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THE DEVELOPMENT OF A COUPLE OBSERVATIONAL CODING SYSTEM FOR COMPUTER-MEDIATED COMMUNICATION

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THE DEVELOPMENT OF A COUPLE OBSERVATIONAL CODING SYSTEM FOR COMPUTER-MEDIATED COMMUNICATION

DISSERTATION

A dissertation submitted in partial fulfillment of the
requirements for the degree of Doctor of Philosophy in the
College of Agriculture, Food and Environment
at the University of Kentucky

By
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2020

ABSTRACT OF DISSERTATION

THE DEVELOPMENT OF A COUPLE OBSERVATIONAL CODING SYSTEM FOR COMPUTER-MEDIATED COMMUNICATION

Many romantic couples integrate text and computer-mediated communication (CMC) into their relationship dynamics, both for general relationship maintenance and for complex dynamics such as problem solving and conflict. Romantic couple dynamics are interactional, dynamic, and sequenced in nature, and a common method for studying interactions of this nature is observational analyses. However, no behavioral or observational coding systems exist that are able to capture text-based transactional couple communication. The main purpose of this dissertation was to develop an observational coding system that can be used to assess sequenced computer-mediated, text-based communication that takes place between romantic partners. This process included assessing couples' text communication to determine how verbal and non-verbal communication behaviors are enacted in CMC, modifying an observational coding system, and establishing reliability and validity of the revised coding system.

Secondary data was utilized, including 48 logs of romantic couples engaging in problem-solving discussions using online chatting for 15 minutes, where a log of the conversation was saved for future research purposes. For this dissertation, the researcher evaluated the dynamics in these logs to determine if behaviors and sequences were similar to basic romantic relationship dynamics that are present in face-to-face (FtF) couples' dynamics. The researcher determined that the dynamics between CMC and FtF were similar, and that modifying a couple observational coding system would be appropriate.

The Interaction Dimensions Coding System was selected for use and modification for this study, and the training manual and codebook were updated to integrate CMC examples. Multiple avenues of assessing face validity were also pursued and feedback from the coding team and original authors of a couple coding system were integrated into the modified coding system. The modified coding system, IDCS-CMC, was used to code 43 text-based chat logs. A team of 4 coders was trained on the coding system, where they provided ratings from 1 to 9 on each partner for different dimensions of communication behaviors that were observed and they also rated each couple on 5 dyadic categories of relationship functioning. Interrater reliability was assessed throughout the training and independent coding process using the intraclass correlation coefficient. Results indicate

that good or excellent interrater reliability was established for the individual dimensions of Positive Affect, Negative Affect, Problem Solving, Support/Validation, Denial, Conflict, and Communication Skills and for the dyadic codes of Positive Escalation, Negative Escalation, Commitment, Satisfaction, and Stability. There were only two dimensions that resulted in fair or poor interrater reliability, which were Dominance and Withdrawal, both of which warrant additional study in how these dynamics are enacted in and coded in CMC. Overall, the IDCS-CMC demonstrated good interrater reliability, and construct validity was established for the coding system in a variety of ways. Construct validity was established by assessing face, content, and convergent validity. Face validity was established by eliciting feedback on the IDCS-CMC from the coding team as well as one of the authors of the system used to inform the development of the IDCS-CMC. Content validity was established by assessing the degree to which the couples in the chat logs engaged in conversations of a similar nature in their real lives, and also by determining the degree to which the couple participants followed instructions to focus on a problem-solving topic during the chats. Convergent validity was assessed by comparing the IDCS-CMC dimensions and positive and negative communication composite scores to a measure of relationship satisfaction.

Overall, this dissertation details the process by which a couple observational coding system was developed and tested, and puts forth a methodological tool that can be used to better assess transactional use of CMC by romantic couples by researchers as well as practitioners and therapists.

KEYWORDS: Romantic Relationships, Computer-Mediated Communication, Electronic Communication, Couple Observational Research, Observational Coding Systems, Conflict Resolution

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THE DEVELOPMENT OF A COUPLE OBSERVATIONAL CODING SYSTEM FOR COMPUTER-MEDIATED COMMUNICATION

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Chapter 1. Introduction

Intimate interpersonal communication that takes place between partners in a romantic relationship is complex and based on a mixture of verbal and nonverbal communication behaviors (Gottman, Markman, & Notarius, 1977; Vangelisti, 2011). One of the most sophisticated and highly researched methods of studying couples' communication is behavioral and observational analysis, where couples are asked to engage in discussions on various topics and researchers observe and make determinations on or rate individuals' or couples' communication behaviors (Baucom, Leo, Adamo, Georgiou, & Baucom, 2017; Gottman & Notarius, 2000, 2002; Heyman, 2001; Kerig & Baucom, 2004; Margolin et al., 1998). The protocols and methodological underpinnings of these observational studies have been exclusively developed and conducted based on couples interacting in person, face-to-face (FtF). However, individuals commonly communicate with their romantic partners using computers, cellphones, and other technology where verbal and nonverbal cues take different forms due to the unique qualities of text-based channels (Houser, Fleuriet, & Estrada, 2012; Johnson, Haigh, Becker, Craig, & Wigley, 2008; Laliker & Lannutti, 2014; M. K. Rabby & Walther, 2003; Ramirez & Broneck, 2003; Sidelinger, Ayash, Godorhazy, & Tibbles, 2008; Stafford, Kline, & Dimmick, 1999; Tong & Walther, 2010).

Given that observational analysis is conducted based on observing in-person interaction, it is then of concern how observational methodologies can be adapted to communication that takes place in whole or in part online, where communication is being navigated using text or technology-based communication cues. Observational analysis is also an important methodological tool that plays a significant role in advancing the understanding of couple and family dynamics (Bakeman & Gottman, 1997; Kerig &

Baucom, 2004; Margolin et al., 1998). It is then necessary to consider that the current literature on couples' communication and dynamics may not fully capture modern day couples' communication, if dynamics and processes that are being mediated by technology are not being considered and included in these theoretical paradigms, methodological tools, and the scholarly generalizations that follow. FtF and computer-mediated communication (CMC) have a variety of differences in how communication is translated inside of these channels, and these differences, in terms of how observational analyses are conducted, must be explored. In addition, there are currently no observational measures or tools tailored to collect and analyze transactional or sequential relationship processes in a text-based channel. It is imperative that research design and methodology account for relationship dynamics that take place in a CMC context, given the ubiquitous nature of text-based communication in romantic relationships.

Observing and assessing how communication dynamics play out in CMC, specifically conflict and problem solving, will be the main focus of this project. These dynamics have been shown to be predictive of relationship stability over time (Gottman, 1993; Gottman et al., 1977; Gottman & Notarius, 2000, 2002). In addition, a review of observational research from the 1990s suggests that the quality of these observable interactions is also related to romantic partners' well-being and the well-being of their children (Gottman & Notarius, 2000). Thus, the focus on problem solving and conflict dynamics is a worthy and essential point of entry for this inquiry.

The main contribution of this dissertation includes putting forth an observational coding system for couples' CMC. Specifically, this will include (a) assessing couples' text communication to determine how unique communication behaviors are enacted in

the channel beyond cues that are included in an established observational coding system; (b) identifying examples of verbal and nonverbal behaviors in CMC chat logs, including exploring the degree to which text communication aligns with categories and dimensions of communication identified in an established observational coding scheme; (c) modifying an observational coding system manual, including updated coding protocols that are inclusive of CMC cues, examples, and scoring guidelines; and (d) making efforts to establish reliability and validity of the revised coding system.

The second chapter of this dissertation will provide an overview and history of CMC; of the basic mechanics of the communication process; of the adaptive communication behaviors that take place in CMC, including theoretical foundations; and of couple observational coding systems. The third chapter will discuss the methodology used across multiple phases of this project. The fourth chapter will detail the results, including discussing the observational coding system modification process, providing an overview of the CMC specific dimensions and examples added, and the revised coding system, and will present efforts to establish reliability and validity. The fifth chapter will include a discussion of the findings, limitations of the study, and implications for future research.

Chapter 2. Review of Literature

This chapter will present an overview of the research on CMC and an explanation of the basic communication process and theories relevant to the adaptation of humans to CMC. It will also present arguments for a conceptualization of couples' use of CMC and the need for modified methodological tools to capture the dynamics that play out in text-based channels.

Overview

The use of technology for interpersonal interaction has become an important aspect of modern day relationships. The invention of the mobile phone set off a gradual integration of technology into the day-to-day lives of humans such that the use of computers, cell phones, and the Internet now plays a pivotal role in the navigation of basic tasks and life experiences. A recent report estimated that the majority of both men (84%) and women (79%) in the United States report owning a smartphone, and about 30% of U.S. adults say they are online almost constantly (Vogels & Anderson, 2020).

The relationship between humans and technology is continuously expanding and evolving and can shape human behaviors and relationships in profound ways. Not only is the impact of technology on relationships, communities, and societies often not wholly understood by technology users, but researchers and scholars also frequently lack comprehensive understanding of the consequences.

Different forms and channels of technology can be used for communication in a variety of ways, ranging from cell phone voice calls and video conferencing to online chatting, social networking sites, text messaging, and video messaging. The use of technology for communication has been referred to in various ways in empirical

literature, including electronic communication, CMC, telecommunication, e-communication, online communication, multimedia communications, and information and communications technology. All terms refer to the use of technology for connecting with or communicating with others in some way. CMC is the term most widely used to describe these technology-based communication phenomena across social science disciplines (Kiesler, Zubrow, & Moses, 1985) and including interpersonal communication and family and couple research (Coyne, Padilla-Walker, & Howard, 2013; Derks, Bos, & von Grumbkow, 2008; Goby, 2011; Matheson & Zanna, 1988, 1990; Rabby & Walther, 2003; Tom Tong & Walther, 2010). CMC refers to communication that is translated into a channel that is then delivered through technology-based means, which indicates that the communication is in some way being mediated by a computer. The originator of a CMC message could be using a personal computer, mobile phone, or other device that can send and receive communication.

The specific channels of CMC are varied and may include text messaging (e.g., short message service, iMessage), email, use of social media networks (e.g., Facebook, Twitter), online chat applications (e.g., instant messenger, Google Hangouts, Snapchat), video or audio messaging, websites, or real-time voice and video conferencing (e.g., FaceTime, Skype). For the purposes of this project, only communication that is mediated by computers and text-based in nature or textually conveyed will be considered, which narrows the focus to text messaging, email, and online chatting or messaging. Text-only communication eliminates traditional nonverbal cues and is slower in pacing than FtF, resulting in distinct differences in communication processes across the two channels (Walther, 1996).

In addition to being specific about the type of technology platform being used, it is also important to be specific about the function that technology serves or the type or category of use of the technology. In an effort to understand the different functions and impact of technology use on relationships, I conceptualized interpersonal technology use to fall into three discrete categories: general, indirect relationship maintenance, and direct transactional.

The first category is *general use* of technology, where the function is for entertainment, online tasks, or getting one's individual needs met in some way using technology or the Internet. General use can have an impact on relationships if general use interferes with connection and communication in a relationship (Leggett & Rossouw, 2014; Vogels & Anderson, 2020). The distraction or interruption in relationships caused by general use of technology has been coined as "technoference" (McDaniel & Coyne, 2016). Examples of general use may be playing video games, reading the news, consuming online pornography, or reading blogs (Vogels & Anderson, 2020). The term "phubbing" refers to the specific act of paying attention to one's cell phone instead of in-person social companions (Chotpitayasunondh & Douglas, 2016; Vanden Abeele, Hendrickson, Pollmann, & Ling, 2019).

When assessing the impact of technology on relationships, many researchers have focused on general use. One study reports that of those in romantic relationships, 51% reported that their partner was distracted by technology when they spent time together, and 40% reported feeling bothered by the amount of time their partner spends on their cell phone (Vogels & Anderson, 2020). The general use of technology can be considered problematic and detrimental to a relationship when it causes interference in life and

relationships and can also move into a category in which it is considered pathological and starts affecting the user's ability to function in life (McDaniel & Coyne, 2016).

The second category encompasses *indirect relationship maintenance use*, which includes an individual engaging in behaviors that maintain, navigate, or affect the relationship dynamic or status in an indirect way. Indirect maintenance use could include an individual posting a picture of their partner on a social networking site or checking for updates on their partner's social media account to stay up to date on their partner's day (Vogels & Anderson, 2020). Indirect maintenance could also include interpersonal electronic surveillance, such as looking at the activity on a partner's cell phone or logging into a partner's email account to read their emails (Hertlein & van Dyck, 2020). Coordinating one's day and social circle can also be considered indirect maintenance, as well as sharing an online calendar or using a group email thread that both partners are on to make plans for an upcoming double date.

The third category consists of *direct transactional use*, where technology is used for the specific purpose of sending and receiving messages directly between the two people in the relationship where the interaction is enacted in a back and forth, sequenced manner. The communication is synchronous to some degree and more closely mimics the dynamics of communication that exists in FtF communication. Relationship maintenance behaviors can also fall into this category, given the direct communication that takes place between partners is an effort to navigate and maintain the relationship. The first two categories of technology use, general use and indirect use, have a definite ability to impact the functioning of relationships; however, the fundamentals of relationships are built in a dance of direct, transactional communication between partners, including

expressing affection, sharing thoughts and emotions, self-disclosure, problem-solving, and conflict.

Computer-mediated transactional couples' communication will be the primary focus of this dissertation. In the following sections, a brief chronological history of communication models will be presented, and the components of both linear and transactional communication models will be discussed.

Communication Model

This section will begin by outlining the basic mechanics of the communication process and exploring the ways in which communicating in a text-based channel may influence one's experience of the interpersonal communication process.

Basic Mechanics of Communication

In understanding the differences that exist between communicating in FtF and CMC, it is important to understand the basic mechanics or dance steps of interpersonal communication. The communication process consists of sending and receiving messages in a variety of contexts. These may include in person, over the phone, letter writing, print magazines or newspapers, radio or television broadcastings, CMC, or any other type of interaction where a message is sent and received. Interpersonal communication inherently consists of interactional communication, defined as the linkage process between senders and receivers of messages (Sereno & Mortensen, 1970).

The field of communication, which coalesced as a distinct field of study in the 1940s, made efforts to define core subject matter and adopt a common vocabulary of organizing terms (Delia, 1987). Foundational researchers in the field including Smith, Lasswell, and Casey (1946) and Schramm (1948) began this process of attempting to

define the "basic communication process": If *who* says *what*, through what *channels* (media) of communication, to *whom*, what will be the *results*, and how can we *measure* what is said and its results? Such a linear-effect perspective was utilized as the field's foundational framework.

The Mathematical Theory of Communication, authored by Shannon and Weaver (1949), was the first official communication process model that was widely used and disseminated in the communication field. This model was based on the mathematical coding and decoding of messages and placed importance on the source and the destination, as well as the message and the channel on which the message is transmitted. Shannon and Weaver (1949) explain that the source is the individual speaking, writing, drawing, or gesturing, and the message can be in the form of ink on paper, sound waves in the air, or any other signal capable of being meaningfully interpreted. The destination is the individual listening, watching, or reading. This model, based on mathematics, fails however to take into account processes that may take place when humans themselves are sending and receiving messages, such as context and interpretation. Humans do not communicate messages with precision, nor do they have codebooks to perfectly interpret all messages.

Schramm (1954) introduced a model that integrated the human factors of communication, including the key component of how messages are interpreted, in that the source encodes a message by taking information and translating it into a message form that is then transmitted to the destination. A coding and decoding process takes place between the source and the receiver where translation of intention and interpretation takes place. These interrelated and at times simultaneous processes include perception or

decoding, cognition or interpretation, and response or encoding (Sereno & Mortensen, 1970).

While the historical models provided a foundation for the study of communication interpersonal communication processes, the present study uses a transactional and continuous processes perspective more consistent with the couples' communication processes focused on this project. These approaches include forward moving and circular or self-informing processes, which were originally based in the transactional model of communication (Barnlund, 1970). A full review of these models or other social or interpersonal communication models is beyond the scope of this manuscript, but the basic assumptions and premises that social and interpersonal communication processes are dynamic, multidimensional, and involve interlinking processes between two communicators adequately supports the purpose and aims of this project, including justifying a closer examination of the use of CMC in romantic relationships.

Similarities and Differences between FtF and CMC

FtF and CMC function in similar ways based on the general communication process, with many aspects of the communication process being innate to both channels. There are a variety of other aspects to FtF and CMC environments that dictate changes or variations in basic processes. Two primary differences exist between communication that takes place in FtF or CMC. The first relates to the process by which information is translated, decoded, and responded to by the sender and receiver. In CMC, the channel selected for use by those communicating dictates how much and what type of information can be sent, referred to as channel capacity. The second main difference relates to the pacing or speed by which information can be sent and received.

In the following sections, channel, process, and verbal and nonverbal information as they relate to general communication as well as CMC will be discussed. The potential impact of these differences on interpersonal communication will also be discussed and framed in both theoretical and empirical literature.

Channel and process. The sections below will provide details on communication components of speed, feedback, and the transactional nature of interpersonal communication.

Speed. As was stated earlier, CMC consists of translating intention of the message into text, transmitting through a computer-mediated channel, reading of the message by the receiver, and then decoding or interpreting information. The process of speaking out loud is inherently faster than writing or typing, and hearing spoken words is faster than reading. CMC simply does not allow for as quick or as synchronous of communication as FtF does. That does not indicate that the use of the FtF channel always results in faster paced communication, merely that it has the potential to be faster. The speed by which messages are sent and received on a channel impacts a variety of aspects in the communication process.

Feedback. Feedback is the part of the communication process where the encoder (or sender) receives information on how his or her information is being interpreted or decoded by the receiver. This is essential in correcting or re-coding a message in an attempt to have the receiver correctly interpret the meaning of the message. Feedback can also be conceptualized in terms of positive or negative feedback, in that positive feedback confirms the existing message and negative feedback elicits change (Watzlawick, 1967, p. 32).

The speed of transmission may also affect the related communication process of redundancy, which refers to the process of a sender either repeating a message or saying the message in different ways, perhaps to clarify meaning. The time between message transmissions is also related to the concepts of space and participation. Space refers to the amount of time allotted for receivers to comprehend the message. The physical distance between users and the necessity of translating messages into text may result in CMC providing more space in the communication process than FtF, thus resulting in slower feedback loops. The concept of participation refers to the level and sense of interaction between sender and receiver. It is important to note that pacing, participation, and feedback are influenced by the channel being used but, beyond basic constraints, are ultimately controlled and experienced by those communicating. For example, when using CMC, someone can respond with their own message or provide feedback as quickly or as slowly as they are motivated or able to do so.

Interpersonal Communication

Interpersonal communication**,** which consists of the exchange of broad and varied types of information and dynamics between two or more people, is an essential and inevitable part of the human experience (Sereno & Mortensen, 1970; Webb, 1975). In interpersonal communication, participation in communication typically takes place in a transactional fashion, where both participants are simultaneously coding and sending information and receiving and decoding information (Barnlund, 1970; Fisher & Adams, 1994). This creates a more complex process of information exchange where multiple processes are playing out at once. Thus, interpersonal communication and interpersonal relationship processes are complex, transactional, and reciprocal processes that require

intentional effort and attention in order to ensure relational health and stability (Barnlund, 1970; Webb, 1975).

The channel, or the environment in which communication is transmitted, works like a bridge, connecting source, and receiver. Thus far in this discussion, the channel has referred to the environment, such as FtF or CMC. Different channels of communication also exist, however, within the message itself. Just as the nature of the environments of communication have an impact on the basics of the communication process, the FtF or CMC environment also affects the types of channels or dimensions that can be included within a message.

Messages consist of two primary types of channels or information. Watzlawick (1967) states that every communication has both content and relationship components. Content refers to messages that are delivered in the form of words or language. Report refers to messages that are delivered outside of the channel of language, which can encompass a wide range of factors that reflect the relationship between those communicating. These relationship-based communication cues can take on a variety of forms, but one common channel is through nonverbal messages. Being able to both translate verbal and nonverbal information as well as interpret verbal and nonverbal messages is essential in order for communication to be successful.

Burgoon, Buller, and Woodall (1989) state that nonverbal behaviors are omnipresent and multifunctional and that people rely heavily on nonverbal cues to express themselves and to interpret the communicative activity of others. There are many different types of nonverbal behavior, which also typically operate in some combination with one another. A complete discussion of the types and functions of nonverbal

communication is beyond the scope of this paper; however, it is necessary to detail to some degree various types of nonverbal communication to understand how they present in FtF and CMC channels.

The main categories of relevance are performance codes, proxemics, and haptics (Burgoon et al., 1989). Performance codes include kinesics (body movement, body language, facial expressions, eye contact, gestures, body positioning) and vocalics (pitch, loudness, laughs, sighs, pauses, accents). The performance nonverbals are among the most powerful of nonverbals in that there are the highest number and variety of them, and communicators are easily able to learn and attend to them (Burgoon et al., 1989). In addition, they have the greatest impact on visual and auditory senses. In FtF communication, all of the traditional forms of performance nonverbals are available for use. Combinations of body language and tone of voice are naturally incorporated into FtF communication because communicators are likely in the same space, can hear each other's voices, and see one another's bodies. In a text-based channel, senders and receivers rely on different forms of nonverbals rather than seeing the other person's face and body language or hearing their voice in order to translate or interpret message meaning.

The nonverbal category of proxemics describes a communicator's perception and use of space, and haptics are the perception and use of touch (Burgoon et al., 1989). The presence of proxemics and haptics in communication can be influential in how one experiences interaction and can provide a great deal of information about the nature of the relationship between communicators (Burgoon et al., 1989). In FtF, communicators can make intentional use of space and touch, thereby communicating information related

to the relationship or to complement content of a message. In CMC, communicators do not have access to these cues, which could influence how the level of social proximity, intimacy, or interpersonal interaction is felt in communication.

Role and Expression of Emotions

The complexities of coding and decoding these combinations of information increases as the nature of the interpersonal relationship becomes more relational or intimate in nature (Klapper, 1954). Close interpersonal relationships are characterized by their navigation of roles, expectations, and emotional sharing and connecting (Stafford, 2010). Interpersonal relationships are based on a foundation of emotional intimacy and understanding, and therefore the ability to translate and interpret affect is paramount (Estrada, 2012). Affect and emotion can be described generally as the positive or negative valence of emotional experience or internal mental states that are focused primarily on affect (Byron, 2008).

Nonverbal behaviors serve different psychological functions, including a process by which our bodies may react externally when we experience an emotion internally (Derks, Fischer, & Bos, 2008). An example would be watching a movie that makes you feel sad and then tear up, where the tears function as a nonverbal behavior to the internal emotional experience. In this scenario, the tears are not functioning to communicate nonverbal information interpersonally. Nonverbal expressions can also function to deliver communicative messages in an interpersonal context and would then be included in a message (at times, along with verbal content) to convey meaning to a receiver or audience (Derks, Fischer, et al., 2008). An example would be making a wincing, concerned face when one's partner communicates that their boss yelled at them.

The facial expression functions to assist in message translation within the context of the relationship.

Based on Watzlawick's (1967) description of the components of the message, affect and emotion information would primarily be translated using the report channel of nonverbal cues. However, Fussell (2002) suggests that nonverbal channels in and of themselves are insufficient for expressing the full range of human emotional experience. Although a nonverbal cue, such as a frown, can indicate a general class of emotion, the cue alone does not provide enough context or detail to understand the full dimension of an emotional state. The verbal and language component of the message can also carry significant meaning related to dimension of affect or emotion. Communicators may use language to express affect by using literal emotion lexicon, such as using actual emotion words such as "happy" or "angry." They may also use figurative language, such as metaphor or overstatements, to strategically express subtle nuances of emotional states.

Planalp and Knie (2002) discuss the expression of emotion using the imagery of a substance leaking from a container, with the body and its expressive channels being the container and emotions being the substance. Emotions get leaked out of their container during expression, which typically comes in some combination of verbal and nonverbal information. Planalp and Knie (2002) describe verbal and nonverbal cues fitting together into integrated messages like interlocking pieces of a puzzle, and they stress how apparent this phenomenon is in the study of messages of emotion. These expressions consist of a division of labor among words, gestures, and facial actions so that material is encoded in the most suitable form. The use of different cues is, however, dependent upon which channels someone has access to, and also which channels or types of

communication behaviors they are more comfortable using. If there is restriction in one channel, the emotion will get pressed out in another more accessible channel.

The following sections will detail the process by which couples' communication can be translated into a text-based channel, including expression of emotion, affect, and the creation of technology-based nonverbals. A brief history of the field of CMC and theoretical developments will be provided first, followed by an overview of how couples use CMC and a review of the behavioral adaptation to CMC process.

Computer-Mediated Communication

CMC can be traced back to 1969 with the Advanced Research Projects Agency and its first group of networked computers, called the ARPANET (Thorne, 2008). ARPANET quickly evolved into a social technology that included email. Agar (2003) suggests that text messaging was originally designed to serve as a marginal means of communication, mostly for phone companies to communicate with their customers. Since its development in the late 1960s, the use and impact of CMC has been studied across a number of disciplines. The fields of information systems, business, and education took notice of the potential utility of online communication. Theory development and research on CMC in the late 1980s and 1990s was generally focused on determining if CMC was an effective channel for interpersonal or complex communication. Two theories that explain CMC as being a cues-filtered-out or inferior channel are media naturalness theory (Kock, 2004; Kock et al., 2008) and media richness theory (Daft & Lengel, 1984, 1986). Media richness theory argues that lack of cues in CMC would hinder communication. Media naturalness theory explains this phenomenon by stating that humans are accustomed to and most comfortable in FtF.

Walther (1996) explains this negative or inferior lens in CMC research, such that CMC was originally intended to be a simple message transmitting system that quickly developed from simple relay systems into being used for group and organizational communication. Groups and organizations then employed use that was more characteristic of relational or social communication. Many researchers then began examining the effectiveness of online communication and the nature of these interactions (Walther, 1996).

