers do not attribute their partners' positive demeanor to their own (actual) influence, to what do they attribute it, and how may this (erroneous) attribution affect relational dynamics?

A review of recent research on intimacy attributions and the hyperpersonal model of CMC helps inform a potential explanation for these findings. The causes that individuals attribute for their partners' behaviors affect the intimacy they ascribe to the conversations. A redefinition of *personalistic attributions* (Newman, 1981) offers a particularly promising view of CMC users' responses to their partners' affective behavior, which may, despite being illusory, trigger further intimacy in online encounters.

Attributions and Intimacy in CMC

Recent research on self-disclosure in CMC provides insights about the role of attributions in the intimacy of online conversations. When disclosures appear to have been prompted by relational concerns (e.g., the unique relationship accounts for the partner's behaviors), receivers experience greater intimacy than when disclosures are attributed to other factors (Jiang et al., 2011).

Generally, when people receive someone's self-disclosure, they attempt to figure out plausible reasons and goals for the discloser's behavior. Attribution patterns in general describe the ways that people tend to make sense of others' behaviors by linking causal reasons to behavioral events (Kelley & Michela, 1980). Traditionally, attributions are seen as situational or dispositional, but when behavior takes place in social settings, additional attributional foci pertain. A dispositional attribution occurs when one believes that another's actions are driven by the partner's personality. A situational attribution occurs when one believes that the context affects the behavior. When conversations occur within ongoing relationships, attributions may include interpersonal factors (Newman, 1981). According to Jiang et al.'s (2011) CMC investigation, an interpersonal attribution occurs when one believes that certain features of the relationship between partners lead to the partner's behavior. Jiang et al. applied this framework to online disclosure in the following way. Dispositional attributions occur when one perceives that the online discloser reveals something because she or he is outgoing. Situational attributions occur when one thinks that the media situation drove self-disclosure, such as the suspected link between anonymous CMC and self-revelation (McKenna, Green, & Gleason, 2002). With interpersonal attributions, according to Jiang et al. (2011), people believe that an aspect of the unique relationship between the discloser and the perceiver led to the partner's self-disclosing behavior.

Jiang et al. (2011) found that interpersonal attributions for self-disclosure increase perceived intimacy. Moreover, they supported their prediction that CMC fosters interpersonal attributions more than FtF communication does. As suggested in the hyperpersonal model, because people communicating via CMC tend to over-interpret available cues and engage in idealized judgments of others' behaviors (Walther, 1996), Jiang et al. argued that people make more interpersonal attributions for self-disclosure online than offline. In their study, a naïve participant and a confederate interacted with each other through either CMC or FtF over five topics (e.g., going to class, doing exercise, etc.). The level of self-disclosure (high vs. low) differed by varying the amount of personal information the confederate revealed during the conversation. As predicted, they found that self-disclosure led to greater intimacy in CMC than in FtF interactions. Moreover, they found that when people received deeper self-disclosure from CMC partners, they tended to attribute the self-disclosure to their unique interpersonal relationship with the discloser and, consequently, perceived greater intimacy toward the discloser than when identical events occurred in parallel FtF conversations. Jiang et al. concluded that interpersonal attributions mediate the relationship between self-disclosure and intimacy in CMC interaction.

Other research suggests additional foci for attributions for disclosure and other interaction behaviors. A similar approach to that of Newman (1981) appears in Collins and Miller's (1994) meta-analysis of disclosure and liking. They include dispositional and situational attributions, which they define in conventional ways, and recognize a third type of attribution that differs from Newman's scheme: *personalistic attribution*. A personalistic attribution is one in which an individual to whom a partner discloses infers that the discloser's behavior was due to the discloser's attitudes about the receiver, such as her liking or trust toward the receiver. Generally, people tend to like

their partners more when they perceive that they have been chosen personally by their partner for self-disclosure. Receivers feel they possess a unique characteristic that prompted their partner to disclose to them, especially when the disclosure is intimate (see, for example, Jones & Archer, 1976; Taylor, Gould, & Brounstein, 1981).

In contrast to personalistic attributions in which receivers attribute another's disclosure to the other's desire for receivers' qualities, receivers may also attribute others' behavior as being directly caused by actors on the scene. Robins, Spranca, and Mendelsohn (1996) argue that in social interactions, the situational attributions one generates with which to explain one's own behavior may refer not only to the environment or context but also to other social actors. Thus, individuals may infer that someone's behaviors were the cause of another person's actions. Evidence for this effect has been found in CMC settings as well (Bazarova & Walther, 2009).

