

# Interpersonal and Hyperpersonal Dimensions of Computer-Mediated Communication

Joseph B. Walther<sup>1</sup>, Brandon Van Der Heide<sup>2</sup>,  
Artemio Ramirez, Jr.<sup>3</sup>, Judee K. Burgoon<sup>4</sup>,  
and Jorge Peña<sup>5</sup>

<sup>1</sup>*Nanyang Technological University, Singapore*

<sup>2</sup>*Michigan State University, MI, USA*

<sup>3</sup>*University of South Florida, Tampa, FL, USA*

<sup>4</sup>*University of Arizona, Tucson, AZ, USA*

<sup>5</sup>*University of California, Davis, CA, USA*

The social information processing theory of computer-mediated communication (CMC) was the first of several theoretical models of interpersonal interaction online to explain how individuals and groups formed impressions and developed relational communication via text-based electronic communication. Prior to its introduction, the predominant theoretical approaches to CMC predicted that the relative lack of nonverbal cues in CMC compared with face-to-face (FtF) communication would reduce the socioemotional quality of communication online. The social information processing (SIP) theory, in particular, articulated assumptions about the CMC medium, the relationships between nonverbal and verbal cue systems, and users' adaptation to media that represented a significant departure from other prevalent models at the time it was introduced.

Premises of the social information processing theory became the basis for several models to follow, including the hyperpersonal model of CMC. Both approaches to CMC focus on message qualities and how the characteristics of the CMC channel (such as the lack of most nonverbal cues, and, at times, the asynchronous nature of messaging systems) interact with interpersonal goals and strategies, resulting in systematic patterns of interaction via mediated channels. They each involve a high degree of human agency and depict how users appropriate the channel and its technological characteristics to suit their communicative purposes. They depict CMC users as more or less creative and opportunistic rather than as passive adopters of a relatively restricted medium. This chapter reviews the development, status, and

future of the social information processing theory and hyperpersonal model of CMC, and their potential contributions to our knowledge about new media in interpersonal relations.

## **The Social Information Processing Theory of CMC**

To understand these models and their potential contributions fully, it is useful to consider the emergence of SIP in its historical theoretical context.

### The theoretical landscape prior to SIP

Although it would not be until the mid-1990s that the Internet was available to the general public, CMC started its adoption in a few professional, educational, and recreational venues in the late 1970s and 1980s. As it appeared in high-tech businesses and proprietary services like CompuServe and Prodigy, in universities and dial-up bulletin-board systems (see Rapaport, 1991), researchers, journalists, and early adopters began to ask how CMC might change communication and how its changes might affect the social processes to which it may be put (e.g., Hiltz & Turoff, 1978; Johansen, Vallee, & Spangler, 1979; Rheingold, 1993).

The new medium was text-based, rather than multimodal. That is, compared with FtF communication, and even to telephone conversations, there were no nonverbal cues accompanying the written messages in CMC. Early on, research considered this characteristic a likely culprit that would make CMC devoid of social and interpersonal richness. The SIP and hyperpersonal models would turn this concern on its head, so to speak, first by addressing how users overcome the lack of nonverbal cues in making their messages sufficiently personal over time, and later, by explaining the actual advantages that accompany the flexibility of communicating via language and only language.

Although CMC sent written messages across vast distances almost instantaneously, it also featured the ability to “store-and-forward” messages asynchronously. Most commonly seen in email, and now text messaging and social network systems, asynchronous communication means that one individual can post a message and it is retained in the CMC system until its intended reader(s) examine it at another time, at their convenience. This characteristic, too, departed from FtF and telephone messaging. Some observers suggested that asynchronous messaging would make it impossible for communicators to make coherent sense of a series of messages and responses (see, e.g., McGrath, 1990). The hyperpersonal model of CMC, in particular, would argue how asynchronous communication and the perceived control over message construction can actually be advantageous and facilitate more desirable messages and enhanced communicative control (Schouten, Valkenburg, & Peter, 2007).

When CMC was new and first being studied, then, much was expected, but much doubt about its interpersonal potential also accompanied the early theories and research about the new medium. Would CMC simply facilitate communication without any particular change, and obviate the need to schedule (or travel to) FtF

meetings (Rockart & DeLong, 1988; cf. Vallee et al., 1975)? Would communicating with others remotely, without nonverbal cues, dehumanize its users (see Orcutt & Anderson, 1977)?

To answer these and more middle-range questions about the effects of interactive media, researchers appropriated established theories from teleconferencing research and developed original theories focusing on CMC *per se* for the purpose of predicting and explaining the likely effects of online interaction, primarily in large and small groups. These positions, as it turned out, were consistent with many positions in nonverbal communication research. The earliest theoretical positions argued that since the vast majority of our emotional expressions relied on the exhibition and detection of nonverbally encoded messages, text-based messaging without nonverbal cues must therefore lack socioemotional expression. Some theorists went farther to suggest that CMC, without the warmth of natural human communication, would lead users to antagonism and hostility with one another. Empirical research, primarily experimental, seemed to support these predictions.

The assumptions and propositions of the “cues-filtered-out” approaches to CMC (see Culnan & Markus, 1987) have been summarized in numerous publications. Their essential position is that nonverbal cues facilitate a number of functions related to identifying who others are, what their individual personalities are, how they express emotion, and what their utterances mean. As though nonverbal cues have a unique capacity to accomplish these functions, the general argument of these approaches is that CMC, without nonverbal cues, is impoverished or is incapable of supporting these communicative functions (for review, see Walther, 2010). Small group interaction research long held that in order to be successful, groups need to support both task and socioemotional communication. Task communication is the facts, opinions, ideas, and arguments that group members need to surface in order to inform their decision making. Socioemotional messages convey charisma, humor, agreement, and interpersonal regard, and are also considered critical in order for groups to have effective and satisfying conversations. Research concerned itself with the question of whether and how well CMC could support both these aspects of small group interaction.

Empirical support for these positions often involved experiments comparing small groups communicating by CMC or FtF methods for a limited time, and content analysis of transcripts with which to compare verbal communication in both settings. Many such experiments appeared to support the cues-filtered-out perspective.

At about the same time as these theoretical and research-based interpretations of the effects of CMC appeared in the management, information systems, engineering, and psychology literature, stories of a quite different nature appeared, sometimes in academic outlets, and at other times in the popular press. Anecdotes described shy youngsters who found friends online, and remained online, who had never experienced the kinds of best friends as they did in cyberspace. Spontaneous romances arose via text, surprising their participants with emotional intensity, and appalling their friends. Case studies of high-tech firms showed that internal networks were being used as much for play as for work (Ord, 1989; Steinfield, 1986), for exchanging movie reviews as a hobby as much as distributing parking rules to employees. The cases did not fit the theories, and the experiments were at odds with the anecdotes.