As the area of CMC research continued to expand across disciplines, and as the sheer number of studies examining the use and experience of CMC increased, inconsistencies in communication outcomes related to these CMC versus FtF comparisons started to emerge. Derks and colleagues (2008) conducted a comprehensive review of the CMC literature with aims to investigate if emotions are communicated differently in different modes of communication and concluded that CMC was no less emotional or personal than FtF. One of these studies consisted of an experiment where participants rated level of affect received across FtF and online chatting dyads, and results indicated that there was affective similarity across conditions (Walther, Loh, & Granka, 2005). A different study found that interpersonal sensitivity did not appear to differ a great deal across conditions, with CMC users appearing to be just as sensitive to their partner's thoughts and feelings as those in a FtF environment (Boucher, Hancock, & Dunham, 2008). Specifically relevant to the study of CMC and romantic relationships, family science researchers found that romantic couples reported no significant difference in their overall feelings or level of satisfaction when communicating with their romantic partner in FtF versus CMC environments (Perry & Werner-Wilson, 2011).

Over time, a consensus developed across academic fields that FtF was no longer consistently found to be the golden standard for positive communication outcomes. The literature provided convincing evidence that users engage in many of the same communication processes and experience successful communication outcomes in both FtF and CMC.

Couples and CMC

People use CMC to communicate with their partners for a variety of reasons and navigate a wide range of interpersonal behaviors and dynamics using the text-based channel. Many researchers have tried to ground the ubiquitous use of CMC by romantic couples by using the relationship maintenance behavior typology (Rabby, 2007; Rabby & Walther, 2003; Ramirez & Broneck, 2003; Sidelinger et al., 2008; Stafford et al., 1999; Tong & Walther, 2010). This typology provides a framework for the many different behaviors that are used in maintaining a close interpersonal relationship and are the basic building blocks that keep relationships relevant and functioning (Stafford, 2010). Stafford (2010) states the full range of relationship maintenance behaviors includes discussing social networks, sharing tasks, expressing positivity, managing conflict, providing understanding, giving assurances, expressing general openness or self-disclosure, and having talks about the relationship. Research indicates that for couples specifically, CMC is being used at high rates to enact the full range of behaviors that help maintain relationships (Houser et al., 2012; Johnson et al., 2008; Laliker & Lannutti, 2014; Rabby & Walther, 2003; Ramirez & Broneck, 2003; Sidelinger et al., 2008; Stafford et al., 1999; Tong & Walther, 2010).

Couple Conflict and CMC

The primary communication behavior that this study will focus on is conflict or problem-solving dynamics, which are dynamics that couples must navigate continuously throughout their relationship rather than just at one stage of development (Gottman & Notarius, 2002). Conflict can be defined in the context of interactions or processes in the couple relationship related to competing needs and interests, where conflict is an individual's attempt to accomplish goals that may interfere with another person's goals (Frisby & Westerman, 2010).

Couples use a variety of verbal and nonverbal communication strategies to send and receive messages about these differences, and a transactional process of connection and disconnection ensues. Conflict may be resolved with successful problem solving and emotional connection, may result in gridlock, or may lead one or both partners to withdraw from the interaction altogether (Estrada, 2012; Fincham, 2004; Frisby & Westerman, 2010; Gottman et al., 1977). Conflict is more likely to occur in couple relationships as opposed to other intimate or interpersonal relationships, and the more intimate a social relationship, the greater the possibility of conflict (Roloff & Soule, 2002).

Processes and interactions related to conflict and emotion regulation are demonstrated in studies to be predictive variables for long-term romantic relationship satisfaction and stability (Gottman, 1993; Gottman et al., 1977; Gottman & Notarius, 2000, 2002), and research shows that navigating and managing conflict in romantic relationships commonly involves use of CMC (Coyne, Stockdale, Busby, Iverson, & Grant, 2011; Czechwsky, 2008; Frisby & Westerman, 2010; Lenhart & Duggan, 2014;

Perry & Werner-Wilson, 2011). Additionally, couple interaction researchers considered observing problem solving dynamics as being almost synonymous with understanding a couple's overall communication dynamics, and thus many observational research techniques are based on the specific dynamic of problem solving or conflict resolution (Baucom & Kerig, 2004).

One study reported that nearly two thirds of respondents reported using CMC to engage in conflict with their partner (Frisby & Westerman, 2010). While most users find themselves engaging in conflict using CMC for reasons related to proximity and convenience, others reported that CMC actually provided some relational or communication advantage (Frisby & Westerman, 2010; Perry & Werner-Wilson, 2011). Another report stated that 9% of couples surveyed stated that they used CMC to resolve an argument on an issue that they were having difficulties solving in person (Lenhart & Duggan, 2014).

Theoretical Applications

A great number of theories exist that conceptualize social behavior, interpersonal processes, and the role of communication. However, the theories that mainly inform the research purposes of this manuscript focus on the human to technology connection, including how people adapt to different channels as well as the role that technology may play in intimate relationships or family systems. However, there still is no parsimonious theory or model that singularly informs the intersection between CMC and dynamic or transactional couples' communication. This section will include a brief summary and critique of each of the theories that are most relevant to the current project.

Hertlein and Blumer (2013) developed the family and technology framework, which makes useful attempts to categorize the many uses of technology related to family functioning. The framework, however, does not adequately address specific interpersonal processes or the indirect versus direct interactional communication that takes place between family members via technology. The framework instead mainly focuses on the general impact of technology, including the rules, roles, and expectations of the family. The model does provide an overall frame of understanding that technology can intersect with family relationships, which supports the overall justification for examining CMC and couples' processes.

Lanigan's sociotechnological family conceptual model (2009) focuses on technology and family processes, including how use impacts degree of connectedness and cohesion. The model does not, however, expand to include processes related to transactional communication, how these processes may look and feel different in CMC, or what the implications of such technology-mediated communication processes are for couples and families.

Social information processing theory (SIPT) developed by Joseph Walther (2008) details the process whereby users of CMC come to understand, accept, and become more comfortable with the channel for interpersonal communication. The theory details a learning process where users become more comfortable over time in using the channel, developing familiarity and then a more positive attitude about the channel and their connection with others who they communicate with over CMC (Walther, 2008). The theory posits that over time, CMC can start serving some of the same relational functions that FtF does and that as ease of experience increases, users may be motivated to use the

environment for more complex social tasks. Walther (2008) also explains that due to the convenience of the channel, users are likely motivated to use it, so they are likely to continue to use the channel, practice, and also engage in adaptive processes that they feel will help maximize the usefulness and success of the channel for intimate, emotional, and complex interpersonal communication. The degree of complexity of the task, in order to achieve success, then requires increased adaptive effort, which will involve users engaging in adaptive behaviors (Walther, 2008).

Media compensation theory is another theory that helps illuminate the adaptation to CMC process (Hantula, Kock, D'Arcy, & DeRosa, 2011). The theory's compensatory adaptation principle argues that "individuals using media that suppress many of the elements of face-to-face communication do not accept passively the obstacles posed by the use of those unnatural media. Those individuals instead try to compensate for the obstacles posed by the unnatural media by changing their communication behavior, often in an involuntary way" (Hantula et al., 2011, p. 347). In addition, the speech imperative principle suggests that the ability of a communication channel to convey speech-related cues may be more globally important in conveying information than the channel's ability to convey facial expression and body language (Hantula et al., 2011).

The sociotechnological family concept model and the family and technology framework provide justification for the focus on CMC and couples but neglect to speak directly to the process by which family members are using CMC for interpersonal or intimate communication. Although they provide justification for a focus on technology and families and articulate the many ways in which technology can influence family processes and dynamics globally, the focus of this manuscript and research purposes is

narrower in scope to transactional communication as well as the nuances of the coding, decoding, and interpretation processes that are enacted within the CMC channel. Media compensation theory and SIPT provide justification for examining the communication process, specifically the process by which people adapt to the channel to include affect and meaning, thus allowing CMC to be a channel in which intimate partners can connect and enact relationship behaviors. Thus, although SIPT and media compensation theory do not explicitly postulate on family systems or the technology to family relationship communication processes, the basic tenants of these theories provide a suitable framework for understanding how individuals can adapt their communication patterns to CMC. Therefore, for the next section reviewing adaptation processes and the remainder of this dissertation, media compensation theory as well as SIPT (and other theoretical assumptions put forth by Walther) will be utilized for theoretical and empirical support.

Communicative Adaptation Strategies

From an evolutionary perspective, FtF communication that includes both auditory and visual cues has been the primary mode of communication in the history of human beings. Hantula and colleagues (2011) discuss that as a species, humans evolved to communicate FtF and are not biologically designed to use channels devoid of nonverbal cues for communication. They further discuss that the first form of written communication appeared only 5,000 years ago in the Sumerian culture, indicating that written communication has been around for less than .02% of our evolutionary cycle as hominids (Hantula et al., 2011). Despite this evolutionary precedent to communicate in person, rather than in written form, the ubiquitous nature of CMC is indicative that humans have, nonetheless, been able to adapt.

Current electronic communication tools require substantial behavioral alterations from their users because humans have not been biologically designed to use those tools (Hantula 2011, p. 340). Through continued use of CMC, the adaptation process takes place behaviorally and neurologically. Neurologically, new "learned" ways of expressing and communicating create new neural pathways in the brain, referred to as behavioral plasticity (Hantula, 2011, p. 345). These new behaviors and neural processes can then be integrated into normal communication behaviors. There is substantial empirical evidence that makes it apparent that users successfully translate affect in text-based environments and that CMC is helpful and meaningful for navigating interpersonal relationships. This is done, however, without the ever-important use of non-verbal cues that have the primary purpose of carrying relational information.

This adaptation process then, as well as the translating and interpretation of meaning in a message across verbal and nonverbal behaviors, was initially ambiguous as these behaviors went online. Two primary adaptive behaviors take place in CMC. The first is affective cues, traditionally expressed nonverbally in FtF, translating into text-based cues in CMC. The second is the development and use of technology-based nonverbal cues that allow a user to express affect and relational information. This section will provide an overview of how these processes take place as well as the empirical research that illuminates these two adaptive efforts.

Translation of Cues

Users of CMC may be able to adapt to the channel by transforming affective intentions into text-based cues, referred to as cognitive reallocation (Walther & Burgoon, 1992). When traditional nonverbal cues are unavailable – as is the case in text-based

communication – the remaining communication systems are employed to do the work of those that are missing. In CMC then, that which is typically nonverbal in FtF is overt (e.g., typed) in CMC (Walther, 1992, 2008). Walther (2008) explains that communication symbols are considered functionally interchangeable, meaning that there are many ways to express social characteristics, emotions, and interpersonal attitudes and that these messages can be successfully translated into language if needed.

In text-based communication, the verbal content is at the forefront of the message. Users must rely on language to communicate the meaning of their messages. Byron (2008) states the most straightforward way of encoding a message to convey the sender's emotion is to verbalize it. Byron (2008) explains that people tend to reliably interpret verbal emotional content, such as "I am really upset," whereas other non-emotionally laden messages may be more open for interpretation. Walther (2007) also adds to this idea by suggesting that users not having to expend their energies on decoding and transmitting FtF nonverbal cues may allow for or result in increased cognitive effort to be placed on the actual verbal message being transmitted, which can be beneficial to communication.

In a study exploring how positive and negative affect were expressed in a text-based environment, it was found that affective intention was translated into text in a number of ways including the length of messages, the level of verbosity in expression, the explicit level of agreement or disagreement that takes place and the use of negative and positive affect terms (e.g., happy, upset) (Hancock, Landrigan, & Silver, 2007). Walther and colleagues (2005) also explored how affinity, measured by the degree of positive communication and level of immediacy, was expressed in CMC. They reported

that verbal text-based interactional strategies related to expressing affinity included explicit statements of positive affection, offering personal information, providing encouragement and offering praise while proposing a different idea, or indirectly disagreeing (Walther et al., 2005). They also found that someone speaking in a monologue, where they are interrupting or talking over someone was associated with decreased feelings of affinity. Walther and colleagues (2005) conclude that communicators adapt to the channels and cues that they have access to, including language, text, and chronemics (i.e., use and role of time in communication). Walther and colleagues (2005) also compared expression of affinity across FtF and CMC channels, and results confirmed that CMC users had significantly more interpersonal affect in their verbal behavior than do FtF communicators who, in contrast, relied more on nonverbal cues for affective expression.

Boonthanom (2004) discusses the computer-mediated communication of emotions at length, including the cue utilization process that takes place in both how the senders create their messages to include emotion and also how the receivers interpret the emotion. In addition to using verbal information, paralinguistic cues or nonverbal surrogates may also be used. These are text-based message characteristics used to convey meaning normally achieved via tone of voice, body gesture, or facial expression and that would normally be translated through vision or sound (Boonthanom, 2004). These cues provide visual information to the communicators, can be pictographic or typographic in nature, and can help establish meaning and intent (Bolliger, 2009).

Below is a list of text-based emotional cues, including examples:

- Emotion words (e.g., happy, angry)

- Linguistic markers (e.g., very, really)
- Vocal spellings (altering spelling to mimic a vocal inflection, e.g., soooo)
- Lexical surrogates (textual representations of vocal sounds that are not words, e.g., uh huh, haha)
- Spatial arrays or emoticons (pictographs constructed from punctuation and letters to represent a facial expression or behavior, e.g., :(, 8-D)
- Manipulation of grammatical markers (alteration of the presentation of words including all capitalization or strings of periods of commas, e.g., HEY, so.....)
- Minus features (deliberate or inadvertent neglect of conventional formatting elements, e.g., abbreviations, acronyms, lack of capitalization)

Riordan and Kreuz (2010) conducted a study of different channels of CMC and the use of online nonverbal cues and found that these cues were often associated with words that have a particular function or semantic meaning and were being used to indicate emotion or disambiguate a message. A study that assessed communication between teachers and students in an online classroom found that students were using visual cues to communicate a pause in communication or to think; to add emphasis, disagreement, or confusion; indicate the end of a statement; joke; ask a question and ask for clarification; apologize; and communicate other positive and negative emotions (Bolliger, 2009). Boonthanom (2004) also studied the use of these cues in communication, specifically how the use of these cues impacted the ability of the receiver to correctly detect affect. Findings from this study suggested that use of positive emotion words was associated with perceptions of positivity, and number of linguistic markers in the message was associated with a receiver's perception of both positive and negative

emotions (Boonthanom, 2004). Overall, the findings suggest that the number of paralinguistic cues coded into the message was related to reporting increased perception of emotions in the message by participants, whether that be negative or positive affect (Boonthanom, 2004). For a full review of CMC verbal cues that are visual in nature, see Boonthanom's dissertation entitled *Computer-mediated communication of emotions: a lens model approach* (Boonthanom, 2004).

Emoticons and Non-Language-Based Cues

The most formative non-language-based mechanism is the emoticon, which is a typographic depiction of smiling faces, frowns, winks, and other facial expression. The emoticon is one of many examples of how affective intentions, rather than being translated into verbal information, are actually translated using a symbol or communication behavior that is unique to CMC. Lo (2008) argued that the use of the emoticon specifically in text-based communication can play an important role in nonverbal communicative functions, stating that "emoticons allow receivers to correctly understand the level and direction of emotion, attitude, and attention expression" (p. 597).

Derks and colleagues (2008) conducted a study which included an online survey about emoticon use and an experimental component where participants were asked to respond to online chats. Results suggested that emoticons are used to express emotion, strengthen the content of a message, or to convey humor. Emoticons may be used to emphasize or clarify one's feelings but also to soften one's negative tone and to regulate the interaction, just as smiles and frowns do in daily life. Overall, the authors concluded that to a large extent, emoticons serve the same functions as FtF nonverbal behaviors (Derks, Bos, et al., 2008).

In addition to emoticons being used to supplement a verbal message, an emoticon can also be the message in its entirety, such that meaning of that message must be derived from the emoticon alone without assistance from language. Such use of nonverbals also happens in FtF, such as making a hand gesture or making a facial expression, with the assumption that the receiver will be able to successfully decode and derive meaning from the nonverbal cue.

The use of emoticons and other visual cues is becoming increasingly common, and as technology advances, these symbols are being incorporated in ever more complex and meaningful ways to help facilitate successful interpersonal CMC. An example of a recent advancement that is pervasive across CMC platforms is the emoji, which provides a multitude of options for facial expressions, reactions, symbols, and figures which could include anything from a picture of physical gestures like a thumbs up or flexing of the bicep to pictures of sports equipment, food, and various household items. The combination of such symbols within a message then conveys a multitude of meaning beyond what is communicated verbally. Advancements and trends with technology and communication have made inclusion of such additional cues easy. Some technology platforms also allow users to send pictures or videos of themselves or their likeness, thereby enabling users to include their own face, body, or environment in a text-based interaction. All of these visual cues, whether they are an emoji, a message using all caps, or a picture of someone making a hand gesture, allow a user to include nonverbal information in CMC that would traditionally be available in FtF.

Additional Considerations for Space and Adaptation in CMC

In the discussion of couples' communication behaviors in CMC, it is imperative to discuss the potential for CMC and text-based or symbol-based cues to be used in ways that may create confusion or contribute to a dynamic that would be perceived as negative or unhealthy for the couple. Due to CMC not automatically including nonverbal information that occurs naturally in FtF, consideration must be given to the degree to which users can control, disguise, or intentionally exclude affective information in CMC. In CMC, the transmission of affect (use of text-based nonverbals) can be more intentional and controlled (Carter, 2003).

In FtF, nonverbal cues can be helpful to the communication process only if they are providing redundancy of meaning, suggesting that they confirm, clarify, or reiterate the meaning of a verbal message. The presence of nonverbal cues then does not always guarantee perception that is more accurate or communication that is more satisfying. This may happen when nonverbal and verbal cues are in conflict, which may create miscommunication or be an indicator of dysfunction or unhealthy communication. Specifically, miscommunication in this manner can take place either when the message is created or when the message is interpreted.

Burgoon and colleagues (1989) explain this phenomenon stating that nonverbal communication may express what verbal communication cannot communicate, perhaps even transmitting information that the sender did not intentionally mean to send or include in a message. Thus, given that in CMC the creation of messages is to some degree intentional rather than reflexive or involuntary, CMC users may be able to intentionally withhold or control the expression of affect. Empirical support for this was

found by Pettigrew (2009), who reported that participants indicated that CMC allowed them to hide or mask their feelings from their romantic partner. Byron (2008) suggests that lack of nonverbal cues in CMC, which act as an indicator of emotions or affect, may result in messages being perceived less intensely (positively or negatively) than intended, resulting in a neutrality effect**.**

The complexity of these behavioral adaptation efforts gives further justification for why observing these transactional behaviors using a suitable observational methodology is essential.

Research Methodology in CMC

The following sections will provide general methodological critiques and a review of the limitations of the CMC literature. An overview of couple interaction research and observational methodologies will also be presented, including justification for the development of a couple observational coding system for CMC.

Methodology Critique and Limitations

When exploring the nature of technology use and its impact on relationships, it is important for researchers to be mindful of the many categories, types of use, and various technology-based platforms that exist and the drastic differences in their function and impact. Researchers must be intentional about both the focus and scope of the research question as well as the implication and generalizations of results. For example, a researcher may ask participants to report on the impact that technology use has on their relationship, whether that be positive, negative, or no impact. In this example, type of technology is not specified, which makes it difficult to understand the implications for the results when the term “technology” can be interpreted in various ways. The language

used for technology channels or devices needs to be specific; for instance, using "technology use" and "Internet use" interchangeably may result in ambiguity about the nature of use and thus how to interpret the results. When the specific type of use and goals and motivations are not identified, the ability to determine how technology impacts specific relationship processes and outcomes is lost.

An example of ambiguity in type of use comes from a synthesis of research from 1998 to 2013 that explores the global impact of technology on family functioning (Carvalho, Francisco, & Relvas, 2015). In this review, family functioning was defined as family cohesion, roles, rules, and boundaries, and the authors were examining and then generalizing about the relationship between technology and families as a whole. This synthesis, however, mainly focused on the area of general use of technology and how this specific type of use within the family affects larger family functioning (Carvalho et al., 2015). The review failed to examine the use of technology for direct or indirect communication between family members and did not make mention of the different types of use when the impact of technology on families was being discussed.

Methodological limitations in this field can be explained in a variety of ways. Luo (2014) helps explain the gap related to using volume of use of CMC as a predictive or influential variable. In a study examining the impact of texting on romantic relationships, Luo (2014) discussed the "ceiling effect" related to texting volume and frequency, such that most users report extremely high volume and frequency of use, making it difficult to use frequency or volume as variables in research. Volume of use is high for most all participants, which makes it difficult to link rates of use to individual

characteristics or relationship outcomes. People are likely to use CMC in most relationships to a high degree in a variety of ways. This highlights the need for researchers to shift the focus from volume and frequency of use to factors related to what interpersonal function CMC serves, what relationship behaviors are being facilitated in CMC, what motivations and goals users have, and what impact these text-based processes have for relationship dynamics and outcomes.

When studying relational processes, it is common for researchers to utilize static measures of interaction for their research designs, such as self-report or surveys, rather than methodologies that capture the dynamic interactions of people (Bakeman & Gottman, 1997). Given this dissertation's focus on couples' use of CMC and the dynamic transactional processes that take place when couples are using CMC, it is imperative to examine the interaction directly. Bakeman and Gottman (1997) state that a defining characteristic of interactive behavior is that it unfolds over time (p. 1), and in order to unpack relationship outcomes, researchers need to examine more closely the process by which couples relate to one another.

Couple Coding Systems and Couple Interaction Research

In Kerig and Baucom's (2004) book *Couple Observational Coding Systems*, they state "if we are going to understand intimate relationships, then we need to observe directly how partners behave toward each other. And as scientists, we must derive systematic ways to rate, describe, and categorize these ongoing flows of complex interaction" (Baucom & Kerig, 2004, p. 3). Additionally, they state "how individuals interact with their partners tells us a great deal about them as individuals and as a unit" (Baucom & Kerig, 2004, p. 4). Margolin and colleagues (1998) state that the kind

of research questions best suited for observational data are those addressing interactional or transactional patterns and structures that are not necessarily accessible or within awareness of the participants themselves.

Observational systems and couple observational methods are a longstanding, empirically-supported methodology used to assess the nature and dynamics of romantic relationships and relationship behaviors (Kerig & Baucom, 2004; Margolin et al., 1998; Weiss & Heyman, 2004). They provide a methodological bridge between qualitative and quantitative research methods (Margolin et al., 1998). These systems are designed to measure and assess how couples are interacting in regard to their observable behaviors, including the content of their messages and the nature of their nonverbal communication (Margolin et al., 1998). They look to assess, capture, and interpret both what a couple is saying to one another and how they are saying it. Observational data also affords researchers the opportunity to observe behaviors that fluctuate within context and across time (Margolin et al., 1998).

The basic assumptions of observational methodology are that (a) the systems utilize both what is being said (verbal), (b) what is not being said (nonverbal), and that (c) real-time, sequential interaction is available for observation and analysis. Based on the empirical and theoretical justifications already summarized earlier in this chapter, CMC also contains (a) what is being said; (b) emotions, adapted nonverbal cues, and technology-based affect; and (c) sequential interactions that are readily available for review. Thus, traditional observational coding systems can be adapted and applied to CMC interactions and would qualify as observational analysis.

The field of couple interaction research is vast, and many different styles and systems of coding and analysis exist (Gottman & Notarius, 2000; Margolin et al., 1998). The next section will give a brief overview of couple interaction research and couple observational coding systems, including the many factors that a researcher must consider and subsequent design decisions that the researcher must make. These decisions influence the development of or use of a coding system and what information can be obtained from the interactions that the system is applied to.

Baucom and Kerig (2004) detail various decisions that must be made in utilizing an observational system, which inform the multiple steps outlined below.

1. *What aspects of couple behaviors are important to the researcher?* These behaviors may include interruptions, patterns of interactions such as mutually avoiding or addressing areas of concern, engaging in supportive behaviors toward each other during difficult personal times, demonstrating negative affect during a conflict discussion, how couples take turns in a conversation, etc.
2. *What type of interaction and task?* Coding systems must be applied to some observable interaction, and the researcher must decide on the type of interaction as well as the instructions for interaction in order to elicit the behaviors of interest. Examples of types of tasks include asking a couple to engage in a problem-solving interaction for 15 minutes; asking a couple to take turns in expressing support, intimacy, or warmth to one another for ten minutes each; or asking a couple to interact as naturally as possible in a laboratory apartment for three hours (Gottman & Notarius, 2000; Kerig & Baucom, 2004).

3. *What level of observation is being made?* The researcher must decide whether to create a coding system that looks at the interaction in an extremely detailed, microanalytic manner (such as how often they take turns or interrupt one another or how many sighs or frowns across a 15-minute interaction) versus a more global, macroanalytic manner (such as level of conflict, negative affect, or degree of dominance there are for each partner overall across a 15-minute interaction). The researcher must also decide how often and in what instances the observers should indicate behaviors observed. When specific behaviors are counted over small periods of time, these are referred to as *observations made by observers* and when a score or overall judgment is made about an overall relational or communication characteristic, these are referred to as *ratings made by raters* (Bakeman & Gottman, 1997; Cairns & Green, 1979).
4. *Who is making the ratings or observations, and what behaviors are they coding?* For most coding systems, coders on a research team will complete training on the system and related protocols and will then code the couple interactions assigned to them. However, at times the partners themselves are asked to observe and then interpret, make determinations on, or rate their own behaviors and interactions (Bakeman, 2000; Kerig & Baucom, 2004; Schulz & Waldinger, 2004).
5. *What are observers or raters looking for in the interactions?* Within each task or relational dynamic of interest (such as problem-solving), dimensions or constructs of behaviors (such as support, denial, or positivity) and specific observable cues or examples (such as head nods, smiling, compliments, or statements of agreement) of said dimensions must be systematically identified (Bakeman &

Gottman, 1997). Thus, behavioral codes need to be designed where a stream of behavior can be observed by one or more coders who are referencing predefined behavior codes or dimensions. The aim is to define beforehand various forms of behavior (behavioral codes), train coders to be able to detect or understand these codes, and record behavior or dynamics corresponding to the predefined codes (see a full review of macro categories and micro codes in Weiss & Heyman, 2004). Additionally, observational systems assume that raters or coders can observe what the couple is doing and saying to one another, and thus most systems include some combination of the language of what is said through words as well as the behaviors that are communicated nonverbally.

6. *What kind of setting should be used?* The interaction tasks that couples engage in for observational research typically take place in a laboratory, where the interaction is video recorded and then reviewed later by a research team for coding and analysis. However, these interactions could also be observed live by a research team, could take place in a pseudo-natural setting (such as a staged apartment), or could take place in a couple's natural environment.

