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**THE IMPACT OF INTER-ACTIVITY ON RELATIONSHIP DEVELOPMENT:
TESTING PREDICTED OUTCOME VALUE THEORY ON
COMPUTER-MEDIATED INTERACTIONS**

by

Artemio Ramirez, Jr.

A Dissertation Submitted to the Faculty of the
DEPARTMENT OF COMMUNICATION
In Partial Fulfillment of the Requirements
For the Degree of
DOCTOR OF PHILOSOPHY
In the Graduate College
THE UNIVERSITY OF ARIZONA

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Not bad a guy who was told by his high school guidance counselor that he wasn't college material.

DEDICATION

This dissertation is dedicated to my mother, Maria, who never had the opportunity to achieve her goal of becoming a teacher. It is also dedicated to all of those individuals who were part of the Department of Communication at the University of Arizona before me.

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ABSTRACT

This study proposed and tested a model of relational development in mediated environments. Burgoon and colleagues' principle of inter-activity (Burgoon, Bonito, Bengtsson, Ramirez, Dunbar, & Miczo, 1999), Suunafrank's (1986) Predicted Outcome Value theory, and Walther's (1996; Walther & Burgoon, 1992) Social Information Processing theory were reviewed and each incorporated into a model for understanding how decisions to pursue relationships in mediated environments occur. The present study examined the role of media and information richness and mediation within the model's framework. Dyads conducted two socially-oriented interactions via one of four conditions (text-only, audioconferencing, videoconferencing, or face-to-face). Results indicated experiential properties were strongly associated with initial predicted outcome values and the certainty with which they are held, which in turn were associated with various relational and communicative factors. Initial predicted outcome values also distinguished relationships which developed from those that did not. Implications for each theoretical perspective are discussed.

CHAPTER I

INTRODUCTION

Rationale

The explosion of the new technologies and media facilitating computer-mediated communication (CMC) has brought with it new and exciting opportunities for initiating, developing, and maintaining social, personal, and work relationships. Since their inception in the early 1970s, for instance, CMC systems quickly took on a social function connecting people through newsgroups, bulletin boards, and personal e-mail (Hahn & Stout, 1994; Zakin, 1996). Today, on-line environments such as MUDs (Multi-User Dimensions or Dungeons), MOOs (MUDs, Object Oriented), and chat-rooms have continued to make it possible for individuals to communicate with others located anywhere in the world and establish ongoing relationships (Parks & Floyd, 1996; Parks & Roberts, 1998; Roberts, Smith, & Pollack, 1996, 1997; Utz, 2000). However, isomorphism between theory and research on mediated environments, on the one hand, and the actual communication practices engaged in by interactants in these environments, on the other hand, have not always been reflected in this literature.

Until fairly recently, most theorizing and research focusing on CMC argued against the likelihood of relationship development in mediated environments. Early studies argued that, due to the structural limitations of CMC systems (i.e., limited number of channels available), messages exchanged through mediated formats are inherently less personal, less socio-emotional, and more task-oriented than those exchanged Ftf (e.g., Rice, & Love, 1987; Short, Williams, & Christie, 1976; Siegel, Dubrovsky, Kiesler, &

McGuire, 1986; Sproull & Kiesler, 1986, 1992). The most common explanation offered by researchers was that CMC formats filter out nonverbal codes that contain rich and important relational information (Burgoon & Hale, 1984; Millar & Rogers, 1976; Watzlawick, Beavin, & Jackson, 1967). Without this information, proponents of this perspective argue, individuals are presumed to have a difficult time establishing and developing relationships via CMC. Recent research, however, has called this position into question (e.g., Parks & Floyd, 1996; Parks & Roberts, 1998; Walther & Burgoon, 1992). Parks, Walther, and others have convincingly shown that not only is it possible to establish and develop relationships using text-based formats, but that they appear to closely resemble those established and maintained through more traditional, FtF interactions (Parks & Floyd, 1996; Parks & Roberts, 1998; Walther & Burgoon, 1992; Walther, 1994, 1996). From this perspective, the structural features of CMC systems do not necessarily exert a deterministic influence on interactants and their communication processes. Rather, interactants are active participators in the communication process and can and do adjust to any limitations imposed upon them by their chosen mediated environment.

While this body of research has focused on relationships established and maintained through CMC (e.g., Parks & Floyd, 1996; Parks & Roberts, 1998; Walther & Burgoon, 1992), clear theoretical explanations for understanding how interactants pursue their communicative and relational goals by strategically using the structural features available to them, how receivers interpret such attempts, and how communication formats, or associated features, affect relational development processes have been lacking. Social

Information Processing Theory (SIP; Wather, 1996) is commonly invoked as an explanation for how relationships develop in mediated environments. Research by Walther suggests that relational development in mediated contexts is simply a slower process than its Ftf counterpart (Walther & Burgoon, 1992; Walther, 1994, 1996). Mediation, according to SIP, slows down the rate of social information exchange and, as a result, impressions take more time to develop. Left unaddressed, however, is that in order for impressions to continue to develop beyond an initial interaction, interactants need to be motivated to continue developing a relationship (Altman & Taylor, 1972; Thibaut & Kelley, 1959). That is, interactants do not just form impressions of each other. They also evaluate those impressions as they are being formed, and those impressions and their associated evaluations form the basis for decisions about future interaction (Altman & Taylor, 1972; Sunnafrank, 1986). What is lacking, then, is an explanatory mechanism for understanding mediated interactions and how they may produce disparate relational trajectories and outcomes depending upon the evaluation of the information exchanged.

The present study begins to address this issue by proposing a model for understanding how relationships develop in mediated environments. The purpose of this model is to incorporate features of communication formats, as conceptualized by the principle of inter-activity (Burgoon, Bonito, Bengtsson, Ramirez, Dunbar, & Miczo, 1999; Burgoon, Bengtsson, Bonito, Ramirez, & Dunbar, 1999), and communication processes, drawing upon Predicted Outcome Value theory (POV; Sunnafrank, 1986, 1988, 1990), into a coherent framework that recognizes the strategic nature of message exchange in

relationship development and its association to relational outcomes. The principle of inter-activity supports the notion that the degree of inter-activity perceived by interactants may be a function not only of their communication format but also the manner in which they communicate. Of particular interest in the present study is the extent to which the degree of inter-activity alters outcome values derived from mediated interactions, and how those outcome values affect future interactions. Similarly, whether or not the degree of inter-activity leads communicators to feel they possess a more developed sense of their partner is assessed in the present study. The extent to which communicators acquire a more developed impression of their partner and, as a result, are more certain of their judgments should be directly associated with the degree of inter-activity afforded by a communication format.

In order to address these issues, the present study begins with a review of the relevant literature on conceptualizations of interactivity and POV, with a focus on how these two bodies of literature inform each other. Next, hypotheses derived from the review will be presented. Finally, a test of the hypotheses is presented and discussed.

Review of Relevant Literature

Overview

While the study of relational development in Ftf situations is not a new topic for communication scholars, the examination of computer-mediated interactions through the application of POV is new. The areas of CMC and relational development have both led to substantial bodies of research as well as substantial controversy over how to theoretically account for processes and outcomes occurring from each. Theoretical explanations involving CMC, inter-activity, and their related effects have been wide and varied with very little agreement as to their nature (e.g., McLeod & Chaffee, 1973; Rafaeli, 1988; Biocca, 1992; Buller & Burgoon, 1996; Burgoon, Bonito, et al., 1999). Theoretical explanations and models focusing on relational development reflect a similar orientation and have ranged from stage models (Duck, 1973; Tuckman, 1965) to reward-cost interpretations (Altman & Taylor, 1973; Sunnafrank, 1986; Thibaut & Kelley, 1959) to uncertainty reduction explanations (Berger & Calabrese, 1975; Berger, 1979; Berger & Bradac, 1982). Few studies, however, have systematically attempted to integrate these two bodies of literature in order to understand relational development in mediated environments.

Most initial socially-oriented interactions have the underlying goal of determining whether or not subsequent interaction will occur. Sunnafrank (1986) has argued that the outcome value derived from this initial interaction determines whether the relationship will develop or be curtailed quickly. The extent to which interactants continue to reduce uncertainty after reaching an outcome value is one method of examining relational

development. From a POV perspective, communicative attempts to reduce uncertainty should continue only in instances in which initial interactions produce positive predicted outcomes values (Sannafrank, 1986, 1988, 1990). In instances resulting in negative outcome values, interactants are predicted to terminate the interaction. In mediated environments, however, deriving a POV, and the associated decision about the likelihood of future interaction, may be more tenuous. Because message exchange occurs at a slower rate and less overall information is exchanged than in Ftf interaction, uncertainty about both the information being exchanged and the valence attached to that information by receivers should make social judgments more pliable, interactants more willing to interact with their partners again, and outcome values subject to change in future interactions.

This stands in direct contrast to task-oriented situations in which future interaction is typically guaranteed, regardless of the social judgments attributed to each interactant. In these situations, the task itself serves as the determinant of future interaction, not the outcome value derived from an initial interaction. The task functions to give interactants a form of shared identity (Lea & Spears, 1992, 1995; Markus, 1994), which implies a shared goal and set of objectives. It is this shared identity that, in turn, produces greater attributions of similarity and liking (Lea & Spears, 1992). As such, task-oriented situations begin with the assumption of future interaction, which leads to positive attributions, whereas socially-oriented situations need to produce positive attributions in order to lead to future interaction.

Figure 1 illustrates a proposed model for understanding socially-oriented mediated interactions. The model integrates theoretical relationships derived from the principle of interactivity (Burgoon, Bonito et al., 1999) and POV (Sunnafrank, 1986) to provide an overview of the interplay between communication processes and communication formats in mediated interactions. This model serves as an organizing tool for the following discussion of relevant literature. First, the literature addressing existing theories of CMC as well as conceptualizations of interactivity in CMC are reviewed. The purpose of this section is to clarify both the evolution of theory on how technology affects communication and relational processes and the conceptualization of interactivity as it commonly appears in the CMC literature. This section will also introduce the principle of inter-activity as a general framework for understanding mediated interactions. Second, the literature on POV is discussed. The emphasis of this section is on differentiating this theory from uncertainty reduction theory (Berger & Calabrese, 1975), upon which POV is based. After each of these first two sections, hypotheses drawn from an integrated perspective are also presented. The final section bridges these two sets of predictions to arrive at the final model shown in Figure 1.

Theories of CMC

The research literature documenting the nature of relationship development in mediated environments has been evolving over the last two decades. Early studies made a convincing case for limiting the use of CMC systems to primarily task-related interactions (Culnan & Markus, 1987; Kiesler, Siegel, & McGuire, 1984). As Phillips and Santoro (1989) articulated a decade ago, CMC moves interactants away “from

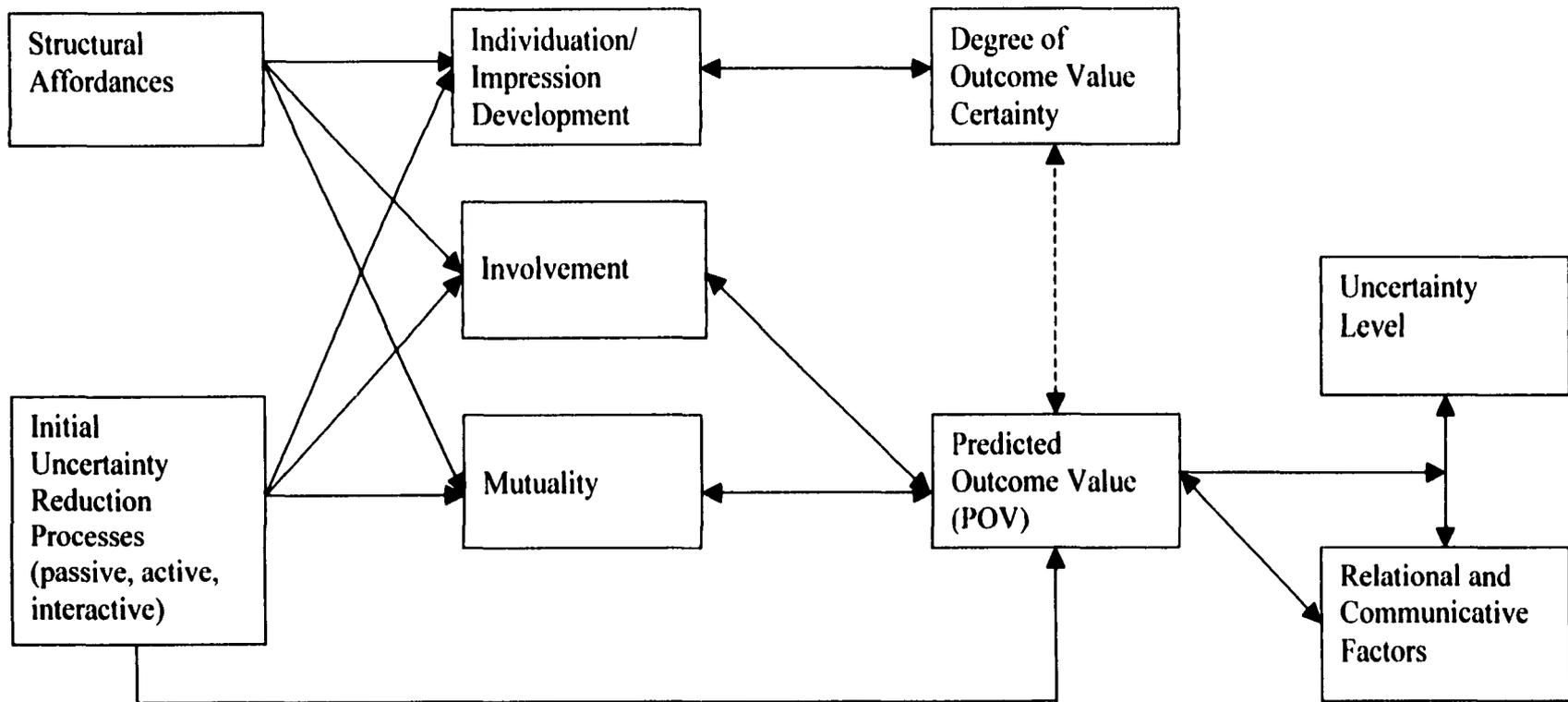


Figure 1. Proposed conceptual model of the relationship between inter-activity and predicted outcome value processes.

consideration of irrelevant interpersonal and theoretical issues by focusing attention on the process and content of problem-solving discussion” (p. 152). These arguments stemmed from the fact that CMC systems lacked the capacity to transmit important nonverbal cues and, as a result, were incapable of providing interactants with important social information needed to establish relationships. From this perspective, the addition or removal of certain technological features, such as modality richness, deterministically affect how, how much, and how quickly social and contextual information is exchanged (Sproull & Kiesler, 1986; Trevino, Lengel, & Daft, 1987). The resultant communication environment was claimed by researchers to be cold and more impersonal, yet more efficient than Ftf for achieving task-oriented goals and objectives (Connolly, Jessup, & Valacich, 1990; Short et al., 1976). To account for these findings, a variety of similar theoretical perspectives surfaced with each focusing on the presence (or absence) of nonverbal cues.