Although anecdotal examples should not be definitive scientifically, they seemed to reflect the experiences of a growing number of CMC users, while the theories and research seemed to map on to the suspicions about the medium among those who had not engrossed in it as much.

One other departure from the cues-filtered-out approach appeared in a theory of managerial media selection. It was originally referred to, also, as the social information processing theory of CMC. The term, in this case, came from work by Salancik and Pfeffer (1978), who had argued that managers' perceptions of organizational artifacts are influenced by the social information one's coworkers generate in regard to them. That is, managers perceive things due in part to the communication reflecting others' perceptions of those same things. Fulk, Steinfield, and colleagues (1987) applied this approach to organizational members' perception of the richness of email. They argued, and later demonstrated empirically, that workers viewed email's expressiveness based not only on their own apprehension of email's capacity, and not only due to its actual features, but to a significant extent their perceptions were affected by the opinions and email-oriented behaviors of other individuals who shared strong sociometric ties to one another. Fulk and colleagues soon renamed their model a *social influence theory* of CMC (e.g., Fulk, Schmitz, & Steinfield, 1990).

### Social information processing

The other social information processing theory of CMC, introduced in the 1992 *Communication Research* article by Walther, was the first formal theory among several that would soon emerge to suggest predictions and explanations about the relational potential of online communication alternative to the cues-filtered-out approach. The introduction of the theory attempted several objectives: to reflect a fundamental but relatively obscure set of paradigmatic assumptions about the relationship of verbal and nonverbal message cues and the relevance of this relationship for the translation of affective expression from physical to verbal behavior when physical behavior is obviated; to be able to account both for the impersonal communication findings of numerous laboratory studies and to account for the anecdotal accounts of relationship development online, through identification of specific factors with the potential to moderate the effect of the medium on its users' communication; and to articulate new theoretical propositions capable of generating testable hypotheses and a new view of CMC. SIP specified a new set of assumptions about what people do when they communicate using different channels, and how they respond to a severe reduction of nonverbal cues by CMC.

The theory seeks to explain how, with time, CMC users are able to accrue impressions of and relations with others online that achieve the level of development that is expected through offline communication. It was developed in light of certain philosophies of communication that are useful in understanding the positions laid out by SIP.

#### *A functional approach to communication*

Social information processing theory arose among a community of researchers who espoused a functional approach to communication research. This approach offered some fundamental assumptions about communication and how to approach its

analysis. It focused on how communicators undertook the processes of social influence, impression formation and management, information processing, and relational communication, across settings and contexts. In rigorous research on nonverbal communication, rather than focus on what certain behaviors or cues meant per se or what specific cues were the sole conveyors of specific effects, the functional approach subscribed to an alternative idea: Any of a number of nonverbal behaviors could contribute to the communication of different communicative functions depending on the activation of other nonverbal and verbal cues. Moreover, any communicative message could potentially be conveyed through alternative combinations of cues, and that, typically, the accomplishment of communication functions involved the combination of verbal as well as nonverbal cues. This latter notion does not suggest that verbal cues denote content while nonverbal cues connote affect (cf. Watzlawick, Beavin, & Jackson, 1967). Rather, message elements from different cue systems may be duplicative, complementary, contradictory, or otherwise intertwined with one another (Burgoon, Buller, & Woodall, 1989). As Walther and Ramirez (2009, p. 289) would later reflect, “No single nonverbal behavior, or specific set of behaviors, had a monopoly on the conveyance of social meanings. To study communication was to study the fluid encoding and decoding of complex interactions of appearance, proximity, touch, and other cues, while communicating verbally, and as relational contexts varied.”

Several prior studies were particularly informative in translating these precepts into the domain of CMC. One was a study by Donohue, Diez, Stahle, and Burgoon (1983) that reported a clever experiment examining whether communicators whose personal space is encroached, who cannot physically retreat, respond to the incursion through psychologically distancing verbal behavior. Indeed, subjects who were crowded by a confederate reduced the *verbal immediacy* of their speech. This dynamic demonstrated a functional interchangeability among nonverbal and verbal cue systems for the management of interpersonal immediacy. When nonverbal responses were constrained, communicators accommodated through language variations to accomplish what would otherwise have been done through physical behaviors.

With this background, the cues-filtered-out notions of CMC—which suggested that nonverbal cues held a monopoly on the expression and detection of identity, affect, and meaning—were antithetical to the functional approach to communication generally and the notion of verbal/nonverbal interchangeability. Others had speculated that CMC users might get used to the medium and learn to improve its emotional expressiveness with experience (Hiltz & Turoff, 1981; see also Carlson & Zmud, 1994). A functional approach suggested that communicators already had the skills to write expressively when a FtF or phone conversation were unavailable, and that this skill should readily port to electronic writing.

From this perspective, the name of the SIP theory suggests that the study of communication generally, and CMC in particular, should focus on how individuals process social information (as well as instrumental, or task-related information) using whatever cue systems they have with which to do so. The use of the term social information processing was consistent with research in cognitive social psychology that focused on cues that lead to variations in person perception (for review, see Wegner & Vallacher, 1977).

### *Assumptions and propositions*

The SIP theory specifies several premises that explain how CMC can affect impressions and relational communication. Although it explicitly recognizes that CMC is devoid of the physical nonverbal cues that accompany FtF communication, it does not recognize that this provides an incapacity or a motivational deterrent to develop impressions. Its first assumption was that communicators seek to develop relationships with others no matter what medium they use. It proposes that communicators use whatever cues they have available to them in order to generate and apprehend interpersonal (as well as instrumental) messages. Therefore, when they cannot employ nonverbal cues to do so, individuals may adapt the encoding and decoding of social information (i.e., personal, socioemotional, or relational messages) into text. Although many readers have interpreted this argument to refer to emoticons (typed-out smiles, frowns, and other faces; Derks, Bos, & von Grumbkow, 2007), the theory focuses primarily on language content and style as more important conduits of interpersonal information. A later study established that, when both emoticons and verbal messages appeared in email, emoticons accounted for less variance in inferences than did language variations (Walther & D'Addario, 2001). But the first argument of SIP theory is that individuals translate their social message encoding and decoding into verbal behavior when, as in CMC, nonverbal cues are unavailable, and that in doing so they can achieve as much impression development and relational depth as do people communicating FtF.

The second major argument is that, despite CMC's capacity to convey personal and socioemotional content, the exchange of information among communicators operates at a different rate than FtF communication. That is, because the language channel carries fewer messages per instant than FtF utterances (since FtF utterances are accompanied by a variety of vocalic, kinesic, proxemic, and appearance cues), CMC users' ability to achieve levels of impression and relational definition equivalent to FtF interaction are expected to require more exchanges. Generally this will require more time, especially when CMC is asynchronous, but the difference should pertain to real-time CMC as well. CMC users need time to compensate for the slower rate in order to accumulate sufficient information with which to construct cognitive models of partners and to emit and receive messages with which to negotiate relational status and definition.