Although research involving the person-as-cause attribution has focused primarily on attributions one makes about one's own behavior being contingent on others', we contend that the reciprocal may also be true: When attributing causes for a social partner's behavior, one may attribute that the other individual's behavior was caused by one's own influence on that person. It is an attribution focusing on one's own intentional social influence. The *attribution to self* as the cause of another person's behavior is consistent with the nature of behavioral and perceptual disconfirmation effects, when an actor infers that his partner behaved as she did because he, the actor, deliberately and successfully influenced the partner into doing so, regardless of the partner's own inclination. When an actor believes that he himself caused an apparent change in a partner's demeanor that diverges from the actor's pre-interaction expectation, he may conclude that the partner's affective response is superficial and not genuine because he believes he caused it himself, and *behavioral* disconfirmation to his expectations occurs, but not *perceptual* disconfirmation, as he believes that the partner's demeanor has not really changed as a result of her own internal initiative.

We may summarize and synthesize the effects of behavioral (dis)confirmation and attributions in different media as follows. Dyadic partners can be interpreted as acting the way they did because of (a) their disposition, (b) the situation, (c) the perceivers' own intentional influence attempt leading them to behave a certain way, that is, a self-attribution, or (d) personalistic attributions in which a partner's behavior is interpreted as resulting from her liking for the perceiver. One factor that should determine which of these attributions is made includes the perceived malleability of the partner's sub-optimal demeanor. If it is perceived to be stable (rather than malleable), a dispositional attribution should ensue. If it is perceived as malleable, perceivers are more likely to convey a positive demeanor of their own in order to influence the demeanor of the partner positively.

Another factor affecting attributions is medium, which affects attributions because people tend to believe that it is more difficult to influence another person's affect via CMC than it is using multimodal communication (although this belief may be a misplaced stereotype about CMC). Therefore, even if one individual affects another person's interpersonal behavior, the individual may discount his own influence on the other if he thinks the medium precludes this kind of interpersonal influence, as appears

often to be the case in people's estimation of CMC's interpersonal potential. For this reason, we may expect an attribution to self as the cause of a target's behavior when communicators use a multimodal medium like a telephone. Moreover, when perceivers are asked to evaluate their partners' demeanor at the end of a conversation, it is expected that perceivers using multimodal channels will not interpret their targets' conversational behavior as genuinely more pleasant (compared to CMC perceivers), as they are likely to think that they themselves caused the target's behavior to change (rendering behavioral *disconfirmation* but perceptual *confirmation* of expectancies). However, we do not expect a self-attribution when perceivers use a medium that they consider to be less expressive. Under those circumstances, when a target behaves unexpectedly pleasantly, and self, disposition, and situation are discounted as causes, perceivers may fill the explanatory gap by inferring that the target's behavior must be due to really liking them. That is, in CMC, perceivers make personalistic attributions about targets when targets behave pleasantly despite perceivers' expectations that targets would be in a bad mood. In the end, after using CMC, perceivers may rate their partners as genuinely more pleasant (rendering behavioral and perceptual disconfirmation effects) attributable to the partner's apparent liking toward the perceiver. Specification of these contingencies and chains of events appear in the hypotheses below.

The first three hypotheses replicate recent findings of Tong and Walther (2014, 2015) in order to establish patterns of beliefs and behaviors that comprise the foundations for the original attribution hypotheses that follow, and allow for a more meaningful interpretation of the attribution results in light of these baseline predictions. The very first hypothesis reflects the assumption that communicators' beliefs about their ability to influence another person's demeanor are more positive regarding the use of a telephone than using CMC. The effect is presumably rooted in stereotypes about CMC vis-à-vis other media.

Hypothesis 1: Partner influence self-efficacy is greater regarding telephone than CMC.

The next hypothesis pertains to the prediction that perceivers who expect their partners to have a negative mood that is malleable enact pleasant behaviors toward their partner, presumably in order to elevate their partners' demeanor. The effect is a response to the malleability (vs. durability) associated with expectations about a partner's negative demeanor and is not medium-based.

Hypothesis 2: Perceivers with a negative *mood* expectation about their Targets display more pleasant behaviors than do Perceivers with a negative *personality* expectation.

In turn, perceivers' pleasant behaviors should lead the target to reciprocate these pleasant behaviors, resulting in behavioral disconfirmation of perceivers' initial negative expectancy about the target. The following hypothesis specifies the reciprocal

behavior by targets toward the perceivers' behavior (which was predicted in Hypothesis 2 above) that shows the influence of the perceiver on the target and provides the basis for behavioral disconfirmation. Because perceivers' behavior should differ as specified in Hypothesis 2, targets' behavior (expected to correlate with perceivers') should likewise differ. The effect should appear regardless of medium.