Social Presence Theory. Social presence theory was originally proposed as an explanatory tool for understanding audio and video teleconferencing but has been widely applied to CMC. The theory attempts to make a connection between a property of communication media (bandwidth) and the social psychological impact of that property (presence). The concept of “social presence” refers to how salient another person is in a given interaction as well as the consequent salience of the relationship and is said to be a function of the amount of nonverbal and feedback cues available to interactants (Short et al., 1976). According to Short et al. (1976), CMC systems vary in their capacity to provide nonverbal cues such as facial expressions, vocalic cues, and posture; the more

cues transmitted by a given medium, the higher the social presence. The theory argues that social presence is necessary in order for interactants to communicate in a more personal, warm, and social manner. Compared to Ftf interactions, interactions conducted via CMC systems are believed to be much lower in social presence and thus more colder and impersonal.

Interestingly, as Walther and others point out, social presence theorists have measured degree of presence perceptually rather than as a concrete media characteristic, although it was generally considered to be a property of a medium (Hilz, Johnson, & Agle, 1978; Steinfield, 1986; Walther, 1992). Short et al. (1976) in their seminal work, for instance, discussed results from studies that measured social presence using a series of semantic differential items rather than as a media property. Other studies using social presence theory as a conceptual framework focused on the functions CMC may fulfill (Hiemstra, 1982; Rice & Case, 1983; Steinfield, 1986). Participants in a study of this sort are typically asked to rate various media according to characteristics or their effectiveness for completing specific tasks, and these perceptions are then examined to predict task and social uses. The implication of taking such an approach is that the influence of the structural components of a given format are not systematically studied and are assumed to be constant in their influence; this point is returned to later in this review.

Lack of Social Context Cues Hypothesis. A similar perspective was proposed by Sproull and Kiesler (1986), who argued that the absence of social context cues could account for the differences between Ftf interaction and those conducted via CMC systems. From this perspective, the nature of a given social situation and the relative

status of the interactants are defined by aspects of the physical environment in which interactions take place. These “social context cues” include cues about both the physical environment, such as artifacts and spatial features, and the interactants themselves, such as personal appearance, physical adornments, and their nonverbal behaviors (Dubrovsky, Kiesler, & Sethna, 1991; Edinger & Patterson, 1985; Sproull & Kiesler, 1986). The theory proposes that because CMC lacks these important cues, behaviors such as uninhibited social behavior (e.g., “flaming”), more self-focused communication, and messages reflecting status-equalization should occur more often than in FtF communication (Kiesler et al., 1984; Siegel, Dubrovsky, Kiesler, & McGuire, 1986; Sproull & Kiesler, 1986).

As with social presence theory, this perspective assumes that structural features of CMC systems are constant in their influence on interactional processes and limit what types of tasks can or can not be done using them (Kiesler, Zubrow, Moses, & Geller, 1985). The problem is that it also ignores the dynamic nature of interpersonal interaction and the adaptive capacities of its users to adjust to contextual influences. Humans do not simply interact in the same manner regardless of the type of medium used nor does the medium deterministically dictate the nature of the interaction. It is more likely that interactants adjust and adapt to media in order to communicate (Montes, 1992). The next perspective also focuses on the structural nature of CMC but attempts to incorporate some of this reasoning.

Information Richness Theory. A third related perspective argues that media differ in terms of their “richness,” or the number of channels used, the immediacy with which

feedback is available, and the form of language used (e.g., formal versus personal, varied versus limited, etc.) (Daft & Lengel, 1986; Daft, Lengel, & Trevino, 1987; Dennis & Kinney, 1998; Trevino, Daft, & Lengel, 1990). The extent to which these features are present in a medium determines its richness. As with social presence theory and the lack of cues hypothesis, Ftf is considered the richest form of communication due to the number of channels and cues available, nonverbal backchanneling cues, and immediate feedback. E-mail, and even more so formal letters and memoranda, are considered the leanest as they limit users to written natural language (Adkins & Brashers, 1995; Trevino et al., 1990).

Information richness theory extends the conceptual framework found in both social presence theory and the lack of social context cues hypothesis by proposing a set of contingencies as to when a specific medium might be optimally used for communicating clearly. The theory argues that the key to finding the proper match between a medium and a communication task is a function of the medium's richness, specifically that the type of message being conveyed dictates the medium used to convey it. According to this perspective, the degree of message clarity (e.g., ambiguity or equivocality) intended by a sender is central to media selection. The theory proposes that rich media are better suited for communicating messages or completing tasks that are highly equivocal or ambiguous, or for situations in which there exists a high likelihood for miscommunication. The availability of feedback and nonverbal factors, which create the potential for immediate two-way message exchange in a richer medium, for example, would allow senders to repeat, adjust, or clarify their message to increase understanding. Lean media, on the

other hand, are better suited for communicating messages or completing tasks that are routine in nature or involve unambiguous information. Lean media are also considered more efficient because they do not require the effort or interactional coordination needed in Ftf communication.

A problem with these early explanations was the over reliance on the use of single dimensions as explanatory mechanisms. In reviewing these and similar perspectives, Culnan and Markus (1987) termed them the “cues filtered-out” perspective since they collectively argue for similar causes and effects as central for understanding mediated interactions; each one emphasizes the need for nonverbal cues in order to establish relationships and communicate socio-emotional information through CMC systems.¹ As a result, each of these perspectives arrays communication formats along one continuum, making overly simplistic comparisons across formats, thereby ignoring other important and significant features that impact interactions and the participant judgments associated with them (Dennis & Kinney, 1998). For example, these approaches ignore the fact that certain features may compensate for others that may not be present in a given format. This is also apparent in the assumptions shared by each of these perspectives, specifically (a) mediation filters out cues that would be present in Ftf communication, (b) different media have different capabilities to retain or filter out cues, and (c) predictable changes in intrapersonal and interpersonal variables will occur by substituting mediation for Ftf communication (Culnan & Markus, 1987). Due to these assumptions, each perspective predicts that interactions taking place via CMC systems are inherently impersonal, less

socially oriented, and detached. In short, the only way for relationships to form via mediated communication formats is through the use of high bandwidth media.

Research examining the cues filtered-out perspective has been inconsistent. In general, support for the cues filtered-out perspective has been the result of laboratory-based, one-shot studies using text-based communication formats. Among the findings in support of this perspective include: more negative emotional expression and inflammatory comments (Kiesler et al., 1985; Rice, 1984); more opinions expressed and fewer statements of agreement (Hiltz et al., 1978; Hilz & Turoff, 1978); greater equality of participation and less dominance displays (Siegel et al., 1986; Dennis, George, Jessup, Nunamaker, & Vogel, 1988); and more task-oriented interactions (Phillips & Santoro, 1989) in computer-mediated interactions than ones conducted Ftf.

In contrast, a substantial body of literature indicates that these perspectives may not be able to account for differences between Ftf and mediated interactions and outcomes. This evidence comes primarily from field research studies examining the use of primarily text-based CMC in naturalistic environments. A frequently cited study by Rice and Love (1987) examining socioemotional content in messages posted to a bulletin board found that a fair percentage of these messages contained some level of socioemotional information, and that the percentage was fairly consistent over the time period examined. Several studies assessing e-mail usage in organizational settings also call into question the cues filtered-out perspective (e.g., Steinfield, 1986; Foulger, 1990). Steinfield (1986), for example, found that factors internal to organizations, such as task complexity and uncertainty related to the environment, and not the medium used by the sender, were

associated with the type of message generated. One study even reported that some text-based interfaces, including e-mail, were rated as equally rich or even richer than other nonverbally-rich interfaces (e.g., telephone conversations, television, and computer conferencing) by experienced users (Foulger, 1990).

These results seem to indicate that understanding mediated interactions require a more complex approach than that offered by the cues filtered-out perspective (Walther, 1992). A viable alternative may be to examine the degree of interactivity associated with communication formats.

Conceptualizations of Interactivity

The use of the term, “interactivity” to describe technology is not new, and the literature on CMC reflects a variety of conceptualizations. Rafaeli (1988), for example, argued that interactivity is a property of the communicative exchange and interdependence reflected in the exchange of messages among participants and is not necessarily a structural property of a medium. Accordingly, Rafaeli (1988) proposed three levels of interactivity, which can be differentiated according to the responsiveness of one interactant’s messages to another’s: noninteractive communication, reactive communication, and fully interactive communication. Noninteractive communication is defined as noncontingent communicative situations in which the content of a message does not rely on another message. The most common example of noninteractive communication would be mass media messages appearing on television or print. Reactive communication is defined as communication that incorporates at least some level of contingency in message exchange such that the latter message is somehow relevant to the

prior one. This level of interactivity parallels the relationship commonly found among adjacency pairs in which one utterance is related to another such as in question and answer pairs. Fully interactive communication reflects the highest level of contingent message exchange and interdependence among participants, as it requires at least three communicative exchanges. Since conversational sense-making involves knowledge of not only messages exchanged immediately prior to an interactant's turn but also of all prior messages both within and across interactions, only this level allows for the continuous reciprocal exchange of messages commonly found in FtF communication.

Although Rafaeli (1988) does not specify clearly the types of outcomes that may result from using one level of interactivity versus another, he does propose that a higher level of interactivity should be more satisfying to interactants, but no causal connection is specified (Buller & Burgoon, 1996; Palmer, 1995; Walther, 1997). This perspective, however, overlooks the possible contextual factors that may influence the selection of one level of interactivity over another. It is possible that in one situation the need for fully interactive communication is mandated by, for instance, a lack of time to complete a task, whereas in another, less time-pressed situation, noninteractive communication may be adequate for task completion. This issue becomes even more problematic in socially-oriented mediated interactions. Consider mediated initial interactions occurring through text-based environments, and how the level of interactivity may favor one interactant over another. Less interactivity in such a situation may benefit the sender by allowing the individual to be more strategic in message composition, thereby having more control over the self-presentation being projected (Walther, 1993b, 1996). From a receiver

perspective, more interactivity may be beneficial for forming an impression of one's partner by giving the receiver more access to social information quicker. As discussed below, the degree of interactivity afforded by a communication format or experienced by interactants should have important implications for determining how (or even if) a relationship will develop. Unfortunately, since this conceptualization does not consider contextual influences on the selection of interactivity level preferences, it does not allow for such predictions.

Biocca (1992) offers an alternative definition on interactivity from a virtual reality (VR) perspective, which focuses on the availability of nonverbal cues to interactants. From this perspective, only communication in which both intended and conscious as well as unintended and unconscious behaviors are available to interactants can be described as fully interactive. Defining interactivity in this stringent manner eliminates many forms of CMC (e.g., text-based CMC, audio-conferencing, and video-conferencing) from being labeled as highly interactive as only Ftf communication gives interactants this ability. Even certain forms of VR, including immersive VR, would fall short of this benchmark. It should be noted that it is exactly this explanatory mechanism—the loss of nonverbal cues in CMC—that is at the center of most theories of CMC, summarized above, which predict negative outcomes from CMC-based interactions.

Biocca's (1992) conceptualization of interactivity appears to fall short of completely capturing its nature by focusing primarily on the presence of (or lack thereof) nonverbal cues. Equally as important as what cues interactants have access to in mediated interactions should be what they do with the cues that are available. For example,

research by Lea and Spears (1995) and Walther (1996) suggests that lean communication formats have the capability of providing interactants with rich, relational information. A similar view has been recently echoed by Burgoon (1998), who has argued that most perspectives on technology and CMC oversimplify the nature of human interaction by primarily using an unidimensional continuum for understanding technological influences on interactional processes and outcomes. In response, Burgoon and colleagues have advanced the principle of inter-activity as a framework for examining CMC (Burgoon, Bonito, et al., 1999; Burgoon, Bengtsson, et al., 1999).

Principle of inter-activity

Conceptualization. A common assumption in much of the research on CMC is that some degree of Ftf interaction must be maintained in order to complete socioemotional tasks such as initiating and developing relationships (Hallowell, 1999; Norhia & Eccles, 1992). The implication is that certain types of tasks simply require that they be handled Ftf. This assumption clearly underlies the perspectives discussed above as they overemphasize the need to retain nonverbal behaviors in order to establish relationships. Burgoon and colleagues have proposed that it is not necessarily Ftf interaction that is important but rather what is important is to retain certain core properties of interpersonal interaction in CMC; it is this set of core properties that the principle argues is responsible for differences between Ftf and CMC interactions (Bonito, Burgoon, Ramirez, & Dunbar, 2000; Burgoon, Bonito, et al., 1999; Burgoon, Bengtsson, et al., 1999).

The principle of interpersonal interactivity, or “inter-activity,” begins with a simple premise: Human communication processes and outcomes vary systematically with the

degree of interactivity that is afforded and/or experienced (Burgoon, 1998; Burgoon, Bengtsson et al., 1999; Burgoon, Bonito et al., 1999). While the term interactivity is frequently used to describe communication technology from a media perspective, this approach stresses the nature of inter-activity from an interpersonal orientation. The principle analyzes inter-activity by identifying the intrinsic properties of Ftf communication that define interpersonal interaction. By approaching inter-activity from this perspective, Burgoon and colleagues make certain assumptions. First, inter-activity is both structural and experiential in nature. Inter-activity defined from a structural perspective refers to the structural affordances associated with different communication formats. The principle proposes that any one or more of these affordances may be responsible for creating the effects labeled as “inter-activity” (Bonito et al., 2000; Burgoon, Bengtsson et al., 1999; Burgoon, Bonito et. al., 1999). The affordances identified by this perspective are the following:

1. participation (defined as the extent to which interactants are fully able to interact as opposed to exchanging monologues, observing passively, or lurking),
2. mediation (defined as whether the communication format is mediated electronically or not),
3. contingency (defined as the extent to which one person’s questions, responses, and comments are dependent upon their co-interactant’s prior turn),
4. media and information richness (defined as the extent to which a communication format utilizes one or more modalities such as text, audio, video, and olfaction as

well as the extent to which it supports the ability to present “rich” or “poor” social information),

5. geographic propinquity (defined as whether users are co-present or distributed),
6. synchronicity (defined as the extent to which mediated interaction is same-time, permitting immediate bidirectional feedback, or asynchronous, permitting the editability and rehearsability of messages),
7. identification (defined as the extent to which interactants are fully identified or anonymous),
8. parallelism (defined as the extent to which a communication format permits concurrent message exchange and multiple addressees or only permits serial messages, and
9. anthropomorphism (defined as the extent to which an interface simulates or incorporates human-like characteristics) (Burgoon, Bonito et al., 1999).

Inter-activity defined from an experiential perspective refers to how a communication mode looks or feels to interactants. Burgoon and colleagues argue that these experiences are what make a communication format appear more or less interactive to interactants (Bonito et al., 2000; Burgoon, Bonito et al., 1999). These experiential properties may serve to mediate the impact of the structural affordances upon other processes and outcomes (Burgoon, Bonito, et al., 1999). Because of this, the principle allows for the fact that different structural properties may produce the same level of perceived inter-activity in terms of the experiential properties. It is possible that, for example, mediation and synchronicity may both produce the same level of perceived inter-activity, although

structurally they are dissimilar in nature. In a similar manner, it is possible that a high level of structural inter-activity, as defined by the above features, may not necessarily produce higher levels of experiential inter-activity.