### *Empirical support*

Empirical tests of SIP initially examined the second proposition, looking at the interaction effect of time and medium on impression development (Walther, 1993) and relational communication (Walther & Burgoon, 1992). Small groups communicated via asynchronous CMC addressing three decision-making tasks over 6 weeks, or via FtF meetings three times, 2 weeks apart. The impression development results were most clear: After the first task, FtF participants had strongly developed impressions of their partners, whereas CMC participants' impressions were significantly less developed. The results after one time interval only perfectly replicated the cues-filtered-out prediction. But after the second interval, CMC participants' impressions continued to develop, and after the third, there was no difference in impression development

between the CMC and FtF conditions. Scores on relational communication measures generally reflected greater positivity over time, although the pattern of differences and similarities in relative levels of each by medium was less clearly pronounced.

These patterns have been replicated in a number of studies by other researchers. It is noteworthy that some of these investigations used synchronous CMC chat systems repeatedly over several days (rather than asynchronous CMC over a period of weeks) and achieved results that strongly supported SIP theory's predictions of development and improvement of impressions and relations over time (Hian, Chuan, Trevor, & Detenber, 2004; Wilson, Straus, & McEvily, 2006). A meta-analysis of published studies existing at the time indicated that CMC experiments that had restricted users' time online averaged less positive socioemotional communication than did studies that did not restrict CMC use (Walther, Anderson, & Park, 1994).

Research has also addressed the first major theoretical contention of SIP, the translation of affective messages from nonverbal to verbal behavior. Ironically, by the time the first direct empirical examination of this proposition was first submitted for publication review in 2004, the premises of SIP theory had diffused so strongly that one journal reviewer argued that the mechanism examined in this study had already been well established. (As a later discussion will review, this theoretical premise is now strongly accepted in some quarters, although it remains strongly challenged elsewhere.) This study, which was the first of its kind, compared the verbiage that dyad members exchanged in an experimental CMC chat setting to the verbiage, kinesic cues, and vocalic cues generated in FtF dyads, in which one dyad member had been prompted by researchers to behave in a strongly friendly or unfriendly manner (Walther, Loh, & Granka, 2005). Researchers did not instruct these ad hoc confederates how to signal positive or negative effect, but to do so as the participants wished. Researchers then analyzed recordings of the FtF confederates in three ways: For verbal behavior, they transcribed the conversations and subjected them to coding content-level strategies; for kinesic cues, they had coders rate the participant's movement by watching videorecordings without any sound; and for vocalic analyses, coders listed to recordings using a low-pass content filtering systems that obfuscated the verbiage while playing the vocal tones, pitch variety, pause/phonation sequences, and other vocal behaviors aside from the verbal content. Likewise, coders analyzed the verbal transcripts from the CMC chats.

Results indicated that CMC transcripts presented as strong a degree of affective difference as did FtF recordings. In the CMC conditions, various verbal cues emerged, ratings on which accounted for over 90% of the variance in perceived liking and immediacy. Some of these behaviors included the manner in which individuals expressed disagreement with partners, either by praising partners' ideas and agreeing with them, or using more bluntly dismissive and disagreeable phrases. In FtF settings, unsurprisingly, vocalic cues conveyed the greatest proportion of variance in affective expression, followed by kinesic behaviors; although some verbal behaviors differed between the liking and disliking conditions in the FtF settings, the verbal behaviors as a whole did not account for a significant degree of emotional expression when compared statistically with the groups of vocalic and kinesic cues. However, the verbal behaviors in CMC accounted for as much variance in affective expression as did the multimodal

cues in the FtF setting. Despite its centrality to the empirical support for SIP theory, there have been few replications of this research (cf. Hancock, Gee, Ciaccio, & Lin, 2008; Hancock, Landrigan, & Silver, 2007).

Another important link in the theoretical chain of SIP pertains to self-disclosure, a form of messaging with a long history of association with the development of impressions and the development of relationships. Independent researchers more or less simultaneously found similar results with respect to the impact of online disclosure relative to FtF. In CMC, disclosures and personal questions comprise greater proportions of the total utterances in dyadic conversations among strangers than they do in comparable FtF discussion (Joinson, 2001; Tidwell & Walther, 2002). Moreover, CMC users' disclosures and questions are more intimate than those of FtF counterparts.

### Continuing impact of SIP

The tenets of SIP appear to have had a meaningful impact on the study of CMC and the field of communication more generally. Although the SIP theory originally emerged before the World Wide Web, when CMC systems were entirely text-based, and although its currency has been questioned in an era of multimodal social media, a variety of factors indicate that its potency as a model of CMC remains strong. Text-based messaging continues to increase on a variety of platforms. Although teens' use of Instant Messaging may or may not be as popular as it once was, teens in particular are among the most frequent users of texting via smartphones (Lenhart, 2012). The Radicati Group (2011), a corporate technology company, estimates that a typical corporate employee sends or receives 105 email messages per day. To the extent that SIP is connected to the use of text-based CMC, its utility persists.

The SIP approach has generated numerous studies extending its focus on language, its use, and its particular potency in online discourse. Hancock (2004) established that communicators are more explicit in their expression of irony online than in FtF encounters. LaRose and Whitten (2000) used the framework to examine instructors' immediacy in online courses, and O'Sullivan, Hunt, and Lippert (2004) examined verbal immediacy as a code that encouraged affiliation via educational websites.

The foundational studies about online disclosure have influenced a variety of new lines of research, including its frequency and accuracy in the use of online date-finding systems (Gibbs, Ellison, & Heino, 2006) and the role of CMC in the development of one's psychological sense of self among adolescents. In this latter regard, a series of studies by Valkenburg, Peter, and colleagues (for review, see Valkenburg & Peter, 2009) has established that teens' online disclosure can lead to improvements in their psychosocial development, in that, presuming that teens disclose more online than offline, their friends offer more reinforcement for the concepts of self that adolescents explore in online chat discussions. Their level of benefit is related to the control they believe they have in using these systems, and the feedback they get from their real-life friends via online channels.