Research Purposes

Couple observational research is the golden standard for assessing couples' communication behaviors and dynamics; however, observational methodologies and current systems do not fully capture modern couples' communication given the pervasive use of CMC. Given the gaps identified in the empirical, theoretical, and methodological literature and based on the justifications provided in this chapter, three research purposes

are put forth below. From these research purposes, research design and methodology will be able to more fully account for relationship dynamics that take place in a computer-mediated context.

Research Purpose 1: Evaluate and select an observational coding system that can be adapted to assess text-based transactional couples' communication. As was stated in the section above pertaining to the various decisions to be made in selecting a system, it is strongly recommended that the process by which a system is identified for use be intentional and rigorous. This selection process is necessary in establishing and maintaining validity of subsequent modifications and implementation of the system.

Research Purpose 2: Modify the coding system. The primary objective for modification of the coding system is to establish applicability of the system for CMC. Given the adaptation of FtF behaviors that occurs in couples' use of CMC, it is critical to account for affect and preserve relevance of the observational coding system to problem-solving and conflict resolution dynamics and behaviors.

Research Purpose 3: Implement the coding system, and test for reliability and validity. Demonstrating communicability of the modified observational coding system will establish the value of the coding system for future projects and additional lines of study of couples' communication.

The subsequent chapters will comprehensively detail these three research purposes. Chapter 3 focuses on Research Purpose 1 and Research Purpose 2; it will detail the steps that were undertaken to select a coding system, to review romantic couples' CMC interactions to determine if the system selected was a good fit, to modify and implement the coding system, and to detail the efforts undertaken to establish reliability

and validity for the modified coding scheme. Chapter 4 focuses on Research Purpose 3 and details the implementation and testing of the coding system.

Chapter 3. Methodology

This section will provide details on the methodological steps taken to develop a couple observational coding system for CMC. The first section will provide an overview of a secondary dataset utilized for the current study, including the sample and the protocol. The next section describes completion of Research Purpose 1, including details of preliminary processes that informed the selection of an observational coding system to be used in the current study. The next section will give an overview of how an established couple observational coding system was modified for application to text-based interactions, fulfilling Research Purpose 2. Whereas Research Purpose 1 and Research Purpose 2 occurred sequentially, Research Purpose 3 required testing and establishing validity and reliability after the coding system was modified in Research Purpose 1, again during coding, and again after coding was completed.

Use of Secondary Dataset

I oversaw creation of a dataset in 2010, of which the design for data collection and protocols used will be detailed below. A small portion of the data was used for my master's thesis, which was published (Perry & Werner-Wilson, 2011). The larger dataset was also used to inform a variety of other scholarly works, including presentations at conferences and the development of a comprehensive concept model on the interpersonal use of CMC. The data that was utilized for this dissertation focused specifically on observational analysis, including text-based problem-solving discussions. The dataset used for the current study did not include any identifying information. The larger study referenced here was approved by the University of Kentucky IRB in 2010 (#09-0963-F4S), and participant recruitment and participation took place from 2010 to 2012. The

use of this dataset for the current study was approved under nonmedical except status for secondary analysis by the University of Kentucky IRB (#61571) in September 2020.

The participants in the dataset include individuals who were recruited from flyers posted and distributed at a large American southern university, ads placed in newspapers, and online ads. Qualifications for participation included being over the age of 18 and being in a serious romantic relationship. Each individual in the relationship needed to agree to participate in the study together as a couple. For the total sample, $N = 96$ individuals (48 couples). Although the majority of the sample consisted of male-female couples, there were three same-sex couples, comprising 6% of the sample. The average age of the participants in the sample was 27.78 ($SD = 7.61$). Approximately 78% of the sample was Caucasian, 13% African American, 3% Latino, 3% Asian, and 1% Native American. Highest level of educational attainment consisted of 4% having completed some high school, approximately 12% having completed high school or received a GED, 42% having attended a two-year college, 30% having a bachelor's degree, and 13% having a graduate degree. For nature of the relationship, 51% of the sample reported dating, 12% were engaged, and 38% were married. The majority of the couples (59%) had been together for one to six months. Those who had been together for seven months to two years comprised 8% of the sample, and the remaining 33% of the sample had been together for more than two years. Of the sample, 42% considered themselves to be in a distressed relationship, and 58% were in a non-distressed relationship.

Participants in the larger study were asked to engage in both FtF and text-based online problem-solving discussions. Each couple was asked to select two topics on which they had differing opinions and on which they would be able to have energized

discussions. A coin was flipped to determine which topic would be used for a CMC discussion and which topic would be used for a FtF discussion. Participants interacted in both FtF and CMC environments while they were at the lab, and the order of the conditions was randomly assigned in advance. For FtF discussions, participants sat in a room facing one another. For CMC discussions, participants sat in separate rooms at computer terminals with a keyboard and were signed into a laboratory account of AOL Instant Messenger. This online platform and set up has similarities to other CMC channels, such as text-messaging or messaging through email platforms in that high synchronization of communication is possible. In the FtF condition, the couples were given ten minutes to communicate about their topic, and in the CMC condition, couples were given 15 minutes. In the field of FtF couple observation research, it is common to sample 10 to 15 minutes of interaction, such that this duration of time is generally sufficient for evaluating global positive and negative dynamics (Weiss & Heyman, 1997); however, Walther (1996) encourages researchers to afford additional time to participants in CMC conditions, which is in alignment with the protocol from the original study giving participants interacting in CMC 15 minutes. CMC conversations were automatically saved and logged on laboratory computers, and there were no video recordings of the CMC discussions.

Preliminary Processes in Evaluating Text-Based Couple Interactions: Qualitative Reviews

Bakeman (2000) suggests that when developing tools to measure systematic behavioral observation, it is essential that researchers examine qualitative studies related to the users' experience of communication or interactional processes when developing

behavioral codes. Unfortunately, in the field of couples' transactional communication and CMC, very few qualitative studies are available.

Perry and Werner-Wilson (2011) conducted semi-structured interviews with a subset of the couples who participated in the larger study used for this dissertation. The couples were asked to describe their experience using CMC and FtF in their relationship specifically for conflict management. Couples explained how their dynamics are enacted in CMC and reported on how they adapted to CMC or engaged in or negotiated affect and emotions in CMC. Couples reported that they regularly engaged in use of CMC for communicating with their romantic partner, including conflict and navigation of disagreements.

The results of the interviews indicated that couples use CMC to engage in couples' communication behaviors in ways that are similar to the behaviors that are enacted FtF. There was no evidence from these interviews or from other empirical or theoretical sources to suggest that entirely new or unique categories or dynamics of behavior would emerge in couples CMC. Thus, the results of these interviews informed the current line of inquiry, including the need to better understand couples' communication behaviors in CMC, which as discussed in Chapter 2, can best be accomplished via observational analysis.

Evaluating and Selecting an Observational Coding System (Research Purpose 1)

The next step was to review the CMC chat logs that would be used for this study as an additional effort to explore the behaviors and dynamics that exist within these couple conversations and to determine what kind of coding system may be the best fit. The text-based chat logs of couples engaging in problem-solving discussions were

obtained from the larger study discussed earlier in this chapter. I carefully and openly reviewed these logs following the guidelines suggested by Bakeman and Gottman (1997 p. 27). As dynamics, behaviors, and cues were observed, I made notes and detailed narrative summaries on the logs. It was determined that the content and communication dynamics present in the chat logs were consistent with many of the basic behaviors, behavioral codes, dimensions, and constructs that are captured in traditional coding schemes (see a full review of macro categories and microcodes in Weiss & Heyman, 2004). In addition, the review of the logs revealed that most participants did use affect-based cues and text or symbol-based nonverbal cues, thus aligning the logs with coding expectations and observable behaviors in coding systems based on FtF dynamics and behavioral cues.

Cairns and Green (1979) state that when researchers aim to describe differences in behavioral style or distinctive interactions between two persons, ratings systems can be most effective. I therefore sought to identify a macroanalytic coding system that utilized ratings. The distinguishing characteristic of rating scales is that they involve a social judgment on the part of the observer, or rater, "with regard to placement of the individual on some psychological dimension" (Cairns & Green, 1979). Additionally, observational systems that utilize ratings are appropriate when the goal is to achieve significant predictive statements about individual differences in social and nonsocial behavior (Cairns & Green, 1979, pp. 223-224).

Bakeman (2000) states that it is important to identify researchers and pre-existing observational systems that have made inquiry about similar questions or phenomena under current study. Bakeman (2000) recommends that once these systems are identified,

adoption or adaption of existing coding systems should be attempted (rather than creating entirely new schemes), assuming the coding system fits the behaviors of interest. Margolin and colleagues (1998) also caution that developing and validating a coding system is an intensive task and should only be undertaken if it is necessary and integral for understanding a unique phenomenon.

Given that the qualitative review of the semi-structured interviews as well as the review of the chat logs indicated that the dynamics and behaviors were consistent with known dynamics of couples' behaviors, it is appropriate and in alignment with research interests for this project to adapt a pre-existing macroanalytic coding system where ratings are given for larger dimensions of behavior and across larger segments of interaction. It was also necessary to identify a system that could capture the interactional task and parameters already existing in the chat logs collected as part of the larger study, specifically where problem-solving or conflict resolution tasks are completed in a laboratory setting, outside coders are utilized, and behavioral dimensions and constructs include both verbal and nonverbal categories.

Interactional Dimensions Coding System

The Interactional Dimensions Coding System (IDCS) (Julien, Markman, & Lindahl, 1989; Kline et al., 2004) met all of the stated requirements. The IDCS was originally designed to assess how couples interact with each other while discussing problem areas in their relationship (e.g., money, in-laws, communication, sexual intimacy), but application of the IDCS can extend to a more diverse set of interaction tasks as well as types of dyads (Kline et al., 2004).

The IDCS is a macroanalytic or global system. The system takes into account the multifaceted nature of communication, such that communication consists of both content and affect. It has categories that are based wholly on the verbal content and language included in communication. These dimensions are referred to as content categories and include Problem Solving, Denial, and Dominance. There are also two dimensions that are based on negative and positive affect, which are based entirely on the use of affect and non-verbal based information. When coding for content or affect categories, the coder looks only at one area of message content at a time, such as only looking at verbal content or only looking at nonverbal content. The IDCS also includes combined dimensions, where both nonverbal and verbal indicators are considered when observers are rating the behaviors. These are referred to as combined categories and include Support Validation, Conflict, Withdrawal, and Communication Skills. The IDCS also includes five dyadic dimensions that reflect a construct based on the overall nature of the couple's sequenced communication during the interaction, their overall patterns of interacting, or generalizations about relationship functioning and relational outcomes. The dyadic codes include Positive Escalation, Negative Escalation, Commitment, Future Satisfaction, and Future Stability. Overall, there are nine dimensions on which raters provide each partner an individual score, and five dyadic dimensions on which the rater provides the couple one score as a dyadic unit.

The IDCS utilizes a ratings system for coding, where coders are trained on the behavioral dimensions, including the behaviors, cues, and contextual examples in the codebook. The raters are expected to review the interaction, assign ratings on the dimensions for multiple segments (e.g., every five minutes), and then assign one rating as

a score for the overall level of that behavior for that individual. Raters assign scores from 1 to 9, with 1 being a non-existent behavior in the interaction and 9 being an extremely characteristic behavior in the interaction. Detailed scoring instructions and scoring anchors are provided in the IDCS training manual and codebook.

The original IDCS dimensions were selected by its creators on the basis of theoretical and empirical works related to overall couple functioning and outcomes (Julien et al., 1989; Kline et al., 2004). A set of core interactional dimensions were included in the IDCS that have previously guided the basis of the most prominent marital and family coding systems, and the dimensions selected were consistent with most theories of family distress. Research using the IDCS has shown reliability (interrater kappa) ranging across the dimensions of .80 to .92 (Stanley, Markman, Prado, Olmos-Gallo, & et al., 2001) and .64 to .71 (Schilling, Baucom, Burnett, Allen, & Ragland, 2003). When intraclass correlation coefficients (ICCs) were used, the reliability across dimensions ranged from .66 to .95 with a median ICC of .87 (Kline et al., 2004), and in another study there was a range of .64 to .92 with a median ICC of .78 (Scott, Rhoades, & Markman, 2019). The last three dyadic codes of Commitment, Satisfaction, and Stability were added to the IDCS since the time that it was originally created, and Kline and colleagues (2004) note that due to these dimensions not having been systematically coded at the time of publication, validity of the dimensions were not yet known. I was unable to identify any reliability testing for these three codes in published literature.

The vast majority of studies using the IDCS either only report overall average IRR for the dimensions that were chosen for inclusion in the studies or collapse the individual dimensions into positive or negative communication composite scores and

typically do not detail why they included some dimensions and excluded others. I was only able to identify two studies that reported and discussed individual dimensions. One reported that acceptable ranges were found for every dimension tested (Scott et al., 2019), and the other reported that acceptable IRR could not be achieved for Denial or Dominance and that subsequently the researchers determined that Dominance would be converted into a dyadic dimension and Denial would be removed (Chartrand & Julien, 1994),

The dimensions in the IDCS (and composite scores of positive communication and negative communication) have been shown to demonstrate concurrent and predictive validity for couple outcomes (Markman, Rhoades, Stanley, & Peterson, 2013) and to be able to discriminate between distressed and non-distressed couples (Julien et al., 1989). The IDCS has been generalized and modified in a variety of ways (see Kline et al., 2004 for a full review) but has never been used for or modified for the coding of text-based interactions.

Initial Processes in Determining if the IDCS Could Be Applied to CMC Coding

The immediate concern in using a coding scheme designed for FtF interaction for CMC is how a coder would identify and then score behaviors in CMC, given that the content and affect examples, cues, and scoring anchors are all designed to describe FtF interaction. It was necessary to explore these potential anomalies, including identifying examples and noting different types of communication behaviors to best discern the applicability of the IDCS to CMC and also to inform potential modification that may be needed to the IDCS.

Applying the IDCS Dimensions, Examples, and Cues to CMC. I, along with a colleague who also received training in the IDCS, examined the CMC chat logs with the IDCS dimensions, training examples, and cues in mind. The hierarchical coding method (Bakeman, 2000) also informed this stage, such that when instances of larger behavioral constructs or dimensions were detected, we noted these instances on the logs and made note of secondary instances of specific behavioral cues that were detectable, as evidence of the larger behavioral dimension.

For example, if the construct of Conflict was detected (a combined code, where both verbal content and nonverbal cues can be observed), instances were then noted of any verbal or nonverbal behaviors that took place to provide evidence of that behavior (e.g., using words to express a complaint about one's partner, using punctuation to create an angry face >:(, using a bold font on words that express disagreement with one's partner). During the review, we also generally looked for instances of affect being displayed, including translation of affect into language content (e.g., "I am happy right now") or the use of technology-based nonverbal cues to express affect (e.g., "YAY", "that is GREAT!").

Results of Chat Log Reviews. All nine individual dimensions included in the IDCS were detectable and observable across the logs. The dyadic codes of Positive Escalation and Negative Escalation were also observable in the logs, including many instances of verbal and nonverbal behaviors being sequentially enacted over time. We determined that both types of affective adaptive behaviors were present in the CMC logs and that the IDCS codes fit the text-based behaviors that were observed. Furthermore, we agreed that the basic IDCS behavioral constructs accounted for enough of the behavior

observed in CMC that it would be appropriate to adapt the IDCS to text-based interactions.

An additional step was then taken to continue to inform the process, wherein we attempted to directly apply the IDCS codebook and protocols to the CMC chats. This step was necessary to determine if the codebook could be applied in its original state; if only minor modifications would be needed; or if a new codebook of behavioral cues, examples, and definitions would need to be developed and tested.

Applying IDCS Directly to CMC Chat Logs. The same colleague and I then attempted to code a subset of the CMC chat logs (N = 11) using only the examples, cues, and scoring anchors provided in the established IDCS codebook. Preliminary discussions and analyses were conducted to determine the level of interrater agreement. Overall, although we agreed that we could detect various verbal and nonverbal behaviors in the logs, once we attempted to provide ratings, we experienced challenges in establishing a high level of agreement across the ratings for six of the nine individual dimensions. The six dimensions of concern were Positive Affect, Negative Affect, Dominance, Denial, Communication Skills, and Withdrawal. The codes that demonstrated higher levels of consensus for ratings and that seemed to be more straightforward in applying directly to CMC were Support Validation, Conflict, and Problem Solving.

In addition to assigning ratings for the nine individual dimensions, we also evaluated the five dyadic dimensions. Overall, we were both able to detect dynamics of positive or negative escalation in the interactions; however, there was disagreement pertaining to how the dyadic escalation dynamics should be rated overall. The coding definitions for these dimensions stated that both verbal and nonverbal behaviors must be

present for a sequence of behaviors to be considered escalation. When evaluating the CMC logs, however, we observed instances of escalation that involved only verbal content, which would indicate a need to modify these definitions.

For the three remaining dyadic dimensions (Commitment, Future Satisfaction, Future Stability), it was determined that additional guidance was necessary to interpret the chat logs, including the language and affect being used or not used and additional discussion around context and intuiting CMC dynamics.

Using the Traditional IDCS Manual for Coding CMC Chat Logs. After these two initial review and ratings processes were completed, we discussed general impressions of the behavioral patterns that presented in CMC, as well as the use of affect in CMC and the process of trying to use the IDCS in its original form to assess behaviors in the text-based logs that included affect.

It was determined that significant variance existed between the CMC chat logs and the IDCS manual's behavioral definitions, cues, examples, and scoring anchors, as well as the general finding that rating agreement between coders was difficult to achieve for the majority of dimensions. Thus, it was indicated that modification of the IDCS would be undertaken to develop a coding system that would be appropriate for text-based couple interactions. The following sections will detail the process by which the IDCS was modified and the new coding system, the Interactional Dimensions Coding System – Computer-Mediated Communication (IDCS-CMC), was developed.

Creation of the IDCS-CMC (Research Purpose 2)

This section details the development process for the IDCS-CMC. Details will be provided on how the introduction, protocol, anchoring, and ratings systems as well as the

codebook were modified. Codebook examples will be discussed as they relate to specific dimensions, definitions of behaviors, cues utilized to make ratings, contextual examples, and scoring anchors. Considerations for modifying codable units and changing the coding protocol will also be discussed.

Modifying the Codebook

Introduction and Instructions. The IDCS manual includes an introduction where the coders are introduced to observational coding systems and the IDCS. This section was updated to include CMC language and relevant context to help coders understand CMC dynamics and the use of the coding system for text-based couple interactions. Modifications were also made to the general protocol section, including updating directions that timestamps within the CMC chat log be used for splitting up segments of time. It was also updated to explain that coders would be reading the chat logs rather than watching videos. Additional modifications were made to replace language in the IDCS that assumed male/female gender-identity and heteronormativity. The IDCS-CMC includes more inclusive language throughout the manual, and the coding scorecard represents two partners rather than a male and female dyad.

The IDCS utilizes a rating system, and in the instructions the anchoring system for providing scores is detailed. The anchors give examples of how many, what variety, and what intensity or duration the behavior needs to be present in the interaction in order to get a score from 1 to 9. Modifications needed to be made to the type and variety for the affect cues, given that the original FtF version required that positive or negative affect be specifically demonstrated by face, body, and voice throughout the interaction in order to get a 9. The CMC version was updated with more general language to state that the

individual must demonstrate multiple examples and types of affect throughout the entire interaction, such as using both punctuation or all caps to express excitement, in combination with using a smiley face emoticon.

Similarly, in the section explaining combined codes, instructions were given in the IDCS that there should be scoring caps for ratings, requiring that both explicit affect and content cues need to be observed in order to rate a combined code a given higher score. In CMC, however, these verbal and nonverbal cues can either be interlinked or the dynamic may be more heavily loaded on the content part of the communication. For the purposes of the IDCS-CMC, there was not any justification for including similar scoring caps or requirements for co-occurring verbal and nonverbal behaviors. Thus, the language pertaining to scoring caps and related requirements to detect certain types and combinations of behaviors was removed for the combined dimensions in the IDCS-CMC.

Code Catalog. Bakeman and Gottman (1997) detail the process recommended for developing or modifying a coding scheme. They state that each behavior should be described in as much detail as possible. When dynamics and behaviors are detected in the initial viewing of interactions, the researchers should always look for the examples and cues that informed the judgment that was made about a behavior being present (Bakeman & Gottman, 1997). These examples should then be included in a code catalog of detailed examples of each dynamic, which should then be used for training of coders. Bakeman and Gottman (1997) state that the code catalog should be as comprehensive as possible, with illustrative examples, to help coders distinguish between behaviors.

For the IDCS code catalog, modifications were made to both the affect dimensions (which consist of nonverbal and relational behaviors) and combined

dimensions (that include nonverbal and verbal behaviors). These modifications included adding more inclusive language to the definitions, providing examples that are relevant to CMC affect cues, and updating scoring anchors. Modifications were also made to the content codes, given that the language itself can be manipulated in a CMC channel to indicate affect or meaning. As described above, this initial codebook modification process was informed by the preliminary review processes when the chat logs were reviewed by a colleague and myself who were trained in the IDCS, as well as by the process of trying to directly assign ratings to the chat logs using the IDCS in its original form. Based on the outcome of the direct application of the IDCS to the CMC interactions, additional focus was given to the six individual dimensions and three dyadic dimensions that were identified as being challenging to establish rating agreement for.

Overall, the initial review of the CMC chat logs indicated that affect is overwhelmingly present in the text-based problem-solving interactions between couples, reflected through emoticons, changes or exaggerations in punctuation use, and expression of laughing (haha, lol, etc.). Through discussion of the interactions, context, and further review, the coders agreed on impressions and interpretations of certain affect cues in CMC and how they may translate to the original dimensions of the IDCS. For example, both coders may have observed the use of a smiley face emoticon but originally may have had different interpretations of which dimension it may be related to or how an individual's use of a smiley face emoticon may influence a decrease or increase in a ratings score.

Modifying Affect Codes. Modification of the coding scheme included making comprehensive changes to the examples and cues included in the affect codes. Affect is

included in the rating of not only the affect codes but the combined codes and the dyadic codes. CMC-based nonverbal cues needed to be added as well as CMC-specific interactions and examples. Contextual examples were also created that will help assist coders in interpreting complex or contradictory cues. For example, instead of interpreting head nods, dynamic speaking voice, or friendly tone as positive affect, a coder analyzing CMC may determine that the use of a smiley face emoticon and use of the acronym "lol" (i.e., laughing out loud) are relevant indicators.

The two dimensions of affect that are traditionally coded using facial expression, tone of voice, and body posture were modified to include the use of emoticons, use of punctuation to express enthusiasm or curiosity, or the use of a message indicating laughter. In addition, the spelling of a word can be modified to indicate a different pronunciation or to indicate an inflection in the voice (e.g., Ok, fiiiine). Changes in font to italics, bold, or all capital letters and inclusion of symbols can also indicate that a user is intending to communicate affect to the receiver. A full crosswalk between the FtF affect examples and the new CMC affect indicators of positive and negative affect can be seen in Table 3.1 and Table 3.2.

Table 3.1 Positive Affect Codes

Face to Face	Computer-Mediated
General Definition Positive affect refers to the positivity of facial expressions, body positioning, and the emotional tone or quality of voice. Positive affect is not the same as absence of negative affect.	**General Definition** Positive affect refers to the expression of positivity through the use of emoticons, manipulation of text, text-based symbols, punctuation, letters, or inclusion of relational affect or emotion-laden language. Positive affect is not the same as absence of negative affect.
Example Positive Affect Cues ***Positive face*** • Combinations of facial expressions	**Example Positive Affect Cues** ***Positive Face, Emoticons and Symbols*** • Use of punctuation or text-based

Table 3.1 Positive Affect Codes (continued)

produced by the forehead, eyebrows, cheeks, and mouth that express happiness in the interaction (cheerful, excited, buoyant, bubbly, joyous, satisfied, relieved, chuckling, laughing). • Facial expressions conveying support for partner (affectionate, warm, soft, tender, caring, loving, empathic, concerned). The maintenance of good eye contact is a key component of positive face. ***Positive voice*** • Affectionate, warm, soft, tender, caring, loving, cheerful, excited, buoyant, bubbly • Happy, joyous, satisfied, relieved, empathic, concerned, chuckling and laughter (unless context suggests negative tone) ***Positive body*** • Relaxed body (check for relaxation of the neck and shoulders, wrist dexterity when arm is moving, and asymmetrical placement of limbs). Whole body (head, torso, hips) is comfortably oriented toward partner, and when the body moves, facial distance between partners is minimized and maintained.	tools to create symbols that represent positive facial expressions or happiness, warmth, excitement, tenderness, relief or laughing in interaction. May include faces indicating smiling ☺, winking ;-), sticking tongue out, :-P, thumbs up, hug. • May also include the use of symbols or other graphics related to expression of love, support or affection, such as a heart <3, a kiss, :-*, a hug graphic, a rose @>-- ***Positive voice*** • Any vocalization that can indicate affection, warmth, tenderness, caring, cheerfulness, excitement, happiness, relief, empathy, concern by use of exaggeration or manipulation of letters, punctuation, font style or use of all capitalized letters. Ex. Yaaaaay!, When can we leave?!?! ☺, I LOVE that ideeaa, **PHEW!** • Sounds of laughter being translated through use of letters to indicate sound or acronyms indicating the behavior of laughing. Ex. hahah, LOL, hah!, hehe, lmao • Use of pet names, nick names, or positive language that reflects affect or emotion, that may or may not be expressed in combination with other cues ***Using Context Clues*** • Use context of conversation to determine intent of affect cues • Positive affect clues could also indicate sarcasm, could buffer negative content or be used to lighten the mood during conflict/negative escalation

Table 3.2 Negative Affect Codes

Face to Face	Computer-Mediated
General Definition Negative affect refers to the negativity of facial expressions, body positioning, and the emotional tone or quality of voice. Negative affect is not the same as absence of positive affect.	**General Definition** Negative affect refers to the expression of negativity through the use of emoticons, manipulation of text, punctuation, or letters, or the use of words or emotion-laden language. Negative affect is not the same as absence of positive affect.
Example Negative Affect Cues ***Negative face*** • Different combinations of facial expressions produced by the forehead, eyebrows, cheeks, and mouth that express *dissatisfaction/uncomfortableness* in the interaction (tense, distressed, worried, bored, sighing, sad, crying). Lack of eye contact, especially for a long time, is also negative. However, during conversations, a speaker naturally alternates gazing at the listener with gazing away, so observers must determine whether the speaker looks away from the listener longer than the speaker looks at the listener. • Different combinations of facial expressions produced by the forehead, eyebrows, cheeks, and mouth that express *anger* toward the other (frown, sneer, mocking, smirking, disgust, contempt, scorn).	**Example Negative Affect Cues** ***Negative Face, Emoticons, and Symbols*** • Use of punctuation or text-based tools to create symbols that represent negative facial expressions and affect including dissatisfaction, discomfort, tension, distress, worry, boredom, sighing, sadness, or crying. May include faces indicating frowning ☹, distress :-/, anger >:-(, or sadness :'-(, face showing eye rolling, sick face, smirking. • May include other symbols or graphics that indicate negative affect Ex. Thumbs down, use of an **X** to indicate disagreement or displeasure, sending a blank message or … to indicate boredom or lack of interest.
Negative voice • Cold, impatient, whining, sarcastic, angry, hurt, depressed, accusing, irritated. Note: It will be important to distinguish the flat or monotone voice from the depressed voice; typically, the latter is accompanied by a sad or dejected facial expression.	***Negative voice*** • Use of language or punctuation or message or sentence structure to create a message with vocal inflection that sounds cold, impatient, whining, sarcastic, angry, hurt, depressed, accusing, irritated.: Ex*…and? What's your point?? What. Is. Your. Problem. (sent as four separate messages)*

Table 3.2 Negative Affect Codes (continued)

Negative body • Tense or rigid body (check for constriction of the neck and shoulders). Body or parts of the body (shoulders, hips) are oriented away from the partner, and when the body moves, facial distance between partners is increased. Touching that does not appear to be playful or supportive; fidgeting with an object, hair, glasses, or clothing.	***SIGH** womp woommmpp.* • Use of emotion-laden language, indicating negative emotions such as teasing, cuss words, or harsh statements, that may or may not happen in combination with other cues. ***Using Context Clues*** • Using text channel or functions in a way that does not appear to be playful or supportive; changing fonts, including punctuation or emoticons in a way that is distracting or considered fidgeting • It will be important to distinguish the flat or monotone communication from the depressed affect; typically, the latter is accompanied by a sad or dejected facial expression.