The principle identifies three experiential properties as particularly important:

1. interaction involvement (defined as the degree to which interactants perceive they are affectively, behaviorally, and cognitively engaged in the interaction),
2. mutuality (defined as the extent to which interactants perceive and create a sense of relational connectedness, coordination, interdependence, and understanding with their partners), and
3. individuation (defined as the extent to which an interactant perceives having a rich, detailed impression of their partner's identity and personal information).

Second, inter-activity is neither inherently positive nor negative. The extent to which inter-activity assists or hinders interactants is a function of a variety of factors including the nature of the interaction, the objectives to be accomplished by interactants, and the interactants themselves (Burgoon, Bonito et al., 1999). In initial mediated social interactions, interactants typically exchange biographical information, general attitudes, and other similar information that reveal important social information about each other. A high level of inter-activity may, for example, detract from their ability to detect deceptive information (Buller & Burgoon, 1996) by distracting them. In fact, some evidence suggests that interactants are more successful at detecting deception over mediated formats when less, not more, nonverbal cues are available to them (Burgoon, Buller, & Woodall, 1996); this finding is relevant to understanding inter-activity since richness is

one of the structural affordances identified above. A low level of inter-activity may actually be more beneficial in such a situation because it allows receivers to focus on the message itself and not on other extraneous or irrelevant information. On the other hand, a high level of inter-activity may assist senders in successfully deceiving their partner and make it more difficult for the receiver to detect the deceptive information (Buller & Burgoon, 1996). Nevertheless, inter-activity in each case is value-neutral, although the outcomes associated with it may be value-laden.

Third, structural affordances are not deterministic in their influence on communication processes and outcomes. That is, the effect of the structural properties of a communication format is not constant or time invariant (Walther & Burgoon, 1992; Walther, 1996). Interactants can and do adapt over time to the constraints imposed upon them by a given communication format and, therefore, may still be able to achieve their objectives and complete their tasks equally well across different mediated formats (Chilcoat & Dewine, 1985; Montes, 1992; Walther & Burgoon, 1992). It is worth noting that by extending this assumption, then, structural affordances should exert their strongest direct influence (if any) during the early stages of relationships, particularly initial interactions. This influence, however, should be mediated by the experiential properties described above.

Tests of the Principle of Inter-activity. The initial test of the principle of inter-activity was conducted in the context of HCI. Bengtsson et al. (1999) investigated the influence of inter-activity, operationalized as computer interfaces of increasingly anthropomorphic characteristics, on outcomes from a decision-making task. Participants were randomly

paired with one of five computer partners or a human partner and then asked to assess their partner, their interaction, and the interface. Results from the hypothesis that greater anthropomorphism should improve decision-making outcomes indicated that computer agents overall were more influential and yielded the highest decision quality than were human partners. Interestingly, comparisons among the computer conditions showed that increases in computer agent anthropomorphism did not yield better decisions. In fact, interactions with text-only as well as text-and-voice computer agents, respectively, yielded the highest levels of decision quality. Interactions with human partners, conversely, resulted in more positive social judgments, such as credibility, than did those with computer partners.

Burgoon, Bonito et al. (1999) provided support for the role of the experiential properties in task-related interactions. In two separate studies, Burgoon and colleagues examined how communication processes were associated with task outcomes through social judgments of one's partner in both HCI and CMC; the results from the CMC study are particularly relevant to the present study, so only those findings will be reviewed. Structural inter-activity was experimentally manipulated by assigning participants to one of three conditions for completing the task: (a) a naturalistic Ftf condition in which participants were paired with another naive participant; (b) a contingent Ftf condition in which participants were teamed with a confederate who had been instructed to follow a script but could respond to questions or other issues raised by the naive participant; and (c) a CMC condition similar to the contingent Ftf condition except that the discussion was conducted via a synchronous, Windows-based chat program. The latter condition

was designed to simulate a group support systems (GSS) environment. Results indicated that higher levels of involvement and mutuality were associated with more positive perceptions of partner credibility and attraction. For instance, perceptions of interaction involvement and mutuality were both positively associated with expertise, dependability, sociability, and task attraction. Interaction involvement was also positively associated with dominance. These positive partner perceptions were also associated with higher decision quality and greater influence. Comparisons across the three conditions, via planned contrasts, indicated no significant differences on the level of involvement or mutuality engendered by the structural properties; individuation was not examined in this study.

Hypotheses Derived from the Principle of Inter-activity. While the principle of inter-activity is still in its theoretical infancy, early tests have focused on task-based interactions. The present study extends the boundaries of the principle by testing its predictions regarding the association between the structural affordances and the experiential properties within the context of socially-oriented interactions. If the principle's predictions are correct concerning the role of inter-activity, then it should also play an important role in mediated socially-oriented interactions as well as task-oriented ones. As Burgoon and colleagues acknowledge, "not all online or mediated exchanges have underlying goals associated with choice and decision-making. Relational building concerns creating and maintaining useful and positive assessments of interactional partners" (Burgoon, Bonito et al., 1999, p. 37). Predictions regarding the relationship

between the structural affordances of a communication format and the levels of the experiential properties that are produced, however, are not so straightforward.

In the present study, inter-activity is operationalized structurally by experimentally manipulating the properties of media and information richness and mediation. As such, it would be expected that increases in media and information richness as well as nonmediation should promote greater interaction involvement and mutuality and a more developed, individuated impression of one's partner. Yet, such a prediction ignores the role of the interactant as a social actor and the role of goals in the interaction process in altering perceptions. An examination of the concept of "hyperpersonal communication" (Walther, 1996) can provide insight into how this might occur. Walther (1996) introduced the concept of "hyperpersonal communication" to account for findings which indicated that, under certain circumstances, CMC—particularly text-based—may be more socially desirable than Ftf and produce more positive social and task judgments. He conceptualized hyperpersonal communication as a complex process that can best be understood by examining four elements of the communication process: the sender, the receiver, characteristics of the channel, and feedback processes. Particularly relevant to this portion of the present study is how this approach explains why senders might gain strategic advantages by using less rich communication formats and how receivers' perceptions are affected by such environments.

According to Walther (1996), self-presentation in CMC environments may be better described as "selective self-presentation," since mediation, in general, and certain features, specifically, of these environments may allow for greater control over the

impression articulated as well as augment its effect on the receiver. For example, features such as lower levels of richness and asynchronous message exchange allow senders to better plan, create, and edit their messages strategically, thereby allowing them to convey their preferred impression. As a result, interactants can present themselves as more socially desirable and attractive to their partners. This should be especially true in text-based environments, in which the primary means of creating an impression is through the use of language. Senders in this type of environment can gradually reveal themselves over time in a strategic, selective manner through planned self-disclosure and divulge information as they desire without worrying about the influence of physical appearance or vocalic cues (see, for example, Matheson, 1991; Silberman, 1995).

A lack of richness in a medium also has an impact on receivers such that they are vulnerable to making attributions based on minimal information, which may amplify the perceptions they form about their partners (Walther, 1996). This process is consistent with the social identification/deindividuation (SIDE) model (Lea & Spears, 1992, 1995). The SIDE model proposes that when nonverbal cues are unavailable and interactants do not have any prior knowledge of each other, any cues that are present—such as those gleaned from written language—become even more important in helping to reduce uncertainty. The interpretation of these cues, according to the SIDE model, depends on whether or not interactants consider themselves to be members of the same group, which Lea and Spears (1995) refer to as “social self-categorization,” and are proximal. If they do consider themselves to be part of the same group, these cues are interpreted positively and lead to positive attributions such as greater liking and credibility. If they do not, the

cues create negative attributions such as being untrustworthy and unsociable. When interactants are not proximal, evidence of group membership becomes even more significant. If such evidence is lacking, the model again predicts interactants will make negative attributions. In socially-oriented interactions, mediation and the use of less rich media should help senders create the perception of group membership. Since their cognitive energy can be directed towards the information management aspect of their message, the written message can be tailored to create the desired impression on the receiver without worrying about having nonverbal cues leak unwanted information (Buller & Burgoon, 1996). The net effect is that senders in less rich environments may benefit from the limited number of cues available while receivers, in turn, may be more susceptible to overinterpreting the information available than they would be in Ftf interaction.

A study by Chilcoat and Dewine (1985) provided support for this line of reasoning by examining the effect of communicating in synchronous environments with varying degrees of richness (e.g., Ftf, audioconferencing, and videoconferencing) on perceptions of attitude similarity, credibility, and physical and social attractiveness. The researchers predicted that increases in richness, or the number of cues available in a medium, should be associated with increased positive perceptions of each dependent variable such that Ftf should produce the most positive evaluations followed by videoconferencing followed by audioconferencing. Their results supported the opposite of this prediction. Specifically, audioconferencing—the only condition without visual cues—produced higher levels of perceived attitude similarity, physical attractiveness, and social attractiveness than did Ftf

or videoconferencing. These results suggest that richer media do not necessarily produce more positive outcomes.

A study by Montes (1992) provides further empirical support for this claim by examining the role of videoconferencing and democratic/non-democratic modes of interaction on quality of outcome and social presence. Montes (1992) predicted that if the influence of the medium was deterministic in nature, the mode of interaction should have a minimal effect on both the quality of decision outcome and perceptions of social presence. To test this prediction, four-person groups were asked to complete two problem-solving tasks in a counter-balanced, repeated measures factorial design in which type of interaction format (within-subjects factor: Ftf, videoconferencing) and mode of interaction (between-subjects factor: democratic, non-democratic) were varied. Overall, higher levels of perceived social presence were reported in groups using a democratic mode of interaction than those using a non-democratic one. Additionally, the results indicated that, within the videoconferencing conditions, a democratic mode of interaction overcame the limitations imposed on interactants by the format by producing better quality decisions and perceptions of higher levels of social presence.

Taken together, Walther's (1996) concept of hyperpersonal communication and the results of the Chilcoat and Dewine (1985) and Montes (1992) studies, respectively, point to the fact that the potential drawbacks of mediation and less rich media can be overcome by interactants, and in some cases even used to their benefit, through strategic communicative strategies and message design. While these convergent lines of research help clarify the role of communication in mediated interactions, they make it difficult to

predict the role of media and information richness and mediation in producing interaction involvement and mutuality. As such, research questions rather than hypotheses will be proposed for those associations:

RQ₁: What is the role of mediation in producing (a) interaction involvement and (b) mutuality?

RQ₂: What is the role of media and information richness in producing (a) interaction involvement and (b) mutuality?

The association between media and information richness and mediation to individuation/impression development, however, is clearer and lends itself to a prediction, especially in initial interactions; this point will be returned to later in this review. Before proceeding to a discussion on the impact of inter-activity on communication processes in mediated interactions, the next section discusses POV and predictions derived from it.

Predicted Outcome Value Theory

Conceptualization. POV theory has its roots in Berger and Calabrese's Uncertainty Reduction Theory (URT; Berger & Calabrese, 1972). URT proposes that communication in initial interactions is best understood as a function of a communicator's goals of being able to predict and explain their own behavior as well as that of their partner through uncertainty reduction strategies. Specifically, these uncertainty reduction strategies are directed at three primary goals: to be able to better predict and explain their partner's behavior, explain their own behavior, and select appropriate behaviors or responses based on the derived predictions and explanations. According to URT, interactants engage in

behaviors directed at reducing uncertainty and that changes in the level of uncertainty during initial interactions will influence a set of relational and communicative factors (e.g., nonverbal affiliative expressiveness, amount and content of communication, information-seeking behavior, reciprocity rate, similarity, and liking) and subsequent communicative attempts. Uncertainty reduction, then, in the original formulation of the theory was viewed as *the* central concern in all initial interactions; a subsequent modification of the theory, however, acknowledged that this may not always be the case and specified three conditions in which concerns about uncertainty reduction may be heightened, and interactants would be motivated to use uncertainty reduction strategies (Berger, 1979, 1987).²

Research by Berger and colleagues has identified a typology of three primary uncertainty reduction strategies: passive, active, and interactive (Berger, 1979; Berger & Bradac, 1982; Berger, 1987). Passive strategies involve the gathering of information through the use of unobtrusive observation. These strategies tend to focus on observing the individual in social situations and making attributions about them based on this observation. In computer-mediated interactions, such as chatrooms or bulletin boards, this may take the form of observing the types of messages posted to a central location or observing interactions conducted with others conducted by a potential partner. In other more information-rich mediated contexts, this may take the form of observing cues such as physical appearance and/or listening to vocalic cues. Active strategies involve observing how a potential partner responds to changes in the interaction environment but does not involve direct interaction with the partner. In general, this category encompasses

indirect knowledge acquisition and is most similar to experimental studies in which contextual conditions are manipulated and participant responses are noted. This category also encompasses the use of third-party sources for information gathering. In computer-mediated environments, for example, this could take the form of exchanging e-mail messages with others with whom the potential partner has had contact. The third type, interactive strategies, is the only category involving the direct contact between the interactant seeking information and the potential partner. According to Berger and Kellermann (1983), interactive strategies typically take the form of question asking, disclosure, and relaxation of one's partner as means for acquiring information. Figure 1 incorporates the three primary strategies identified by Berger and Kellermann (1983) into the model although no specific predictions will be proposed regarding their role in the present study; the design of the present study allows only for the use of interactive strategies. Theoretically, the use of these strategies may occur at multiple time intervals according to POV theory. The strategies are used initially, as noted in Figure 1, to reduce uncertainty in order to predict an outcome value. The use of these strategies may again surface after a predicted outcome has been derived, depending on the valence of the outcome value.

A major criticism against URT has been a positivity bias in its axioms and propositions. This bias, discussed in depth by both Scheidel (1977) and Sunnafrank (1986, 1990), assumes that reducing uncertainty inherently has positive consequences and, as a result, may be responsible for inconsistent empirical support of URT-derived predictions. For instance, research conducted by Planalp and colleagues (Planalp &

Honeycutt, 1985; Planalp, Rutherford, & Honeycutt, 1988) directly called into question predictions based on the original formulation of the theory regarding the association between uncertainty level and communication; their findings indicated that uncertainty in relationships may be increased, rather than decreased, by communicative acts.

Furthermore, relational partners may not always be motivated to reduce uncertainty if they believe that its consequences may be negative. Predictions derived from revised versions of URT have not fared much better (Berger, 1979, 1987; Berger & Bradac, 1982). Gudykunst and others (Gudykunst, 1983, 1985b; Gudykunst, Yang, & Nishida, 1985) found that the associations between uncertainty level and other variables identified in URT may be in the opposite direction, or even unassociated, than that predicted by the theory.

Sunnafrank (1986) proposed POV theory as a revision of and an alternative to URT in an attempt to explain these inconsistent findings. As noted above, URT regards uncertainty reduction as the central concern of interactants in initial interactions. POV theory, on the other hand, argues that uncertainty reduction in initial interactions is a secondary goal to achieving positive relational outcomes (Sunnafrank, 1986). According to Sunnafrank (1986), interactants attempt to forecast the POV of both short-term and long-term relational outcomes during their initial interaction. POV theory acknowledges that early interaction processes, including uncertainty reduction, are directed towards this goal. Uncertainty reduction processes help to supply interactants with data that can be used to make predictions about outcome values; these processes are the same as those set forth by Berger and Calabrese (1975). Once a tentative value has been reached, however,

interactants use the value to determine how or even whether to continue the interaction and potential relationship. Sunnafrank (1990) proposed how an outcome value may be used by interactants:

These outcome value expectations might lead to such general alternatives as attempts to terminate, restrict, continue, expand, or escalate the beginning interaction or relationship. The choice from these alternatives should have a direct influence on the communication environment of these interactions. At a minimum, individuals would engage in conversational behaviors, which they expect will yield the most positive route to their chosen alternative(s) (p.81).