New extensions to SIP continue to emerge. Recent work suggests that different message contents in CMC vary in the distinctiveness and relevance they offer readers,



depending on the context and goal of those readers. As a result, readers place different weight on contextually distinct pieces of social information. In one study, participants formed strong extraversion or intelligence judgments of a target only when the context propelled them to try to identify message senders in terms of these specific personality characteristics. When the same cues were distinctive but not contextually relevant (or vice versa), they impacted impression judgments significantly less (Van Der Heide, 2009). Future research on information-seeking goals and the differential value of social information cues has the potential to replace SIP's original assumptions that CMC users garner impressions holistically and inductively. Research on contextual influences on the interpretation of social and relational information in CMC has already established that readers interpret text-based self-disclosures exchanged via Facebook as being more intimate when they are transmitted privately rather than shared publicly (Bazarova, 2012). Turning to the social information value of photographic information (see Westerman, Van Der Heide, Klein, & Walther, 2008), D'Angelo and Van Der Heide (in press) demonstrated that observers evaluate physicians who post a professional photograph of themselves on Facebook as significantly more credible than those who post the same photograph on a WebMD.com profile. The researchers concluded that when social information is normative (and not particularly distinctive) it has less impact on social judgments than social information that stands out.

### Challenges to SIP

The impact that SIP has had has not gone without challenges. One line of contest arose from disagreements about CMC's potential to convey personal information rather than group-based impressions. Game studies presents an opportunity for SIP research that has been relatively underexplored to date. Another challenge has come, and continues to surface, from the perspective that text-based CMC is communicationally impoverished compared with multimodal alternatives.

A strong critique of SIP appeared in a number of papers advancing an alternative approach to CMC, the social identity model of deindividuation effects, or SIDE model (for review, see Spears, Lea, & Postmes, 2000). Authors connected with the SIDE model have suggested that data-analytic results from SIP-related research does not support SIP (when indeed a pure SIP effect was overridden in an disordinal interaction), to more extreme criticism dismissing the entire enterprise of online interpersonal relations as asystematic, charging that the study of interpersonal communication online was misguided and had set back the study of CMC (Postmes & Baym, 2005). The SIDE model formerly argued, as an alternative, that when CMC users communicate with others who they do not see, they experience deindividuation, or a suspension of individual identity. That is, CMC users who communicate without seeing each other and without visually witnessing each other's individual appearance characteristics experience *visual anonymity*. As a result, according to SIDE theory, an overall sense of interpersonal anonymity pervades CMC use. In this individual identity vacuum, when a group to which such a communicator belongs becomes salient to the CMC user due to contextual clues (such as the name of the communication site, the purpose to which communication takes place, due to unconscious cueing, or due to instructions from an

experimenter, CMC users gravitate toward the group identity and relate to other CMC conversants on that basis. Rather than relate interpersonally, that is, as individuals, CMC users relate on the basis of in-group/out-group dynamics. According to SIDE, members' attraction to the group supersedes what otherwise might have been, as SIP would argue, attraction to other individual group members. A good deal of evidence supports the SIDE model (for review, see Walther & Carr, 2010).

Careful readers will detect that a basic disagreement between the SIDE and SIP approach deals with anonymity. Anonymity is a central construct in SIDE theory, but it is more or less dismissed in SIP. The SIDE model relies on a causal leap from the existence of visual anonymity of CMC to a sense of depersonalization. On the other hand, SIP theory admits there is visual anonymity online, but holds that CMC users get to know each other inter-individually despite the lack of visual cues. Moreover, SIP acknowledges that there are a number of other individual identifiers in much CMC, such as unique usernames, or self-descriptions, not to mention style and language differences, that readily mark individuals as different from one another online, and become especially salient over time.

In their later works, SIDE theorists have come to agree that CMC users do get to know each other online, over time, as individual people. Specifically, some SIDE advocates—major critics of SIP among them—have embraced the potential necessity of the development of interpersonal impressions, identifications, and relationships online over time and the exchange of text-based messages as part of a process of developing a group identity in CMC groups (Postmes, Spears, Lee, & Novak, 2005).

But rather than suggesting that the two theories are converging, it is most likely the case that each theory has its place depending on the boundary conditions imposed by the nature of the setting, and especially the time frame within which online communication may take place. A recent article suggested that the study of CMC was badly in need of more consideration of theoretical boundaries, so that, rather than dismiss one theory as superior to others, we may identify circumstances in which one theory simply does not apply and another may (Walther, 2009). For instance, in settings where CMC users have time-constrained (or no actual) interaction with one another, anticipate no future interaction, and have been prompted to seek common group characteristics, there is every reason SIDE dynamics may result, whereas the full impact of SIP cannot be expected to obtain. Likewise, when CMC users encounter comments left by other users who are similar to them in some obvious respect, yet are visually anonymous, and do not interact, SIDE adheres (e.g., Walther, DeAndrea, Kim, & Anthony, 2010). Where CMC users experience long-term associations, however, interpersonal attraction tends to increase over time even when CMC groups are prompted to look for group identification (Rogers & Lea, 2004).

The SIP approach has had minimal impact on the study of online games, but more could be done in this area. One significant contribution has been in the work of Peña and Hancock (2006), who established that unacquainted gamers playing battle games exchange a considerable proportion of socioemotional communication. Klimmt and Hartmann (2008) provide an extensive review of the interpersonal dynamics at various levels of relationships within online games, many of which involve a great deal of social interaction. For instance, not only do unacquainted gamers become acquainted, they also join clans or

other social groupings in which players develop a sense of one another's personal and sociotechnical capabilities, and come to trust and regard one another. As game studies tend to be cross-sectional rather than longitudinal, the opportunities to examine SIP's precepts in these environments have been minimal, but can occur in future research.

It is also the case that SIP continues to be challenged by researchers who maintain that more bandwidth (i.e., more communication channels) is superior to text-based CMC. These positions do not generally offer rationales that differ substantively from the cues-filtered-out positions that were popular in the 1980s. Empirical studies accompanying such challenges generally find that telephone communication, FtF interaction, or avatars generate more positive socioemotional responses than does text-based CMC (e.g., Epley & Kruger, 2005; Okdie, Guadagno, Bernieri, Geers, & McLaren-Vesotski, 2011). However, rather than accept that SIP is simply incorrect, it is important to note (as most such research efforts do not) that in no case have these studies included the boundary conditions that SIP requires. That is, no such study has included long-term interaction or even the anticipation of future interaction. In a sense, they corroborate SIP's contention that, when CMC users operate in a time-limited context with no anticipation of future interaction, their behavior is expected (by SIP) to reflect the impersonal qualities that are also predicted by the cues-filtered-out positions. Only when such parameters are relaxed is SIP expected to adhere, and when those conditions are met, SIP appears to be relatively accurate.