Modifying Verbal Content Codes. For the content codes, we were interested in the language used by participants and the nature of exchange and content of the message. In the initial application of the IDCS codes of Support/Validation and Denial, my colleague and I agreed that the original IDCS definition and examples translated appropriately to CMC. Assessing for Dominance, however, provided challenges. We both indicated that dominating the conversation and typing too much, sending too long of messages, typing too quickly, not letting your partner catch up or take a turn, or sending short messages very quickly in a row could be evidence of Dominance. These dynamics are similar to dominance in FtF, but the text-based behaviors in which they are enacted are unique to CMC. An individual who is overpowering or more vocal or expressive in text may have similar characteristics in person, but these text-based dynamics could also

be attributed to factors related to the use of technology itself. One partner may be more comfortable with the technology and use of the keyboard or keypad, one may be faster at typing or a better speller, or the two individuals may have different preferences for the length of messages that they construct and send.

Within the dimension of Dominance is the specific behavior of interrupting. The process of interrupting is also necessarily different in CMC than in FtF, so the detection of this behavior in CMC may also be altered. In FtF, one partner who is interrupting can effectively stop the other from talking. In CMC, however, both individuals are able to continue to contribute messages to the interaction, which are then necessarily reviewed by their partner. Partners each get a chance to say what they want.

Table 3.3 Dominance Content Codes

Face to Face	Computer-Mediated
General Definition Dominance is the actual achievement of control or influence an individual exerts over one's partner during the interaction. Dominance may be identified through forceful, monopolizing, and/or coercive behaviors. **Example Dominance Cues** • Directing the course of the conversation • Talking forcefully and/or taking charge • Commanding partner and partner complies • Talking more often than partner and/or not letting partner talk • Successfully interrupting partner and/or resisting partner's interruptions • Starts or introduces problem discussion and/or closure of problem discussion abruptly, against partner's wishes or without input or consent	**General Definition** Dominance is the actual achievement of control or influence an individual exerts over one's partner during the interaction. Dominance may be identified through forceful, monopolizing, and/or coercive behaviors. **Example Dominance Cues** • Directing the course of the conversation • Talking forcefully and/or taking charge • Commanding partner and partner complies • Talking more often than partner and/or not letting partner talk. • Successfully interrupting partner and/or resisting partner's interruptions • Starts or introduces problem discussion and/or closure of problem discussion abruptly, against partner's wishes or without

Table 3.3 Dominance Content Codes (continued)

from partner • Forces partner to accept own opinions without reasons • Completely changes partner's opinions • Withholds contributions to conversations as a means of exerting control	input or consent from partner. • Forces partner to accept own opinions without reasons • Completely changes partner's opinions • Withholds contributions to conversations as a means of exerting control ***Using Context Clues*** • Some people will type in shorter or longer blocks of text and some may be faster at typing or more familiar with the platform being used for the interaction. • Take note of the differences in typing volume, style, and pacing. Consistency or change in these dynamics may indicate attempts to talk more or talk over a partner, which could indicate dominance or conversely may demonstrate that someone types faster. Also, someone sending messages in fast sequence and in shorter blocks may indicate an effort to dominate the typing window, but could also indicate that the person has a different style of typing messages. • Take note of timestamps during conversation and any changes in style of typing or pacing, • Withholding or delays in communicating could be considered dominance, but could also be an indication of someone thinking or typing out a longer message.

Modifying Combined Codes. The content aspects of the combined codes (including Support/Validation, Conflict, Withdrawal, and Communication Skills) were relatively straightforward to detect in CMC. There were, however, a few examples

of affect-based behaviors that required additional consideration. The first was within the dimensions of Support/Validation, including the act of active listening**,** which is an aspect of being supportive or validating. In FtF interaction, these cues are usually spontaneous and natural reflections of the nature of the listening taking place by the receiver of a message. Receivers of messages may use their bodies to convey attentiveness (nodding head, eye contact, leaning in, etc.) or may use vocal utterances (uh huh, I see, yeah, okay, right, hmm, etc.). In CMC, the use of the nonverbal indicators of traditional active listening are not available, and translating active listening content messages is not automatic or reflexive as it would be in FtF. Therefore, in CMC the listener would need to type these messages out, which may or may not feel natural. During the log review, couples were identified that did use active listening messages, and there were other couples that did not. The codebook was modified to reflect CMC-based active listening cues.

Table 3.4 Support/Validation Combined Codes

Face to Face	Computer-Mediated
General Definition Support/Validation focuses on positive listening skills and speaking skills that demonstrate support and understanding to the partner. Close synonyms for this code are encouragement, acknowledgement, and acceptance. ***Example Support/Validation Affect Cues*** • Attentive while listening • Good eye contact while speaking • Face is congruently responsive to what partner is saying (e.g., head nods, smiles, eyebrow movements) while listening • Body is relaxed and open	**General Definition** Support/Validation focuses communication that indicates positive listening skills and communication skills that demonstrate support and understanding to the partner. Close synonyms for this code are encouragement, acknowledgement, and acceptance. ***Example Support/Validation Affect Cues*** • Positive face emoticon or graphic to indicate paying attention when someone is listening or express positivity if someone is being the speaker • Use of text-based vocal inflection or

Table 3.4 Support/Validation Combined Codes (continued)

• Body is oriented toward partner while listening and speaking • Expressive face while speaking • Demonstrates vocal inflection (variation of rhythm and intonation) while speaking	listening to express positivity or active listening, Ex. “uh huh”, “hmmm”, “…..”, “??” • The listener using symbols or in-message reactions to indicate agreement, validation, and responsiveness by giving their message a thumbs up, heart, or exclamation point, haha. • Use of emoticons, symbols, graphics, or manipulation of words, spelling, font, or use of punctuation to indicate warmth, concern, sympathy, or flattery. Ex. You have the BEST ideas!!, I loooove you <3 <3, okaaaay, lets DO it ☺
Example Support/Validation Content Cues • Expresses warmth, concern, and sympathy toward partner • Makes positive or neutral attributions about partners behavior • Accepts partner’s attributions about own behavior • Summarizes or paraphrases partner’s statements • Encourages partner • Flatters, compliments partner	***Example Support/Validation Content Cues*** • Expresses warmth, concern, and sympathy toward partner • Makes positive or neutral attributions about partners behavior • Accepts partners attributions about own behavior • Summarizes or paraphrases partner’s statements • Encourages partner • Flatters, compliments partner ***Using Context Clues*** • Some of the emoticons or vocal utterances used while someone is being a listener need to be evaluated in context, such that they could also indicate boredom, lack of responsiveness, or even passive aggressiveness. • A lack of affect-based active listening should not always be interpreted as a lack of support/validation, as a listener may be providing the speaker space to type and not including these cues. • Use of nicknames or pet names in a

Table 3.4 Support/Validation Combined Codes (continued)

	loving, supportive, or relational way may be used only in content of the message or they may be used in combination with a symbol or other affect indicators.

Within the dimension Conflict, the use of sarcasm is given as a behavioral cue, and this specific behavior warranted further consideration for modification in the IDCS-CMC codebook. As defined by the IDCS, uses of sarcasm in couples' communication is coded as negative affect or in the combined code as evidence of conflict. The interpretation of meaning or intention behind sarcasm is often ambiguous in FtF interactions and can be equally confusing in CMC. After review of the logs, it was observed that use of sarcasm in the interactions was often followed by a positive affect cue, such as a wink or smiley face or text-based laughter, presumably to give additional information to the receiver about the meaning of the content of the message. However, there were also instances when even the partner of the individual expressing the sarcasm experienced difficulty decoding the meaning, and the sender would then explicitly state that they were being sarcastic.

Table 3.5 Conflict Combined Codes

Face to Face	Computer-Mediated
General Definition Conflict is an expressed struggle between two individuals with incompatible goals or opinions. The level of tension, hostility, disagreement, antagonism, or negative affect an individual displays can identify conflict. ***Example Conflict Affect Cues*** • Face displays tension, nervousness (includes eye contact, clenched jaw,	**General Definition** Conflict is an expressed struggle between two individuals with incompatible goals or opinions. The level of tension, hostility, disagreement, antagonism or negative affect an individual displays can identify conflict. ***Example Conflict Affect Cues*** • Use of emoticons, symbols, graphics, or manipulation of words, spelling,

Table 3.5 Conflict Combined Codes (continued)

eye twitches, nostrils flair, decreased or overly intense eye contact) • Body is tense, tight • Speaks in a negative voice – impatient, angry, whining, cold or curt • Reacts with negative affect to own or partner's negative affect ***Example Conflict Content Cues*** • Judges and criticizes partner or people/things important to partner • Imposes own will on partner, is controlling • Demonstrates indifference and lack of commitment • Minimizes the value of partner' s contributions • Expressing rigidity in one's willingness to listen to partner • Disagrees more often than agrees with partner • Makes negative interpretations/mind reads – attributes negative feelings, attitudes, beliefs or motives to partner (e.g., "You never wanted to go to my parents' house in the first place") • Makes negative overgeneralizations – e.g., "You always say that!" or "You never ask me how my day went..." • Antagonizes partner by using sarcasm, complaining in response to partner's complaint, or commenting negatively on partner's negative behavior • Appears to instigate more conflict	font, or use of punctuation to indicate impatience, anger, coldness, curtness, sarcasm, indifference. Ex. You NEVER pay attention!! …whatever… whhyyyyy can't you remember?? UGH >:(. ya.sure.mk. • Reacts with negative affect to own or partner's negative affect ***Example Conflict Content Cues*** • Judges and criticizes partner or people/things important to partner • Imposes own will on partner, is controlling • Demonstrates indifference and lack of commitment • Minimizes the value of partner' s contributions • Expressing rigidity in one's willingness to listen to partner • Disagrees more often than agrees with partner • Makes negative interpretations/mind reads – attributes negative feelings, attitudes, beliefs or motives to partner (e.g., "You never wanted to go to my parents' house in the first place") • Makes negative overgeneralizations – e.g., "You always say that!" or "You never ask me how my day went..." • Antagonizes partner by using sarcasm, complaining in response to partner's complaint, or commenting negatively on partner's negative behavior • Appears to instigate more conflict ***Using Context Clues*** • Use of sarcasm should be interpreted in context by both the person who initiated it and how it is interpreted by the partner. Behavior should be

Table 3.5 Conflict Combined Codes (continued)

	explored as it may contribute to positive or negative escalation to determine if it is evidence of conflict.

Withdrawal is another interactional behavior that appeared different in nature in CMC than in FtF. In lab-based interactional studies, participants are asked to sit and discuss a topic with their partner, often while being video recorded. Given this restraint, finding evidence of natural couple withdrawal where one partner actually leaves the room or refuses to talk is unlikely. Coders can then look to body language that communicates distance and to content of messages that communicates that the participant is bored, is avoiding questions, or is not contributing to the interaction or their partner's goals in a productive way. The detection of a participant being withdrawn in a text-based interaction could potentially be based on these definitions; however, body language cannot be utilized to detect the behavior. Even a delay in response by a user to a message cannot be assumed to be withdrawal because a user could just be taking additional time to think, typing their message, or may be experiencing technological difficulties. Expressions of boredom, the introduction of irrelevant topics, or a user communicating that they are not interested in discussing a topic anymore are clear content cues of withdrawal, but affective intentions or other online behaviors complicate the accurate and valid coding of this communication behavior.

For the dimension Withdrawal, the definition in the IDCS manual states that withdrawal behavior cannot be expressed through the content or language used by participants and is instead typically communicated through nonverbal behaviors. In CMC then, an indication of withdrawal may be communicated verbally in an explicit way, such

as stating “I don’t want to talk about this anymore” or may be observed through delays in response, sending short messages, or engaging in behaviors that may act as a distraction from the topic or interaction. This updated explanation and examples were included in the Withdrawal section of the codebook.

Table 3.6 Withdrawal Combined Codes

Face to Face	Computer-Mediated
General Definition Withdrawal is the avoidance of the interaction or of the problem discussion. The individual may evade the issue, retreat into a shell, back off, or may seem to pull oneself out of the interaction. ***Example Withdrawal Affect Cues*** • Avoids eye contact while speaking or listening (looks away or down a lot) • Body turned away from partner • Increases and maintains physical distance from partner (i.e., changes chair position to create more distance, reclines chair back, tilts chair away) • Puts a physical barrier between self and partner (i.e., arms crossed, hands covering part of the face) • Fidgets with hair, glasses, clothes or jewelry repeatedly • Appears uncomfortable or bored ***Example Withdrawal Content Cues*** • Allows partner to dominate the discussion • Displays a low level of communication assertiveness by allowing partner to talk over them or redirect the flow of conversation • Is unresponsive to partner • Displays a low level of self-	**General Definition** Withdrawal is the avoidance of the interaction or of the problem discussion. The individual may evade the issue, retreat into a shell, back off, or may seem to pull oneself out of the interaction. ***Example Withdrawal Affect Cues*** • Uses text-based cues to communicate rather than using words to express thoughts and feelings such sending a message with only punctuation, Ex. “…”, or “??”, or sending a blank message • Shortens words to indicate a lack of participation, such as typing “idk” instead of “I don’t know”, or “k” instead of “okay”, or not including punctuation when it may be easily included otherwise, such as sending “y” instead of why?, indicating a lack of effort or interest • Uses text, symbols, font, punctuation in a way that creates distraction or distance in communication ***Example Withdrawal Content Cues*** • Allows partner to dominate the discussion • Displays a low level of communication assertiveness by allowing partner to talk over them or redirect the flow of conversation • Is unresponsive to partner • Displays a low level of self-

Table 3.6 Withdrawal Combined Codes (continued)

disclosure • Ends conversation • Clams-up • Says “I don’t want to talk”	disclosure • Ends conversation • Clams-up, or states “I am uncomfortable” • Says “I don’t want to talk” ***Using Context Clues*** • Withdrawal may look like being completely unresponsive, or a partner may send short responses, or responses that take minimal effort to construct. Use context and changes in response affect or content of message style to determine if someone’s behaviors indicate a minimal effort being made to communicate • Short responses or efforts indicating minimal effort being made to respond may be an indication of withdrawal.

Overall, the content codes of Problem Solving and Denial were unchanged as well as the combined code of Communication Skills, apart from updating the affect cues to include CMC examples including use of emoticons, graphics, font, punctuation, symbols, or vocal inflection to indicate interest in partner or topic, excitement, emotional engagement, humor, or laughing.

The last set of dimensions is referred to as dyadic dimensions, and the two codes that needed to be updated included Positive Escalation and Negative Escalation. In the IDCS-CMC codebook, the definition for positive and negative escalation was updated to include nonverbal behaviors typical of CMC as well as changing the instructions to allow both verbal and nonverbal behaviors to count toward the rating.

Codable Units

In developing or modifying a coding system, it is also necessary to assess the coding process and general protocols utilized for training. First, codable units and specifics for observing the interactions were considered. In observational analysis, the thing being coded, in this case the interaction, is considered the codable unit (Bakeman, 2000; Bakeman & Gottman, 1997). Unitization is the process of breaking a stream of behavior into units for coding, which can be done in a variety of ways, some of which are segments of time, instances of turn taking, or behavioral or observational ratings. Throughout the data collection, coding, and analysis plan, the unit of analysis can continue to be considered and revised (Margolin et al., 1998).

The IDCS manual recommends that the entire recording of a given couple be segmented into three time portions where the total length of the interaction is divided in three and coders pause at each of these time markers and provide a score across all nine dimensions for each individual in the dyad. After all three segments are viewed and scored, the coder then provides a final score that represents the entire interaction for that person and that dimension (i.e., a mean score). For interrater reliability analysis, as well as subsequent analysis, only the overall rating is used, and the three scores assigned to the small segments are discarded. The coders are instructed to provide the interval scoring as an anchor for themselves to remember the dynamics that played out at the beginning, middle, and end, thus making their overall end score more reliable. However, in CMC, the entire chat log is available for the coders to view at once. They are not viewing the chat log in three different segments, and coders have the ability to read through the log to view beginning, middle, and end dynamics when they provide their overall scores.

However, Bakeman and Gottman (1997) stated that having more discrete things to observe, and also collecting data at more detailed level than required, allows the observer to have more “hooks” to grab onto in a passing stream of behavior, thus likely influencing the reliability of their observations (p. 25). Thus, although the nature and physicality of the recording itself differs across the interaction types (watching a video versus reading a log), it was decided that the IDCS-CMC would retain the expectation for three-segment coding as well as raters assigning an overall code. This decision was further evaluated when a coding team was trained on the IDCS-CMC and initial and continuous feedback was elicited from the team on the usability of the system. The team’s feedback will be discussed further in the next chapter.

Chapter 4. Results

Introduction

The results of the qualitative review processes previously discussed under Research Purpose 1 indicated that the CMC interactions were consistent along basic parameters with FtF interactions. After the CMC logs themselves were reviewed, the behavioral constructs and cues that would generally be associated with problem-solving tasks outlined in the IDCS could be adapted to CMC. It was then necessary to determine how definitions and examples for coding in the IDCS could be modified to reliably and validly assess for text-based couple interaction. The result of that effort, under Research Purpose 2, was the development of the IDCS-CMS manual that included how scores are assigned and scoring anchors are utilized, how behaviors are defined, and what examples and cues are included that encompass text-based affect and interactional dynamics.

This chapter will focus on Research Purpose 3, including applying the IDCS-CMC and testing the system for interrater reliability (IRR) and various types of validity. This chapter will progress chronologically based on the iterative process of testing and refining an observational coding system, including training the coders, getting feedback on the usability of the system, modifying the codebook as needed, assessing rater agreement, retraining and recoding the data as needed, facilitating group discussion in instances of disagreement or divergent interpretations, updating the manual if needed with clearer explanations or interpretations of behaviors, and testing reliability until an adequate level of IRR for the dimensions as well as overall reliability and validity for the coding system can be established.

Implementing and Testing the IDCS-CMC (Research Purpose 3)

The process for modifying and testing the IDCS-CMC is informed by previous studies where the IDCS was successfully modified (e.g., Black, 2000; Black & McCartney, 1997) and by best practice for design, coding, and analysis of observational coding systems (Bakeman, 2000; Bakeman & Gottman, 1997; Baucom et al., 2017; Kerig & Baucom, 2004; Margolin et al., 1998).

Recruitment of Coders

The IDCS-CMC utilizes outside raters who observe interactions, detect various types of communication behaviors, and assign scores on the degree to which that dimension was enacted by each individual in the couple during the interaction. The role of the coder then is twofold; they must both become expert on the behavioral constructs in the codebook, such that they can detect dynamics, identify cues, and score behaviors, and they must also use their own life experience, expertise, and judgment to interpret and then confidently provide ratings on the meaning and the intention of the observed behaviors. Thus, the role of the coders for this coding scheme is that of a detector of information but also a cultural informant inferring others' intentions (Bakeman & Gottman, 1997, p.22).

Although many observational analysis coding protocols utilize only one coder who has been trained to rate observations, using two or more coders increases the odds of interrater reliability and provides additional perspective from a larger coding team to further refine the IDCS-CMC (Bakeman, 2000). In addition, many previous studies utilizing the IDCS have used two or more coders (Kline et al., 2004; Scott et al., 2019). Based on these premises, research interns were recruited who were (a) comfortable with

interpreting couple interactions, (b) demonstrated skill in being able to do so, and (c) had familiarity and knowledge of a large range of text-based communication behaviors, specifically including use of affect in CMC contexts.

Recruitment for the internship took place over email distributions sent to undergraduate students in the departments of Family Sciences and Communication (see Appendix 1). Requirements included being at least 18 years old, having an in-major GPA of at least a 3.0, and having personal experience using text-based communication for interpersonal relationships. All applicants were required to complete an interview, which consisted of questions pertaining to interest in the project, time management, and independent working and group work capabilities; experience working on a team; behavioral questions assessing their ability to quickly learn and then independently implement a detailed protocol; and their communication style and role in groups. The interview also consisted of skills assessments including identification of text-based affect, identification of commonly used emoticons and symbols, providing explanation for when and how these would be used in context, and reviewing a sample chat log and providing interpretations of interaction and ratings on various dimensions. The full interview script is available in Appendix 2. Six undergraduate students expressed interest in the internship, five completed the interview, and ultimately four were selected for the research team. All four coders selected demonstrated a base knowledge level and ability to accurately identify a variety of different technology-based communication symbols and identify the context in which such symbols would be used. All four coders were also able to correctly identify positive and negative affect in an example CMC log, as well as interpret meaning behind a variety of communication behaviors, including conflict and

dominance dynamics. The coding team consisted of all females who were in their 20s. Two were students in the Department of Family Sciences, and two were students in the Department of Communication. Interns who were accepted onto the team were offered three hours of upper level undergraduate course credit.

Prior to engaging in training for the IDCS-CMC, all team members were added as study personnel to the approved IRB study protocol and completed social and behavioral investigator training through the Collaborative Institutional Training Initiative (CITI), which included training modules on research with human subjects, ethics, regulations, informed consent, privacy, and confidentiality. Once these steps were completed, the coding team began training on the IDCS-CMC.

Establishing Content Validity and Face Validity of the IDCS-CMC

To assess content validity, two key criteria are (a) to what extent the behaviors displayed in the study setting (i.e., problem solving using CMC) resemble the couple's usual way of interacting with one another and (b) whether what is being observed in the chat logs (what behaviors and dynamics the couples are actually engaging in during the chats) evidences behaviors that are relevant to the issue being studied (e.g., if the study is focused on problem solving, the couples during actions avoid conflict and focus on other topics or dynamics instead) (Floyd & Rogers, 2004).

To answer the first criteria, we can look to the participant's own report on their use of CMC in their normal life. All couples who participated in the larger study were asked to complete assessments immediately after they completed their FtF interaction task and again after they completed their CMC interaction task (or vice versa, depending on the order assigned of the communication conditions). These self-report assessments

included questions pertaining to one's level of satisfaction with the interaction as well as describing the overall experience. One of the questions in the assessment aimed at determining to what degree the individual felt that communicating in the way they did in the study was common for them, and the results from this self-report question can help determine content validity. The question reads, "Using this method of communication for a discussion of this nature would be common for me and my partner," and 56.3% responded that they strongly agreed, agreed, somewhat agreed, or neither agreed or disagreed. This gives some indication that a large part of the sample does frequently use text-based channels for problem-solving or conflict resolution in their romantic relationship.

Furthermore, the second content validity criterion can be assessed by reviewing the CMC chat logs themselves, which was completed as part of Research Purpose 1. Part of the observational coding system selection process was to determine what a good fit for the content of the chat logs would be for observation, including behavioral constructs and type of system. Not only were problem-solving dynamics prevalent throughout the interactions, but almost all couples attempted to stay focused on the topic that they selected for the duration of the 15 minutes. This indicated that that the dynamic of interest, as it was assigned to the participants in the protocol of the larger study, is actually being enacted in the study interactions (Floyd & Rogers, 2004). For this study, problem solving is the larger behavioral construct being studied, and the interactions being coded do indeed contain problem-solving dynamics.

Face validity is an assessment of validity of a newly developed or modified system (Cicchetti, 1994), asking the question "Do the items indeed look as though they

measure what they are intended to measure?" (p. 287). During the training phase (which will be discussed at length later in this chapter), feedback was elicited from the research team on the general usability of the codebook. They were introduced to the system, asked to read the training manual in its entirety, assigned three example CMC interactions, and asked to use the scorecard (See Appendix 3) to assign ratings. Upon completion of this pilot process, they were asked the following questions:

- How well did you understand each dimension?
- Were any dimensions confusing?
- How helpful were the examples provided in the scoring instructions and the behavioral constructs?
- What are other relevant behavioral examples that you could think of that could be included?
- Are there different words or better examples of text or technology-based behaviors that could be included?
- Could more or different context examples or explanations be provided to help distinguish when a behavior is happening?
- Could more or different instructions be given pertaining to how to determine and assign a rating?