Although POV theory retains the same conversational behaviors set forth by URT (Berger & Calabrese, 1975), the fact that an outcome value may be either positive or negative produces different predictions depending on its valence. When the POV is positive, the theory makes predictions similar to those proposed by URT; when the POV is negative, the theories produce different predictions (see Appendix A). For the purpose of the present study, however, attention will be focused only upon predictions derived from POV.

POV theory hypothesizes that several initial interaction behaviors should be related to POVs. According to Sunnafrank (1986, 1991), the amount of communication, intimacy level of the communication content, nonverbal affiliative expressiveness, information seeking, and liking should be negatively associated with uncertainty level when the POV is positive. The logic underlying these predictions is somewhat simple: when an interactant labels a partner as rewarding, either immediately or potentially so in the

future, he or she will attempt to prolong or continue the interaction and possibly escalate the relationship. The predicted associations, then, reflect the desire to reduce uncertainty through the use of these behaviors. When the POV is negative, the theory predicts that uncertainty level would be unassociated associated with the amount of communication, intimacy level of the communication content, nonverbal affiliative expressiveness, information seeking, and liking over time. Since the prediction of a negative outcome value should lead to the desire to terminate the interaction, the theory recognizes that each of these behaviors would be significantly reduced regardless of the level of uncertainty.³

Tests of Predicted Outcome Value Theory. Predictions based on POV's propositional framework have received strong support in limited testing (Grove & Werkman, 1991; Sunnafrank, 1988, 1990). Sunnafrank (1988) found support for the association between POV and the initial interaction behaviors presented above. In this study, previously unacquainted participants were allowed to interact with a partner for 10 minutes and then completed measures for each of the behaviors of interest. As predicted by the theory, the outcome value derived from the interaction was positively associated with the amount of verbal communication, intimacy of the communication content, nonverbal affiliative expressiveness, and liking. Additionally, this study provided evidence of a positive association between POV and both perceived attitude similarity and perceived background similarity, which were subsequently added to the propositional framework.

Two studies have tested competing predictions derived from POV theory and URT. Sunnafrank (1990) tested several contrasting predictions between POV theory and URT

regarding the association between uncertainty level and initial interaction behaviors as a function of the POV (see above). Previously unacquainted dyads were allowed to interact for either 3, 6, or 10 minutes before completing measures of POV and the initial interaction behaviors.⁴ The results provided strong support for POV-derived predictions and no support for URT-derived ones. Grove and Werkman (1991) also reported similar results in support of POV. Examining contrasting predictions between POV theory and URT involving information-seeking behavior, awareness of partner's behavior, nonverbal affiliative expressiveness, and amount of verbal communication, this study experimentally manipulated POV by having participants interact with both an able-bodied partner (positive POV condition) and a visibly disabled partner (negative POV condition). Participants in this study engaged in two short conversations, each one with either an able-bodied or a visibly disabled partner, and completed measures after each conversation. The results provided support for predictions derived from POV theory over those derived from URT.

In summary, these studies provide support for POV's theoretical framework and its ability to properly explain and predict initial interaction processes and outcomes. Tests of POV theory, however, have been limited exclusively to Ftf interactions and have not been examined beyond initial interactions. The present study extends POV theory to computer-mediated interactions. The application of POV theory to computer-mediated interactions is consistent with literature addressing impression development in computer-mediated environments (Lea & Spears, 1991, 1992, 1995; Walther, 1993b, 1996). This body of research indicates that the impression development process in mediated

environments may not differ much from that in Ftf interactions, and that these impressions begin to approach the level of those developed through Ftf interaction over time (Walther, 1993b).

Predicted Outcome Value Theory and Impressions. From a POV theory perspective, impressions developed during mediated interactions are the result of uncertainty reduction processes, serve as the basis for determining a POV, and reflect the degree of certainty with which an individual holds the derived POV. As interactants begin to reduce uncertainty at the onset of an initial interaction, they begin to form impressions of each other regardless of the level of inter-activity afforded to them (Lea & Spears, 1995; Walther, 1993b, 1996). As presented above, research investigating the SIDE model (Lea & Sears, 1991, 1992, 1995) and the hyperpersonal perspective (Walther, 1992, 1993b, 1996; Walther & Burgoon, 1992) indicates that interactants use whatever cues are available to them—no matter how minimal these cues may be—to infer social information about others. In the leanest of communication environments, such as in bulletin boards, chatrooms, MOOS, or MUDs, interactants use information gleaned from language use to draw inferences and make attributions about their social partners (Adkins & Brashers, 1995). In richer environments, interactants use the additional vocalic and/or visual cues to make attributions about and form initial impressions of their partner. This information, in turn, serves as the basis for shaping future communication, if any, with their partners. It is worth noting that this research does not mean structural inter-activity is irrelevant to the impression development process. Rather, structural inter-activity plays an important role in determining the amount and rate of information available for

developing impressions and relationships such that greater levels of structural inter-activity in initial mediated interactions should be associated with a more developed impression of a partner. From this discussion, the following hypotheses can be derived:

H₁: Greater levels of media and information richness produce higher levels of individuation in the form of the perception of a more developed initial impression of one's partner.

H₂: Greater levels of structural inter-activity in the form of nonmediation produce higher levels of individuation in the form of the perception of a more developed initial impression of one's partner than should mediation.

As predicted by the principle of inter-activity, structural inter-activity should also affect outcomes, in this case the POV, indirectly through the experiential properties of interaction involvement and mutuality. However, all of the experiential properties should not equally affect the POV. A brief examination of each property reveals why this should be the case. The principle of inter-activity describes each experiential property as multi-faceted. Interaction involvement, for example, may be experienced as a sense of engagement in an interaction or a perception of an interaction as being stimulating or elevating related affective, behavioral, or cognitive processes. Mutuality includes a sense of relational connectedness and solidarity with one's partner. It also includes the perception that one is similar to one's partner through shared attitudes, values, backgrounds, and experiences. Another facet of mutuality focuses on increased interdependence, behavioral coordination, and tightly meshed communicative exchanges, all of which may occur both within and across interactions, as indicators of mutual

behavioral influence (Burgoon, Bonito et al., 1999). Mutuality can also manifest itself in the degree to which individuals perceive their partner understands them. Since mutuality is an experiential property, it is the sense that one's ideas and disclosures are understood that is important rather than actual understanding or comprehension. Clearly, high levels of each of these facets reflect a sense of a positive regard for one's partner.⁵ The extent to which high levels of each of these properties are engendered, reflecting a high level of experiential inter-activity, should promote favorable social judgments (Burgoon, Bonito et al., 1999; Burgoon, Bengtsson et al., 1999). Results reported by Burgoon, Bonito et al. (1999) support this prediction. Their findings indicated that higher levels of interaction involvement and mutuality were associated with more favorable perceptions of partner credibility and attraction. As such, these two properties are predicted to be associated with the POV derived from the initial interaction.

H₃: Higher levels of the experiential properties of (a) interaction involvement and (b) mutuality should be associated with a more positive POV.

The third experiential property, individuation, reflected by the degree of impression development, emphasizes the extent to which interactants believe they have an image of their partner as an individual and feel their partner is "known" to them. When interactants hold a highly individuated impression of each other, each believes he or she has both the breadth and depth of personal information about their partner needed to develop a detailed impression. Individuation may take the form of more stylized communication or cognitive representations of one's partner as a unique individual rather than defined primarily by group membership or other social categorization (Lea & Spears, 1995). This

may also be reflected in knowledge about a partner's idiosyncratic tendencies or the ability to accurately take their perspective during a conflict.

The degree to which a partner's impression is formed, though, is not equivalent to the valence attached to that impression. The impression itself is more of a quantitative evaluation whereas the derived POV based on that impression reflects a qualitative evaluation. The model set forth in this study conceptually acknowledges it is possible to have a well-developed impression of an interactional partner that can be either positive or negative just as it is possible to have less a well-developed impression that is positive or negative in nature. Whereas interaction involvement and mutuality are predicted to be associated with more positive POVs, the degree to which an impression is developed, however, should be associated with how certain an individual is of the POV he or she holds of a partner and not necessarily of the valence of the POV itself. At this point, it is especially noteworthy to point out that tests of POV theory have only examined one-time interactions and have not examined the plasticity of POV judgments in subsequent interactions. This statement is not intended to be a criticism of POV theory, which is acknowledged as a theory about initial interactions, but rather to point out the need for examining the issue of outcome certainty as a conceptual extension of the theory.

Research in the area of physical appearance and impression formation suggests that even before physically co-present individuals begin to interact, they start to form impressions about each other based on characteristics such as gender, race, hair and eye color, and clothing (Burgoon, Buller, & Woodall, 1996). This process continues once the actual interaction begins, with partner characteristics such as their vocalic cues and

communication style also contributing to the impression development process. Although this process continues throughout the interaction, interactants tend to ascribe a valence to these impressions within relatively short periods of time—even as short as 30 seconds into the interaction (Burgoon et. al, 1996). This finding is consistent with the Sunnafrank (1990) study described above in which dyad conversational length was varied (e.g., 3, 6, and 10 minutes) but resulted in no significant impact on the dependent measures of interest, including POVs. He concluded that the inference of a POV appears to occur in conversations even as short as 3 minutes long.

An alternative yet complementary explanation may be the fact that, although the process of impression development and that of arriving at a POV are conceptually distinct from each other, they are likely to occur concurrently by exerting mutual influence upon each other. That is, as an impression is being developed through the exchange of messages, it is also being evaluated which in turn affects the impression development process and so on. Applying this explanation to a POV perspective, it makes logical sense that if interactants are asked to determine an outcome value at any time period during a conversation, they would do so based on the information exchanged during the duration of the interaction. Interpreting the Sunnafrank (1990) findings from this perspective, however, should indicate that, all other factors being equal, the amount of social information exchanged during a 3-minute interaction versus a 10-minute interaction should not be equivalent. The question then becomes not just one of valence but also one of the degree of certainty with which interactants hold these social judgments. In other words, do interactants who base their POVs on a less individuated

impression of their partner have the same degree of certainty about those values as those who have more individuated impressions? The answer appears to be no.

Several convergent lines of research lend support to the prediction that higher levels of individuation should be associated with more POV certainty. First, as presented above, individuation involves the perception of both depth and breadth of information. This means interactants have not only more knowledge about their partner in general but also more knowledge about more topics as well (Altman & Taylor, 1972). Because of this, they should believe they have a good understanding of their partner and, as a result, more certain of their evaluation and prediction of possible future rewards. Second, from a cognitive perspective, more individuation should translate into a more developed knowledge structure, or schema, about their partner. This schema, in and of itself, is composed of only the characteristics of the partner and not the evaluation of those characteristics (Wright, in press). The more consistent these characteristics are with each other, though, the more they should provide confidence for an interactant's judgment of a partner. Third, research in the area of social influence indicates that a higher level of knowledge about a topic typically translates into a stronger attitude about that topic, irrespective of its valence (Gross, Holz, & Miller, 1995; Petty & Krosnick, 1995). For both positive and negative attitudes, higher levels of knowledge have been associated with more certainty about them and more difficulty in changing them (Gross, Holz, & Miller, 1995; Petty & Krosnick, 1995).

Each of these lines of research, at a general level, point to the relationship between more information or knowledge and the consistency of the information, the confidence in

the evaluation of the information, and rigidity of that evaluation. The next hypothesis proposes a similar relationship between individuation and POV certainty.

H₄: Higher levels of individuation, in the form of a more developed impression of one's partner, should be associated with more certainty of the POV derived from the initial interaction.

Predicted Outcome Values and Outcome Value Certainty

The present study proposes a new dimension for conceptualizing POVs that should have important implications for understanding relational development. Before progressing into that discussion, it is important to clarify the relationship between a POV and the degree of certainty associated with it.

Within the proposed model, the two variables are conceptualized as being distinct but not necessarily independent of each other. As discussed earlier, a POV is the expectation of the extent to which the prospective relationship will be a source of positive or negative outcomes while the degree of certainty is how sure one is of that expectation. Two alternative conceptualizations are possible for describing this association: (a) the POV and its associated certainty are positively associated with each other such that the more positive the POV, more certain interactants are of their judgment, or (b) the two variables interact with each other such that only extremely positive or extremely negative POVs are perceived as being more certain, whereas less extreme outcomes values are perceived as less certain.

The first conceptualization seems unlikely since it is possible to complete an initial interaction, have a negative evaluation/POV, and be highly certain of it. Consider a

common on-line occurrence in which an interactant in a chat room, for example, exhibits uninhibited behavior and flames another. The receiver of such behavior is likely to leave such an interaction with a negative POV and feel fairly certain of that prediction. The second conceptualization may be a more accurate representation of the association between these two variables. Consistent with the previous discussion on the association between individuation and POV certainty, neither a positive nor a negative outcome value should be associated with the impression developed; rather, the POV should be independent of the degree of impression development but should reflect some degree of certainty which is based on the degree of impression development. In other words, impression development should affect the POV through outcome value certainty such that as the degree of individuation increases, outcome value certainty increases, and the POV should be more extreme.

H₅: The association between POV and its certainty should be such that the higher the degree of certainty, the more extreme the POV.

Predicted Outcome Value Theory Predictions. Thus far, the theoretical links between the structural affordances and experiential properties of inter-activity have been proposed along with their expected associations to the POV and the degree of certainty attached to that value, respectively. The remaining set of predictions comes directly from POV.

POV theory predicts a positive association between POV and the amount of communication, intimacy level of the communication content, nonverbal affiliative expressiveness, information seeking, and liking. The rationale reflects the assumption that the more positive the POV, the more likely interactants will communicate more and

deeper information, be more nonverbally expressive, seek more information about their partner, and generally like their partner more. As described and explained above, POV theory also makes different predictions about the association between uncertainty level and the relational and communicative factors as a function of the projected POV (Sunnafrank, 1986, 1991). POV theory predicts that the association among the amount of communication, intimacy level of the communication content, nonverbal affiliative expressiveness, and information seeking should be negatively associated with uncertainty level when the POV is positive. Liking, on the other hand, is predicted to be negatively associated with uncertainty level. When the POV is negative, POV predicts that uncertainty level would be unassociated with the amount of communication, intimacy level of the communication content, nonverbal affiliative expressiveness, information seeking, and liking. These predictions have been tested only in Ftf situations; therefore, the first set of POV predictions formally states them.

H₆: POV should be positively associated with (a) the amount of communication, (b) intimacy level of the communication content, (c) nonverbal affiliative expressiveness, (d) information seeking, and (e) liking.

H₇: The association between uncertainty level and (a) the amount of communication, (b) intimacy level of the communication content, (c) nonverbal affiliative expressiveness, (d) information seeking, and (e) liking should differ as a function of the POV such that these associations should be negative when the outcome value is positive and unassociated when the outcome value is negative.

Additionally, given the earlier discussion on the role of outcome value uncertainty, the following research question is posed:

RQ₃: What is the role of outcome certainty in the relationship between POVs and (a) the amount of communication, (b) intimacy level of the communication content, (c) nonverbal affiliative expressiveness, (d) information seeking, and (e) liking?