Hypothesis 3: Targets whose Perceivers have negative mood expectations display more pleasant behaviors than do Targets whose Perceivers have negative personality expectations.

The attributional patterns that we predict to result from the influences of malleability, medium, and behavior appear in the following three hypotheses. Hypothesis 4 reflects the attributional basis of behavioral confirmation, in which a perceiver believes that a target possesses certain enduring characteristics that he himself cannot influence. Like Hypothesis 2, the prediction is based on responses to the malleability expectation about a partner's demeanor and is not affected by medium.

Hypothesis 4: Perceivers with negative expectations of Targets' personality attribute Targets' behavior to her disposition more than do Perceivers with negative expectations of Targets' mood.

Hypotheses 5 and 6 reflect how the different media, CMC and voice, generate different attributions when a target behaves pleasantly. Voice users attribute targets' behavior to themselves as the cause, as the voice medium presumably supports their ability to influence partners (Hypothesis 5). But this attribution is discounted in CMC due to the medium's suspected lack of expressiveness, leading to an alternative attribution about why targets act unexpectedly pleasantly (Hypothesis 6). These effects should result both from cognitive responses to differences in (false) expectations about different media's capacity for interpersonal influence, and to perceivers' and targets' behaviors that were set in motion as a result of perceiver's expectation that the targets' demeanor was malleable.

Hypothesis 5: Perceivers using voice communication with negative expectations of Targets' mood attribute Targets' (pleasant) behavior to their self, compared both to Perceivers using CMC who have negative mood expectations about Targets, and to Perceivers using voice communication who have negative personality expectations about Targets.

Hypothesis 6: Perceivers using CMC with negative expectations of Targets' mood attribute Targets' (pleasant) behavior to Targets liking the Perceiver, compared both to Perceivers using voice who have negative mood expectations, and to Perceivers using CMC who have negative personality expectations about Targets.

Finally, the last hypothesis regards Perceivers' final, post-chat perceptions of Targets as a result of behavioral disconfirmation processes and differential attributions

due to media. Hypothesis 7 replicates findings that CMC perceivers see change in targets' demeanor as a result of the conversation, whereas voice communicators see less real demeanor change since they attribute targets' behaviors to their own influence and not to targets' actual demeanor. It reflects an effect of media stereotypes on perceivers' interpretations of others' actions.

Hypothesis 7: Perceivers using CMC who expect their Targets to have an unpleasant mood rate their Targets more terminally pleasant than do Perceivers using voice communication and CMC Perceivers do who expect their Targets to have an unpleasant personality.

Method

A 2×2 factorial experiment included medium (CMC vs. audio) as one independent variable; the other was the induction of Perceivers' pre-interaction expectancies about the malleability of their Targets' unpleasant demeanor: enduring versus malleable. The researchers induced differences in malleability perceptions by telling Perceivers that their partners either had an unpleasant personality (an enduring state) versus a bad mood (a malleable state). An expectation of an unpleasant mood should motivate Perceivers to attempt to elevate the Targets' mood through their own positive communication behavior, whereas a stable negative personality expectation should reduce such efforts from Perceivers, according to the theory of behavioral disconfirmation (Ickes et al., 1982) as applied to CMC (Tong & Walther, 2015). These varying expectations should in turn prompt dyadic interactions leading to different (pleasant vs. unpleasant) reciprocal behavior by the Targets.

Participants

A sample of $N = 112$ participants volunteered from introductory communication and telecommunication classes at a large American university. Researchers assigned participants to mixed-sex dyads and randomly assigned dyads to one of four experimental conditions. Following the protocols of prior research (Ickes et al., 1982; Snyder & Haugen, 1994), male participants were assigned to the role of Perceiver and females were assigned to the role of Target. These role/gender assignments pervade behavioral (dis)confirmation research, with the original justification pertaining to differences in nonverbal sensitivity, a factor thought to underlie this and other expectancy effects. Although future research should vary this arrangement, in order to test new factors and explanations, replication seems advisable in the short term. Male Perceivers' mean age was $M = 20.21$ years ($SD = 2.07$), and female Targets' mean age was $M = 19.78$ ($SD = 1.57$).

Procedure

Participants reported individually to a research lab where an assistant ushered each one to an individual, sound-dampened room with a Windows-based computer in it.

Participants completed consent forms, received subject ID numbers, and learned they were going to engage in a getting to know you conversation with a partner of the opposite sex using either CMC chat or an audio/voice (headphone/microphone) system. Perceivers and Targets completed questionnaires measuring their PISE and demographic information.