One recent study sought to estimate the role that alternative channels in social network sites such as Facebook or the Dutch Hyves system offered users in terms of uncertainty reduction about another person: Antheunis, Valkenburg, and Peter (2010) argued that social network sites provide an abundance of asynchronous and unintrusive biographical, pictorial, and sociometric information about other people, and that such forms of social information are more accessible than interactive, text-based CMC should offer. Their results indicated, however, the interactive communication remained the information-seeking strategy that reduced uncertainty the most strongly, despite the appeal and use of other modalities. Despite the massive popularity of Facebook, its most frequently used features remain text-based messaging in the form of wall postings, status updates, commenting, and private messaging using synchronous or asynchronous modes. Despite the perseverance of plain-text CMC, the prevalence of multimodal CMC compel us to ask what happens to disclosure and other relational messages when they occur within interfaces with additional modalities. If pictures and videos and such do not replace interactive exchanges, do they provide interactive exchange an interpersonal running start, so to speak? That is, do conversations go deeper, faster, when they are grounded against a profile and/or photos? These are important questions for future research.

## **Hyperpersonal CMC**

The aspect of SIP that has become a foundation point for other conceptual models of CMC is its assumption that CMC users encode and decode language cues in the service of impressions and relational goals, and that different levels of effort accompany

different media's capacity to transact communication that supports these goals. The hyperpersonal model of CMC (Walther, 1996) extends the first of these assumptions into processes in which impressions and relational states exceed rather than simply meet what is expected to occur in parallel, FtF settings. The hyperpersonal model proposes a set of four concurrent routines that, together, seek to explain CMC's support of relationships with relatively greater desirability and intimacy than occur in offline counterparts.

### Receivers

When receiving messages from others in CMC, an individual may tend to exaggerate perceptions of the message sender. Absent the physical and other cues that FtF encounters provide, rather than fail to form an impression, receivers fill in the blanks with regard to missing information. This often takes the form of idealization if the initial clues about another person are favorable. The original hyperpersonal model drew on SIDE theory (Lea & Spears, 1991) in formulating how receivers make over-attributions of similarity when communicating under conditions of visual anonymity, if contextual cues suggest that a conversational partner shares some salient social identity with the receiver. A revision of the hyperpersonal model has broadened its view to consider that receivers' exaggerated impressions may derive from stereotyped perceptions of others personality characteristics or person prototypes (Walther, 2006).

A recent study shows how simple these kinds of overattributions based on language can be (Spottswood, Walther, Holmstrom, & Ellison, 2013). An experiment presented sample postings from an online social support system, where one individual ostensibly complained about being stood up for a date, and a variety of responses followed. These responses' language varied in the degree of person-centeredness they exhibited, that is the degree they reflected sympathy and acknowledged the original poster's feelings rather than giving advice or telling him what to do or think. In offline social support, user-centered messages are more normatively associated with females, and they are not accepted by receivers when male support-givers offer them. In this study, in some cases, person-centered messages were accompanied by usernames for which the gender was indeterminate (e.g., b0k\_choi and zy523). Indeed, when the message form was more person-centered, observers attributed the sender's sex to be female, whereas when the messages appeared in low person-centered form, observers interpreted them as coming from male online helpers.

### Senders

Text-based CMC facilitates selective self-presentation. Online users can transmit only those cues they desire, and need not reveal physical, environmental, or undesirable speech behaviors. By constructing messages that portray themselves in desirable ways, they contribute to the idealized perceptions receivers develop of them.

One of the most interesting applications of this component of the hyperpersonal model appears in studies of deceptive self-presentation, particularly in online dating systems. Toma, Hancock, and Ellison (2008) described how facets of CMC facilitate

deception by explicit reference to the hyperpersonal model. They argue that the development of online dating profiles takes place using asynchronous communication tools, allowing users to plan and write their online self-presentations more deliberately than they would FtF. Moreover, as Toma and Hancock (2011) suggested, online profiles are editable, allowing users to rewrite and revise their profiles to make them more appealing, a notion that leads to the next aspect of the hyperpersonal model.

### Channel

The third dimension of the hyperpersonal model is characteristics of the channel and how CMC as a medium contributes to the deliberate construction of favorable online messages. One part of the channel factor focuses on the mechanics of the CMC interface, suggesting that users exploit the ability to take time to contemplate and construct messages mindfully, as alluded to in the dating/deception research cited earlier. In many CMC applications (especially asynchronous systems), users may take some time to create optimally desirable messages without interfering with conversational flow, unlike the effects of response latencies in FtF interaction. The hyperpersonal model further suggests that CMC users capitalize on the ability to edit, delete, and rewrite messages, in order for messages to reflect intended effects, before sending them. The introduction of the model further suggested that CMC users may redirect cognitive resources into enhancing one's messages; without the need to pay attention to the physical behaviors of one's conversational partner or oneself, or to the ambient elements where one is physically located when communicating (in contrast to these demands on attention in FtF conversations), CMC users can focus their attention on message construction to a greater extent than they could FtF. Research found that CMC users in an asynchronous discussion system who believed they were writing to an attractive partner exhibited more editing (backspaces, deletions, replacements) composing their messages than did those who believed they were writing to less attractive partners (Walther, 2007). The degree of editing also corresponded to the degree of relational affection that outside coders found in the recorded messages.

A recent study extended the idea of CMC users planning their messages for optimal affective impact by examining how CMC users avail themselves of web-based resources in order to plan and devise the composition of their exchanges (Walther, Van Der Heide, Tong, Carr, & Atkin, 2010). In this study, pairs of strangers were told they would be discussing what the best hamburger restaurant was in the area. One of the partners was either instructed to try and get the other partner to like him or her, or to get the partner to dislike him or her. More often in the dislike than like condition, the CMC user looked up the partner's favorite hamburger before the chat started in order to find (bad) things to say about it during the discussion. These users expressed more disagreements and negative opinions during the chat as well. Users who had been asked to be more friendly were more spontaneously agreeable.

One side effect of these discussion strategies is that the friendly and unfriendly chat users came to experience a shift in their own attitudes as a result of the discussion. This finding is consistent with theories of counter-attitudinal advocacy, cognitive dissonance, and self-perception, and so the exact psychological mechanism underlying

the effect warrants greater study. Nevertheless, it is apparent that, in order to get a partner to like oneself in CMC, people express their interpersonal affinity by means of sharing or conflicting attitudes about some target of the discussion. In FtF conversations, we expect liking and disliking to be expressed using vocalic and kinesic cues primarily, signaling one's affective orientation to one's partner quite directly. In CMC, without nonverbal cues to reflect affect, users focus on something else more visible—their stated opinions and their consistency with their partners'. But doing so not only affected their attitudes about the topic. It also affected their perceptions of their partners, in that disagreeable participants came to think of their partners as less physically desirable and socially attractive than did those who tried to get their partners to like them. These kinds of distortions seem unlikely to take place in FtF interaction, but that notion awaits empirical verification.