Longitudinal Effects of Predicted Outcome Values and Outcome Value Certainty.

The effect of a POV on relationship development remains to be tested as studies examining POV-derived predictions have examined only initial interactions. While POV is, in fact, a theory about initial interaction processes, its framework also provides insight into what can be expected after initial interactions. An implicit assumption of POV theory is that initial interactions resulting in a positive POV will develop into qualitatively different relationships than those resulting in a negative POV. The theory holds that initial interactions producing positive POVs should continue to develop, whereas those producing negative POVs would be either terminated or not allowed to develop. POV theory's propositional framework, however, allows for another possibility, specifically that if relationships with initially negative POVs, it can be inferred that they would not become as developed according to relational development indices as their counterparts. If the degree of POV certainty is taken into consideration, then, more refined predictions can be made. For example, when a POV is held with less certainty, subsequent interaction should have more of an effect than if the POV is held with a high degree of certainty. In this case, subsequent interaction would give interactants the opportunity to become more sure of their initial prediction by gathering more information about their

partner or even try to verify their initial predictions. In the case of high certainty, further interaction would likely have no effect in terms of the POV or even result in biased information processing such that any social information exchanged is simply interpreted as further evidence supporting their initial prediction. The importance of these longitudinal predictions is that they provide a theoretical understanding of why some relationships continue to develop and others do not in mediated environments. Examining the longitudinal effects of POVs and their associated certainty may also inform SIP, which is commonly invoked as an explanation for understanding relational development in CMC. As is explained below, this theory in its current form offers only a limited explanation of the relational development process.

Social Information Processing Theory. SIP was originally advanced to explain the contradictory findings derived from lab and field studies investigating relationship development in CMC environments. Many studies examining relational development through CMC, according to Walther (1996), limited the amount of time interactants had to exchange messages and simply not allowed enough time to progress for relational development to have occurred. SIP assumes that interactants in CMC environments, like those in other environments, are driven to develop relationships. As participants begin to exchange messages they also begin to form impressions of their partners. Rather than simply assuming that relational or socio-emotional information is conveyed strictly through nonverbal channels, SIP recognizes that in CMC this type of information may be conveyed through both nonverbal and verbal channels but exchanged more slowly than in Ftf interaction. In other words, SIP argues that the main difference between relational

development occurring via CMC and that occurring through Ftf interaction is the rate of social information exchange not the amount (Walther, 1992, 1993b, 1996; Walther & Burgoon, 1992). Given enough time, relationships developed through CMC should be no different than those developed through Ftf interaction.

Tests of SIP indicate the theory provides a solid theoretical framework for understanding CMC relational development. For example, tests of the theory have provided support for predictions that (a) relational development through CMC and that occurring through Ftf interaction eventually reach similar levels (Walther & Burgoon, 1992); (b) impressions formed through CMC would be less developed than those formed through Ftf, but would over time come to equal those formed through Ftf interaction (Walther, 1993b); and (c) anticipation of future interaction could account for many of the findings from one-shot studies conducted early in the study of CMC (Walther, 1994).

Two important points, however, need to be noted about SIP's empirical tests. First, SIP has been primarily tested in task-focused groups, or groups brought together for the purpose of making a decision or completing a project (see, for example, Walther & Burgoon, 1992, Walther, 1994). As discussed above, future interaction among group members was required due to their assigned task and not by their own choice; in most cases, participants in these studies were given this knowledge of future interaction prior to beginning their tasks. These findings, therefore, do not distinguish between relationships that do develop and those that do not since the completion of the task is what drives relationship development in work groups. By contrast, whether or not future interaction occurs in socially-focused relationships tends to be determined by the

interactants themselves. Individuals who meet, for example, in on-line chat rooms do not simply assume they will continue communicating beyond their initial interaction; rather, whether or not they will continue interacting is determined *by* their initial interaction. Second, as stated above, SIP assumes individuals are driven to develop relationships. From a POV perspective, this assumption would have to be modified to read, “individuals are motivated to develop relationships with others whom they find rewarding.” In the often-cited Walther and Burgoon (1992) study examining relational development, the authors do not examine developmental differences between groups characterized by positive outcome values and those characterized by negative ones. Again, since future interaction was required due to group tasks, interactants did not make the determination of future interaction.

The implication for SIP is that the developmental pattern of socially-oriented relationships typified by positive outcome values should be different than those typified by negative outcome values. Furthermore, the degree of certainty should also play an important role. To test this prediction, the following hypothesis is presented:

H₈: Socially-oriented relational development varies as a function of the POV derived from initial interactions and the degree of certainty associated with the POV.

CHAPTER 2

METHOD

Overview

The present study constituted a longitudinal test of the relational development model described above. Same-sex dyads interacted either Ftf or via one of three mediated conditions: text-only, audio-only, or audio-visual. In order to insure variability in the POV, one member of the dyad was recruited and instructed to create either a positive or negative impression on their interaction partner (see below). For the initial interaction, participants engaged in a 15-minute discussion focusing on five questions or topics and then completed post-interaction measures of POV, outcome value certainty, communicative and relational factors, the three experiential inter-activity properties, and the Relational Communication Scale (Burgoon & Hale, 1988). The second interaction focused on the completion of a socially-based collaborative task (described below) and then completed the same post-interaction measures as they did after the initial interaction.

Participants. Participants ($N = 80$) were undergraduates at a large southwestern university, recruited from communication courses, and compensated with extra credit for their participation in this study. The overall sample size was equally divided among males and females (overall age $M = 23.61$, $S.D. = 4.23$) across conditions. Dyads for the present study were composed of previously unacquainted same-sex participants; no dyad was composed of two members recruited from the same class. Participants were also screened as to their relational status before being assigned to a dyad and condition. In

instances in which dyad members had previous knowledge of each other, one member was assigned to an alternative task while the other was paired with another partner.

Procedures and Conditions. The study took place in the Human Communication Research Laboratory, a location equipped with furniture resembling an apartment and use in similar research (e.g., Burgoon, Bonito et al., 1999). In order to avoid having participants inadvertently interact prior to the beginning of the study, upon arriving at the laboratory participants entered a waiting area, were checked in by an assistant, and immediately taken into one of four separate rooms in the laboratory. Each room in the laboratory was equipped in a similar manner as the waiting area with the addition of a pair of chairs and a computer. Participants were then given a consent form to complete, received an explanation of the nature of the study, and told which condition their dyad has been assigned for completing their task.

Dyads were randomly assigned to one of four experimental conditions: a FtF condition; a synchronous, text-based condition; an audio-only condition; and an audio-visual condition. In the FtF condition, both participants were brought together in the same lab room in order to conduct their initial interaction and then separated to complete measures. The three mediated conditions were the operationalization of media and information richness, with text-based representing the leanest and audio-visual representing the richest. Each mediated condition was conducted using NetMeeting, a Windows-based communication program that allows for interaction to occur in any of the three conditions. For these conditions, rather than bringing the participants together to the same room, they were taken to separate rooms and stationed in front of a computer to

complete the initial interaction and post-interaction measures. The synchronous, text-based condition had participants interact by typing their messages into a text box, which, once sent, were visible to both participants immediately. The audio-only condition was similar to communicating via a telephone except that the call is placed through the computer via the Internet and used headphones equipped with a microphone to communicate. The audio-visual condition was similar to the audio-only condition except that, in addition to hearing their partner, participants were also able to see one another through a video box on the computer; participants in this condition also used headphones to communicate.

Participants were told that the study involved how people get acquainted with each other using different communication formats. Participants were also told that they should assume they would have the same partner for the second interaction, but that their thoughts about their partner would also be taken into consideration. This instruction was necessitated by the fact that one of the conditions identified by Berger (1979), and incorporated into POV, for uncertainty processes to be activated is the possibility of future interaction. Participants were then informed that they should proceed as they would in any initial interaction by trying to get to know their partner. To assist participants in doing this, they were furnished with five questions or statements to discuss. Similar questions/statements have been used in prior studies of initial interactions (e.g., Miller, Berg, & Archer, 1983) and provide an adequate range of topics for discussion. The questions were: (a) What do like or dislike about your classes? (b) Discuss something from your past that you feel guilty about; (c) What type of job would

you like to have? (d) What are the best and worst things that have ever happened to you? and (e) How would your male and female friends describe you? Before leaving, the assistants asked if the participants had any questions and stated that they would return to the room in approximately 15-20 minutes; because all of the conditions were synchronous in nature, 15-20 minutes was assumed to be a sufficient amount of time for completing the interaction and arriving at a POV (Sunnafrank, 1990).

To increase variability in POV judgments, one participant was recruited by a laboratory assistant upon initially arriving at the laboratory and instructed to create either a positive or negative impression on their partner. The participant was instructed that different media and technology have the ability to augment or suppress certain characteristics of communication behavior. They were also told that the present study was designed to examine how different modes of communication affect the types of impressions individuals make on others. As a result, they were being asked to present either a positive or negative image to their partner. Furthermore, they were informed that their partner was unaware of the instructions they had been given and that they should try to create the assigned impression in a manner natural to them. Participants were then asked if they had any questions about what they had been asked to do and then instructed to begin the interaction according to their assigned condition. No further instructions were given to participants.

After completing the interaction, participants in the mediated conditions were directed to complete the post-interaction measures, which were located on the World Wide Web. In the Ftf condition, the participants were separated with one of them being

brought into another lab room and seated at a computer station to complete the post-interaction measures. Upon completing the post-interaction measures for the first interaction, participants were then given instructions for the second interaction.

For the second interaction, participants interacted with the same partner through the same communication format used in their initial interaction; the participant who had been recruited to create either a positive or negative impression in the first interaction was again asked to do the same. The second interaction involved the completion of a socially-based collaborative task similar to that used in previous studies (e.g., Bernieri, Davis, Rosenthal, & Knee, 1994; Bernieri, Gillis, Davis, & Grahe, 1996; Grahe & Bernieri, 1999). The task required participants to collaborate in planning a trip around the world that they would take together had they been given real money to do so. Each participant was furnished with a map of the world and told that the total cost of their trip had to total \$5,000. The conditions of the interaction included that (a) both participants needed to agree on the travel locations and duration of their stay in each location, and (b) that the discussion had to continue until all of their money had been spent; to insure the latter, participants were asked to estimate the amount of money they spent on each location of their trip on a worksheet. After completing the interaction, participants were directed to complete all of the post-interaction measures with the exception of those for the relational and communicative factors. Upon completion, participants were debriefed and thanked for their participation.

Post-Interaction Measures. Each of the three experiential properties were assessed in the following manner.

Interaction involvement was assessed using seven Likert-type items taken from the Relational Communication Scale (RCS; Burgoon & Hale, 1987): “My partner was highly involved in the interaction;” “My partner was detached from our interaction;” “My partner was attentive to our discussion;” “My partner created a sense of distance between us in our interaction;” “My partner was open to my questions and comments in our interaction;” “My partner was attuned to our interaction;” and “My partner was engaged in our interaction.” Participants were asked to assess each item on a 7-point scale with the endpoints of “strongly disagree” at one end of the continuum and “strongly agree” at the other end. A mean score for the seven items was computed for each participant. A Cronbach’s alpha reliability of .90 was achieved for the present study.

Mutuality was assessed through the use of multiple measures to represent its multidimensional nature. In the present study, measures of perceived receptivity, perceived understanding, and perceived relational connectedness were used as empirical indicators of mutuality. Perceived receptivity was assessed with a three-item Likert-type measure. Two items were taken from the RCS receptivity/trust sub-scale: “My partner was open to my ideas;” and “My partner was interested in talking to me.” A third item, “My partner was responsive to my comments,” was added to increase the psychometric qualities of the measure. Participants were asked to assess each item on a 7-point scale with the endpoints of “not accurate at all” at one end of the continuum and “very accurate” at the other end. A mean score for the three items was computed for each participant to represent the degree of perceived receptivity. Reliability for this measure was .74.

Perceived understanding was assessed through the use of a modified version of the Feelings of Understanding/Misunderstanding Scale (Cahn & Shulman, 1984), a measure that provides a list of affective and experiential descriptors (e.g., annoyance, relaxation, acceptance, etc.) and asks participants to indicate the extent to which each term describes their interaction experience. The original measure contained 24 items equally distributed into three groups composed of feeling understood, feeling misunderstood, and distractor items; the version used in the present study made two modifications. First, in order to reduce the overall number of items participants would need to complete after each interaction, only a limited number of items, seven, were selected to measure perceived understanding. Item selection was guided by previous research by Burgoon and colleagues (Burgoon, Bengtsson et al., 1999; Burgoon, Bonito et al., 1999) examining the principle of interactivity, which used the complete measure. In those studies, only a limited number of items were used to arrive at an acceptable alpha level.

Second, the format of the items was modified. Whereas the original measure asked participants to rate a series of single word descriptors, the version used in the present study consisted of a series of statements based on the seven descriptors selected. Items, for example, included “I feel accepted by my partner;” “I left the interaction feeling I was important;” and “I feel the interaction was a good experience.” Given that the majority of the items from the other measures were similar in format, and that the original format would have made it difficult to mask its intention, this modification allowed these items to be interspersed with items from other measures more readily. Participants were asked to assess the extent to which they agreed with each statement during or immediately after

their interaction on a 7-point scale ranging from “strongly agree” at one end of the continuum to “strongly disagree” at the other end. An overall score was computed for each participant, with higher scores indicating the more understood the participant generally felt. An alpha of .95 was achieved for this measure.

The final indicator of mutuality, perceived connectedness, was assessed through the use of Aron, Aron, and Smollan’s (1992) single-item Inclusion of Self in Other measure as modified by Bernieri (1999; Grahe and Bernieri, 1999). The original instrument asks participants to select one of seven drawings, each depicting a pair of increasingly overlapping circles, representing the degree of perceived relational connectedness between participants. These drawings range from two circles with their outer edges touching to almost completely overlapping circles. The selection of a drawing with more overlap between the circles is interpreted as representing higher levels of perceived connectedness. Grahe and Bernieri (1999) modified the measure by adding two more pictures, each depicting unconnected circles but with differing degrees of distance between them. This measure was used rather than the original since it is unlikely that participants would achieve a high level of connectedness after only two brief interactions.

The degree of individuation/impression development was assessed via Walther’s (1993a) measure of impression development. This 14-item measure asks participants to evaluate their partner according to a set of qualities (e.g., honest, intelligent, lazy, etc.) and indicate on a 4-point scale the extent to which they agree with each descriptor. The scale also allows for a response of “don’t know,” which Walther (1993a) argues allows for the differentiation of median assessments of each quality from a lack of knowledge

about the quality. An overall impression development score was assessed by comparing the number of “don’t know” responses against the number of completed items to create an index of the degree of impression development. A lower number of “don’t know” responses was interpreted as a more developed impression. The nature of this measure made computing a measure of reliability not possible.