All feedback that was given by the team was recorded and then integrated into an updated version of the IDCS-CMC. A summary of basic feedback included the following:

- Overall, coders stated that training protocol, scoring examples and instructions, and overall behavioral constructs were clear and comprehensive and that the CMC examples provided throughout were relevant, applicable, and identifiable.
- A coder requested that different examples for emoticons that could indicate lack of interest (e.g., :-/, eyes closed sleeping face emoji) be included.
- A coder requested that examples and types of content that may be included in short responses that indicate lack of interest (e.g., …, blank message, k) be included.
- A coder requested that use of pet names or nicknames be included in Positive Affect.
- A coder requested that cussing, name calling, and "harsh language" be included in Negative Affect.
- Overall, coders agreed that for Support/Validation behaviors, "in message" symbols used to respond to a message, such as in-text thumbs upping one's partner's message, putting a heart on a message, etc. be included as these behaviors can indicate active listening, being present, and being supportive.

In addition to eliciting feedback from the coding team and integrating their feedback into the manual, face validity was also established by contacting the originators of the IDCS coding system. This process ensures that the integrity, intention, and application of the new system is consistent with the original version (Floyd & Rogers, 2004). Based on this recommendation, the original authors of the IDCS were contacted. Dr. Galena Rhoades agreed to review the IDCS-CMC and provide feedback. This

meeting took place in September 2020, within one week of having originally introduced the IDCS to the coding team, allowing us to discuss Dr. Rhoades' overall impressions and also affording the opportunity to collaborate with her on integrating some of the feedback collected from my research team.

Overall, the feedback received in the discussion was that the IDCS-CMC was consistent with the "essence" of the original IDCS. The value of observational coding of text-based communication was validated, and both this line of scholarly work and this specific study were strongly supported.

During the discussion, we also discussed the Affect dimensions, specifically how the behaviors and cues that are included in the original IDCS include nonverbals but do not include other emotion or relational based cues where affect is present and could be detectible. This topic was originally raised by the research team when observing pet names, nicknames, or "sweet" or "harsh" language in instances when a nonverbal cue was not present. Dr. Rhoades confirmed that the Affect dimensions only included nonverbal cues and explained that in FtF communication, when someone uses affect-laden language, they are also likely expressing it in combination with a nonverbal cue, which then reinforces the content language used. She agreed that in CMC, such a corresponding nonverbal would not always be detectable. This suggests that an observation and rating error would then occur in CMC if words that communicate affect do not qualify based on the narrow definition, examples, and cues provided in the Affect construct.

Dr. Rhoades supported updating the IDCS-CMC codebook to indicate that Positive and Negative Affect can include any emotion or affective expression that is

expressed through word choice or relational language-based behaviors. An example for positive affect is “hello baby,” and an example of negative affect would be “shut up I’m not talking to you.” It is expected that when viewing such statements, an observer will be able to detect the presence and nature of affect, even though the text based examples do not include nonverbal cues or technology-based symbols (e.g., “SHUT UP. I am NOT talking to you! >:(” or “Hellooooo baby! ☺”).

Both the coding team and one of the original authors of the IDCS agreed that updating the IDCS-CMC codebook to include more description about affect-based language would more accurately represent the behavioral construct as it exists in CMC and would provide clearer instructions on how affect behaviors should be observed and rated in CMC. This was the only major area where a dimension of the IDCS was operationalized in a new way. Positive and Negative Affect definitions, examples, and cues can be seen in Table 3.1 and Table 3.2.

The processes by which feedback was elicited from users of the IDCS-CMC as well as one of the authors of the IDCS helps increase the face validity of the new coding system. Bakeman and Gottman (1997) also suggest that a coding system continue to evolve as it is used by the coders for actual coding and that eliciting this feedback. This can be done in a systemic way, if coders are required to take notes on each interaction coded and log any instances of new behavior, including context, which can then be discussed in group meetings and influence the ongoing shaping of the system (Bakeman & Gottman, 1997). This guidance was integrated into the coding protocol for the current study, and each team meeting started with the coders summarizing their coding experience for that week and reporting on any new behaviors, dynamics, or

characteristics about the interactions. Overall, no new behaviors surfaced during the independent coding phase, and group discussions instead focused on other coding challenges, where re-training or further explanation on a dimension or observed behavior was needed. These coding challenges are summarized later in this chapter.

The next sections will detail the process by which the coding team was trained and the multi-stage process by which IRR was established and then tested.

Coder Training

For observational coding systems, the coders should receive intensive training at the beginning, but due to the nature of observational coding and using a ratings system, the training process should be ongoing. Raters can become fatigued, can lose motivation, or can drift in their attentiveness to their scoring or in their understanding of the system, and new issues with coding can also arise (Margolin et al., 1998). Thus, for this study intensive training was completed at the beginning of the process (a total of 40 hours of training meetings and assignments across four weeks), and weekly training meetings continued for the duration of the coding process, which was completed over eight weeks. All trainings and meetings took place in virtual group format using Zoom, given that establishing agreement and facilitating discussion on coding challenges are more efficiently and effectively discussed in a group forum (Margolin et al., 1998).

The training process consisted of two areas of focus based on the nature of the observational rating system and the unique role of the rater. The two areas of training are first to ensure that the raters fully comprehend and become expert on all aspects of the codebook and second to successfully integrate their newly acquired knowledge with their own personal experience, expertise, and skills and abilities to detect and interpret

behavior. The overall training and coding processes included in this study were informed by Margolin and colleagues' (1998) recommendations for best practice in observational coding protocols as well as the original IDCS manual and outlined in *Couple Observational Coding Systems* (Kline et al., 2004). Both areas of training focus will be discussed below.

Observational coders must become precise detectors of behavior, who are expert on the codebook and who can demonstrate high agreement across the team when rating interactions. To accomplish this, the team received training on each dimension and were instructed on the coding protocols and use of the scorecard. They were introduced to sample interactions, and coders were encouraged to organize and classify behaviors that they detected based on the codebook (Margolin et al., 1998). Ultimately, the end goal of the initial training process is for the coders to detect all relevant behaviors in the interaction, to reference back to the codebook and the scoring anchors, to assign a score, and to justify their rating. These processes were completed as a team during weekly meetings and also independently during the training phase.

Once the coders became expert on the IDCS-CMC codebook and developed the ability to reliably detect behaviors and utilize the scoring anchors in the manual to make ratings, the coders were then encouraged to integrate their knowledge and skills with their own field of experience where their own inferential abilities and judgments could be applied. Bakeman and Gottman (1997) discuss this process, stating that coders can start to look beyond the specific examples and cues in the codebook and use their own knowledge and understanding of communication and dynamics to see instances of "family resemblance" (p. 21).

Given that no single codebook can include every single behavior or cue that could be included in a behavioral construct or provide a contextual description of every couple dynamic, ratings systems are then based on the judgments, interpretations, and complex information-processing capabilities of raters (Cairns & Green, 1979). This unique role distinguishes global rating systems from count-based microanalytic systems, such that they involve a social judgment on the part of the rater with regard to placement of the individual being observed on some psychological dimension (Cairns & Green, 1979).

Given this unique role and the realities that exist when raters are charged with detection as well as interpretation of behavior, these dynamics were then incorporated into ongoing weekly trainings. The coders were regularly asked to assess how they utilized their own life experience to strengthen their coding skills and alternatively how their own experience may influence or bias their interpretations or ratings. Overall, the coders were open to these discussions, and when bias or undue influence were disclosed or detected, feedback and training was provided.

Assessing Interrater Reliability (Background)

Interrater agreement and IRR were assessed through the training and coding process, as is necessary in developing and testing an observational coding system. During the training process, both qualitative and quantitative approaches were used to determine when coders were deemed to be adequately trained and qualified to move on to independent coding of real data. Once independent coding began, IRR was tested at multiple stages using the intraclass correlation coefficient (ICC). This process will be discussed in detail, and an overview and justification will be provided for the use of the ICC as the most appropriate reliability coefficient for this study.

For most observational coding systems, interrater agreement is emphasized, but indices of agreement are not indices of reliability. In fact, reliability can be low even if interobserver agreement is high, such as a team of coders all having a high level of agreement with one another but the team as a whole not being in alignment with the set of master codes that reflect the observations and ratings that the researcher intended.

Thus, coders need to first code against a standard preset protocol to ensure that they are specifically coding what is desired, and it is recommended that an a priori level of IRR be achieved by the coders or team before real data are rated (Bakeman & Gottman, 1997, pp. 59-60). For the current study, I selected five training logs, representing a wide range of communication behaviors and coded them utilizing my own clinical expertise as well as previous training on observational coding. These ratings became the master scores. The coding team was asked to code these five training logs, and their scores were compared to one another as well as to the master scores to determine if adequate agreement and reliability had been achieved.

Two different methods informed the setting of a priori levels of IRR for the training process. First, through consultation with Dr. Rhoades (personal correspondence, September 2020), she indicated that when supervising coding teams she looked for coders to provide ratings that were within 1 or 2 units of each other (e.g., when coding for Problem Solving Skills, on a scale of 1 to 9, scores of 4, 5, 5, and 6 were given across the team), thus indicating adequate agreement. This qualitative method was used for the current study, and this 1-to-2-unit score range also informed group discussions on coding divergence for various problematic logs throughout the coding process.

The second method to establish reliability in the training phase was calculating ICCs and setting a benchmark for an acceptable range before coders could rate chat logs with study data (ICCs will be discussed at length in the next section). Unfortunately, most research that uses observational techniques as a measure in their models does not provide details about observational coding training processes or specifics on what agreement or reliability in the training stage would be, or if such a standard was even achieved. One recent study (Scott et al., 2019) that used the IDCS to code interactions that were included in a larger model stated that during the training process in which they utilized training videos and master scores, they considered IRR to be established when the *average* ICC across all dimensions coded reached .8 and only once this level was reached did the coders engage in independent coding with study data.

Overview of ICC. The current study utilized the ICC to establish IRR, and the ICC was used for the independent coding process as well. The ICC is calculated using analysis of variance procedures (to review these procedures in detail, see Shrout & Fleiss, 1979), and scores range from 0, indicating no agreement or no better rating at random, to 1, indicating complete agreement.

ICCs are suitable for studies with two or more coders; where the data is ordinal, interval, or ratio; and where measure of reliability should reflect both degree of correlation and agreement between measures. ICC is recommended for use in couple observational reliability testing, such that variance in scores from raters can be attributed to variation among couples, rather than raters (Floyd & Rogers, 2004). The sample size of the interactions being coded should be large enough that adequate variation and range in behaviors among different individuals is present, to maximize between-couple

variance (Floyd & Rogers, 2004). The ICC is also appropriate when all subjects in a study are rated by multiple coders or when a subset of subjects are rated by multiple coders and the rest are rated by one coder.

Cicchetti (1994) provides commonly-cited cutoffs for qualitative ratings of agreement based on ICC values, with IRR being *poor* for ICC values less than .40, *fair* for values between .40 and .59, *good* for values between .60 and .74, and *excellent* for values between .75 and 1.0.

Assessing Interrater Reliability (Application)

For the training phase, the coders were assigned five training logs and were required to submit completed scorecards in advance, then present and discuss their ratings in weekly team meetings. The goal was for all coders to provide ratings that were within 1 or 2 units of the master code and achieve an ICC of .8 prior to being given study data to code independently. The coders worked together to establish consensus on the interpretation of these interactions and the scoring applied. In instances when the ratings were divergent, coders were retrained and asked to recode and resubmit their scorecards.

After coding and recoding took place for the first five logs, it was determined that although the coders were in general agreement (within 1 to 2 units) with the master codes, there were still areas in which there was divergence across the team (e.g., master score was a 7, and two coders give 5s, two coders give 9s, thus within 2 units of the master score but with an overall range across coders of 4 units). After reviewing scores from the training scorecards, the master scores were consistently in the middle across the team, and there was concern that while reliability with the master scores had been established, interrater agreement was not yet achieved.

The training logs were discussed as a team and retraining was completed for the dimensions where there was lower IRR. During the process, coders recoded logs where adjustment was needed and resubmitted them to the primary investigator. ICC was then calculated again for the recoded logs. The trend of master scores anchoring the rest of the team was confirmed. When the four coders' scores were combined with the master scores in an ICC calculation, the average ICC across all dimensions was .85, but when the ICC was calculated for only the four coders (excluding master scores from the model), it revealed a lower ICC of .79, failing to meet the benchmark of .8 to establish adequate IRR and readiness for independent coding.

Given the insufficient level of IRR from the original five training logs, it was decided that an additional three training logs would be assigned to the team, and additional training would be conducted. The scores given for the three additional training logs were combined with the original five training logs, ICC was calculated, and average ICC for all dimensions for the eight training logs in total increased to .83, meeting the benchmark for IRR in the training phase. See Table 4.1for the ICC of each individual IDCS-CMC dimension.

Table 4.1 Intraclass Correlation Coefficients for All IDCS-CMC Dimensions

Variable	8 Training Logs (16 Participants)	First 10 Study Logs (20 Participants)	Total 16 Study Logs (32 Participants)
Positive Affect	.93	.96	.91
Negative Affect	.84	.66	.60
Problem Solving	.76	.84	.81
Denial	.76	.79	.80
Dominance	.69	.50	.30
Support and Validation	.86	.74	.75
Conflict	.82	.88	.88
Withdrawal	.87	.51	.52
Communication Skills	.89	.86	.80
Positive Escalation	.86	.82	.83
Negative Escalation	.90	.72	.74
Commitment	.80	.77	.74
Satisfaction	.91	.74	.77
Stability	.75	.78	.74
Average ICC	.83	.79	.73[1]

[1]Average ICC after Dominance was removed was .76.

For this study, a fully-crossed design was used, where IRR was assessed when all four coders rated the same subjects. Sixteen chat logs (32 individuals) were coded by all four coders on the team, and ICCs were calculated for each dimension. The remaining 24 logs (48 individuals) were randomly assigned across the four coders, and each log was only coded by the assigned coder.

The cross-sorted CMC chat logs were assigned throughout the independent coding process, first with a batch of ten logs, followed by a batch of six logs so that IRR could be assessed continually and deviations or non-standard results could be discussed and addressed or corrected in team meetings.

For the specific ICC analysis, a two-way, mixed-effect design was utilized, where consistency and average-measures for interpretation was utilized. Two-way is justified

given that a fully-crossed model was implemented, where a set number of subjects were coded by a set number of coders**.** Mixed effect was justified given that the coders were assigned the same set of subjects rather than being randomly selected from a larger pool of coders (these models are called mixed because the subjects are considered to be random, but the coders are considered fixed). Note, however, that the ICC estimates for random and mixed models are identical, and the distinction between random and mixed is important for interpretation of the generalizability of the findings rather than for computation (McGraw & Wong, 1996). The consistency option concerns if raters' scores to the same group of subjects are correlated in an additive manner. Average measures interpretations were used, which reflects an index of the reliability of different raters averaged together. This was justified for this study, given that the unit of analysis for this study's IRR and subsequent reliability and validity analyses will use combined and averaged scores from the raters. Furthermore, in this study the ICC refers to the reliability of the ratings based on the averages of their ratings, rather than by a single coder.

Independent Coding and ICCs. Once the training phase was completed, consensus through interobserver reliability for the coders was established, face validity was established, the IDCS-CMC codebook was updated and re-released to the team for use, and the independent coding process began. The first step was assigning ten CMC chat logs to the team, where team members were informed that they would be coding the same logs and would then have their scores compared. This was done to allow the IRR of the independent coding to be quickly assessed early in the process. See Table 4.1 for results of the ICC for the first ten coded study logs. Average ICC across all 14 dimensions was .76, indicating excellent IRR. The second batch of cross-sorted logs was

assigned, and overall after all of the logs in the data set were coded, the average ICC across all dimensions was .73, indicating good reliability. The average ICC for each separate dimension for each of the IRR checks (after 8 training logs, batch of 10 logs, and final ICC calculations) can be seen in Table 4.1.

Exploring Low Levels of ICC. Two of the 14 dimensions received fair or poor ICCs, including Dominance, *ICC* = .30, and Withdrawal, *ICC* = .52. Additional exploration was required to determine potential sources for low IRRs and to inform implications for subsequent reliability analyses. ICCs for the Dominance dimension were in the good, fair, and poor range throughout the training and independent coding process (with highest *ICC* = .69), despite concerted efforts to provide intensive training on detecting and rating this behavior. Dominance was the most challenging dimension for the coding team to demonstrate IRR on, and 95% confidence intervals were between -.21 and .62, indicating that a true ICC could exist anywhere in that interval, ranging from no better than fair to only as reliable as random guesses, or no level of agreement at all. If Dominance were to remain in the overall ICC calculation, it would introduce measurement error as well as validity concerns into the overall observational tool and subsequent attempts to test the measure for construct validity. Thus, it was determined that the ratings provided by the team for Dominance were not usable in that they did not reflect IRR in any quantifiable or interpretable way. Thus, for the next section, the Dominance scores will not be included. It is of note that a previous study using the IDCS also determined that Dominance was problematic to code and subsequently converted the dimension into a dyadic code for inclusion in their observational coding system (Chartrand & Julien, 1994).

When the Dominance score was removed from the model, the average ICC increased to .76, indicating excellent IRR. The average ICC for the two affect codes was .76, the average ICC for the content codes was .80, the average ICC for the combined codes was .77, the average ICC for the Positive and Negative Escalation codes was .79, and the average ICC for the dyadic relationship outcomes was .75.

The final ICC for Withdrawal was .52, indicating fair IRR and the dimension was also in the fair range after the first batch of 10 CMC logs were coded (*ICC* = .51). The 95% CI was .17 to .74, indicating that a true score could be as high as in the good range. Similarly, the final ICC for Negative Affect was in the low range for good reliability estimates (*ICC* = .60), and after the first batch of 10 logs were coded, the ICC was marginally higher (*ICC* = .66). For the final ICC calculation, the 95% CI was .31 to .76, indicating that a true score could be as high as in the excellent range.

To explore possible causes of the low ICC, an inter-item correlation matrix where each of the coder's scores was compared was then reviewed for both Withdrawal and Negative Affect. It was discovered that one coder had weak or inverse correlations with some of the other coders on both of these dimensions. When this coder's scores were entirely removed from the ICC for Withdrawal and Negative Affect, ICC for Withdrawal increased from .52 to .66 (both being scores indicating fair IRR), and ICC for Negative Affect increased from .60 to .70 (indicating a change from fair to good).

I then explored this coder's scores related to the rest of the team and found that throughout the training and coding process and for all remaining dimensions, the coder performed similarly to the rest of the team. Despite the reported increases that resulted in IRR for Withdrawal and Negative Affect when the one coder was removed, due to not

knowing definitively if the one coder's scores were the specific origin of the low ICC, or if lower ICC could also be related to other issues pertaining to the sample or the subjects (such as sample size or lack of variance in the low ICC behaviors), it was determined that all four coders' scores would remain in the ICC calculations.

Establishing Construct Validity

Interrater reliability analysis is distinct from validity analysis, such that validity assesses how closely an instrument measures an actual construct rather than how well coders provide similar ratings (Hallgren, 2012). It is recommended that when developing a new coding scheme, efforts be made to develop construct validity (Baucom et al., 2017; Heyman, 2001).

Convergent validity refers to the extent to which a new assessment instrument correlates with other instruments measuring the same or similar constructs (Baucom et al., 2017; Cicchetti, 1994). For this assessment, the IDCS-CMC individual dimensions and composite scores were compared to a known measurement of romantic relationship satisfaction, the Revised Dyadic Adjustment Scale (RDAS) (Busby, Crane, Larson, & Christensen, 1995). Relationship satisfaction has been shown to be associated with communication behaviors in romantic relationships, and relationship satisfaction is known to be associated with dynamics of conflict (Heyman, 2001).

In order to compare the IDCS-CMC to these relationship measures, composite scores of positive communication and negative communication were created. Positive communication consists of Positive Affect, Problem Solving, Support Validation, Communication Skills, and Positive Escalation. Negative communication consists of Negative Affect, Denial, Withdrawal, Conflict, and Negative Escalation. Composite

scores of overall observed communication are almost exclusively used in analysis in studies that utilize the IDCS, and a similar combination of dimensions is very common for the creation of composite scores that are used in subsequent analysis in published IDCS based research (Kline et al., 2004). For this study, average ICC for the composite positive communication behaviors was .82 and for negative communication behaviors was .70.

The composite scores were used to determine if expected correlational relationships would exist between IDCS-CMC constructs and other relationship assessments known to be related to observed communication behaviors. Correlations for the IDCS-CMC dimensions and RDAS can be seen in Table 4.2.

Convergent validity between the IDCS-CMC and the RDAS was achieved, with the relationship between the composite score for positive communication behaviors and RDAS being positive and statistically significant and the relationship between the composite score of negative communication behaviors and RDAS being inverse and statistically significant. The individual and dyadic dimensions for the IDCS-CMC were also compared to the RDAS. The expected correlational relationships for the vast majority of the dimensions were present, most notably all five dyadic codes, which shows the expected direction as well as statistical significance. See Table 4.2 below for values.

Table 4.2 Means, Standard Deviations, and Correlations of IDCS-CMC Dimensions and Relationship Satisfaction

Variable	*M*(*SD*)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. RDAS	49.99(7.62)	1															
2. Positive Composite	20.75(4.52)	.26*	1														
3. Negative Composite	10.02(3.94)	-.46**	-.41**	1													
4. Positive Affect	2.75(1.53)	.37**	.61**	-.03	1												
5. Negative Affect	1.68(.85)	-.05	.07	.44**	.30**	1											
6. Problem Solving	5.04(1.25)	-.06	.61**	-.29*	-.01	-.1	1										
7. Denial	1.63(1.03)	-.41**	-.41**	.78**	-.21	.11	-.22	1									
8. Support Validation	3.87(1.54)	.11	.78**	-.31**	.31**	.04	.46**	-.28*	1								
9. Conflict	2.30(1.46)	-.42**	-.28*	.87**	.04	.35**	-.13	.59**	-.21	1							
10. Withdrawal	1.58(1.00)	-.14	-.26*	.55**	.01	-.01	-.22*	.40**	-.08	.36**	1						
11. Communication Skills	5.54(1.07)	-.09	.70**	-.33**	.15	.03	.77**	-.32**	.51**	-.12	-.40**	1					
12. Positive Escalation	3.55(1.53)	.40**	.57**	-.42**	.40**	-.06	-.03	-.32**	.24*	-.47**	-.23*	.09	1				
13. Negative Escalation	2.83(1.20)	-.50**	-.50**	.78**	-.19	.23*	-.34**	.58**	-.49**	.59**	.2	-.35**	-.28*	1			
14. Commitment	6.03(1.37)	.25*	.51**	-.37**	.17	-.13	.48**	-.25*	.35**	-.27*	-.22*	.50**	.24*	-.38**	1		
15. Satisfaction	5.62(1.49)	.47**	.68**	-.59**	.28*	-.13	.50**	-.44**	.61**	-.44**	-.21	.49**	.37**	-.76**	.75**	1	
16. Stability	6.09(1.67)	.39**	.45**	-.53**	.24*	-.19	.33**	-.40**	.29**	-.41**	-.27*	.40**	.25*	-.53**	.88**	.76**	1

*Correlation is significant at the .05 level, two-tailed. **Correlation is significant at the .01 level, two-tailed.

Comparison to Original IDCS. Cicchetti (1994) suggested that an additional method to determine convergent validity is to compare any new measure with an original version, when it is available, such that scored interactions using the IDCS-CMC could be compared to scored interactions of the original IDCS. Given the nature of the study protocol for the larger study where the CMC logs for the current study were obtained, it was possible to compare IDCS-CMC scores for the CMC chat logs to a subset of the couple participants who also engaged in FtF interactions during the data collection process. However, due to sound quality issues, only 15 video recordings of FtF interactions from that data were able to be coded using the IDCS, and only five of that subset of couples (10 individuals) were cross-sorted to two coders. Thus, due to low sample size of the FtF interactions, this cross-setting comparison was not possible.

One final effort to determine if the IDCS-CMC protocol demonstrated consistency with the original IDCS was comparing outcomes of the coding protocol itself. Kline and colleagues (2004) estimated that the time that it would take to code an interaction would be twice the length of the couple interaction, plus 5 to 7 minutes of extra time to assign ratings (p. 121). For the IDCS-CMC, the time to code logs during training period was estimated to be 45 to 60 minutes but quickened to 30 to 45 minutes by the end of the coding process. Once coders were fully trained and comfortable with the coding system, the total time needed to code a 15-minute CMC chat log was 45 minutes, which aligns with the estimate of the original IDCS protocol.

In summary, following the multi-step process described in Chapter 3 and Chapter 4 for informed selection of an observational coding scheme; modification for CMC interactions; and implementation, including multiple checks for reliability and validity,

the IDCS-CMC demonstrates both adequate levels of interrater reliability for the coding team and various types of construct validity, including face, content, and convergent validity.

Chapter 5. Discussion

This study informs the understanding of observational coding of couples' CMC. Although use of CMC for interpersonal communication, specifically with one's romantic partner, is pervasive, little was known about the transactional nature of couples' use of CMC or how couple observational research would account for such communication. Couple interaction research has a long history of utilizing observational coding systems to capture the essence of couples' communication dynamics, but no system existed that could be applied to text-based communication. Observational coding systems are based on FtF interactions, and behavioral constructs and codebooks are based on in-person nonverbal cues and dynamics that are enacted within the context of in-person communication. Thus, the research purposes of this study, specifically the development of a couple observational coding system for CMC with similar transactional elements to FtF, was justified.

For this study, multiple research purposes related to methodology and development of the coding system were put forth, and a comprehensive narrative of this multistep process was provided across Chapter 3 and Chapter 4. This final chapter will provide a summary of the findings, and a discussion of limitations and future directions of the IDCS-CMC and methodological and practical implications.

Coding Process

As discussed in the previous chapter, the team provided feedback on the unique challenges of coding nonverbals and affect in CMC or in providing ratings on interactions where nonverbals or affect could not be detected, referred to by the team as "dry texters." They also expressed challenge in detecting behaviors and assigning ratings when the word count was low and one or both partners were slow to contribute or overall

did not process much information or engage in many communication behaviors that could be rated during the interaction, despite the participants being logged into the chat room for 15 minutes. The coders also stated that contradicting cues created a challenge for interpretation, including the use of mean-spirited humor (e.g., teasing, name calling, insults) that was communicated alongside positive nonverbals or affect (e.g., LOL, HAHA!, :D, looove yoooou, :-P).