Replicating the methods of Tong and Walther (2015), a research assistant asked Perceivers (but not Targets) to complete a form on which to write their names and to indicate either their personality or their current mood, depending on which condition they fulfilled. Perceivers indicated their mood or personality by circling a number on each of seven-interval bipolar adjective scales (e.g., gloomy-cheerful, upset-calm, depressed-happy). Researchers told Perceivers that these forms would be exchanged with their partner in order to give them a head start getting acquainted. In actuality, the Target did not complete the form, and a bogus form was presented to the Perceiver. The bogus form contained the real Target's name but was pre-populated with relatively negative mood or personality responses. If Perceivers indicated that they knew the Target by name, the session was terminated.

The researcher administered the malleability manipulation by giving the Perceiver the bogus form and by commenting about the Target using one of the following statements: "Well, this interaction could be kind of hard since your partner doesn't seem to be the most positive personality type I've ever seen. Well, good luck" or "Well, this interaction could be kind of hard since your partner doesn't seem to be in the most positive mood I've ever seen. But that can change since moods come and go. So, good luck."

Based on the ostensible answers indicated in their partner's (bogus) personality or mood questionnaire, Perceivers then completed pre-interaction questions regarding their partners' demeanor (see section below on "Demeanor valence"). Questions also assessed Perceivers' perceptions about the *demeanor stability/malleability* of their partner's affective state, as a manipulation check and baseline measure of interpersonal perceptions. Demeanor stability was measured using seven-interval, bipolar adjective scales developed by Tong and Walther (2015) including fixed/shifting, enduring/fleeting, flexible/consistent, continuous/temporary, lasting/changing, resolute/malleable, and fluctuating/steadfast, with a greater score indicating a more stable/less malleable assessment (Cronbach's $\alpha = .85$).

Participants in the CMC chat condition then signed in to a real-time online chat system (Chatzy.com), where they could select a screen name and color for their messages if they wished to. They chatted for 30 minutes. Participants in the audio/voice condition used a wireless microphone and headphones to talk for 15 minutes (see Tidwell & Walther, 2002, for the time difference rationale). All discussions were recorded for subsequent coding. If male Perceivers made reference to the pre-chat demeanor manipulation form, researchers terminated the sessions and removed the data. Following completed chats, participants responded to a questionnaire rating their partner's behavior as well as their own behavior during the chat. They were debriefed, thanked, and awarded participation credit.

Measures

Partner influence self-efficacy (PISE). Perceivers' levels of PISE were assessed using the mean of six items measured on 7-point Likert-type scales (1 = *strongly disagree*, 7 = *strongly agree*). The items were adapted from previous research (Tong & Walther, 2015) and included, "I can affect people's emotions through my online messages" and "I find myself to be persuasive when using online chat," re-worded for phone in the other condition ($\alpha = .90$).

Demeanor valence. Perceivers rated their Targets' expected demeanor prior to interaction using 7-point semantic differential scales, which the researchers adapted from a previous study (Tong & Walther, 2015). Demeanor items included crabby/jolly, cranky/pleasant, and grumpy/perky. Pre-test $\alpha = .79$, post-test $\alpha = .85$.

Sociability. Perceivers completed assessed Targets' sociability (McCroskey, Holdridge, & Toomb, 1974) using seven-interval semantic differential scale items such as irritable/good-natured and unfriendly/friendly. Reliability was the same for both pre-interaction and post-discussion measures ($\alpha = .87$).

Extraversion. A 7-point semantic differential scale (McCroskey et al., 1974) measured Perceivers' assessments of their Targets' extraversion before the conversation ($\alpha = .68$) and again after it ($\alpha = .67$). Items included extraverted/introverted, talkative/silent, and energetic/tired.

Social attraction. Perceivers rated Targets' social attractiveness after the conversation using five 7-interval Likert-type scales (McCroskey & McCain, 1974). Items included, "I could have another friendly chat with this person" and "I think this person could be a friend of mine," among others ($\alpha = .79$).

Attributions. Although hypotheses concerned only two attributional foci, measures included items to explore the four types of attributions enumerated above. All of the attribution measures used 5-point Likert-type scales (1 = *strongly disagree*, 5 = *strongly agree*). Scales were adapted from those reported by Jiang et al. (2011) and other items from that research (L. C. Jiang, personal communication, March 20, 2012) as well as additional, original items. These additions helped to enhance reliability and allow for the development of a new measure of personalistic attributions (rather than relational attributions used by Jiang et al.).