Predicted outcome value was assessed with Sunnafrank’s (1988) 10-item POV measure. This instrument asks participants to predict how positive a future relationship with their interactional partner would be for them personally. Items use a 6-point scale anchored by responses of, “much less positive than I would normally expect” at one extreme and “much more positive than I would normally expect” at the other, and are summed to produce an overall POV score. According to Sunnafrank (1988, 1990), positive POV expectations are defined as overall scores of 37 and above and negative POV expectations are defined as scores of 33 and below. The alpha associated with this measure was .94. Adding an additional item after each of the 10 items used to measure POV assessed Outcome Value Certainty. In each case, the item asked participants to indicate on a 6-point scale anchored by responses of “very sure” at one extreme and “very unsure” at the other end, how sure they were of their response to the previous item. A mean score for the 10 items was computed for each participant to represent the degree of outcome value certainty such that higher scores indicated more certainty in their prediction. An alpha of .93 was achieved for this measure.

Assessment of uncertainty level was conducted through the use of Clatterbuck’s (1979) CLUES7 instrument. A staple of uncertainty reduction studies, this instrument

provides a measure of participant attributional confidence about their interactional partner; the degree of attributional confidence has been used as a reverse indicator of uncertainty level. Items ask participants to indicate the extent to which they are, for instance, confident of predicting their partner's behavior, certain their partner likes them, and accurate at predicting their partner's values and attitudes. A mean for the overall measure was computed for each participant such that higher scores indicated reduced uncertainty. An alpha of .88 was achieved.

Relational and Communicative Factors. The present study employed similar instruments to those used in earlier POV studies measuring the relational and communicative factors (Sunnafrank, 1988, 1990). Amount of communication was assessed through participant self-report measure of their contribution to the interaction. Past studies have used a single-item measure on a 7-point scale, ranging from "very little" to "very much," asking participants to indicate how much they personally contributed to the conversation (Gudykunst, Yang, & Nishida, 1985; Sunnafrank, 1988, 1990). The present study employed a measure consisting of three items asking participants to indicate on a 7-point scale, ranging from "very little amount" to "very large amount," their contribution to the interaction, their contribution relative to other initial interaction they've engaged in, and the overall amount of communication in the interaction (see Appendix E). This measure produced an alpha of .92.

Intimacy of communication content was also measured through a self-report instrument composed of three items. Participants were asked to indicate on a 7-point scale, ranging from "very little amount" to "very large amount," the amount of

information about themselves they revealed, the intimacy of the self-information revealed, and the amount of personal information they disclosed. Each item was composed so that participants are asked to compare the conversational intimacy of their just completed interaction relative to their typical level of intimacy in initial interactions. Responses to the three items were summed to create an overall score of communication content intimacy, and the measure achieved an alpha of .86.

The assessment of affiliative expressiveness in previous URT and POV studies asked participants to self-report their use of nonverbal behaviors during the interaction as well as that of their partner (Sunnafrank, 1988, 1990; also see Gudykunst & Nishida, 1984). This measure of nonverbal affiliative expressiveness consisted of four items asking participants to indicate the degree to which they (and their partner) employed facial expressiveness, eye contact, smiling, and body animation on a 7-point scale with endpoints of “very little” and “very much.” This measure was clearly created with Ftf initial interactions in mind. Given the nature of the present study, an alternative measure of affiliative expressiveness was employed to capture the more global nuances of this variable across the interaction conditions. This measure recognized that global affiliative expressiveness could be conveyed through both verbal and nonverbal channels. Affiliative expressiveness can be conceptualized as the extent to which a participant conveys an overall sense of animation, dynamism, and energy in a positive manner to their partner (Coker & Burgoon, 1987).⁶ Participants were asked to respond to four items about the overall degree to which they were expressive in their interaction. These items were, “I was enthusiastic in how I communicated with my partner;” “I was expressive in

a positive manner with my partner;” “I would describe my communication in this interaction as energetic;” and “I would describe my communication in this interaction as animated.” Participants were also asked to complete similar items regarding their partner’s behavior. The self-version of this measure achieved an alpha of .82 while the partner version achieved a .90. The correlation between the two measures was .45 ($p < .001$).

As in Sunnafrank (1990), information seeking was assessed according to the three categories of interactive strategies identified by Berger and Kellermann (1983): interrogation, disclosure, and relaxation of the target. Existing measures of these strategies, however, have not yielded very high reliabilities (see, for example, Sunnafrank, 1990). In the present study, each strategy was measured through the use of two items for each sub-scale on a 7-point Likert-type scale. Participants were asked to indicate the extent to which they “strongly agree” or “strongly disagree” with each statement. Items assessing the use of interrogation as a strategy were, “I asked my partner any questions about him/herself;” and “I did not ask my partner any follow-up questions after they disclosed personal information to me.” Items measuring disclosure as a strategy were, “I purposely shared information about myself in hopes partner would do the same;” and “I communicated information about myself that I hoped my partner would tell me about him/herself (e.g., name, attitudes, etc.).” Items measuring relaxation of the target as a strategy were, “I did not encourage my partner to relax;” and “I attempted to get my partner to loosen up.” These measures achieved alphas of .56, .84, and .35, respectively. While two of the three measures yielded low reliabilities, the decision was made to keep

both items for the interrogation measure and to assess relaxation of the target by using one item, "I did not encourage my partner to relax," selected on face validity. Each strategy was coded such that higher scores for a given strategy indicated increased use of it.

Liking was assessed with four items from the McCroskey and McCain (1974) attraction scale's social attraction dimension. A fifth item from the social attraction dimension was inapplicable as it assumes participants have not yet interacted. This measure has been used as an indicator of liking in other POV studies and produced reliabilities of .83 in each instance (Sunnafrank, 1988, 1990). It also produced an alpha of .83 in the present study.

Relational development was assessed after both interactions through the use of the RCS (Burgoon & Hale, 1987). The RCS is a multidimensional, 64-item instrument measuring 8 conceptually distinct dimensions upon which relational messages are encoded and decoded. Participants were asked to indicate their level of agreement with each item on a 7-point scale. Walther and Burgoon (1992) were the first to apply the RCS to mediated interactions and adapted it to reflect differences between dyadic and small group interactions in FtF and mediated environments. Their subsequent analysis produced a modified version of the original measure with 9 dimensions: immediacy/affection; similarity/depth; receptivity/trust; equality; task-social orientation; composure; formality; attempted influence (part of the dominance scale in the original RCS); and dominance. The present study used a reduced version of the RCS with only three items per dimension. While a reduced version of this instrument has not been used

in the domain of mediated interactions, other studies employing one have reported acceptable reliabilities for each dimension (see, for example, Burgoon, Newton, Walther, & Baesler, 1989). The present study yielded the following alphas, averaged across the two time periods, for each dimension: .86 for immediacy/affection; .78 for similarity/depth; .83 for receptivity/trust; .82 for equality; .72 for task-social orientation; .77 for composure; .63 for formality; .77 for attempted influence; and .76 for dominance.

CHAPTER 3

RESULTS

Research Questions 1 and 2

Research questions 1 and 2 asked the role of mediation (RQ₁) and media and information richness (RQ₂) in producing (a) interaction involvement and (b) mutuality. Since both research questions focused on the same dependent variables, they were assessed jointly through a series of multivariate contrasts on involvement and the three empirical indicators of mutuality (perceived receptivity, perceived understanding, and perceived connectedness) within a MANOVA. Multivariate analysis, rather than a series of univariate analyses, was conducted because the interaction processes of involvement and mutuality are conceptually as well as empirically related (average $r = .73$); Bartlett's test of sphericity ($\chi^2 = 277.19$, $p < .001$) also provided support for the decision.

The contrasts were a set of Helmert contrasts with one additional contrast (described below). The first Helmert contrast compared the face-to-face condition (coded +3) to the three mediated conditions (text-only, audio-only, audiovisual, each coded -1) and served as a test of the first research question involving the role of mediation. The remaining contrasts compared increases in media and information richness against the remaining conditions (audiovisual versus text-only and audio-only combined; audio-only versus text-only) and were used in conjunction with an additional contrast to address the second research question. The additional, non-orthogonal contrast (coded as +3, +1, -1, -3) was added to assess if there was a linear increase in media and information richness across the

conditions. The complete set of contrasts is reported in Table 1, and Table 2 reflects the significant tests associated with each one.

Table 3 reports the means and standard deviations associated with the contrasts conducted to address research questions 1 and 2. The overall multivariate test associated with both of the research questions failed to produce a significant effect on the four dependent variables (involvement, perceived receptivity, perceived understanding, and perceived connectedness), $F(12, 193) = 1.17, p > .05$, Wilks' $\lambda = .83$, power = .59, as did the multivariate contrasts with one exception. The multivariate contrast comparing the audio-only condition to the text-only condition produced a significant effect, $F(12, 193) = 3.18, p < .05$, Wilks' $\lambda = .73$. An examination of the accompanying univariate contrasts revealed that the effect centered on perceived connectedness, $t(76) = 2.10, p < .05, \eta^2 = .06$. The means associated with each condition indicated that participants in the audio-only condition ($M = 5.85, S.D. = 2.03$) reported higher levels of perceived connectedness than did those in the text-only condition ($M = 4.55, S.D. = 2.11$). This contrast also approached statistical significance on involvement, $t(76) = 1.66, p = .11, power = .37$, with participants in the audio-only condition ($M = 5.69, S.D. = 1.09$) reporting higher levels of involvement than participants in the text-only condition ($M = 5.12, S.D. = 1.10$). All other univariate contrasts failed to achieve statistical significance.

Hypotheses 1 and 2

The analysis associated with each of these hypotheses mirrored that conducted in assessing research questions 1 and 2. A series of Helmert step-down contrasts along with one additional contrast examining increases in media and information richness on

Table 1

Contrast Coefficients Used to Assess the Effect of Media and Information Richness and Mediation on the Experiential Properties

Contrast	<u>Condition</u>			
	Face-to-face	Audiovisual	Audio-only	Text-only
Contrast 1	+3	+1	-1	-3
Contrast 2	+3	-1	-1	-1
Contrast 3		+2	-1	-1
Contrast 4			+1	-1

Table 2

Summary of Univariate Contrast Results Associated with Tests of the Experiential Properties

	<u>Involvement</u>		<u>Perceived Receptivity</u>		<u>Perceived Understanding</u>		<u>Perceived Connectedness</u>	
	Value	T-statistic	Value	T-statistic	Value	T-statistic	Value	T-statistic
	Contrast 1	1.16	.92	.15	.11	1.57	1.02	2.40
Contrast 2	.23	.72	.02	.05	.38	.94	.13	.27
Contrast 3	-.06	-.16	-.13	-.34	.04	.09	.35	.67
Contrast 4	.58	1.66	.35	.83	.36	.75	1.30	2.10*

Notes: "Value" represents the actual contrast difference.

* $p < .05$.

Table 3

Means (and Standard Deviations) of the Experiential Properties by Condition

Experiential Property	<u>Condition</u>			
	Face-to-face	Audiovisual	Audio	Text-only
Involvement	5.62 (1.34)	5.35 (1.44)	5.69 (1.09)	5.12 (1.10)
Perceived Receptivity	5.60 (1.25)	5.50 (1.34)	5.80 (1.31)	5.45 (1.45)
Perceived Understanding	5.45 (1.44)	5.10 (1.66)	5.24 (1.48)	4.88 (1.59)
Perceived Connectedness	5.45 (1.82)	5.55 (1.82)	5.85 (2.03)	4.55 (2.11)
Impression Development	3.55 (3.07)	3.85 (2.06)	3.65 (1.79)	3.00 (2.20)

Notes: Standard deviations are noted in parentheses below means. Higher means indicate higher levels of each property with the exception of impression development, for which a higher score indicates a less developed impression. For each condition, N = 20.

Walther's (1993a) impression development measure. It should be noted once more that means and standard deviations in Table 3 for impression development reflect the number of "don't know" responses on this measure. Thus, the descriptive statistics associated with this measure should be interpreted such that lower scores reflect a more developed or individuated impression of one's interaction partner.

Hypotheses 1 and 2 were not supported. Hypothesis 1 predicted that greater levels of media and information richness produce higher levels of individuation in the form of the perception of a more developed initial impression of one's partner. Hypothesis 2 predicted that greater levels of structural inter-activity in the form of nonmediation produce higher levels of individuation in the form of the perception of a more developed initial impression of one's partner than should mediation. The omnibus F -test⁷ examining impression development failed to reach statistical significance, $F(3,76) = .49$, $p > .05$, power = .15, indicating that impressions developed during the initial interaction of the present study did not differ as a function of interaction condition (e.g., face-to-face, audiovisual, audio-only, or text-only). Since the hypotheses proposed specific differences in the structural features associated with the conditions, the accompanying contrasts were examined.

The contrasts associated with each hypothesis also failed to reveal any significant differences. None of the contrasts examining the effect of media and information richness on impression development were statistically significant. The first contrast examining the linear increase in media and information richness on impression development failed to achieve statistical significance, $t(76) = .80$, $p > .05$, as did the Helmert contrasts

comparing audiovisual conferencing (coded +2) to both the audio-conferencing (coded -1) and text-only (coded -1) conditions, $t(76) = .82, p > .05$, as well as comparing the audio-conferencing (coded +1) condition to the text-only condition (coded -1), $t(76) = .88, p > .05$. Taken together, these findings suggest that participants in the present study did not benefit from increases in media and information richness by forming more developed impressions of their partners.

The contrast conducted to assess the second hypothesis produced similar results. The first Helmert contrast, comparing the Ftf condition (coded +3) to the three mediated conditions (each coded -1), served as a test of the prediction that nonmediation should produce a higher level of individuation. The results of this contrast failed to provide support for the prediction, $t(76) = .08, p > .05$, indicating that the use of mediation by participants in the present study did not hinder their ability to develop impressions at a similar level to those interacting Ftf. It is worth noting that interactants in the text-only condition reported the highest level of impression development ($M = 3.00, S.D. = 2.20$), followed by the Ftf condition ($M = 3.55, S.D. = 3.07$), the audio-conferencing condition ($M = 3.65, S.D. = 1.79$), and the audiovisual-conferencing condition ($M = 3.85, S.D. = 2.06$).

Hypothesis 3

Hypothesis 3 predicted that higher levels of the experiential properties of (a) interaction involvement and (b) mutuality should be associated with a more positive POV. This hypothesis received strong support. Table 4 reflects the correlation between POV and each of the experiential properties. The findings indicate statistically significant

Table 4

Intercorrelations between Predicted Outcome Value (POV) and the Experiential Properties (N = 80)

Variable	1	2	3	4	5	6
1. Predicted Outcome Value	--					
2. Involvement	.63**	--				
3. Perceived Receptivity	.70**	.85**	--			
4. Perceived Understanding	.73**	.81**	.86**	--		
5. Perceived Connectedness	.62**	.54**	.63**	.71**	--	
6. Impression Development	-.08	-.20*	-.18*	-.18*	-.12	--

Notes: Each variable was coded such that a higher score indicates a higher level of the property with the exception of impression development, for which a higher score indicates a less developed impression.

* $p < .05$; ** $p < .001$.

correlations between POV and involvement, perceived receptivity, perceived understanding, and perceived connectedness. Because Table 4 also indicates strong associations among the experiential properties, the correlation between POV and a composite of the mutuality measures was also computed, $r(78) = .68, p < .001$. Overall, these results indicate that interactivity experienced in the form of involvement and mutuality is strongly associated with the POV derived from an initial interaction.