The coding team continually discussed needing to develop and utilize an ability to "read between and around the lines" when behaviors were challenging to detect, were confusing, or were inconsistent in style or frequency. This nuanced method of detection could mean looking for contextual change in texting style throughout the course of the interaction to discern if a change in behavior or lack of a behavior can be attributed to a behavioral construct or dynamic, looking at timestamps throughout the interaction, or looking to immediately before or after a behavior was enacted to determine the meaning and intentions of the behavior as well as the partner's response.

Evidence for Validity

Efforts to establish construct validity through face and content validity were discussed at length in the previous chapter. This section will provide additional information on convergent validity, as it relates to established literature on this type of validity. The IDCS-CMC individual constructs, as well as positive and negative communication composite scores, were compared to a measure of relationship satisfaction (measured in this study by the RDAS). Previous studies using the IDCS have compared construct and composite scores to the Marital Adjustment Scale (MAT) (Locke & Wallace, 1959) and a sample of these findings is provided below, as a means to

compare and validate the findings of the current study. It is important to note that the MAT was used by the authors of the RDAS to establish construct validity and the two measures correlated at .68 (Busby, et al., 1995).

For the current study, the full correlations between the IDCS-CMC dimensions and relationship satisfaction are available in Table 4.2. The correlations that had stronger correlations (that were significant at the .01 or .05 levels) are listed here. For composite scores, positive communication, r = .26, and negative communication, r = -.46. Individual dimensions in the IDCS-CMC with strong correlations included Positive Affect, r = .37; Denial, r = -.41; Conflict, r = -.42; Positive Escalation, r = .40; Negative Escalation, r = -.50; Commitment, r = .25; Satisfaction, r = .47; and Stability, r = .39.

One of the original studies where the IDCS was developed and tested found that for males, the IDCS constructs being related to the relationship satisfaction (assessed by the MAT) included Conflict, r = -.43; Denial, r = -.38; and Support/Validation, r =.42.

Another study (Julien, Chartrand, Simard, Bouthillier, & Bégin, 2003) reported on the relationship between composite scores for the IDCS and MAT and a summary of the relationships includes negative communication composite (Conflict and Withdrawal), r = -.40; positive communication composite (Communication Skills and Problem Solving), r = .25; negative dyadic (Negative Escalation, Dominance, and Asymmetrical Repairs (a dimension not included in the original IDCS)), r = -.48; and positive dyadic (Interactional Synchrony, previously called Positive Escalation), r = .39.

Stanley, Rhoades, Olmos-Gallo, and Markman (2007) also reported correlations between communication composite scores and the MAT for two different community samples for males and females. In their study the positive communication composite

score consisted of Positive Affect, Problem Solving, Support/Validation, and Communication Skills and the negative communication composite consisted of Negative Affect, Denial, Dominance, Withdrawal, Conflict, and Negative Escalation. The correlations reported between the composites and MAT for one of the samples for females were positive communication, r = .33, and negative communication, r = -.28, and for males were positive communication, r = .25, and negative communication, r = -.25. For the other sample for females, positive communication r = -.01 and negative communication r = -.25, and for males, positive communication r = .17 and negative communication r = -.30 (Stanley et al., 2007).

Heyman (2001) also provided an extensive review of validity assessments completed in published research between constructs within observational coding systems and other known measures of relationship functioning and for correlations between individual constructs of coding systems and measures of relationship satisfaction. Specifically, correlations anywhere from .20 to .65 were reported as being an indication of a relationship existing, and thus evidence of validity being present.

Overall, based on this review, it can be surmised that the relationship between the IDCS-CMC dimensions and composite scores with relationship satisfaction measures appear similar to that of other IDCS studies suggesting convergent validity.

Discussion of IRR and ICC Findings

IRR was assessed using a two-way mixed, average-measures consistency ICC (McGraw & Wong, 1996; Shrout & Fleiss, 1979) to measure the degree that coders provided consistency in their ratings of the nine individual dimensions and five dyadic dimensions across subjects. The resulting average ICC was in the good range, *ICC* = 0.73

(Cicchetti, 1994). It was determined that the team did not reliably rate the dimension of Dominance, and the dimension demonstrated low ICCs throughout the coding process. Some of the coders themselves also reported in team meetings and trainings that they had difficulty conceptualizing, detecting, and rating Dominance in CMC. A previous study using the IDCS reported having similar challenges with the Dominance dimension, and rather than utilizing it as an individual code, they converted it into a dyadic code (Chartrand & Julien, 1994). For the current study, upon the completion of the coding process, and in consultation with the coding team, we came to the same conclusion about Dominance. As a behavioral construct, the dynamic of Dominance as well as the related scoring anchors indicate that Dominance would involve one partner acting forcefully and the other partner responding with submission (See Table 3.3). Thus, this construct may be more accurately experienced, conceptualized behaviorally, and accurately observed and rated by coding teams as a dyadic dimension. Due to the low ICC, as well as the lack of confidence that the raters were providing scores on behaviors that were accurately reflecting an intended construct of Dominance, the decision was made to remove Dominance from the final ICC calculation. When this dimension was removed, the average ICC increased to .76, indicating excellent IRR. Overall, establishing adequate IRR demonstrates the communicability of the IDCS-CMC system, such that the "coding system is not the idiosyncratic perception of the investigator but can be reliably taught to others" (Margolin et al., 1998, p. 209).

Although it is essential for investigators to report IRR at the level in which the IRR analysis is made (e.g., the individual construct or dimension level) rather than IRR for the entire coding system, or just providing a range of IRR across all dimensions, in a

review of couple observational coding systems, Heyman (2001) estimated that only about 20% of the published validity-related studies included reliability information for the constructs studied. This is also the case for previous studies where the IDCS was used, where it is most common to see the average IRR for the coding system, the range of IRR for the dimensions that they included in their study, or the average for the calculated negative and positive communication composite scores. This then creates difficulties in being able to compare the IRR results of the IDCS-CMC to the original IDCS. Nevertheless, a thorough review of the published literature was completed that reports at least one level or type of IRR for the IDCS and determined that a general conclusion can be reached that the overall ICC for this study (.76), the average ICC for positive communication composite (.82), and negative communication composite (.70), as well as the range for all dimensions included (.52 to .91) in the IDCS-CMC was consistent with or better than the IRR results reported in the literature, most of which report good levels of IRR (i.e., ICC range of .60 to .74) (Allen, Rhoades, Stanley, & Markman, 2011; Black, 2000; Black & McCartney, 1997; Chartrand & Julien, 1994; Julien et al., 1989; Kline et al., 2004; Laurenceau, Stanley, Olmos-Gallo, Baucom, & Markman, 2004; Lindahl, Clements, & Markman, 1997; Markman, Renick, Floyd, Stanley, & Clements, 1993; Markman et al., 2013; Markman, Rhoades, Stanley, Ragan, & Whitton, 2010; Paley, Cox, Burchinal, & Payne, 1999; Scott et al., 2019; Stanley et al., 2001).

For this study, Dominance, Withdrawal, and Negative Affect were all on the lower range for ICC, and the overall composite score for negative behaviors was also at the low end of the good range at .70. These low or fair ICCs could be a result of low agreement between raters or could be due to low variability of behaviors that are within

the dimension or behavioral construct (Margolin et al., 1998). Multiple factors may influence variability of behaviors within an interaction study, such as the type of sample population, sample size, the task assigned, or the setting (Margolin et al., 1998). Kline and colleagues (2004) reference that previous instances where the IDCS was used resulted in low IRR due to low variability in negative behaviors observed in a particular sample of non-clinical newlywed couples (Kline et al., 2004). Heyman (2001) also discusses a possible origin of low variability in negative behavior related to the interactions taking place in a laboratory setting, such that when people are being observed, it has been shown that they demonstrate less negative behaviors than would be typical in their natural settings. Another factor related to the variability of the enactment of negative behaviors, also relevant to the current study, is how negative affect is translated into CMC specifically.

The next section will explore negative communication behaviors, including negative affect, as they are enacted in CMC and then detected and rated by coders. Sections will then follow where Dominance and Withdrawal as behavioral constructs are explored, and the enactment of these behaviors in CMC is discussed.

Enactment and Detection of Positive versus Negative Behaviors in CMC

For this study, the average ICC for the composite positive communication behaviors was .82, and for negative communication behaviors it was .70. These ICC results indicate that ratings of negative behaviors were detected less reliably than positive behaviors, and the raters themselves also continually stated that the negative behaviors were harder to detect and interpret and stated that at times, it was challenging to assign ratings because negativity was not pervasive or very intense across the interactions that

they observed. For the current study, we do not know definitely if variability in negative behaviors was specifically an origin of lower ICCs, but this section will consider the implications of such a possibility, specific to what the literature indicates about the enactment of negative affect in CMC.

Previous research on CMC and expression of affect confirms a trend of negative affect being translated into CMC to a less degree than positive, with one study showing that difference in emotional states (relaxed, angry, happy, sad) influenced the type and quantity of emotion-related cues used during interactions, specifically that happy emotional states led to more use of nonverbal cues than the other three conditions, including more punctuation, vocal spellings, and lexical surrogates (Pirzadeh & Pfaff, 2014). Another study showed that participants experiencing negative affect produced fewer words and exchanged messages at a slower rate, and positive affect was related to agreeing more with one's partner, responding more quickly to messages, and using more punctuation (Hancock, Gee, Ciaccio, & Lin, 2008).

It is also worth noting that despite the lower levels of negative affect contributions to the text conversations, it was found in multiple studies that communication partners were still able to correctly detect the affect that was being expressed, both when partners were known to one another (Hancock et al., 2008; Hancock et al., 2007) and also with randomly assigned dyads (Boucher et al., 2008). This gives some indication that observational raters should also be able to detect behaviors and affect when communicators experience negative emotional states, even if their translation of negative affect is less frequent than it would be in positive affect states, and level and speed of participation in the interaction is lower. Heyman (2001) also discusses this detection

phenomenon, citing research that indicates that even when FtF research participants are being observed and negative behaviors are lessened, their negativity still "leaks out" and dynamics, and affect can still be detected by coders.

For future research, when the IDCS-CMC is utilized, the selection of population, task, and setting should all be considered to ensure that adequate levels of variability across behaviors exists within the interactions. The next sections will discuss the specific negative communication behaviors of Dominance and Withdrawal, specific to how they are enacted in CMC.

Dominance

Power and control in relationships are dynamics that are reflected in a couple's communication (Noller, Feeney, Roberts, & Christensen, 2005). The IDCS and IDCS-CMC define Dominance as "the actual achievement of control or influence an individual exerts over his or her partner during the interaction. Dominance may be identified through forceful, monopolizing, and/or coercive behaviors." The codebooks also categorize Dominance as being a content-based dimension, indicating that the behavior will be primarily translated using words and language and that raters should look for verbal and language-based cues to rate the behavior.

Examples of linguistic dominance include the intensity of language used, making assertive statements, frequency of messages sent, or sheer volume of information being expressed (Zhou, Burgoon, Zhang, & Nunamaker, 2004). If one partner is very quick to process information and is verbose in their expression, it can indicate control of the conversation. Interruptions or speaking over one's partner is also an indication of power and control in the conversation and the relationship.

Zhou (2004) also indicates that in FtF interaction, dominance is typically observed more heavily in the language used and the nature of the content of the communication rather than in nonverbal channels. Given that dominance is generally text-based and linguistically focused, when enacted in a text-based channel, where communicators are physically separated and both are able to type simultaneously, this may impact the degree to which dynamics of dominance are experienced by those communicating and also how they are observed by coders.

Dominance communication behaviors in CMC have also been studied, specifically as they relate to control of the conversation and a partner's ability to participate. Users of CMC have reported that the text-based channel facilitates more equal interaction than in FtF (Perry & Werner-Wilson, 2011). When engaging in interactions in CMC, users are not typically occupying the same physical space, and therefore the dynamics previously discussed, related to how power and control are enacted through the use of occupying verbal space, are necessarily different. In multiple studies, research participants indicated that they find CMC to be helpful because it allows them to express themselves without getting interrupted by their partner (Frisby & Westerman, 2010; Perry & Werner-Wilson, 2011). Pettigrew suggests that the CMC interface keeps one partner from overwhelming the conversation or talking too much, thus keeping the conversation focused and simple (2009).

In the current study, the research team stated that they were able to detect Dominance in the CMC interactions but had trouble agreeing as a team about dynamics of Dominance when both partners displayed dominance or higher levels of participation and influence, which we coined as "dual dominance." The physical distance afforded by

the CMC channel, which creates psychological space for the communicators, in combination with the dominance behavior, which is focused primarily in linguistic behaviors, may create a new or different dynamic of mutual or converging influence. The team continually discussed examples of one partner demonstrating dominance "overtly" and the other exerting it "covertly," but the ways in which this was done crossed through verbal, nonverbal, and affect cues. Couples were observed using the same cue type or utilized different cue types (e.g., one exerted overt dominance through language choice and verbosity, and the other exerted covert or passive dominance by sending multiple short messages in fast sequence, followed by the extended delays in responding to any of their partner's messages – dominance via withholding of participation).

The unique nature of the CMC channel may then result in a neutralization or zero-sum game of power and control dynamics, which then may make the Dominance behavior in the IDCS-CMC challenging to detect; especially if successfully gaining control or influencing one's communication partner is a requirement or primary indicator that dominance is present. It may be that the traditional dynamics of dominance (based on FtF interactions) are actually quite differently enacted in a text-based channel. Dominance in CMC, including how it is enacted and experienced when utilizing an observational coding system for detection, should be further studied.

Withdrawal

In the IDCS and IDCS-CMC codebooks, the definition of withdrawal is "the avoidance of the interaction or of the problem discussion. The individual may evade the issue, retreat into a shell, back off, or may seem to pull him/herself out of the interaction." The IDCS classifies this behavior as a combined code, indicating that it is

communicated both verbally and nonverbally and can be detected by observers in either content or relational component of the message.

Withdrawal, by definition, is enacted by minimally verbally participating, either with short responses, complete absence of verbal participation (i.e., silent treatment), or through a wide array of nonverbal behaviors (Noller et al., 2005). If a user of CMC wanted to voluntarily communicate that they were engaging in withdrawal behaviors, they would have to send a message specifically stating, "I don't want to talk about this" or "I am so checked out of this conversation right now" – making what was nonverbal in FtF explicitly verbal in CMC. Given the basic hallmark of withdrawal being a lack of verbal participation, it is unlikely that a withdrawn partner would make such statements. As was explained earlier, it is also not likely that the withdrawn communicator would be motivated to find a new, technology-based adaptive way to communicate their lack of interest or related affect.

In FtF, nonverbal withdrawal behaviors can be translated through facial expression, body posture, or by utilizing chronemics (Walther & Tidwell, 1995) as a method of delaying response or slowing time in responding in an effort to communicate lack of interest or a desire to exit the conversation. However, in CMC, when there is a lack of verbal contribution (in quality, quantity, or pacing) with a withdrawing partner, in combination with traditional nonverbal withdrawal behaviors not being inherent to the text-based channel, a sender may lack options on how to communicate their feelings and communicative intent. In addition, if the sender cannot code the affect or intent into their message (e.g., boredom) in a text-based channel, then the receiver will not be able to detect or decode it, and the information will thus be absent from the feedback loop. In

CMC, messages and behaviors must be intentionally translated into the CMC channel by the communicators, and negative affect states may not be as readily included or translated into the channel.

One traditional nonverbal withdrawal behavior that is relevant and also readily available in FtF and CMC is the use of time-related messages, or chronemics. Walther & Tidwell (1995) explain that CMC oftentimes conveys nonverbal cues in terms of chronemics and that different uses of time signals in CMC, such as timestamps, affected interpersonal perceptions of CMC senders and respondents. Withdrawing communicators may delay responding or may halt communication entirely, and the passage of time becomes integrated into the message decoded by the receiver (Walther & Tidwell, 1995). However, given the nature of the CMC channel, where partners are in separate physical spaces, the receiver may or may not successfully decode that the intent behind the time-based behavior was lack of interest, boredom, discomfort, etc. (Noller et al., 2005). A delay in response during CMC should not automatically be assumed to be withdrawal because a communicator could just be taking additional time to think, typing their message, or experiencing technological difficulties or other distractions.

There are also instances in which not responding at all or taking a very long time to respond would not be socially appropriate, such as when two partners are engaged in a synchronous, transactional dialogue and there is a relational expectation that they both participate. This type of constrained interaction also applies to couples who are participating in research protocols who are asked to interact for set periods of time in a laboratory setting about certain topics or tasks (or who are in a car together for an

extended period of time). As such, this unique interactional dynamic and associated behaviors are directly relevant to the current study.

In such a constrained environment, and in combination with using a CMC channel (where traditional FtF nonverbal cues of withdrawal are not available), it was observed by the team of coders that the withdrawing partner would then employ communication tactics to engage only minimally, contributing technology-based behaviors that served to distract or deflect from the topic or functioned as a way to deflate or invalidate the communication partner's opinion, communication goals, or efforts. The state of being socially constrained, and then expected to engage in discourse despite desires to withdraw was coined as "captive participation," which elicits low participation responses or nonresponse responses (where the receiver acknowledges receipt of information but stalls the feedback loop by not contributing further). Examples of such participation then, when withdrawal is halted, include various forms of technology-based nonverbal behaviors that serve to distract, deflect, or deflate the interaction process.

These adaptive behaviors of withdrawal in CMC were included in the IDCS-CMC codebook. These low participation or nonresponse responses include sending a message with only punctuation (e.g., "…"; "??"; a blank message to indicate "I am here, but I am not responding;" shortening words to indicate a lack of participation such as typing "idk" instead of "I don't know" or "k" instead of "okay"; or not including punctuation when it may be easily included otherwise, such as sending "y" instead of "why?", indicating a lack of effort or interest). Communicators may also use text, symbols, font, or punctuation in a way that creates distraction or distance in communication, which would mimic the FtF-based nonverbal behavior of fidgeting.

The intentional inclusion of such technology-based nonverbals then serve to translate the intention and affect of the sender, such that they are pulling away from the conversation, or do not want to discuss the topic. The translation of this affect into CMC thus allows the intention of "pulling away" to be received and decoded by the receiver and thus integrated into the communication feedback loop.

For this study, the ICC for Withdrawal across the coding team was .52, indicating fair reliability. Based on the complex and at times ambiguous nature of how the withdrawal behavior is enacted in the CMC channel, the coding team did engage in in-depth discussion about the detection of the behavior in the chat logs, and how to interpret the intensity or impact of these subtle behaviors. The research team also utilized chronemics, and the passage of time by looking at timestamps on the logs, to assess for level of participation, but there were instances when the coding team would disagree about what the passage of time meant or how to ascribe meaning to it. Future research should focus on how withdrawal behaviors are both enacted in CMC, how they are interpreted or decoded by communication partners, and also how these behaviors can best be integrated into behavioral constructs in observation coding systems.

Dominance and Withdrawal, both with lower IRR for this study, are enacted in relationships in interconnected ways, such that they are both primary behaviors by which power and social control are exercised in intimate relationships and by which transactional interactions are regulated (Noller et al., 2005). Thus, an additional recommendation for future research is that the link between dominance and withdrawal communication behaviors be explored, specifically as they are enacted in CMC, and how that may influence overall relationship dynamics including power and social control.

Methodological Limitations and Future Directions

This section will summarize limitations of the current study and related recommendations for future research, with a focus on methodological implications. A generalization of this research to natural settings will also be provided, including recommendations for implementation and considerations of challenges and barriers to this line of inquiry.

Multiple methods of validity and reliability testing were explored and implemented throughout this study. Evidence for face validity, content validity, and construct validity were collected and presented, and interrater reliability and agreement were also established for the IDCS-CMC. The IDCS-CMC should continue to be tested, utilizing the detailed protocols that were presented here. Replication of the study would be warranted, and additional efforts can establish predictive or discriminant validity. In addition, the IDCS-CMC scores and collapsed subscales or composite scores should be tested for inter-item reliability and factorial validity, and exploratory or confirmatory factor analysis could be conducted to explore the presumed categories, constructs, and composite score groupings.

Overall, the decision to use a macroanalytic rating system for observing couples' problem-solving interactions in CMC was supported, based on the general fit of the behavioral constructs in the original IDCS to the communication behaviors detected in the CMC chat logs and on the resulting high level of IRR for the coding process when the IDCS-CMC was implemented. However, based on the findings and results of this study, there are various ways in which couple interactional research methods could continue to explore this topic. Bakeman and Gottman (1997) state that researchers should employ a

variety of measures and methods that capture the constructs that they are interested in assessing. Thus, there would be potential benefit from using a microanalytic coding system to assess transactional and sequential text-based communication. This more detailed detection process may allow processes and sequences of complex behaviors to be more explicitly captured and analyzed. Cairns and Green (1979) state, "That which is implicit in ratings processes becomes explicit in observational procedures" (Cairns & Green, 1979, p. 224). They go on to state that "for purposes of understanding the mechanisms of social patterns and how new patterns are brought into the repertoire of individuals and groups, there can be no substitute for direct observational analysis of the activities to be explained" (Cairns & Green, 1979, p. 224). The closer look afforded by a microanalytic coding system may be particularly helpful in understanding the complex or dyadic processes discussed earlier in this chapter to include dominance, withdrawal, and overarching power and control dynamics that are enacted in CMC.

In the IDCS-CMC coding process, the observers became expert detectors and interpreters of each individual's communication behaviors. Where there was confusion in this interpretation process, the behaviors and motivations were discussed as a group, and consensus was typically reached. However, these coding processes took place from an outsider's perspective, and for the specific communication behaviors that coders established lower reliability, it would be helpful have research subjects review their own interaction and detail their thoughts about their behaviors and the interaction, specifically their emotional experience or affect, to capture their own internal subjective experience of the interaction. This interaction-recall technique has been used in other observational coding systems and could significantly enhance researchers' understanding of both the

sender's translation of cues into CMC process and also the processes by which they interpret and respond to their partner's behaviors (Schulz & Waldinger, 2004).

Another limitation of this study, related to the generalizability and external validity of laboratory-based couple interactions, is true for all observational research that utilizes similar settings and protocols. These laboratory-based protocols attempt to capture dynamics that would also be present in a natural setting for the couple, and although reflexive or automatic couple dynamics do emerge (even while being observed in a lab), a better detection of couples' transactional use of CMC would involve tracking, recording, and reviewing real-life use of CMC. Observing couples' natural use of CMC would allow couples to engage more naturally through CMC and for researchers to observe naturally occurring behaviors. However, accessing or being able to monitor or log text communication from participants' personal devices would pose significant privacy challenges. Likewise, having clients self-select what messages from their interactions they want to submit for research would introduce bias and concerns about capturing behaviors or dynamics of interest and likely would not result in the interactions being truly transactional or sequential in nature. Also, capturing a true stream of naturally occurring sequential interaction between a couple over an extended period of time would likely involve researchers and observers needing to navigate multimodality, or modality switching (Ledbetter, 2008; Ramirez & Wang, 2008). In a given day, observations of a couple could include text-based communication streams, FtF interactions, voice only-based channels (e.g., phone call), or video-based channels (e.g., video call, FaceTime).

A general recommendation for couple interaction researchers is that given the multimodal nature of nearly all couples' communication in today's society, observational

coding systems, behavioral codes, and observation and ratings processes should comprehensively reflect both FtF and CMC as well as other communication channels of interest or relevance to the sample being studied (e.g., voice-only channels, video conferencing platforms). Additionally, it is imperative that as technology continues to evolve and bring improvements to usability and new features, CMC researchers focus on larger processes of technology use that transcend time (to the degree that we can predict), rather than align to specific platforms, devices, or social media or Internet trends that may not exist or be relevant within a few years.

For the current study, the online chatting platform that was utilized for the CMC interactions consisted of a computer terminal, a keyboard, and being signed in to an online chatting program where the couple typed into a window where they could both seeing one another's messages. This set up was basic but standard enough that participants acclimated to the computer terminal and program quickly, and the resulting CMC chat logs remain relevant and interpretable years later. In addition, efforts were made when modifying the IDCS-CMC codebook to provide generalized CMC behaviors and cues that can capture simple behaviors as well as more complex ones. These efforts will then allow future users of the IDCS-CMC to see similar types of behaviors in emerging technology platforms or in other CMC channels where either a larger variety of cues are available to users (e.g., sending "congratulations" in a text message accompanied by confetti graphics appearing from the word in the chat window) or when the very nature of a text-based capability is new (e.g., being able to express fondness of someone's message by selecting a thumbs up symbol on their text message or putting a heart symbol on a post on a social media page).

Theoretical Implications

Media compensation theory and SIPT both helped inform this study's focus on, conceptualization of, and integration of romantic couples' adaptive behaviors to text-based channels. In the initial phase of this study where CMC chat logs were reviewed and behaviors were evaluated, it was determined that the dynamics that traditionally take place in FtF were being enacted in CMC. It was apparent that the use of affect and technology-based nonverbal cues in these interactions was pervasive. This supports media compensation theory's compensatory adaptation principle that individuals who use communication channels, where traditional FtF methods of communicating are not available, will compensate by changing their communication behavior in voluntary and involuntary ways (Hantula et al., 2011, p. 347). A comprehensive inventory of these adaptive behaviors was then included in the IDCS-CMC codebook, which can act as a starting point for understanding and conceptualizing a large inventory of adaptive behaviors engaged in by romantic couples.

SIPT details processes where CMC users come to understand, accept, and become more comfortable with the channel for interpersonal communication (Walther, 2008). The theory posits that over time, users are motivated to use CMC for more complex social tasks and will then engage in adaptive processes that will help maximize the usefulness and success of the channel for relational purposes. The text-based problem-solving communication tasks that were evaluated for this study illustrate the processes identified in SIPT; and the couples in this sample engaged in a full range of adaptive behaviors while participating in complex and affect-laden conflict and problem-solving discussions. Not only were these adaptive processes apparent, but the degree to which the

couples could translate content and affect pertaining to problem solving and conflict resolution was sophisticated, creative, and effective.

As these interactions relate to the observation coding system, the use of raters necessitates that the text-based behaviors enacted in the CMC interactions be clear, expressive, and dynamic enough that a team of coders (outsiders to the relationship) could detect and interpret specific communication behaviors and then reach statistically reliable levels of agreement on the degree to which behaviors were being enacted. The coding team was also able to use the dynamics presented in the CMC logs and make determinations on the couple's level of emotional commitment, satisfaction, and stability. If outsiders to the relationship can reliably detect what is being said and how it is being said, then it can be inferred that a successful adaptive process of transferring complex relationship processes on a text-based channel has taken place.