Dispositional attribution involved five items from Jiang et al.'s (2011) research including, "My partner's behavior reflects who she or he is" and "The way my partner behaved was determined by his or her personal nature," $\alpha = .66$. Situational attribution involved only two items (after removing others in order to achieve acceptable reliability): "My partner's behavior was mostly shaped by the environment" and "My partner acted as she or he did because of the situation," $\alpha = .71$. The three-item self-attribution measure used in previous research—"My partner acted that way because of the way I

acted toward her,” “My partner’s behavior was mainly influenced by me,” and “My partner may behave differently in front of other people”—yielded inadequate reliability in the present administration ($\alpha = -.07$). The last of these items was dropped out of concern for its similarity to situational attributions (see Robins et al., 1996), and four original items took its place, including these: “My partner acted in the manner she or he did because that was what I wanted her to do,” “My partner acted that way because I made him/her feel that way,” “My partner acted that way because that’s how most people respond to me,” and “My partner acted that way because I changed the way she or he felt.” Final reliability was $\alpha = .90$.

Jiang et al.’s (2011) measure of interpersonal attribution involved three items which achieved $\alpha = .59$. This research originally planned to include the interpersonal attribution in addition to a new, personalistic attribution reflecting a Perceiver’s inference that the Target acted as she did because of her affection toward the Perceiver, and her affection alone, independent of the relationship. In order to assess the personalistic attribution, we developed seven original Likert-type items, including “My partner acted the way she did because she seemed to take to me,” “My partner acted that way because she was fond of me,” “My partner acted that way because she wanted to be friends with me,” and “My partner acted that way because of her his feelings in regard to me.” Because two of Jiang et al.’s three scale items for interpersonal attribution suggested possible personalistic focus reflecting the Target’s liking for the Perceiver (e.g., “My partner’s behavior was shaped by the chemistry between the two of us,” “The way my partner behaved was because the way we got along with each other”) rather than a clearly relationship-based resource (e.g., “Our unique relationship accounts for my partner’s behaviors”), factor analysis attempted to discern two distinct dimensions of these attributions. Several analytic approaches failed to distinguish two orthogonal factors. It appears that the scales designed for interpersonal and personalistic attributions constitute a single dimension for this particular context: It is plausible that the initial conversation among two previously unacquainted individuals makes it difficult for them to imagine the existence of a relationship as an attributional resource, and that a partner’s liking is more salient in a context such as this. The face validity of the items suggests that personalistic partner liking is the construct this measure reflects, and as a result, further analyses of these items are interpreted as personalistic attribution; no further consideration is made for interpersonal attributions from these data. The final scale included one of Jiang et al.’s interpersonal attribution items and five original items, $\alpha = .83$.

Coder ratings of participants’ social behavior. Three outside coders who were blind to the hypotheses and treatments (aside from media) rated Perceivers’ and Targets’ communication from the transcripts of the CMC sessions or from audio recordings of the voice sessions. Coders used the same scales to assess Perceivers’ and Targets’ observable behavior as the Perceivers in the study had used to assess Targets: extraversion and social attractiveness. Coders analyzed only a Perceiver’s or a Target’s part of the conversation in separate passes so that coders could rate each individual without contamination due to the behavior of the respective partners. Coder training used records

from terminated CMC and voice sessions that were not used in the final analysis. Coders rated these records independently then met with researchers to discuss intercoder reliability and items where they diverged in their judgments. Coders iterated this process until they reached $\alpha > .90$, after which they each rated all of the CMC transcripts and voice recordings. One coder's ratings were removed from the final analysis whose scores detracted from the reliability of some measures. The remaining two coders achieved .85 reliability on sociability and .88 on both extraversion and social attractiveness.

Results

A manipulation check assessed the malleability induction, that is, whether Perceivers whose induction indicated that their Targets had an unpleasant personality perceived those Targets' demeanors as less malleable than did Perceivers whose inductions indicated that their Targets were in a bad mood. A one-tailed *t*-test examined the effect of the mood/personality induction on Perceivers' stability/malleability assessment of Targets prior to their conversation. Results showed that the induction was successful, $t(110) = 3.64, p < .001, d = 0.69$. Targets described as being in a bad mood were apprehended as being less stable ($M = 3.65, SD = 0.79$) than were those ostensibly with an unpleasant personality ($M = 4.16, SD = 0.69$).

Hypothesis 1 proposed that participants perceive that they have a greater ability to influence someone else's affective state when using telephone communication than those using CMC. The PISE responses of voice Perceivers ($M = 4.85, SD = 0.96$) were significantly greater than those of CMC Perceivers ($M = 4.00, SD = 1.07$), $t(110) = 3.60, p < .001$ (one-tailed), $d = 0.84$, supporting the hypothesis and laying the groundwork for possible attribution differences due to the perceived differences in utility of the media.