Hypothesis 4

Hypothesis 4 predicted that higher levels of individuation, in the form of a more developed impression of one's partner, should be associated with more certainty of the predicted outcome value derived from the initial interaction. This hypothesis was supported. Results of this test indicate that impression development and predicted outcome value certainty were significantly associated, $r(78) = -.30, p < .005$. The correlation indicates that a more developed impression, as indicated by fewer "don't know" responses on the measure, was significantly associated with greater certainty of the POV judgment.

Hypothesis 5

Hypothesis 5 examined the association between POV and the certainty associated with it. Specifically, the fifth hypothesis predicted that the higher the degree of certainty, the more extreme the POV. In order to assess this prediction, deviation scores were calculated for POV. Interactant POV scores were subtracted from the mid-point of the measure (3.50) to create a deviation score representing the degree of extremity; the nature

Table 5

Overall Correlations between Predicted Outcome Value and the Communicative and Relational Factors (N = 80)

Factor	Predicted Outcome Value
Amount of communication contributed	.22*
Intimacy of communication content	.32**
Partner affiliative expressiveness	.63**
Self affiliative expressiveness	.48**
Information seeking strategies	
Interrogation	.05
Self-disclosure	.15
Relaxation of target	.27*
Liking	.58**

Notes: All values are one-tailed.

* $p < .05$; ** $p < .005$.

of this prediction dictated that absolute values, rather than raw difference scores, be used to represent the degree of extremity. This hypothesis was also supported. The correlation between the POV deviation score and the certainty associated with it, $r(78) = .36, p < .001$, indicated a statistically significant association between the variables such that interactants holding more extreme POVs were also more certain of those judgments.

Hypothesis 6

Hypothesis 6 examined predictions derived from POV theory. The hypothesis proposed that POV should be positively associated with (a) the amount of communication, (b) the intimacy of the communication content, (c) global affiliative expressiveness, (d) information seeking, and (e) liking. Table 5 reports correlations between these variables. Overall, the pattern provides support for the predictions with two exceptions. While POV was positively associated with the amount of communication, intimacy level of the communication content, self and partner affiliative expressiveness, and liking, two of the three information seeking measures were not. POV was significantly associated with the information seeking strategy of target relaxation but unassociated with the information seeking strategies of interrogation and self-disclosure, respectively. The general pattern of the correlations, then, provides support for the application of POV theory to mediated interactions.

Hypothesis 7

Hypothesis 7 also assessed predictions derived from POV theory. The seventh hypothesis proposed an interaction between uncertainty and POV such that the association between uncertainty level and (a) the amount of communication, (b) intimacy

level of the communication content, (c) global affiliative expressiveness, (d) information seeking, and (e) liking should differ as a function of the POV such that these associations should be negative when the outcome value is positive and unassociated when the outcome value is negative. Before reporting the results of this hypothesis, however, a brief explanation of the analysis undertaken follows.

The nature of this hypothesis dictates that a series of regression analyses be conducted in order to examine each of the criterion variables of interest. Each regression analysis would typically proceed in a manner such that POV, uncertainty level, and the interaction between the two would be entered as predictors in order to assess the model. The relative contributions of each predictor would be examined to determine whether or not each prediction was supported.

Certain factors, however, required that a different approach be undertaken for the present analysis. First, theoretical interest would dictate that the approach be altered. Hypothesis 7 predicts an interaction between POV and uncertainty level and does not make any predictions regarding either of the two predictors individually (e.g., main effects). While it may be common practice to examine main effects when assessing an interaction in regression analysis, such an approach may unduly reduce the degrees of freedom available in a given analysis (Cohen & Cohen, 1983). As set forth by Cohen and Cohen (1983) and Hays (1994), theoretical interest should guide empirical practices. Second, empirical concerns also suggested that an alternative approach be used. An important qualifier to any multiple regression analysis is the absence of collinearity among the predictor variables. The presence of high levels of collinearity may bias

parameter estimates associated with regression models, inflate regression coefficients, produce Type II errors, and generally make the interpretation of the results difficult and inaccurate (Cohen & Cohen, 1983; Hays, 1994). While some level of collinearity may exist between predictor variables and their resulting cross-product interaction terms, the correlations between POV, uncertainty level, and their cross-product interaction term indicate a high level of collinearity between the cross-product and both predictors. The correlation between the cross-product interaction term and POV, $r(78) = .69$, $p < .001$, as well as its correlation with uncertainty level, $r(78) = .89$, $p < .001$, revealed the presence of a high level of redundancy among the three variables in the current analysis.

In situations such as this, Berry and Feldman (1985), Cohen and Cohen (1983), Hays (1994), and Pedhazur (1997) recommend potential approaches vary in terms of their level of conservativeness: either combining the highly correlated variables to form a single, new variable; entering the variables together as a block and tenuously interpreting the results; or, if theoretically unimportant, simply eliminating the variables from the analysis. The latter alternative is problematic if used as the only method of analysis since in order to assess the explanatory value of an interaction, within the context of regression analysis, the effects of the variables used to create it must be first partialled from the criterion. Cohen and Cohen (1983) point out that this must be done because a product of two continuous variables is not the interaction itself, but rather the cross-product product includes variance attributable to both predictor variables as well as that attributable to the interaction between them. To evaluate the interaction accurately, then, requires the partitioning of variance attributable to each predictor variable beforehand. In the present

analysis, this would be difficult, if not impossible, to accomplish without unduly biasing the parameter estimates associated with the interaction. The nature of the relationship between the two predictors and the cross-product interaction term was such that separating the effect of the interaction term from either one with any degree of precision would be unlikely. The use of this approach, then, in isolation of other analyses may not be as informative as other alternatives.

The first alternative, creating a new variable from the two existing ones, was not viable. Although the correlations indicated a substantial amount of empirical redundancy between the variables in question, conceptually the variables were distinct. The high correlation, in this case, did not indicate that the variables represent the same phenomenon conceptually. Clearly, this was the case since the interaction was the product of both uncertainty and POV; a more plausible interpretation, based on the magnitude of the correlations, would be that the effect of uncertainty level was stronger than that of POV in the interaction term. For these reasons, this alternative was rejected.

The second alternative, however, appeared to be too liberal. Berry and Feldman (1985), for instance, argue that under circumstances of severe collinearity a feasible alternative is to employ what they call "joint hypothesis tests," in which the individual significance tests associated with the correlated variables are tested together through the F-test rather than the individualized t-statistic accompanying each regression coefficient. The logic underlying this approach is that because a high level of collinearity will inevitably produce biased and unreliable estimators, increasing the likelihood that individual regression coefficients may be statistically insignificant, the overall F-statistic

may be a more accurate representation of the variables under study. In the present study, this would mean that POV and uncertainty level as well as the cross-product interaction term would be entered into each analysis simultaneously and the associated F -statistic assessed for significance.⁸ A potential problem with conducting joint hypothesis tests, however, is that, because they examine the main effects and their interaction simultaneously, significance tests may overestimate the contribution of the cross-product interaction term. This is in direct contrast to the “standard” approach described above of partialling the main effects first and then assessing the interaction, which in the present study, would clearly underestimate its contribution. As a result, this approach was also rejected.

Hypothesis 7 was, therefore, assessed in the following manner. First, both POV and uncertainty level were centered. Cohen and Cohen (1983) recommend the use of centering, which involves subtracting each participant’s score on a given variable from its overall mean (median or mode) and then conducting the analysis on the resulting values, as a means of minimizing multicollinearity. Second, for each of the relational and communicative factors, hierarchical regression analysis was conducted entering each of the centered main effects in separate steps followed by the interaction cross-product term to assess the relative contribution of each. Both POV and uncertainty level were coded such that higher scores indicated a more positive POV and lower levels of uncertainty. Therefore, the presence of a statistically significant F -statistic associated with the cross-product interaction term, within the context of the previous discussion, provided support

for a prediction. A second, complementary supplemental analysis was also conducted to bolster confidence in the accuracy of these results.

Researchers have voiced concerns that Cohen and Cohen's (1983) recommendation of testing the cross-product interaction term, as described above, may only test one form of a linear interaction (see, for example, Darlington, 1990; Jaccard, Turrisi, & Wan, 1990). For instance, Jaccard et al. (1990) argued that an analysis yielding a non-significant cross-product term might not reflect the absence of a statistically significant interaction as much as the presence of an alternative form. As such, employing separate bivariate analyses for different levels of one predictor (e.g., positive versus negative POV) while assessing the moderating effect of the other and then testing for statistically significant differences between the slopes of each should increase confidence that the results obtained from the hierarchical analysis accurately reflect the data.

The present analysis regressed each relational and communicative factor on uncertainty level in a series of analyses separately for conditions of positive and negative POV, resulting in 16 separate bivariate regressions. The resulting slopes were then tested for statistically significant differences. Since each within-condition analysis employed only one predictor, a comparison of standardized slopes (i.e., beta coefficients) would be equivalent to comparing correlation coefficients, the patterns of which hypothesis 7 was predicated upon; a test of the standardized coefficients rather than the unstandardized ones should nevertheless yield equivalent results. A point that should not be lost in this analysis is that POV makes no claims about whether or not the difference in the pattern of associations between uncertainty level and each of the relational and communicative

factors should be statistically significant as a function of POV valence. Rather, the theory simply predicts that the pattern of associations will be different as a function of POV valence.

Hypothesis 7 received some support. Table 6 summarizes the results of each regression analysis assessing the effect of POV, uncertainty level, and their interaction cross-product term. Table 6 indicates that of the eight analyses conducted, only one produced a significant coefficient of determination for the interaction term; the interaction term accounted for 10% of the variance in the information seeking strategy of self-disclosure. The first step, which entered POV into the analysis, restated the results of hypothesis 6 illustrating the strong impact of POV on six of the relational and communicative factors. The next step entered uncertainty level and produced two significant coefficients of determination. Uncertainty level accounted for significant amounts of variance in both the amount of communication contributed (7%) as well as the intimacy of the communication content (10%). The aforementioned lack of statistically significant effects for the interaction cross-product, however, should be interpreted tenuously.

The supplemental bivariate regression analyses yielded further support for hypothesis 7. As recommended by Sunnafrank (1990), categories for both positive and negative POVs were created by recoding POV scores such that scores of 37 and above were coded as the positive outcome value group ($n = 54$) while those of 33 and below

Table 6

Summary of Hierarchical Regression Analyses for Predicting Relational and Communicative Factors from Predicted Outcome Value, Uncertainty Level, and their Interaction (N = 80)

Criterion	Step 1: <u>Predicted Outcome Value</u>			Step 2: <u>Uncertainty Level</u>			Step 3: <u>Interaction Term</u>		
	β	R^2	$F(1, 78)$	β	R^2	$F(1, 77)$	β	R^2	$F(1, 76)$
Amount of communication contributed	.22	.05	4.12*	.27	.07	5.72*	-.03	.00	.09
Intimacy of communication content	.32	.10	9.07**	.34	.10	9.72**	.03	.00	.10
Partner affiliative expressiveness	.63	.40	51.60***	.06	.00	.35	.03	.00	.08
Self affiliative expressiveness	.48	.23	23.14***	.13	.01	1.42	.11	.01	1.28
Information seeking strategies									
Interrogation	.05	.00	.18	-.05	.00	.15	-.19	.04	2.89
Self-disclosure	.15	.02	1.90	.12	.01	.94	-.32	.10	8.77**
Relaxation of target	.27	.07	6.18*	.20	.04	3.08	-.11	.01	.99
Liking	.58	.34	39.66***	-.03	.00	.07	.13	.02	2.00

Notes: R^2 -values and F-values reported for the second and third steps reflect the incremental changes associated with each.

* $p < .05$. ** $p < .005$. *** $p < .001$.

were assigned to the negative outcome value group ($n = 21$); 5 participants were coded as neutral and eliminated from this portion of the analysis.⁹ These groupings were used for the remaining analyses including those conducted for research question 3 and hypothesis 8.

Table 7 reflects the results of the bivariate regression analyses conducted as a function of POV valence and the comparisons between standardized slopes. Of the eight relational and communicative factors examined in the analysis, five produced a significant effect for uncertainty level under conditions of positive POV. The analyses examining the amount of communication contributed, intimacy of communication content, partner affiliative expressiveness, self affiliative expressiveness, and liking provided support for the role of uncertainty level under positive POV. Uncertainty level, coded so that higher scores indicated reduced uncertainty, was significantly associated with a greater amount of communication, intimacy level of the communication content, self global affiliative expressiveness, partner global affiliative expressiveness, and liking when the POV was positive. In each case, the magnitude of the association between uncertainty level and the criterion, under positive POV, clearly exceeded the same association under negative POV, although only two of the five comparisons between their respective standardized slopes were statistically significant (see Table 7). Only the slopes associated with self affiliative expressiveness, $z = 1.99$, $p < .05$, and liking, $z = 1.82$, $p < .05$, differed as a function of POV valence. The remaining three comparisons approached significance ($p < .15$), and the inability of the test to detect a significant difference may

Table 7

Summary of Slope Comparisons from Bivariate Regression Analyses Predicting
Relational and Communicative Factors from Uncertainty Level by Predicted Outcome
Value Valence

Criterion	Predicted Outcome Value		z-test Value
	Positive (n = 54)	Negative (n = 21)	
Amount of communication contributed	.39**	.08	1.21
Intimacy of communication content	.45***	.20	1.03
Partner affiliative expressiveness	.33*	-.05	1.43
Self affiliative expressiveness	.40***	-.12	1.99*
Information seeking strategies			
Interrogation	-.13	.08	-.77
Self-disclosure	-.05	.53*	-2.33**
Relaxation of target	.17	.43*	-1.05
Liking	.24*	-.25	1.82*

* $p < .05$; ** $p < .005$; *** $p < .001$.

be more of a reflection of low statistical power rather than of magnitude of difference between the slopes.

Contrary to the prediction, however, under conditions of negative POV, two of the analyses yielded a significant effect for uncertainty level. As shown in Table 7, the analyses involving the information seeking strategies of self-disclosure and target relaxation indicated that uncertainty level was a significant predictor of each under negative POV conditions. The results suggest that, even under conditions of a negative POV, information seeking, in the form of self-disclosure and target relaxation, is strongly related to uncertainty level such that increased information seeking is associated with reduced uncertainty. Only the comparison of standardized slopes for uncertainty level associated with self-disclosure produced a significant difference, $z = -2.33$, $p < .05$. The difference between the slopes for uncertainty level associated with relaxation of target approached statistical significance ($p < .15$).