An unexpected application of SIPT was in understanding the learning process of the coders themselves, and their ability to decode text-based communication. The team's learning and training process and their ability to detect affect and dynamics in CMC evolved over time. Whereas the original application of SIPT was to romantic couples and CMC, the coders themselves demonstrated these same processes. The coding team was highly motivated to assess and analyze the CMC chat logs, and thus continued to practice, learn, and develop their text interpretation skills over time. In the beginning phases of the training process, they expressed trepidation and confusion about what they were viewing and how to decode it and stated that it took extended periods of time (an average of 60 minutes per log) to conceptualize the interactions. However, over time with ongoing training, practice, and encouragement and accountability from the group, they

evolved into coders of complex text-based interactions who were confident, skilled, and efficient (decreasing their average coding time to 40 minutes per log).

Methodological Implications of the IDCS-CMC

Observational coding systems have been primarily utilized to help inform our understanding of relationship dysfunction, such that most all relationship dynamics are played out via observable communication, either verbally or nonverbally (Heyman, 2001). The investigation of couples' communication then is a common pathway across theories and therapies to both predict long-term relationship outcomes and functioning, including risk and protective behaviors, and then also to pinpoint therapeutic intervention to prevent or ameliorate certain communication behaviors (Heyman, 2001).

Given the pervasive use of CMC by couples, it is then indicated that how couples communicate while using CMC also be studied through similar observational analysis and models. This could include attempting to discern what observable communication behaviors in CMC predict various relationship outcomes and additionally exploring what interventions can be designed to decrease communication behaviors in CMC that put relationships at risk. Similarly, observed communication behaviors in CMC can be incorporated to determine if users of CMC and those who use CMC for enacting relationship dynamics (e.g., problem solving) utilize the channel and experience relational dynamics in ways that predict relationship outcomes.

The enactment of negativity or negative behaviors in CMC is of particular interest as it may relate to widely published and supported research about observed couple processes in FtF that focus on the specific role of negative communication behaviors in predicting relationship outcomes. Heyman (2001) provides a summary of these dynamics

including distressed partners, compared with nondistressed partners, being more hostile, starting their conversations more hostilely, maintaining hostility during the course of the conversation, being more likely to reciprocate and escalate hostility, being less likely to edit their behavior during conflict, emitting less positive behavior, and enacting more withdrawal demand patterns. These patterns and processes could all be studied and replicated based on the observed communication behaviors that take place in CMC. This approach would be an example of how a researcher could update and make current a previously reported finding, thus informing a more parsimonious depiction of couples' communication and related relationship outcomes.

Variables then related to an individual's experience (e.g., age, level of education, attachment style, personality type, level of skill in using CMC) and the relationship experiences (e.g., length of relationship, level of relationship satisfaction, emotional connection, trust) should also be incorporated to inform the role that they play in determining what communication behaviors are present in CMC, and thus how the channel is potentially used or conversely how enacting certain communication relationship behaviors in CMC may influence relationship outcomes (e.g., increasing relationship satisfaction, promoting secure attachment).

It is also widely debated if the use of technology is merely a new vehicle on which our existing patterns are enacted (i.e., whether CMC is just another type of setting) or if the use of CMC is transforming romantic relationships, family life, and interpersonal relationships. Whereas many studies look at the general impact of technology use on families, the IDCS-CMC will allow researchers to detect and assess these dynamics and their potential impact on a very detailed and process-oriented level.

Research has also shown that some individuals report preference for CMC when they are engaging in complex relational processes (e.g., conflict). Aside from interviews that were completed with participants to explore their motivations and experience of use in the channel (Perry & Werner-Wilson, 2011), there had been no methodological vehicle that allowed for a closer look at these sequenced, transactional interactions to take place. Thus, determining how and why some individuals find the use of CMC to be so advantageous for themselves or their relationships was elusive (Murray & Campbell, 2015; Perry & Werner-Wilson, 2011). The development of the IDCS-CMC can now serve as such a vehicle, and future research on the affordances of CMC for transactional communication can utilize this new observational coding system to explore these lines of inquiry.

In addition to the coding system and related protocols presented in the IDCS-CMC, the IDCS-CMC codebook itself includes a comprehensive library of definitions, behavioral cues, and contextual overviews that represent complex communication behaviors that are adapted to CMC. This coding scheme and the behavioral code categories and examples could be used to inform research questions that aim to understand these phenomena or processes or that seek to assess couple dynamics using similar observational methodologies.

Implications and Recommendations for Applied Settings

Direct and indirect use of technology and how they may impact romantic relationships is widely studied; however, CMC for direct transactional communication is still relatively unexplored. Thus, many couple-focused practitioners and educators may struggle to give direction, advise, or provide research-informed support as it pertains to

communication channel choices or CMC-based couple communication. This study represents the very beginnings of systematically observing, interpreting, and rating couples' CMC interactions, and clinicians or family and couple-focused educators could utilize the IDCS-CMC and the codebook to better inform their practice as it pertains to these clinical topics. It is also recommended that when exploring clients' use of CMC or the role of CMC in one's intimate relationships, these practitioners first seek to more directly observe and openly understand the dynamic, patterns, and communication behaviors present in the CMC, rather than automatically assuming that the use of CMC for problem-solving or conflict is harmful to the relationship.

Conclusion

This study represents the very beginnings of systematically observing, interpreting, and rating couples' CMC interactions. Due to the complexities of the interplay between interpersonal communication processes, couple dynamics, and CMC, it is recommended that clinicians or educators continue with efforts to directly observe CMC interactions and understand the dynamics, patterns, and communication behaviors present in the CMC.

Technology has the potential to have both positive and negative effects on intimate relationships, and a more inclusive perspective on technology's effects would benefit future research and practice. Many scholars are continuing to focus on the use of CMC by families and those in relationships (Carvalho, Fonseca, Francisco, Bacigalupe, & Relvas, 2016; Carvalho et al., 2015; Hertlein & Chan, 2020; Hertlein & Twist, 2018), and family researchers, educators, and couple and family therapy practitioners are urged

to do so as well, as the intersection between dynamic couple and family processes and technology continues to be relevant.

APPENDICES

APPENDIX 1. ADVERTISEMENT FOR RESEARCH INTERNSHIP

Internship Description: Department of Family Sciences associate professor Dr. Nathan Wood and doctoral candidate Martha Rackets are seeking research assistants for Fall 2020 to help support a research project focusing on romantic couples' use of online communication. Specifically, how couples navigate conflict using technology. Research assistants will receive extensive training on couple communication and dynamics and learn research protocols commonly used to study couples and families. Students can gain up to 3 upper division credit hours (FAM 495) or can volunteer for the opportunity with no course credit or enrollment required. Interns can expect to work 10 hours/week, with one team meeting per week. All work will be conducted remotely, with no in-person meetings required. Interns will also be provided opportunities for professional mentorship, guidance, and future reference letters (if requested).

Requirements: Research assistants need to be at least 18 years old, have at least a 3.0 GPA (or 3.0 GPA within their major), have a strong work ethic, ability to work independently, and be detail oriented. Candidates must also have considerable personal experience and comfort using technology (text-message, email, online chatting, etc.) to communicate with friends, family, or a romantic partner in the English language. Candidates should also demonstrate a passion or interest for advancing their understanding and skills in working with couples, families, or engaging in research.

The deadline to apply is 5 pm, August 19th. Interested candidates can contact Martha Rackets via email at mpe222@uky.edu . There will be screening interviews held via Zoom the first week of classes, starting on Monday 17th and ending on Thursday August 20th. Interviews can be scheduled between 9am-1pm on August 17th, 18th and 19th. On Thursday August 20th, interviews can be scheduled between 5-8pm. In your email, please indicate *all the possible* times you would be available within the time slots above to participate in a screening interview.

APPENDIX 2. INTERVIEW GUIDE

1. Introductions and Project Overview
2. Why are you interested in this project?
3. How do you think this kind of experience may benefit you academically or professionally in the future?
4. Describe any experience that you have that may be relevant to this project.
    a. What kind of experience do they have in learning about healthy relationships or communication? Previous classes, trainings, lectures, podcasts, work experience?
    b. What experience do you have in learning and precisely following a protocol?
5. Describe any work experience that you have had that requires you to work independently, with little supervision?
    a. How do you plan to complete this work independently from home?
6. How will you balance completing this with other responsibilities?
7. Describe an instance when you worked on a team. What are you like as a team member?
    a. How would others on the team describe you?
    b. Give an example of a time that you worked on a team to make a decision about something. What role did you play in the decision making process?
    c. Give an example of a time that you expressed your opinion or advocated for a different opinion than others on the team? What was that like for you and what was the result?
8. Skill Assessment
    a. Identifying emoticon meanings
        <3
        :D
        ^_^
        :-)
        ;-)
        :-/
        :-*
        :P
        O:-)
        :-(
        @->
        :-!
        >:(
        :’-(
    b. CMC chat log assessment
        i. Identify all examples of Positive Affect in the first five-minute segment
        ii. Identify in the first segment which partner demonstrates more Dominance, and explain why
        iii. In last segment, identify any instances of healthy Communication Skills. Explain why you think these behaviors or dynamics represent

healthy communication based on your own personal or educational experience.

iv. How Committed are they as a couple to the relationship on a scale of 1-9?

APPENDIX 3. IDCS-CMC MANUAL

INTERACTIONAL DIMENSIONS CODING SYSTEM –

COMPUTER-MEDIATED COMMUNICATION

(IDCS-CMC)

Created by Martha Rackets

September 2020

This coding system is a revised version of the Interactional Dimensions Coding System Manual – Problem Solving (IDCS-PS).

See Kline, G. H., Julien, D., Baucom, B., Hartman, S. G., Gilbert, K., Gonzales, T., et al. (2004). The Interactional Dimensions Coding System: A global system for couple interactions. In P. K. Kerig & D. H. Baucom (Eds.), *Couple observational coding systems* (pp. 113-127). Mahwah, NJ: Lawrence Erlbaum Associates.

Also see the original Couples' Interaction Global Coding System presented by Julien, Markman, and Van Widenfelt, July 1986, University of Denver.

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INTRODUCTION

The Interactional Dimensions Coding System-Computer-mediated Communication (IDCS-CMC) was designed to assess how couples interact with each other while discussing problem areas in their relationship using computer-mediated communication (CMC). CMC is primarily text-based, electronically transmitted communications.

The IDCS-CMC is a *global* coding system and, as such, the focus is on getting a sense of the bigger picture of how a couple is communicating. This type of coding system differs from a *microanalytic* coding system in that it codes major dimensions of behavior over relatively long time periods (i.e., level of conflict across one third of the interaction) rather than small, specific pieces of behavior over short periods of time (e.g., number of exclamation points used in five second portion of interaction).

Researchers can use this system for various text-based communication channels, such as online chatting, email, and text messaging. The coding system accounts for the basic use of symbols, graphic displays of faces and images, and a user's ability to manipulate font. Additional variations of graphics and technology capabilities should be considered in the generalization of this system. In selecting communication platforms or channels, the researcher should also ensure that time can be monitored by timestamps and that accurate recording of back and forth sequencing of each partner's contributions can be accurately captured.

Using this manual, coders will become familiar with how to recognize and rate key observable behaviors and verbal statements in couples' interaction. IDCS-CMC is based on the general assumption that any message, or attempt at communication, will consist of two parts: a *content* component and an *affect*, or feeling, component. The content component is the surface level of the message; it refers to the actual words being used and typed. The affect component is how the message is delivered; it refers to the emotion behind the content.

For this coding system, examples and cues of CMC behaviors will be included as well as the examples included in the original IDCS-PS manual that was designed for face-to-face (FtF) interaction. Given that analysis of transactional CMC couples' dynamics and behaviors is still a new field of study, including the FtF examples will allow coders to reference what behaviors in traditional FtF settings may look like. This may then help coders create a cognitive and contextual crosswalk between the FtF and CMC channels, thus increasing the ability of coders to imagine what the dimensions and cues may look like in CMC.

Although coders will be trained on the IDCS-CMC coding system that includes specific behaviors and cues that they will look for, coders will also need to utilize their own personal experience in relationships and using CMC to help discern the meaning of patterns, behaviors, and dynamics. Coders will need to make judgments on the meaning and the intention of these behaviors. Thus, the role of the coders for this coding system is both that of a detector of information but also a cultural informant, such that inference about others' intentions is necessary.

CODEBOOK OVERVIEW

Dimensions

The IDCS-CMC is made up of 9 individual dimensions. The coder will provide scores for each individual. The system also includes 5 dyadic dimensions where the coder will give the couple a score as a unit.

Individual Dimensions

- There are 2 **affect codes**: Positive and Negative Affect.
    - When making ratings for the affect codes, facial expressions, tone, or other typed or electronically created affect cues for each individual will be taken into account.
- There are 3 **content codes**: Problem Solving Skills, Denial, and Dominance.
    - When making ratings for content codes, the specific language being used by each individual will be taken into account.
- There are 4 **combined codes**: Support/Validation, Conflict, Withdrawal, and Communication Skills.
    - These take into account both content and affect components of communication of each individual. Each dimension will be described later in further detail.

Dyadic Dimensions

- There are 5 couple-level or **dyadic dimensions**: Positive Escalation, Negative Escalation, Commitment, Satisfaction, and Stability. For these dimensions the dyad is rated together, where one score is assigned to the couple as a unit:
    - Positive Escalation and Negative Escalation: involve coding the entire behavioral stream of interaction, focusing on how each partner responds to the other.
    - Commitment, Satisfaction, and Stability: involve assessing the couple's commitment to the relationship, and your estimations of the couple's future level of marital satisfaction and stability. Explicit consideration of content and affect components is not necessary for these codes because they are more intuitive inferences based on the couple's entire interaction.

Scoring on a 9-Point Scale

The IDCS-CMC is a coding system where the coder assigns a score, or rating, for the dimensions of behavior that are listed above. Individual and dyadic codes will be scored on **a 9-point scale (1-9)** with a low score of "1" indicating the dimension is *extremely uncharacteristic* of the interactions and a high score of "9" indicating that the dimension is *extremely characteristic* of the interaction. See Assigning Ratings section for additional details.

PROCEDURE

Each couple who participates in this protocol will be asked to discuss a problem area in their relationship, which they have previously identified. The couple will use a text-based channel to communicate about this problem for a designated length of time. A record of the interactions that includes timestamps will be logged and saved for future coding.

The coder will:

- Obtain the total time for the interaction by reviewing timestamps on the CMC logs. They will then divide this time into 3 equal time segments, using simple arithmetic. For example, divide the total time of 15 minutes into 3 segments, each equaling 5 minutes.

- The coder will then read and review the entire problem discussion. The coder will take notes on the corresponding space on the coding sheet, paying attention to both content and affect cues. No ratings should be assigned yet. The purpose of the initial viewing is to get a feel for the couple's overall interaction.

- The coder will then review only the first segment again and take notes in the corresponding space for this segment on the coding sheet. The rater will then assign ratings on a 9-point scale for the segment using the manual for each of the 9 individual dimensions. The coder should make ratings for each of the individuals. It is unlikely, especially when first becoming familiar with the coding system, that the coder will be able to automatically rate all of the dimensions at this point. Review the segment as many times as needed in order to confidently assign ratings for the codes. (See below section "Assigning Ratings" for a detailed explanation of this process.)

- Once the coder has assigned ratings for Segment 1, the coder will review Segment 2. Once again, the coder will take notes in the corresponding section on the scorecard and assign ratings for each of the individual 9 dimensions. This process will then be repeated for Segment 3.

- Having rated each third of the interaction separately, the coder now needs to assign an overall rating for each of the 9 dimensions for each person. This essentially means "summing over" the three ratings that have been made for each dimension to reach one rating which best describes the overall intensity of each dimension for each person. In total, the coder will assign 4 ratings (1 for each of the 3 segments and 1 overall) to each person for each of the 9 individual codes. Although the final rating for a dimension usually reflects either the mode (most commonly assigned rating; 6-6-5 = 6) or mean (average rating; 4-5-6 = 5) of the three segment ratings, this is not always the case. The coder has some discretion in departing from this custom if the overall feel for the interaction is, on reflection, more accurately represented by, say, one of the three segments (e.g., 3-4-5 = 5 or 2-3-3 = 2).

- Lastly, the coder will assign a score using the same 9-point scale for the couple (as a dyad) on the five dyadic dimensions, using the entire interaction as the coding unit.

ASSIGNING RATINGS

Using the Manual to Assign Ratings

For each dimension, you need to take into consideration the general definition given for the code, the specific behavioral cues, or examples, listed under the definition, and finally, the 9-point scale anchorings given for the ratings below the list of cues.

Although there is no definite order in which to consider these three sources of information, one is suggested here. After reviewing the segment in question:

- Read and familiarize yourself with the general definition. How much does it apply to the participants for the segment in question? Did the participants exhibit a low, moderate, or high degree of the dimension according to the definition?

- Read through the behavioral cues listed and, referring back to your notes, consider again whether the individuals exhibited a low, moderate, or high degree of the dimension in question. (See section "Taking Example Cues into Account" below.)

- Scroll through the different anchorings for the scale. Based on the general definition and the cues, consider a rating for the code for each participant. Does the anchoring next to the number selected accurately represent the code for the participant? If it does, assign that rating. If it does not, based on the general definition and specific cues, consider a slightly lower or higher rating/anchoring, and assess its accuracy in capturing the code for the participant. Note: Some numbered values do not have any text next to them. These values are used when a person exhibits behaviors that should be rated higher than the number below the value, but the coder determines their behaviors are not quite up to the next highest value. For example, if a person seems to be stronger than a 4 but not quite as strong as a 6, that participant may be given a 5.

Taking Example Cues into Account

It is important for the coder to understand that the list of behavioral cues given for each code is not a checklist in the strict sense, with a certain number of cues observed corresponding to a certain rating on the scale. *Furthermore, the lists are not exhaustive of the possible manifestations of the dimensions in question.* Despite these two caveats, *it is still likely* that the *more cues on the list observed*, the more extreme the ratings will be for that code. For example, if an individual displays a negative face expression (e.g., frown or angry emoticon) *and* negative tone (e.g., ugh, pshh, NO!) they would typically receive a higher rating on Negative Affect than if they had exhibited only one of the cues.

In addition to *how many different* cues are observed for a dimension, the *frequency* and *intensity* of the cues are also considered. Regarding *frequency*, it is typically the case that the more frequently an individual displays one or more of the behavioral cues listed, the more impact that cue(s) has on the dimension in question. Using the example above, if an individual used frown emoticons repeatedly throughout the interaction, but does not show negative affect in other areas of tone or expression, they would still probably receive a high rating on Negative Affect.

Regarding *intensity* of the observed cues, it is typically the case that the more intense or strong the cue, the more impact that cue has on the assigned rating. For example, a concerned or mildly frustrated emoticon expression would not be considered as negative as an angry face or someone typing in all caps and bold font to express disgust. Another example would be using haha to indicate a laugh versus HAHAHA or LOL!!, which both indicate a higher intensity of laughter.

These three facets of the cues (number of different cues observed, frequency of cues, and intensity of cues) apply to *content cues* in the same way. For example, regarding intensity, the statement "This problem is all your fault" is a considerably more intense, or strong, example of a Denial cue than the statement "I haven't had time to take out the trash."

The Case of the Combined Code

As was previously stated, the codes used are based on content cues, affect cues, and some that are a combination of the two. The codes that are combined content and affect codes include Support/Validation, Conflict, Withdrawal, and Communication Skills. While some participants will exhibit many of the affect *and* content cues for these codes, others will display very few of either the affect or content cues. In either case, the entire 9-point scale is used to code the dimension. Some participants, however, will display either content cues or affect cues but not both. This situation can be tricky for coders. There are also instances in CMC when what is considered an affect cue can transfer onto the content of the message. For example, someone may be expressing happiness, and state "OH YAY!!" where the words represent the content and the capitalization and punctuation represent the affect. Someone may also say "I feel so angry right now", where the words used represent content, but the use of the word angry indicates affect.

AFFECT CODES

Positive Affect

Face to Face	Computer-Mediated
General Definition Positive affect refers to the positivity of facial expressions, body positioning, and the emotional tone or quality of voice. Positive affect is not the same as absence of negative affect. **Example Positive Affect Cues** ***Positive face*** • Combinations of facial expressions produced by the forehead, eyebrows, cheeks, and mouth that express happiness in the interaction (cheerful, excited, buoyant, bubbly, joyous, satisfied, relieved, chuckling, laughing). • Facial expressions conveying support for partner (affectionate, warm, soft, tender, caring, loving, empathic, concerned). The maintenance of good eye contact is a key component of positive face. ***Positive voice*** • Affectionate, warm, soft, tender, caring, loving, cheerful, excited, buoyant, bubbly • Happy, joyous, satisfied, relieved, empathic, concerned, chuckling and laughter (unless context suggests negative tone) ***Positive body*** • Relaxed body (check for relaxation of the neck and shoulders, wrist dexterity when arm is moving, and asymmetrical placement of limbs). Whole body (head, torso, hips) is comfortably oriented toward partner, and when the body moves, facial distance between partners is minimized and maintained.	**General Definition** Positive affect refers to the expression of positivity through the use of emoticons, manipulation of text, text-based symbols, punctuation, letters, or inclusion of relational affect or emotion-laden language. Positive affect is not the same as absence of negative affect. **Example Positive Affect Cues** ***Positive Face, Emoticons and Symbols*** • Use of punctuation or text-based tools to create symbols that represent positive facial expressions or happiness, warmth, excitement, tenderness, relief or laughing in interaction. May include faces indicating smiling ☺, winking ;-), sticking tongue out, :-P, thumbs up, hug. • May also include the use of symbols or other graphics related to expression of love, support or affection, such as a heart <3, a kiss, :-*, a hug graphic, a rose @>-- ***Positive voice*** • Any vocalization that can indicate affection, warmth, tenderness, caring, cheerfulness, excitement, happiness, relief, empathy, concern by use of exaggeration or manipulation of letters, punctuation, font style or use of all capitalized letters. Ex. Yaaaaay!, When can we leave?!?! ☺, I LOVE that ideeaa, **PHEW!**. • Sounds of laughter being translated through use of letters to indicate sound or acronyms indicating the behavior of laughing. Ex. hahah, LOL, hah!, hehe, lmao • Use of pet names, nick names, or positive language that reflects affect or emotion, that may or may not be expressed in

	combination with other cues ***Using Context Clues*** • Use context of conversation to determine intent of affect cues • Positive affect clues could also indicate sarcasm, could buffer negative content or be used to lighten the mood during conflict/negative escalation

Positive Affect Anchors

1 = Extremely uncharacteristic. Individual displays no signs of positive affect.
2 = Highly uncharacteristic. Individual displays almost no positive affect cues; cues are weak in intensity.
3 =
4 = Minimally characteristic. Individual displays some signs of positive affect, though these signs are infrequent and/or weak.
5 =
6 = Moderately characteristic. Individual displays notable signs of positive affect, though they are not necessarily consistent throughout entire interaction.
7 =
8 = Highly characteristic. Individual displays strong signs of positive affect that are frequent, intense, and consistent.
9 = Extremely characteristic. Individual displays unmistakably clear, consistent and intense signs of positive affect. Individual demonstrates multiple examples and types of positive affect throughout the entire interaction.

Negative Affect

Face to Face	Computer-Mediated
General Definition Negative affect refers to the negativity of facial expressions, body positioning, and the emotional tone or quality of voice. Negative affect is not the same as absence of positive affect. **Example Negative Affect Cues** ***Negative face*** • Different combinations of facial expressions produced by the forehead, eyebrows, cheeks, and mouth that express *dissatisfaction/uncomfortableness* in the interaction (tense, distressed, worried, bored, sighing, sad, crying). Lack of eye contact, especially for a long time, is also negative. However, during conversations, a speaker naturally alternates gazing at the listener with gazing away, so observers must determine whether the speaker looks away from the listener longer than the speaker looks at the listener. • Different combinations of facial expressions produced by the forehead, eyebrows, cheeks, and mouth that express *anger* toward the other (frown, sneer, mocking, smirking, disgust, contempt, scorn). ***Negative voice*** • Cold, impatient, whining, sarcastic, angry, hurt, depressed, accusing, irritated. Note: It will be important to distinguish the flat or monotone voice from the depressed voice; typically, the latter is accompanied by a sad or dejected facial expression. ***Negative body*** • Tense or rigid body (check for constriction of the neck and shoulders).	**General Definition** Negative affect refers to the expression of negativity through the use of emoticons, manipulation of text, punctuation, or letters, or the use of words or emotion-laden language. Negative affect is not the same as absence of positive affect. **Example Negative Affect Cues** ***Negative Face, Emoticons, and Symbols*** • Use of punctuation or text-based tools to create symbols that represent negative facial expressions and affect including dissatisfaction, discomfort, tension, distress, worry, boredom, sighing, sadness, or crying. May include faces indicating frowning ☹, distress :-/, anger >:-(, or sadness :'-(, face showing eye rolling, sick face, smirking • May include other symbols or graphics that indicate negative affect. Ex. Thumbs down, use of an **X** to indicate disagreement or displeasure, sending a blank message or … to indicate boredom or lack of interest ***Negative voice*** • Use of language or punctuation or message or sentence structure to create a message with vocal inflection that sounds cold, impatient, whining, sarcastic, angry, hurt, depressed, accusing, irritated. Ex*…and? What's your point?? What. Is. Your. Problem. (sent as four separate messages) **SIGH** womp woommmpp* • Use of emotion-laden language, indicating negative emotions such as teasing, cuss words, or harsh statements, that may or may not happen in combination with other cues ***Using Context Clues***

Body or parts of the body (shoulders, hips) are oriented away from the partner, and when the body moves, facial distance between partners is increased. Touching that does not appear to be playful or supportive; fidgeting with an object, hair, glasses, or clothing.	• Using text channel or functions in a way that does not appear to be playful or supportive; changing fonts, including punctuation or emoticons in a way that is distracting or considered fidgeting • It will be important to distinguish the flat or monotone communication from the depressed affect; typically, the latter is accompanied by a sad or dejected facial expression.