Hypothesis 2 predicted that Perceivers with a negative mood expectation about their Targets behave more pleasantly than do Perceivers with a negative personality expectation. The mood versus personality variable was tested for effects on the coders' ratings of Perceivers' extraversion, sociability, and social attractiveness. Although behavioral disconfirmation was expected to obtain in both voice and CMC, an omnibus analysis included media and malleability factors in the analysis of variance (ANOVA) to detect unanticipated interaction effects (which did not occur). Results only partially supported the prediction. The hypothesized effect of malleability did not exert a main effect across the dependent variables, $F(1, 82) = 0.008$ for extraversion, $F(1, 82) = 1.06$ ($p = .31$) for sociability, and $F(1, 82) = 0.26$ for social attractiveness.

An unhypothesized main effect of channel emerged on sociability, $F(1, 82) = 4.90, p = .03, d = 0.66$, and social attractiveness, $F(1, 82) = 23.81, p < .001, d = 1.40$. The CMC perceivers appeared more sociable ($M = 6.17, SD = 0.66$) and socially attractive ($M = 6.05, SD = 0.84$) than the voice Perceivers did ($M = 5.60, SD = 1.03; M = 4.44, SD = 1.39$, resp.). A post hoc probe found that the predicted effect of malleability obtained only on social attractiveness among CMC Perceivers, $t(76) = 1.69, p = .048$ (one-tailed), $d = 0.35$, with mood Perceivers behaving more attractively ($M = 6.21, SD$

= 0.77) than personality Perceivers ($M = 5.90$, $SD = 0.88$). No effects of demeanor malleability obtained within the voice condition alone. Apparently, CMC Perceivers were generally more sociable and friendly than were voice Perceivers, with fluctuation within CMC due to expectations of a negative mood versus a negative personality.

Hypothesis 3 predicted that Targets would reciprocate the social behavior of Perceivers in a manner mirroring the anticipated effects of demeanor malleability on Perceivers' behaviors in Hypothesis 2. Given the inconsistent findings for Hypothesis 2, it became unlikely that Targets' behavior scores would conform to the originally hypothesized directions even if reciprocity occurred, since Perceivers' behavior did not array as predicted. An ANOVA test similar to that of Hypothesis 2, but focusing on the coders' ratings of the Targets' extraversion, sociability, and social attractiveness yielded no significant effects with regard to Hypothesis 3. However, examination of correlations between Perceivers' coded behaviors and Targets' coded behaviors provides some evidence of the kind of reciprocity that the original hypothesis predicted, but only in the CMC conditions. Male Perceivers' observed extraversion correlated with female Targets' extraversion, $r(78) = .48$, $p < .001$, $d = 1.09$; sociability, $r(78) = .32$, $p = .004$, $d = 0.68$; social attractiveness, $r(78) = .21$, $p = .062$, $d = 0.43$. In the voice conditions, no correlations approached significance. There appears to be more affective reciprocity in CMC than in voice communication. Looking across the results from Hypotheses 1, 2, and 3, it appears that, relative to participants using a voice connection, CMC Perceivers were more pleasant and more influential on their partners' pleasant responses, despite their significantly lower expectations that they could be. How CMC users interpret these dynamics remains a focal question.

Hypothesis 4 predicted that Perceivers who expect Targets' to have an unpleasant personality attribute Targets' behavior to their disposition more than Perceivers do who expect Targets' to have a bad mood. An ANOVA examined the potential effect of both malleability and medium on dispositional attributions. No significant interaction involving medium occurred, but neither did the hypothesized effect of demeanor malleability, $F(1, 108) = 0.20$. No effects obtained within just CMC or voice, either. The hypothesis is not supported.

Hypothesis 5 predicted that voice Perceivers who expect Targets to have an unpleasant mood attribute Targets' subsequent behavior to their own influence on the Targets, that is, to make more self-attributions, compared with Perceivers using CMC who had unpleasant mood or unpleasant personality expectations about their Targets, or Perceivers using voice with unpleasant personality expectations about Targets. A focused contrast analysis weighted conditions so that voice/mood was predicted to render stronger self-attribution scores (+3) than all other conditions (-1 for each). The results indicated support for this pattern, $t(108) = 1.81$, $p = .036$ (one-tailed), $d_{\text{contrast}} = 0.35$.² Voice Perceivers who expected a bad mood more strongly attributed their partners' responses to their own influence on the Targets ($M = 3.44$, $SD = 0.52$) than did voice/personality Perceivers ($M = 3.23$, $SD = 0.68$), CMC/mood Perceivers ($M = 3.25$, $SD = 0.61$), or CMC/personality Perceivers ($M = 2.92$, $SD = 0.55$). The hypothesis on self-attribution is supported.