### Feedback

The hyperpersonal model of CMC suggested that the enhancements provided by idealization, selective self-presentation, and channel effects reciprocally influenced matters, forming a feedback system by which the CMC intensified and magnified the dynamics each component of the model contributes. That is, when a receiver comes upon a selectively self-presented message and idealizes its source, that individual may respond in such a way that reciprocates and reinforces the partially modified personae, reproducing, enhancing, and potentially exaggerating them. The manner by which the dynamics of these reciprocated expectations modify the participant's character may reflect the process of behavioral confirmation.

Behavioral confirmation (Snyder, Tanke, & Berscheid, 1977) describes how one individual's impression about a target partner leads the first individual to behave toward the target, and how that individual's behavior actually alters the responses of the target person. The original behavioral confirmation study involved male subjects who were shown photos priming them to believe that their upcoming female telephone interaction partners were physically attractive or unattractive (even though the actual partners were not really those depicted in the photos but were randomly selected female subjects). Not only did this expectation affect the male's involvement, it affected the female's personality-related responses as well, as revealed in outside raters' evaluations of the females' personalities based on audio-recordings of their conversations. The hyperpersonal model argued idealized impressions of online partners lead CMC users to respond based on that biased impression, and that those responses influence the partner's behavior toward the expected impression. In this way feedback intensifies hyperpersonal effect, bringing together receiver idealization, sender selective self-presentation, and manipulation of channel.

Recent research has added to our understanding of how these cycles affect the development of hyperpersonal relations. An experiment involving dyads who were about to chat via CMC, where, in one condition, experimenters led one dyad member to expect that his partner was in an unpleasant mood; although, the experimenter, bad moods are malleable. Subjects in another condition were told that their partner had an unpleasant personality, which—the experimenter reminded the subject—is

pretty permanent. In actuality the partners were naive subjects whose moods and personalities were normal. When the chat was over, subjects who expected bad moods found that their partners had changed (Walther Kashian, Jang, & Shin, in press). Similar studies show definitively that these changes are due to the conversational efforts of the expecting subjects (Tong & Walther, in press). Yet, in this study, the subjects attributed the partner's mood elevations not to their own efforts, but to the conclusion that their partners liked them personally; and this effect did not occur among subjects who believed their partners to have an unpleasant personality. Obviously the subject's attributions were false. The targets behaved nicely because the subjects coaxed them into doing so. But the (misplaced) attribution of personal liking becomes the (false) basis for mutual attraction in such settings. It does not take much, and we are relatively unaware of the things we ourselves do, to affect others' moods online, and rather than recognize our subtle interpersonal influence on others, we think others really like us.

Future research will continue to push these models forward as they deal with the benefits and constraints of new media forms such as social media and similar platforms. When does an online interaction lead CMC users to "Google" their partner, and does the text in historical archives tell a user enough about a partner, or is continued interaction required? Does access to a group partner's picture on Facebook satisfy the desire for impression formation, or does it give CMC users a head start for conversations that can then probe deeper and reveal more about the participants, perhaps in less time than before the advent of online photos and "about me" sections of Facebook? How much does one learn about friends of friends online through their postings to each other's status updates, and how much must they interact directly with one another? New media platforms seem to encourage more SIP and hyperpersonal questions for future study, rather than fewer of them.

## Conclusion

At the National Communication Association's 2012 conference, a panel discussed the contributions of SIP theory to communication research in general, in light of its 20th year after publication. This chapter concludes with a review of some of these qualities.

It is an unusual theory in that it specifies its assumptions explicitly, which offers researchers a clear view with which to argue about its premises and its logic.

It is a theory with an explicitly process view of communication, with its emphasis on time and its longitudinal perspective on change.

It reinforced the notion of cue substitutability, in which nonverbal and verbal cues may comprise equivalent forms of communication. In doing so, it was one of few theories to emphasize a functional rather than structural view of nonverbal communication.

Its considerations of cues, rate, and time reflect the principle of equifinality, akin to a systems theory perspective on communication, in which various different combinations and interactions among system attributes routes lead to similar end-states.

It connected the independent principle of interactivity into a theoretical framework.

CMC today is a whirlwind of applications and tools that operate on our desktops, laptops, and hand-held devices. Researchers are beginning to recognize that contemporary social interactions are not conducted through one medium or another but often through a variety of channels. Research has yet to conceptualize what this means for people. Even those who urge researchers to take a “multimodal perspective” have not offered methods by which to do so. At the same time, the social goals that individuals and groups undertake may exert considerable influence over what people do online and how they do it. The SIP and hyperpersonal models assume that social goals are undeterred by interactive media, and to study CMC is to study the way people pursue these goals using new channels that present challenges as well as opportunities to the enhancement of social information-based activities. Advancing technology makes it easier to connect, have fun, and stay in touch. By making some communications easier, they reinforce that other communications require more effort, but the SIP and hyperpersonal perspective suggest that there is a payoff for the extra effort that some of these communication technologies require. Communication was never completely easy and it has not always been done FtF. Letters and phone calls were the mainstays of communication in close relationships in the past, and as these technologies diffused so did concerns over their depersonalizing ill-effects. Just as one form led to love letters and another led to all-night banter, new technologies transform but do not ultimately impede relationships. To study CMC from the SIP and hyperpersonal perspective is to observe the latest in these transformations.

## References

- Antheunis, M. L., Valkenburg, P. M., & Peter, J. (2010). Getting acquainted through social network sites: Testing a model of online uncertainty reduction and social attraction. *Computers in Human Behavior*, 26, 100–109.
- Bazarova, N. N. (2012). Public intimacy: Disclosure interpretation and social judgments on Facebook. *Journal of Communication*, 62, 815–832.
- Burgoon, J. K., Buller, D. B., & Woodall, W. G. (1989). *Nonverbal communication: The unspoken dialogue*. New York: Harper & Row.
- Carlson, J. R., & Zmud, R. W. (1994). Channel expansion theory: A dynamic view of media and information richness perceptions. In D. P. Moore (Ed.), *Academy of management: Best papers proceedings 1994* (pp. 280–284). Madison, WI: Omnipress.
- Culnan, M. J., & Markus, M. L. (1987). Information technologies. In F. M. Jablin, L. L. Putnam, K. H. Roberts, & L. W. Porter (Eds.), *Handbook of organizational communication: An interdisciplinary perspective* (pp. 420–443). Newbury Park, CA: Sage.
- D’Angelo, J. D., & Van Der Heide, B. (in press). The formation of physician impressions in online communities: Negativity, positivity, and non-normativity effects. *Communication Research*.
- Derks, D., Bos, A. E. R., & von Grumbkow, J. (2007). Emoticons and social interaction on the Internet: The importance of social context. *Computers in Human Behavior*, 23, 842–849.