Negative Affect Anchors

1 = Extremely uncharacteristic. Individual displays no signs of negative affect.
2 = Highly uncharacteristic. Individual displays almost no negative affect cues; cues are weak in intensity.
3 =
4 = Minimally characteristic. Individual displays some signs of negative affect, though these signs are infrequent and/or weak.
5 =
6 = Moderately characteristic. Individual displays notable signs of negative affect, though they are not necessarily consistent throughout entire interaction.
7 =
8 = Highly characteristic. Individual displays strong signs of negative affect that are frequent, intense, and consistent.
9 = Extremely characteristic. Individual displays unmistakably clear, consistent and intense signs of negative affect. Individual demonstrates negative face, negative throughout the entire interaction.

CONTENT CODES

Problem-Solving Skills

Face to Face	Computer-Mediated
General Definition Problem-solving skills refer to an individual's ability to define a problem and work toward a mutually satisfactory solution for the problem. Ratings are assigned based on a person's ability to try to solve the problem, not on whether or not the problem was actually solved. **Example Problem-Solving Skills Cues** • Recognizing the problem exists within the dyad. • Describing/Defining the problem positively or neutrally without resorting to blaming partner. • Clearly expressing wishes and desired outcome to be reached. • Contributing to problem discussion effectively and keeping the conversation on task. • Proposing positive plans or a solution designed to solve the problem. • Negotiating, compromising, and/or working with partner to come to a mutually agreeable conclusion. • Making a commitment to take action toward the problem. • Suggesting a hypothetical plan(s) to solve the problem.	**General Definition** Problem-solving skills refer to an individual's ability to define a problem and work toward a mutually satisfactory solution for the problem. Ratings are assigned based on a person's ability to try to solve the problem, not on whether or not the problem was actually solved. **Example Problem-Solving Skills Cues** • Recognizing the problem exists within the dyad. • Describing/Defining the problem positively or neutrally without resorting to blaming partner. • Clearly expressing wishes and desired outcome to be reached. • Contributing to problem discussion effectively and keeping the conversation on task. • Proposing positive plans or a solution designed to solve the problem. • Negotiating, compromising, and/or working with partner to come to a mutually agreeable conclusion. • Making a commitment to take action toward the problem. • Suggesting a hypothetical plan(s) to solve the problem.

Problem-Solving Anchors

1 = Extremely uncharacteristic. Individual makes no attempt to solve the problem; may make mention to the problem yet changes the topic.
2 = Highly uncharacteristic. Individual makes almost no attempts to solve a problem; displays few or weak signs of involvement in terms of solving the problem.
3 =
4 = Minimally characteristic. Individual seems generally interested in trying to solve the problem and shows some signs of trying to come to a solution.
5 =
6 = Moderately characteristic. Individual demonstrates notable problem-solving skills throughout a large portion of the interaction.

7 =
8 = Highly characteristic. Individual demonstrates strong problem-solving skills throughout all or nearly all the interaction.
9 = Extremely characteristic. Individual demonstrates exemplary problem-solving skills. The whole of the interaction is dedicated to solving the problem constructively.

Denial

Face to Face	Computer-Mediated
General Definition Denial is the active rejection of a problem's existence or of personal responsibility for the problem being discussed. **Example Problem-Solving Skills Cues** • Disputing the existence of or minimizing the problem being discussed. • Making excuses for one's role in the problem area. • Acknowledging the problem but refusing to take any personal responsibility. • Acknowledging the problem and entirely blaming one's partner. • Blames partner for blowing the problem out of proportion. • Claims partner is imagining or making up the problem.	**General Definition** Denial is the active rejection of a problem's existence or of personal responsibility for the problem being discussed. **Example Denial Cues** • Disputing the existence of or minimizing the problem being discussed. • Making excuses for one's role in the problem area. • Acknowledging the problem but refusing to take any personal responsibility. • Acknowledging the problem and entirely blaming one's partner. • Blames partner for blowing the problem out of proportion. • Claims partner is imagining or making up the problem.

Denial Anchors

1 = Extremely uncharacteristic. Individual demonstrates absolutely no denial; the person is aware of, acknowledges, and discusses the problem.
2 = Highly uncharacteristic. Individual displays almost no denial; may make a brief rebuttal or clarification.
3 =
4 = Minimally characteristic. Individual displays some weak or infrequent signs of denial.
5 =
6 = Moderately characteristic. Individual displays denial throughout a large portion of the interaction.
7 =
8 = Highly characteristic. Individual demonstrates denial throughout almost the entire interaction; individual strongly demonstrates that they do not think there is a problem or that they have no role in problem.
9 = Extremely characteristic. Individual denies any awareness of the problem, responsibility for it and/or is unwilling to learn more about problem from partner; denial is exhibited throughout entire interaction.

Dominance

Face to Face	Computer-Mediated
General Definition Dominance is the actual achievement of control or influence an individual exerts over one's partner during the interaction. Dominance may be identified through forceful, monopolizing, and/or coercive behaviors. **Example Problem-Solving Skills Cues** • Directing the course of the conversation • Talking forcefully and/or taking charge • Commanding partner and partner complies • Talking more often than partner and/or not letting partner talk. • Successfully interrupting partner and/or resisting partner's interruptions • Starts or introduces problem discussion and/or closure of problem discussion abruptly, against partner's wishes or without input or consent from partner. • Forces partner to accept own opinions without reasons • Completely changes partner's opinions • Withholds contributions to conversations as a means of exerting control	**General Definition** Dominance is the actual achievement of control or influence an individual exerts over one's partner during the interaction. Dominance may be identified through forceful, monopolizing, and/or coercive behaviors. **Example Dominance Cues** • Directing the course of the conversation • Talking forcefully and/or taking charge • Commanding partner and partner complies • Talking more often than partner and/or not letting partner talk. • Successfully interrupting partner and/or resisting partner's interruptions • Starts or introduces problem discussion and/or closure of problem discussion abruptly, against partner's wishes or without input or consent from partner. • Forces partner to accept own opinions without reasons • Completely changes partner's opinions • Withholds contributions to conversations as a means of exerting control ***Using Context Clues*** • Some people will type in shorter or longer blocks of text and some may be faster at typing or more familiar with the platform being used for the interaction. • Take note of the differences in typing volume, style, and pacing. Consistency or change in these dynamics may indicate attempts to talk more or talk over a partner, which could indicate dominance or conversely may demonstrate that someone types faster. Also, someone sending messages in

	fast sequence and in shorter blocks may indicate an effort to dominate the typing window, but could also indicate that the person has a different style of typing messages. • Take note of timestamps during conversation and any changes in style of typing or pacing. • Withholding or delays in communicating could be considered dominance, but could also be an indication of someone thinking or typing out a longer message.

Dominance Anchors

1 = Extremely uncharacteristic. Individual displays no signs of dominance in the time apportioned. Individual either takes turns with their partner equitably or is completely stifled and overrun by a more dominant partner.
2 = Highly uncharacteristic. Individual displays almost no dominance; may demonstrate a characteristic of dominance, but has little effect on the direction and course of the discussion.
3 =
4 = Minimally characteristic. Individual displays some signs of dominance that are weak in intensity.
5 =
6 = Moderately characteristic. Individual demonstrates dominance throughout a large portion of the interaction; has a significant effect on the interaction through their expression of dominance.
7 =
8 = Highly characteristic. Individual demonstrates dominance throughout almost the entire interaction; rarely allows partner an opportunity to express themselves.
9 = Extremely characteristic. Individual demonstrates a remarkably intense level of dominance that is exhibited throughout the entire interaction.

COMBINED CODES

Support/Validation

Face to Face	Computer-Mediated
General Definition Support/Validation focuses on positive listening skills and speaking skills that demonstrate support and understanding to the partner. Close synonyms for this code are encouragement, acknowledgement, and acceptance. ***Example Support/Validation Affect Cues*** • Attentive while listening • Good eye contact while speaking • Face is congruently responsive to what partner is saying (e.g., head nods, smiles, eyebrow movements) while listening • Body is relaxed and open • Body is oriented toward partner while listening and speaking • Expressive face while speaking • Demonstrates vocal inflection (variation of rhythm and intonation) while speaking ***Example Support/Validation Content Cues*** • Expresses warmth, concern, and sympathy toward partner • Makes positive or neutral attributions about partners behavior • Accepts partners attributions about own behavior • Summarizes or paraphrases partner's statements • Encourages partner • Flatters, compliments partner	**General Definition** Support/Validation focuses on communication that indicates positive listening skills and communication skills that demonstrate support and understanding to the partner. Close synonyms for this code are encouragement, acknowledgement, and acceptance. ***Example Support/Validation Affect Cues*** • Positive face emoticon or graphic to indicate paying attention when someone is listening or express positivity if someone is being the speaker • Use of text-based vocal inflection or punctuation while speaking or listening to express positivity or active listening, Ex. "uh huh", "hmmm", ".....", "??" • The listener using symbols or in-message reactions to indicate agreement, validation, and responsiveness, by giving the partner's message a thumbs up, heart, or exclamation point, haha. • Use of emoticons, symbols, graphics, or manipulation of words, spelling, font, or use of punctuation to indicate warmth, concern, sympathy, or flattery. Ex. You have the BEST ideas!!, I loooove you <3 <3, okaaaay, lets DO it ☺ ***Example Support/Validation Content Cues*** • Expresses warmth, concern, and sympathy toward partner • Makes positive or neutral attributions about partner's behavior • Accepts partner's attributions about own behavior • Summarizes or paraphrases partner's statements • Encourages partner

	• Flatters, compliments partner ***Using Context Clues*** • Some of the emoticons or vocal utterances used while someone is being a listener need to be evaluated in context, such that they could also indicate boredom, lack of responsiveness, or even passive aggressiveness. • A lack of affect-based active listening should not always be interpreted as a lack of support/validation, as a listener may be providing the speaker space to type, and not including these cues. • Use of nicknames or pet names in a loving, supportive, or relational way, These may be used only in content of the message or they may be used in combination with a symbol or other affect indicators.

Support/Validation Anchors

1 = Extremely uncharacteristic. Individual displays no signs of support/validation; clearly demonstrates the inability to listen, validate, or show support toward their partner.
2 = Highly uncharacteristic. Individual displays almost no signs of support/validation; may be cold, unsympathetic, unresponsive, and/or flat toward their partner.
3 =
4 = Minimally characteristic. Individual displays some signs of support/validation that are weak and infrequent.
5 =
6 = Moderately characteristic. Individual displays notable signs of support validation, though they are inconsistent.
7 =
8 = Highly characteristic. Individual displays strong signs of support/validation; is responsive, warm and attentive toward their partner consistently during the interaction.
9 = Extremely characteristic. Individual displays exemplary signs of support/validation throughout entire interaction.

Conflict

Face to Face	Computer-Mediated
General Definition Conflict is an expressed struggle between two individuals with incompatible goals or opinions. The level of tension, hostility, disagreement, antagonism, or negative affect an individual displays can identify conflict. ***Example Conflict Affect Cues*** • Face displays tension, nervousness (includes eye contact, clenched jaw, eye twitches, nostrils flair, decreased or overly intense eye contact) • Body is tense, tight • Speaks in a negative voice – impatient, angry, whining, cold or curt • Reacts with negative affect to own or partner's negative affect ***Example Conflict Content Cues*** • Judges and criticizes partner or people/things important to partner • Imposes own will on partner, is controlling • Demonstrates indifference and lack of commitment • Minimizes the value of partner' s contributions • Expressing rigidity in one's willingness to listen to partner • Disagrees more often than agrees with partner • Makes negative interpretations/mind reads – attributes negative feelings, attitudes, beliefs or motives to partner (e.g., "You never wanted to go to my parents' house in the first place") • Makes negative overgeneralizations – e.g., "You always say that!" or "You never ask me how my day went..." • Antagonizes partner by using sarcasm, complaining in response to partner's complaint, or commenting negatively on partner's negative behavior	**General Definition** Conflict is an expressed struggle between two individuals with incompatible goals or opinions. The level of tension, hostility, disagreement, antagonism or negative affect an individual displays can identify conflict ***Example Conflict Affect Cues*** • Use of emoticons, symbols, graphics, or manipulation of words, spelling, font, or use of punctuation to indicate impatience, anger, coldness, curtness, sarcasm, indifference. Ex. You NEVER pay attention!! …whatever… whhyyyyy can't you remember?? UGH >:(. ya.sure.mk. • Reacts with negative affect to own or partner's negative affect ***Example Conflict Content Cues*** • Judges and criticizes partner or people/things important to partner • Imposes own will on partner, is controlling • Demonstrates indifference and lack of commitment • Minimizes the value of partner' s contributions • Expressing rigidity in one's willingness to listen to partner • Disagrees more often than agrees with partner • Makes negative interpretations/mind reads – attributes negative feelings, attitudes, beliefs or motives to partner (e.g., "You never wanted to go to my parents' house in the first place") • Makes negative overgeneralizations – e.g., "You always say that!" or "You never ask me how my day went..." • Antagonizes partner by using sarcasm, complaining in response to partner's complaint, or commenting negatively on partner's negative behavior

• Appears to instigate more conflict	• Appears to instigate more conflict ***Using Context Clues*** • Use of sarcasm should be interpreted in context by both the person who initiated it and how it is interpreted by the partner. Behavior should be explored as it may contribute to positive or negative escalation to determine if it is evidence of conflict.

Conflict Anchors

1 = Extremely uncharacteristic. Individual displays no affective or content signs of conflict.
2 = Highly uncharacteristic. Individual displays almost no signs of conflict.
3 =
4 = Minimally characteristic. Individual displays some signs of conflict though signs are weak and/or infrequent.
5 =
6 = Moderately characteristic. Individual displays the characteristics of conflict throughout a large portion of the interaction, though these signs are inconsistent.
7 =
8 = Highly characteristic. Individual displays strong signs of conflict throughout almost the entire interaction.
9 = Extremely characteristic. Individual displays remarkably intense signs of conflict throughout the entire interaction.

Withdrawal

Face to Face	Computer-Mediated
General Definition Withdrawal is the avoidance of the interaction or of the problem discussion. The individual may evade the issue, retreat into a shell, back off, or may seem to pull one's self out of the interaction. ***Example Withdrawal Affect Cues*** • Avoids eye contact while speaking or listening (looks away or down a lot) • Body turned away from partner • Increases and maintains physical distance from partner (i.e., changes chair position to create more distance, reclines chair back, tilts chair away) • Puts a physical barrier between self and partner (i.e., arms crossed, hands covering part of the face) • Fidgets with hair, glasses, clothes or jewelry repeatedly • Appears uncomfortable or bored ***Example Withdrawal Content Cues*** • Allows partner to dominate the discussion • Displays a low level of communication assertiveness by allowing partner to talk over them or redirect the flow of conversation • Is unresponsive to partner • Displays a low level of self-disclosure • Ends conversation • Clams-up • Says "I don't want to talk"	**General Definition** Withdrawal is the avoidance of the interaction or of the problem discussion. The individual may evade the issue, retreat into a shell, back off, or may seem to pull one's self out of the interaction. ***Example Withdrawal Affect Cues*** • Uses text-based cues to communicate rather than using words to express thoughts and feelings such as sending a message with only punctuation. Ex. "…", or "??", or sending a blank message • Shortens words to indicate a lack of participation, such as typing "idk" instead of "I don't know", or "k" instead of "okay", or not including punctuation when it may be easily included otherwise, such as sending "y" instead of why?, indicating a lack or effort or interest • Uses text, symbols, font, punctuation in a way that creates distraction or distance in communication ***Example Withdrawal Content Cues*** • Allows partner to dominate the discussion • Displays a low level of communication assertiveness by allowing partner to talk over them or redirect the flow of conversation • Is unresponsive to partner • Displays a low level of self-disclosure • Ends conversation • Clams-up, or states "I am uncomfortable" • Says "I don't want to talk" ***Using Context Clues*** • Withdrawal may look like being completely unresponsive, or a partner

	may send short responses, or responses that take minimal effort to construct. Use context and changes in response affect or content of message style to determine if someone's behaviors indicate a minimal effort being made to communicate • Short responses or efforts indicating minimal effort being made to respond may be an indication of withdrawal.

Withdrawal Anchors

1 = Extremely uncharacteristic. Individual displays no signs of withdrawal; is engaged in the discussion both verbally and non-verbally throughout the entire interaction.
2 = Highly uncharacteristic. Individual displays almost no signs of withdrawal; is actively engaged in the discussion, as evidenced by frequent and strong expressions of support/validation, conflict, or both.
3 =
4 = Minimally characteristic. Individual displays some weak or infrequent signs of withdrawal; is more involved than detached.
5 =
6 = Moderately characteristic. Individual displays notable signs of withdrawal that are inconsistent; is more detached than involved.
7 =
8 = Highly characteristic. Individual displays very frequent and/or strong signs of withdrawal.
9 = Extremely characteristic. Individual is completely withdrawn during the interaction.

Communication Skills

Face to Face	Computer-Mediated
General Definition Communication skills describe an individual's ability to convey thoughts and feelings in a clear, constructive manner. ***Example Communication Skills Affect Cues*** • Good eye contact while speaking. Most people do not maintain eye contact the whole time while speaking, especially when bringing in new information, but should have a majority of the time with eye contact. • Expressive face while speaking (i.e., brow movements) • Body (head, shoulders, hips) oriented toward partner while speaking. • Relaxed arms, hand movements to accompany and enhance statements, flexible wrists. ***Example Communication Skills Content Cues*** • Expresses emotions or feelings about partner, self or others • Displays high level of self-disclosure, but also allows for partner's input • Expresses opinions in a clear, direct, and neutral manner • Is able to disengage from negative escalation cycles • Summarizes partner's opinions, feelings, or decisions • Seeks to understand partner's point of view through questions • Displays appropriate humor and laughing • Makes effort to validate the importance of partner's feedback • Supports partner's decisions although they may not agree with them • Accepts responsibility for behaviors toward partner	**General Definition** Communication skills describe an individual's ability to convey thoughts and feelings in a clear, constructive manner. ***Example Communication Skills Affect Cues*** • Use of emoticons, graphics, font, punctuation, symbols, or vocal inflection to indicate interest in partner or topic, excitement, emotional engagement, humor or laughing ***Example Communication Skills Content Cues*** • Expresses emotions or feelings about partner, self or others • Displays high level of self-disclosure, but also allows for partner's input • Expresses opinions in a clear, direct, and neutral manner • Is able to disengage from negative escalation cycles • Summarizes partner's opinions, feelings, or decisions • Seeks to understand partner's point of view through questions • Displays appropriate humor and laughing • Makes effort to validate the importance of partner's feedback • Supports partner's decisions although they may not agree with them • Accepts responsibility for behaviors toward partner ***Using Context Clues*** • In text-based communication, partners may include additional affect cues, or may translate meaning of emotions or non-verbals directly into text with more frequency and intention when they are trying to be the best communicators possible, or ensure that their messages,

	meaning and their state are being interpreted correctly. The translation of affect into language or the inclusion of affect to supplement meaning of a message can be indicators of healthy communication skills.

Communication Skills Anchors

1 = Extremely uncharacteristic. Individual demonstrates no communication skills; is unable to appropriately express any thoughts or feelings.
2 = Highly uncharacteristic. Individual displays almost no ability to communicate with one's partner.
3 =
4 = Minimally characteristic. Individual exhibits some infrequent and/or weak communication skills.
5 =
6 = Moderately characteristic. Individual is able to express the general meaning of their thoughts most of the time.
7 =
8 = Highly characteristic. Individual is able to convey one's thoughts and feelings almost all the time with very little ambiguity.
9 = Extremely characteristic. Individual displays exemplary communication skills; is able to clearly and concisely relay thoughts and feelings throughout the entire interaction.

DYADIC CODES

Positive Escalation

General Definition: The positive escalation dimension is defined as a sequential pattern in which a positive behavior of one partner is followed by a positive behavior of the spouse and so forth, creating a snowball effect. This measure rates how often positive behaviors of one partner are responded to with positive behaviors from the other partner. Consecutive positive chains of behaviors are the essential ingredients that must be observed. This means that unrelated positive behaviors in an interaction do not constitute a snowball or spiraling effect; such an interaction must be rated low on the positive escalation dimension, even though one or both partners may receive moderate or high scores on the positive affect dimension. To be rated very high on positive escalation, both partners would display a high frequency of positive verbal and affect-based behaviors and also give the impression of triggering each other's positive behaviors.

Negative Escalation

General Definition: The negative escalation dimension is defined as a sequential pattern in which a negative behavior of one partner is followed by a negative behavior of the spouse and so forth, creating a snowball effect. This measure rates how often negative behaviors of one partner are responded to with negative behaviors from the other partner. Consecutive negative chains of behaviors are the essential ingredients that must be observed. This means that unrelated negative behaviors in an interaction do not constitute a snowball or spiraling effect; such an interaction must be rated low on the negative escalation dimension, even though one or both partners may receive moderate or high scores on the negative affect dimension. To be rated very high on negative escalation, both partners would display a high frequency of negative verbal and affect-based behaviors and also give the impression of triggering each other's negative behaviors.

Commitment

General Definition: Look for how willing this couple is to make their relationship a high priority, to work on improving their relationship. How personally dedicated are they to their relationship? Do they put their partner's needs or the relationship's needs above their own at times? Do they think of themselves as a team ("we" versus "I")? Do you see a desire for them to continue their relationship because of a love for their partner?

Future Satisfaction

General Definition: How happy do you predict the couple will be five years from now? How rewarding will this relationship be for the couple? How pleased will the couple be with the relationship?

Future Stability

General Definition: How likely is it that this couple will be together five years from now? Base your answer on the following: dedication, satisfaction, patterns of behavior, and *amount of constraints*. Constraints are forces which keep people in relationships regardless of their desire to stay in relationships. Examples of constraints include social pressure, religious beliefs, monetary

investments, children, difficulties associated with ending the relationship, availability of alternatives to current relationship (and the attractiveness of these alternatives).

CODING SHEET

Couple ID:
Coder Initials:
Topic:

OVERALL NOTES:

SEGMENT 1 NOTES

SEGMENT 2 NOTES

SEGMENT 3 NOTES

AFFECT CODES

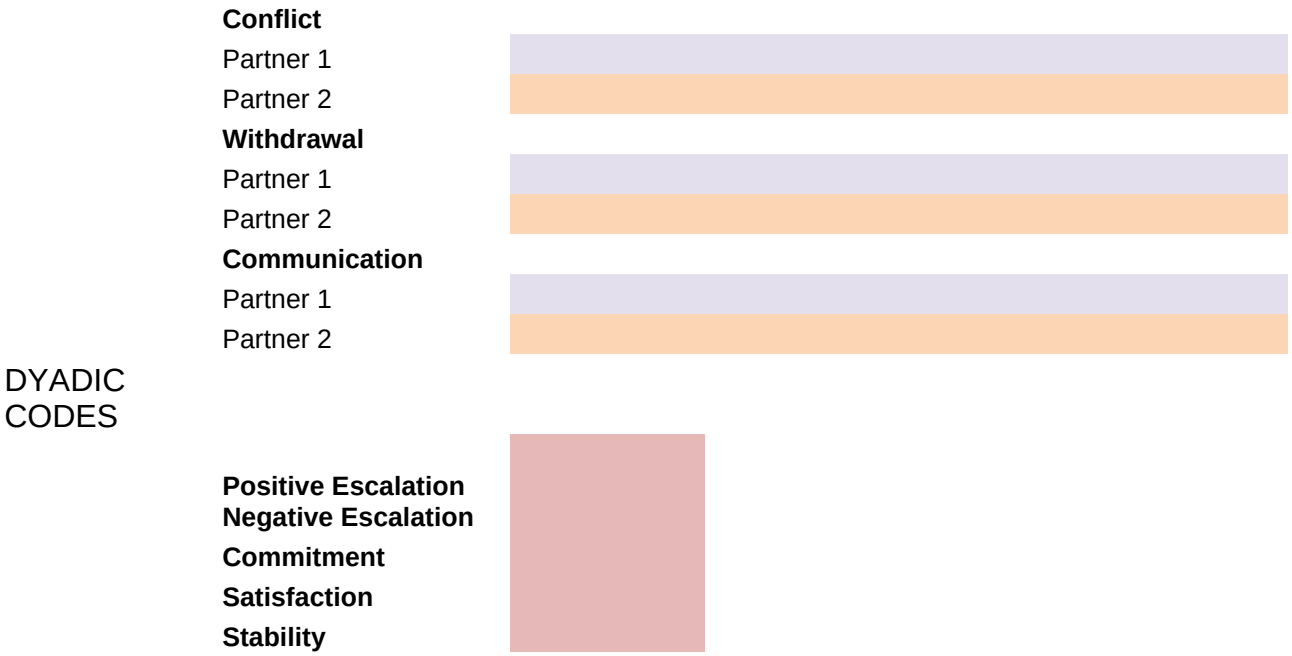
	Segment 1	Segment 2	Segment 3	Overall Score
Positive Affect				
Partner 1				
Partner 2				
Negative Affect				
Partner 1				
Partner 2				

CONTENT CODES

	Segment 1	Segment 2	Segment 3	Overall Score
Problem Solving				
Partner 1				
Partner 2				
Denial				
Partner 1				
Partner 2				
Dominance				
Partner 1				
Partner 2				

COMBINED CODES

	Segment 1	Segment 2	Segment 3	Overall Score
Support Validation				
Partner 1				
Partner 2				



Note. Coders must confirm and document with the research lead or primary investigator which participants are assigned to Partner 1 and Partner 2 to ensure (a) consistency of coding across the coding team and (b) alignment to the master dataset.

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VITA

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Professional Positions

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Commonwealth of Virginia Board of Health Professions, Richmond, VA, Board Member, July 2014–Present

TOGETHER Program, Virginia Tech and University of Maryland, Falls Church, VA, Couples Expert, November 2019–August 2020

Advanced Recovery Systems, Upper Marlboro, MD, Clinical Director, April 2019–August 2019

Sagebrush Treatment Center, Tysons Corner, VA, December 2015–February 2019
Executive Director, January 2018–February 2019
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Family and Addictions Therapist, December 2015–June 2016

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IDEALS of Kentucky, Lexington, KY, Clinical Supervisor/AAMFT Supervisor Candidate, January 2012–October 2012

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Publications

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Honors and Awards

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