Hypothesis 6 predicted that a personalistic attribution is more likely in CMC—Perceivers are more likely to think that their Targets responded to them because the

Targets liked them—when using CMC with a Target who was expected to have a bad mood, compared to Perceivers using CMC with unpleasant personality expectations or Perceivers using voice communication with unpleasant mood or unpleasant personality expectations. A contrast analysis tested this directional prediction, with a contrast weight of +3 assigned to the CMC/mood condition, and -1 assigned to each other condition. Results supported the hypothesis, $t(107) = 2.65$, $p = .005$ (one-tailed), $d_{\text{contrast}} = 0.52$. The mean personalistic attribution score was greatest among the CMC/mood Perceivers ($M = 2.58$, $SD = 0.73$) relative to CMC/personality ($M = 2.05$, $SD = 0.84$), voice/mood ($M = 2.00$, $SD = 0.78$), and voice/personality ($M = 2.36$, $SD = 0.92$).

The analysis of Hypothesis 7 tested whether the mood versus personality conditions and voice versus CMC communication led to differences in the Perceiver's final perceptions of the Target's demeanor. The Perceiver's perceptions were predicted to improve in the mood condition more so than in the personality condition due to the Perceiver's influence on the Target. A repeated-measures ANOVA examined the (between-subjects) effects of affective malleability and medium on (within-subjects) differences in pre-discussion ratings of demeanor valence and extraversion to post-discussion assessments on these variables. With regard to demeanor valence, there was a significant effect for the change between pre-discussion to post-discussion ratings, $F(1, 108) = 61.50$, $p < .001$, $d = 0.37$. This effect interacted with communication medium, however, $F(1, 108) = 35.95$, $p < .001$, $d = 1.65$. There were no interactions or main effects of affective malleability expectations. Inspection of the means suggested that the pre-chat/post-chat change was greater in the CMC condition ($M_{\text{pre-chat}} = 3.35$, $SD = 0.55$; $M_{\text{post-chat}} = 5.05$, $SD = 1.02$) than in the voice conditions ($M_{\text{pre-chat}} = 3.43$, $SD = 0.54$; $M_{\text{post-chat}} = 3.68$, $SD = 0.26$).

Similar results obtained on Perceivers' ratings of the Targets' extraversion. A repeated measures ANOVA on the measures of perceived extraversion yielded a significant change from pre-chat to post-chat perceptions, $F(1, 108) = 86.05$, $p < .001$, $d = 1.77$, and a pre-/post-chat by medium interaction effect, $F(1, 108) = 18.41$, $p < .001$, $d = 1.23$; affective malleability did not affect change in extraversion perceptions. Again, there appeared to be greater before-and-after change in CMC ($M_{\text{pre-chat}} = 3.08$, $SD = 0.61$; $M_{\text{post-chat}} = 4.29$, $SD = 0.68$) than in the voice conditions ($M_{\text{pre-chat}} = 3.13$, $SD = 0.57$; $M_{\text{post-chat}} = 3.57$, $SD = 0.38$).

Discussion

This study tested the chain of affective and attributional responses that ensue in CMC when one individual tries, behaviorally but not consciously, to elevate the affective demeanor of another. This experiment used a ruse to stimulate Perceivers' motivation to enthruse a Target partner, reinforcing what recent research (Tong & Walther, 2015) has documented with respect to behavioral disconfirmation effects in CMC: When an interactant encounters a conversation partner who may be temporarily unpleasant, that individual tries to cheer the partner up. This is a typical occurrence in conventional conversations, according to Ickes et al. (1982).

Atypical in the case of CMC are several aspects. First, communicators think that the CMC medium reduces their ability to influence another person's affect. This is a

common stereotype in both early and recent research on CMC (see, for example, Okdie, Guadagno, Bernieri, Geers, & Mclarney-Vesotski, 2011), and it apparently still suppresses CMC users' sense of influence efficacy, even though their online behavior clearly shows that the opposite is true at a behavioral, communicative level: Not only were CMC perceivers more communicatively pleasant to their partners than were voice perceivers (as emerged in the analysis of Hypothesis 2), but they also led their partners to reciprocate pleasantness more effectively (as seen in the Hypothesis 3 correlation results), despite thinking they were less able to do so (Hypothesis 1).