- Donohue, W. A., Diez, M. E., Stahle, R., & Burgoon, J. K. (1983, May). *The effects of distance violations on verbal immediacy: An exploration*. Paper presented at the annual meeting of the International Communication Association, Dallas, TX.
- Epley, N., & Kruger, J. (2005). What you type isn't what they read: The perseverance of stereotypes and expectancies over email. *Journal of Experimental Social Psychology, 41*, 414–422.
- Fulk, J., Schmitz, J., & Steinfield, C. W. (1990). A social influence model of technology use. In J. Fulk & C. Steinfield (Eds.), *Organizations and communication technology* (pp. 117–140). Newbury Park, CA: Sage.
- Fulk, J., Steinfield, C. W., Schmitz, J., & Power, J. G. (1987). A social information processing model of media use in organizations. *Communication Research, 14*, 529–552.
- Gibbs, J. L., Ellison, N. B., & Heino, R. D. (2006). Self-presentation in online personals: The role of anticipated future interaction, self-disclosure, and perceived success in Internet dating. *Communication Research, 33*, 1–26.
- Hancock, J. T. (2004). Verbal irony use in face-to-face and computer-mediated conversations. *Journal of Language and Social Psychology, 23*, 447–463.
- Hancock, J. T., Gee, K., Ciaccio, K., & Lin, J. M.-H. (2008). I'm sad you're sad: Emotional contagion in CMC. In B. Begole & D. W. McDonald (Eds.), *Proceedings of the 2008 ACM conference on computer supported work* (pp. 295–298). New York, NY: ACM.
- Hancock, J. T., Landrigan, C., & Silver, C. (2007). Expressing emotion in text-based communication. In M. B. Rosson & D. Gilmore (Eds.), *Proceedings of the SIGCHI conference on human factors in computing systems (CHI 2007)* (pp. 929–932). New York, NY: ACM.
- Hian, L. B., Chuan, S. L., Trevor, T. M. K., & Detenber, B. H. (2004). Getting to know you: Exploring the development of relational intimacy in computer-mediated communication. *Journal of Computer-Mediated Communication, 9*(3). Retrieved from <http://onlinelibrary.wiley.com/doi/10.1111/j.1083-6101.2004.tb00290.x/abstract>
- Hiltz, S. R., & Turoff, M. (1978). *The network nation: Human communication via computer*. Reading, MA: Addison-Wesley.
- Hiltz, S. R., & Turoff, M. (1981). The evolution of user behavior in a computerized conferencing system. *Communications of the ACM, 24*, 739–762.
- Johansen, R., Vallee, J., & Spangler, K. (1979). *Electronic meetings: Technical alternatives and social choices*. Reading, MA: Addison-Wesley.
- Joinson, A. N. (2001). Self-disclosure in computer-mediated communication: The role of self-awareness and visual anonymity. *European Journal of Social Psychology, 31*, 177–192.
- Klimmt, C., & Hartmann, T. (2008). Mediated interpersonal communication in multiplayer video games: Implications for entertainment and relationship management. In E. A. Konijn, S. Utz, M. Tanis, & S. B. Barnes (Eds.), *Mediated interpersonal communication* (pp. 309–330). New York, NY: Taylor & Francis/Routledge
- LaRose, R., & Whitten, P. (2000). Re-thinking instructional immediacy for web courses: A social cognitive exploration. *Communication Education, 49*, 1–19.
- Lea, M., & Spears, R. (1991). Computer-mediated communication, de-individuation and group decision-making. *International Journal of Man-Machine Studies, 34*, 283–301.
- Lenhart, A. (2012). *Teens, smartphone, & texting*. Retrieved from [http://www.pewinternet.org/~media/Files/Reports/2012/PIP\\_Teens\\_Smartphones\\_and\\_Texting.pdf](http://www.pewinternet.org/~media/Files/Reports/2012/PIP_Teens_Smartphones_and_Texting.pdf)
- McGrath, J. E. (1990). Time matters in groups. In J. Galegher, R. E. Kraut, & C. Egidio (Eds.), *Intellectual teamwork: Social and technical foundations of cooperative work* (pp. 23–61). Hillsdale, NJ: Erlbaum.

- Okdie, B. M., Guadagno, R. E., Bernieri, F. J., Geers, A. J., & Mclarney-Vesotski, A. R. (2011). Getting to know you: Face-to-face vs. online interactions. *Computers in Human Behavior*, *27*, 153–159.
- Orcutt, J. D., & Anderson, R. E. (1977). Social interaction, dehumanization, and the “computerized other.” *Sociology and Social Research*, *61*, 380–397.
- Ord, J. G. (1989). Who’s joking? The information system at play. *Interacting with Computers*, *1*, 118–128.
- O’Sullivan, P. B., Hunt, S. K., & Lippert, L. R. (2004). Mediated immediacy: A language of affiliation in a technological age. *Journal of Language and Social Psychology*, *23*, 464–490.
- Peña, J., & Hancock, J. T. (2006). An analysis of socioemotional and task-oriented communication in an online multiplayer video game. *Communication Research*, *33*, 92–109.
- Postmes, T., & Baym, N. (2005). Intergroup dimensions of the Internet. In J. Harwood & H. Giles (Eds.) *Intergroup communication: Multiple perspectives* (pp. 213–238). New York, NY: Peter Lang.
- Postmes, T., Spears, R., Lee, T., & Novak, R. (2005). Individuality and social influence in groups: Inductive and deductive routes to group identity. *Journal of Personality and Social Psychology*, *89*, 747–763.
- Radicati Group, Inc. (2011). *Email statistics report, 2011–2015*. Retrieved from <http://www.radicati.com/wp/wp-content/uploads/2011/05/Email-Statistics-Report-2011-2015-Executive-Summary.pdf>
- Rapaport, M. (1991). *Computer mediated communications: Bulletin boards, computer conferencing, electronic mail, information retrieval*. New York, NY: Wiley.
- Rheingold, H. (1993). *The virtual community: Homesteading on the electronic frontier*. Reading, MA: Addison-Wesley.
- Rockart, J. F., & DeLong, D. W. (1988). *Executive support systems: The emergence of top management computer use*. Homewood, IL: Dow Jones-Irwin.
- Rogers, P., & Lea, M. (2004). Cohesion in online groups. In K. Morgan, C. A. Brebbia, J. Sanchez, & A. Voiskounsky (Eds.) *Human perspectives in the Internet society: Culture, psychology and gender* (pp. 115–124). Southampton, UK: WIT Press.
- Salancik, G. R., & Pfeffer, J. (1978). A social information approach to job attitudes and task design. *Administrative Science Quarterly*, *23*, 224–252.
- Schouten, A. P., Valkenburg, P. M., & Peter, J. (2007). Precursors and underlying processes of adolescents’ online self-disclosure: Developing and testing an “Internet-attribute-perception” model. *Media Psychology*, *10*, 292–315.
- Snyder, M., Tanke, E. D. & Berscheid, E. (1977). Social perception and interpersonal behavior: On the self-fulfilling nature of social stereotypes. *Journal of Experimental Social Psychology*, *35*, 656–666.
- Spears, R., Lea, M., & Postmes, T. (2000). Onside: Purview, problems and prospects. In T. Postmes, M. Lea, R. Spears, & S. D. Reicher (Eds.). *SIDE issues centre stage: Recent developments in studies of de-individuation in groups* (pp. 1–16). Amsterdam, The Netherlands: KNAW.
- Spottswood, E. L., Walther, J. B., Holmstrom, A. R., & Ellison, N. E. (2013). Person-centered emotional support and gender attributions in computer-mediated communication. *Human Communication Research*, *39*, 295–316.
- Steinfeld, C. W. (1986). Computer-mediated communication in an organizational setting: Explaining task-related and socioemotional uses. In M. L. McLaughlin (Ed.), *Communication yearbook 9* (pp. 777–804). Newbury Park, CA: Sage.
- Tidwell, L. C., & Walther, J. B. (2002). Computer-mediated communication effects on disclosure, impressions, and interpersonal evaluations: Getting to know one another a bit at a time. *Human Communication Research*, *28*, 317–348.