Second, most likely because they discount their own influence on others, CMC users must look elsewhere for an explanation of their partners' surprisingly pleasant behavior. Without themselves or their partners' disposition to credit for their partners' actions and with no reason to suspect that the technology-mediated situation can account for it (and, in contrast to Jiang et al.'s, 2011 assertions, without an established relationship between them to explain it), process of elimination appears to lead them to conclude that their partners acted nicely because the partners must have liked them. Voice communication generates somewhat different interpretations. Voice communicators are more likely to credit themselves for their partners' affective responses, and discount the real affective orientation of their partners.

These interpretations describe the data patterns with respect to the attributions among CMC users who expect their partners to be in a bad mood. Across both mood and personality expectancies, however, when their partners reciprocated their demeanor, CMC perceivers interpreted their partners' behavior less as the reciprocation that it really (empirically) was (compared to the attributions made by voice perceivers). Rather, CMC perceivers saw it as an overture.

The study used a behavioral (dis)confirmation framework to replicate and extended prior expectancy studies (Tong & Walther, 2014, 2015). Behavioral (dis)confirmation occurs when a Perceiver anticipates his interaction partner to have certain characteristics (e.g., a good or bad mood), behaves in accord with these expectations, and prompts the Target to *confirm* or *disconfirm* the expected behavior (i.e., to maintain or change their good or bad mood; Ickes et al., 1982; Snyder & Haugen, 1994). In the present study, as in other recent work, CMC also produced *perceptual* disconfirmation while voice communication did not. Perceptual disconfirmation occurred as CMC Perceivers viewed their partners as more pleasant following their conversation, whereas voice communicators did not.

In interpreting these findings, it is useful to recall that the Targets were not actually in bad moods nor did they have unpleasant personalities; they were naïve participants and their demeanor was probably not initially unfavorable. The personalistic attributions by CMC/mood Perceivers, such as the self-attributions by the voice/mood Perceivers, were of course completely false, at least initially; the Targets' behavior was less dour than expected because their moods were not, in actuality, systematically unpleasant. Those who think that their partners could somehow change, engage their partners in changing, especially in CMC where, ironically, they erroneously thought they would be less effective in doing so.

These findings have significant implications for a number of theoretical issues. First, they suggest that there is an attributional basis to behavioral, and especially perceptual disconfirmation effects. When one believes (as the voice/mood Perceivers appeared to do) that he changed his partner's affective behavior himself, that is, makes a self-attribution, he also does not recognize any improvement in his partner's demeanor between his pre-discussion expectancy and his post-discussion assessment of the partner, even though her behavior was probably not initially as bleak as he maintained it was. Behavioral disconfirmation without perceptual disconfirmation results from the self-attribution. For CMC/mood Perceivers, on the other hand, since they attribute a partner's terminal demeanor to the partner's liking for themselves, they see an affective/behavioral change from initial expectancies, and they believe that it emanates from the target. Both behavioral and perceptual disconfirmation follow the personalistic attribution. These findings not only extend our understanding of disconfirmation processes by including attributional elements, but they also reinforce the utility of attributional approaches to CMC which have made useful contributions to the recent CMC literature.

The findings also have implications for the hyperpersonal model of CMC. As noted earlier, one gap in the hyperpersonal model is that it needs greater specification of when hyperpersonal processes should be expected to arise, and the model may draw on other theories to help do so (see Walther, 2006). An underlying assumption driving the present work is that the attribution that a CMC partner likes someone, early in a conversation, even if it is mistaken, has the potential to drive positive affective reciprocal behavior of the type described in the model. Moreover, that the illusion of liking may result from a partner's relatively benign responses to a perceiver who is attempting to garner her favor suggests one mechanism by which individuals help to stimulate their own hyperpersonal affective inferences, stimulate their own pleasant interpersonal behaviors (quite possibly beyond their awareness), and instigate the pattern of reciprocal affection that describes hyperpersonal interaction online.

Acknowledgments

The authors are grateful to Stephanie Tom Tong, Crystal Jiang, and Natalya Bazarova for their conceptual and methodological advice, and to Aditi Paul, James Falin, and Ashley Attisha for data collection and coding assistance.

Authors' Note

A previous version of this research was presented at the annual meeting of the National Communication Association, Washington, D.C., 2013.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

Notes

1. References to Perceivers as “he” and to Targets as “she” are intentional, as the experiment assigned only males to the Perceiver role and only females to the Target role, the reason for which appears in the “Method” section.
2. Effect size d is used throughout this article, in order to simplify comparisons of results. The coefficient d_{contrast} represents a conversion of r_{contrast} (Furr, 2004) to d .

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