- Toma, C. L., & Hancock, J. T. (2011). A new twist on love's labor: Self-presentation in online dating profiles. In K. B. Wright & L. M. Webb (Eds.), *Computer-mediated communication in personal relationships* (pp. 41–55). New York, NY: Peter Lang.
- Toma, C. L., Hancock, J. T., & Ellison, N. B. (2008). Separating fact from fiction: An examination of deceptive self-presentation in online dating profiles. *Personality and Social Psychology Bulletin*, *34*, 1023–1036. doi:10.1177/0146167208318067
- Tong, S. T., & Walther, J. B. (in press). The confirmation and disconfirmation of expectancies in computer-mediated communication. *Communication Research*.
- Valkenburg, P. M., & Peter, J. (2009). Social consequences of the Internet for adolescents: A decade of research. *Current Directions in Psychological Science*, *15*, 1–5.
- Vallee, J., Johansen, R., Lipinski, H., Spangler, K., Wilson, T., & Hardy, A. (1975). *Group communication through computers, volume 3: Pragmatics and dynamics*. Menlo Park, CA: Institute for the Future.
- Van Der Heide, B. (2009, June). *Computer-mediated impression formation: A test of the sticky-cues model using Facebook*. Paper presented at the annual meeting of the International Communication Association, Singapore.
- Walther, J. B. (1992). Interpersonal effects in computer-mediated interaction: A relational perspective. *Communication Research*, *19*, 52–90.
- Walther, J. B. (1993). Impression development in computer-mediated interaction. *Western Journal of Communication*, *57*, 381–398.
- Walther, J. B. (1996). Computer-mediated communication: Impersonal, interpersonal, and hyperpersonal interaction. *Communication Research*, *23*, 3–43.
- Walther, J. B. (2006). Nonverbal dynamics in computer-mediated communication, or: (and the net: ( 's with you,: ) and you: ) alone. In V. Manusov & M. L. Patterson (Eds.), *Handbook of nonverbal communication* (pp. 461–479). Thousand Oaks, CA: Sage.
- Walther, J. B. (2007). Selective self-presentation in computer-mediated communication: Hyperpersonal dimensions of technology, language, and cognition. *Computers in Human Behavior*, *23*, 2538–2557.
- Walther, J. B. (2009). Theories, boundaries, and all of the above. *Journal of Computer-Mediated Communication*, *14*, 748–752. doi:10.1111/j.1083-6101.2009.01466.x
- Walther, J. B. (2010). Computer-mediated communication. In C. R. Berger, M. E. Roloff, & D. R. Roskos-Ewoldsen (Eds.), *Handbook of communication science* (2nd ed., pp. 489–505). Los Angeles, CA: Sage.
- Walther, J. B., Anderson, J. F., & Park, D. (1994). Interpersonal effects in computer-mediated interaction: A meta-analysis of social and anti-social communication. *Communication Research*, *21*, 460–487.
- Walther, J. B., & Burgoon, J. K. (1992). Relational communication in computer-mediated interaction. *Human Communication Research*, *19*, 50–88.
- Walther, J. B., & Carr, C. T. (2010). Internet interaction and intergroup dynamics: Problems and solutions in computer-mediated communication. In H. Giles, S. Reid, & J. Harwood (Eds.), *The dynamics of intergroup communication* (pp. 209–220). New York, NY: Peter Lang.
- Walther, J. B., & D'Addario, K. P. (2001). The impacts of emoticons on message interpretation in computer-mediated communication. *Social Science Computer Review*, *19*, 323–345.
- Walther, J. B., DeAndrea, D., Kim, J., & Anthony, J. (2010). The influence of online comments on perceptions of anti-marijuana public service announcements on YouTube. *Human Communication Research*, *36*, 469–492. doi:10.1111/j.1468-2958.2010.01384.x
- Walther, J. B., Kashian, N., Jang, J.-W., & Shin, S. Y. (in press). Overattribution of liking in computer-mediated communication: Partners infer the results of their own influence as their partners' affection. *Communication Research*.

- Walther, J. B., Loh, T., & Granka, L. (2005). Let me count the ways: The interchange of verbal and nonverbal cues in computer-mediated and FtF affinity. *Journal of Language and Social Psychology, 24*, 36–65.
- Walther, J. B., & Ramirez, A., Jr. (2009). New technologies and new directions in online relating. In S. W. Smith & S. R. Wilson (Eds.), *New directions in interpersonal communication research* (pp. 264–284). Newbury Park, CA: Sage.
- Walther, J. B., Van Der Heide, B., Tong, S. T., Carr, C. T., & Atkin, C. K. (2010). The effects of interpersonal goals on inadvertent intrapersonal influence in computer-mediated communication. *Human Communication Research, 36*, 323–347.
- Watzlawick, P., Beavin, J. H., & Jackson, D. D. (1967). *Pragmatics of human communication: A study of interactional patterns, pathologies, and paradoxes*. New York, NY: Norton.
- Wegner, D. M. & Vallacher, R. R. (1977). *Implicit psychology: An introduction to social cognition*. New York, NY: Oxford University Press.
- Westerman, D. K., Van Der Heide, B., Klein, K. A., & Walther, J. B. (2008). How do people really seek information about others? Information seeking across Internet and traditional communication sources. *Journal of Computer-Mediated Communication, 13*, 751–767. doi:10.1111/j.1083-6101.2008.00418.x
- Wilson, J. M., Straus, S. G., & McEvily, W. J. (2006). All in due time: The development of trust in computer-mediated and FtF groups. *Organizational Behavior and Human Decision Processes, 99*, 16–33.