Research Question 3

The third research question asked about the role of outcome certainty in the relationship between POV and (a) the amount of communication, (b) intimacy level of the communication content, (c) global affiliative expressiveness, (d) information seeking, and (e) liking. This research question was analyzed in a manner similar to that used for hypothesis 7, specifically through a series of regression analyses examining the interaction cross-product term of POV and uncertainty level after partialling the main effects of each from the criterion under examination. Initial analysis again revealed a high level of collinearity between the independent variables and the interaction term. POV,

Table 8

Summary of Hierarchical Regression Analyses for Predicting Relational and Communicative Factors from Predicted Outcome Value, Outcome Value Certainty, and their Interaction (N = 80)

Criterion	Step 1: Predicted Outcome Value			Step 2: Outcome Value Certainty			Step 3: Interaction Term		
	β	R^2	$F(1, 78)$	β	R^2	$F(1, 77)$	β	R^2	$F(1, 76)$
Amount of communication contributed	.22	.05	4.12*	.22	.08	7.05*	.29	.04	4.08*
Intimacy of communication content	.32	.10	9.07**	-.07	.01	.42	-.05	.00	.18
Partner affiliative expressiveness	.63	.40	51.60***	.05	.00	.30	-.01	.00	.01
Self affiliative expressiveness	.48	.23	23.14***	.27	.07	7.94*	-.24	.05	5.64*
Information seeking strategies									
Interrogation	.05	.00	.18	.17	.03	2.29	-.20	.04	2.89
Self-disclosure	.15	.02	1.90	.03	.00	.07	-.04	.00	.10
Relaxation of target	.27	.07	6.18*	.05	.00	.24	-.06	.00	.25
Liking	.58	.34	39.66***	-.15	.02	2.76	-.03	.00	.10

Notes: R^2 -values and F-values reported for the second and third steps reflect the incremental changes associated with each.

* $p < .05$. ** $p < .005$. *** $p < .001$.

$r(78) = .84, p < .001$, and outcome value certainty, $r(78) = .66, p < .001$, were both significantly correlated with the interaction term. Therefore each predictor was centered prior to the analysis, and the centered predictors were then used to create the cross-product interaction term. Hierarchical analysis was again used to assess the contribution of each predictor to the overall model, followed up with separate bivariate analyses based upon POV valence.

Table 8 presents a summary of the hierarchical regression analyses. Overall, two of the eight analyses yielded significant coefficients of determination for outcome value certainty. Specifically, outcome value certainty was a significant predictor of the amount of communication contributed, $\beta = .22, R^2\text{-change} = .08, F\text{-change}(1,77) = 7.05, p < .05$, and self affiliative expressiveness, $\beta = .27, R^2\text{-change} = .07, F\text{-change}(1,77) = 7.94, p < .05$. For each of these analyses, however, the POV by outcome value certainty interaction also emerged statistically significant. The interaction cross-product term between POV and outcome value certainty was a significant predictor of the amount of communication contributed, $\beta = .29, R^2\text{-change} = .04, F\text{-change}(1,76) = 4.08, p < .05$, and self affiliative expressiveness, $\beta = -.25, R^2\text{-change} = .05, F\text{-change}(1,76) = 5.64, p < .05$. The only other analysis in which the interaction approached significance involved the information seeking strategy of interrogation, $\beta = -.20, R^2\text{-change} = .04, F\text{-change}(1,76) = 2.89, p = .09$. Similarly, outcome value certainty approached significance in only one other analysis, that involving liking, $\beta = -.15, R^2\text{-change} = .02, F\text{-change}(1,77) = 2.76, p = .10$. Table 9 reflects the standardized slopes associated with outcome value certainty and each of the communicative and relational factors as a function of POV valence. The

Table 9

Summary of Slope Comparisons from Bivariate Regression Analyses Predicting
Relational and Communicative Factors from Outcome Value Certainty by Predicted
Outcome Value Valence

Criterion	Predicted Outcome Value		z-test Value
	Positive (n = 54)	Negative (n = 21)	
Amount of communication contributed	.30*	.36*	-.25
Intimacy of communication content	-.01	-.02	.04
Partner affiliative expressiveness	.24*	-.08	1.19
Self affiliative expressiveness	.36**	.50*	-.63
Information seeking strategies			
Interrogation	.43**	.07	1.42
Self-disclosure	.11	.11	.18
Relaxation of target	.13	.22	-.34
Liking	-.02	-.27	.94

* $p < .05$; ** $p < .005$.

results indicate that under both positive and negative POV conditions, outcome value certainty was a significant predictor of the amount of communication contributed and self-affiliative expressiveness, whereas it was a significant predictor of partner affiliative expressiveness only under the positive condition. The only other association to approach significance was that between outcome value certainty and liking under the negative outcome value condition ($p < .15$). Subsequently, the z -tests comparing the standardized slopes failed to produce any statistically significant differences; the only comparisons approaching significance were the standardized slopes associated with partner affiliative expressiveness, $z = 1.19$, $p = .12$, and interrogation, $z = 1.42$, $p = .08$. As discussed under hypothesis 7, however, the lack of statistical significance is likely a function of low statistical power rather than the magnitude of differences between these slopes given the dichotomization of POV in order to conduct these tests (Pedhazur, 1997).

Hypothesis 8

Hypothesis 8 was designed to replicate and extend Walther and Burgoon's (1992) research on relational development in mediated interactions by assessing the role of POV and its associated certainty over two interactions. This hypothesis was also designed to extend POV beyond initial interactions and assess its effect on subsequent interactions. Hypothesis 8 predicted that socially-oriented relational development differs as a function of the POV derived from initial interactions and the degree of certainty associated with it. This prediction was tested through a pair of $2 \times 2 \times 2$ mixed-model MANOVAs followed up with examinations of the accompanying ANOVAs with POV and outcome value certainty as the between-subjects factors and time as the within-subjects factor.

Categories for each of the independent variables were created in the manner described under hypothesis 7, and each dimension of the RCS was treated as a dependent variable (immediacy/affection, similarity/depth, receptivity/trust, equality, task-social orientation, composure, formality, attempted influence, and dominance).

Since the RCS dimensions were expected to correlate with each other (see Table 10), results from both multivariate and univariate analyses are reported below for the following reasons. First, multivariate analysis does not protect against the occurrence of Type I error, whose likelihood is increased when composites of correlated measures are analyzed. Second, significant univariate effects may go undetected in the absence of a significant multivariate effect (Keppel, 1991). This situation may lead to Type II errors by producing an incomplete picture involving the hypothesis or research question being assessed. Third, theoretical interest dictated that univariate analysis be conducted. Univariate analysis was conducted along the same dimensions used by Walther and Burgoon (1992) in order to make comparisons between those findings and the ones produced by the present study.

Support for hypothesis 8 required the presence of a significant interaction between POV and outcome value certainty for a given test. Overall, Table 10 indicates the existence of two clusters of conceptually and empirically related relational dimensions. The first cluster consisted of seven interrelated variables, composed of the intimacy theme (immediacy/affection, similarity/depth, and receptivity/trust) along with equality, task-social orientation, composure, and formality (average $r = .59$). The

Table 10

Intercorrelations between Relational Communication Scale Dimensions (N = 80)

Dimension	1	2	3	4	5	6	7	8	9
1. Immediacy/Affection	--								
2. Similarity/Depth	.67	--							
3. Receptivity/Trust	.77	.78	--						
4. Equality	.68	.67	.70	--					
5. Task-Social Orientation	.61	.55	.53	.52	--				
6. Composure	.73	.70	.64	.57	.43	--			
7. Formality	.41	.37	.37	.37	.48	.31	--		
8. Attempted Influence	-.14	-.08	-.04	-.30	-.29	-.08	-.12	--	
9. Dominance	-.39	-.36	-.31	-.59	-.52	-.28	-.25	.74	--

Note: Correlations are for dimensions collapsed across the two interactions.

second grouping consisted of dominance and attempted influence ($r = .74$). As a result, each composite was analyzed with a MANOVA. Results associated with each dimension of the RCS are discussed below, with multivariate results for composites presented first followed by results associated with each individual dimension. When appropriate, tests were corrected for heterogeneity of variance. Means and standard deviations associated with each dimension are reported in Table 11.

Multivariate analysis of immediacy/affection, similarity/depth, receptivity/trust, equality; task-social orientation, composure, and formality. Bartlett's test of sphericity ($\chi^2 = 753.77, p < .001$) confirmed the decision to treat the seven variables as a composite. The MANOVA for this cluster produced three significant multivariate effects. Main effects emerged for both POV, $F(1, 71) = 42.67, p < .001, \text{Wilks' } \lambda = .63$, and time, $F(1, 71) = 6.68, p = .01, \text{Wilks' } \lambda = .91$. However, a significant POV by time interaction also emerged, $F(1, 71) = 9.69, p < .005, \text{Wilks' } \lambda = .88$. No other multivariate effects were produced for outcome value certainty or interactions involving it. The univariate tests were examined next.

Immediacy/affection. Results associated with the accompanying univariate tests for this dimension indicated the presence of a main effect for time, $F(1, 71) = 17.98, p < .001, \eta^2 = .20$, such that immediacy/affection increased across all conditions from time 1 ($M = 4.93, S.D. = 1.42$) to time 2 ($M = 5.47, S.D. = 1.18$). A significant main effect for POV, $F(1, 71) = 42.53, p < .001, \eta^2 = .38$, was also produced indicating that those in the positive POV condition ($M = 5.63, S.D. = 1.00$) reported higher levels of

Table 11
Means (and Standard Deviations) of Relational Communication Scale Dimensions by
Predicted Outcome Value Valence and Outcome Value Certainty Level

Dimension	Predicted Outcome Value			
	Positive ($n = 54$)		Negative ($n = 21$)	
	HOVC ($n = 25$)	LOVC ($n = 29$)	HOVC ($n = 7$)	LOVC ($n = 14$)
Immediacy/Affection				
Time 1	5.56 (.98)	5.50 (1.03)	3.71 (1.18)	3.20 (1.14)
Time 2	5.85 (.88)	5.58 (1.15)	4.54 (1.37)	4.93 (1.37)
Similarity/Depth				
Time 1	5.60 (.98)	5.49 (.96)	3.73 (1.09)	3.36 (1.29)
Time 2	5.66 (.91)	5.43 (1.16)	4.39 (1.38)	4.82 (1.32)
Receptivity/Trust				
Time 1	5.23 (1.02)	5.13 (1.02)	3.29 (1.28)	3.38 (1.41)
Time 2	5.22 (.90)	5.28 (1.24)	3.81 (1.54)	4.02 (1.07)
Equality				
Time 1	6.26 (.79)	6.26 (.86)	4.21 (1.32)	4.57 (1.30)
Time 2	5.93 (1.37)	6.26 (.97)	4.43 (1.84)	5.32 (1.22)
Task-Social Orientation				
Time 1	4.97 (.99)	4.63 (.98)	3.96 (1.22)	3.30 (.95)
Time 2	4.54 (.81)	4.31 (1.26)	4.32 (.84)	3.45 (.92)
Composure				
Time 1	5.78 (.75)	5.20 (1.01)	3.91 (.88)	4.19 (1.44)
Time 2	5.48 (.88)	5.56 (.96)	4.38 (1.24)	5.12 (1.21)
Formality				
Time 1	5.35 (.97)	5.30 (1.06)	5.57 (1.02)	4.25 (1.24)
Time 2	5.16 (1.01)	5.18 (1.26)	5.71 (1.07)	4.29 (1.24)
Attempted Influence				
Time 1	2.69 (1.13)	2.84 (.86)	4.07 (.57)	2.75 (1.24)
Time 2	3.42 (1.36)	3.64 (1.31)	4.14 (1.04)	3.91 (1.47)
Dominance				
Time 1	2.40 (1.20)	2.88 (1.31)	4.29 (1.50)	3.21 (2.02)
Time 2	2.69 (1.56)	2.80 (1.46)	3.64 (.56)	3.57 (1.80)

Notes: "HOVC" represents high outcome value certainty; "LOVC" represents low outcome value certainty.

immediacy/affection than did those in the negative outcome value condition ($\underline{M} = 4.09$, $\underline{S.D.} = 1.25$) across both time periods. An additional POV by time ordinal interaction, $\underline{F} (1,71) = 9.98$, $p < .005$, $\eta^2 = .12$, was also produced but allowed for the main effects to be interpreted unambiguously. The pattern of the cell means associated with the interaction suggested that the interaction centered on the time 1 negative POV cell ($\underline{M} = 3.37$, $\underline{S.D.} = 1.15$), the lowest level of immediacy/affection, which differed from the remaining cells, time 2 negative POV cell ($\underline{M} = 4.78$, $\underline{S.D.} = 1.35$), time 1 positive POV cell ($\underline{M} = 5.53$, $\underline{S.D.} = 1.00$), and the time 2 positive POV cell ($\underline{M} = 5.73$, $\underline{S.D.} = 1.01$).

None of the tests involving outcome value certainty produced significant results. Tests examining the main effect for outcome value certainty, $\underline{F} (1,71) = .24$, $p > .05$, power = .08, two-way interactions between outcome value certainty and POV, $\underline{F} (1,71) = .05$, $p > .05$, power = .06, and outcome value certainty and time, $\underline{F} (1,71) = 1.02$, $p > .05$, power = .17, or the three-way interaction between POV, outcome value certainty, and time, $\underline{F} (1,71) = 2.65$, $p > .05$, power = .36, were not significant.

Similarity/depth. The results associated with this dimension paralleled those reported for immediacy/affection and also produced two significant main effects and an accompanying significant two-way interaction. The significant POV by time interaction associated with this dimension, $\underline{F} (1,71) = 10.87$, $p < .005$, $\eta^2 = .13$, indicated that this interaction also centered on the time 1 negative POV cell ($\underline{M} = 3.48$, $\underline{S.D.} = 1.21$). The pattern of the means suggested that participants who came away from their first interaction with a negative POV reported lower levels of similarity/depth than they did after the second interaction ($\underline{M} = 4.68$, $\underline{S.D.} = 1.32$) or did those in the positive POV

condition after either the first ($M = 5.55$, $S.D. = .96$) or second ($M = 5.55$, $S.D. = 1.03$) interaction. A significant main effect was also produced for time, $F(1,71) = 10.81$, $p < .005$, $\eta^2 = .13$, such that participants reported increased similarity/depth regardless of their POV condition from time 1 ($M = 4.97$, $S.D. = 1.39$) to time 2 ($M = 5.31$, $S.D. = 1.18$), and for POV condition, $F(1,71) = 36.77$, $p < .001$, $\eta^2 = .34$. As expected, participants in the positive POV condition ($M = 5.55$, $S.D. = 1.00$) reported higher levels of similarity/depth than did those in the negative POV condition ($M = 4.08$, $S.D. = 1.00$).

None of the tests associated with outcome value certainty produced significant results. Tests examining the main effect for outcome value certainty, $F(1,71) = .09$, $p > .05$, power = .06, the two-way interactions between outcome value certainty and POV, $F(1,71) = .18$, $p > .05$, power = .07, and outcome value certainty and time, $F(1,71) = 1.09$, $p > .05$, power = .18, or the three-way interaction between POV, outcome value certainty, and time, $F(1,71) = 2.03$, $p > .05$, power = .29, were not significant.

Receptivity/trust. A main effect for POV, $F(1,71) = 42.79$, $p < .001$, $\eta^2 = .38$, was the only significant test result associated with this dimension. Participants in the positive POV condition ($M = 5.22$, $S.D. = 1.04$) reported higher levels of receptivity/trust than did those in the negative condition ($M = 3.65$, $S.D. = 1.28$). The only other test approaching significance examined a main effect for time, $F(1,71) = 3.31$, $p = .07$, power = .44. Tests examining a main effect for outcome value certainty, all two-way interactions, and the three-way POV, outcome value certainty, and time interaction did not approach significance ($p > .10$).

Equality. Univariate tests associated with this dimension produced a significant main effect for POV, $F(1,71) = 35.85$, $p < .001$, $\eta^2 = .34$, accompanied by a significant two-way interaction between POV and time, $F(1,71) = 4.03$, $p < .05$, $\eta^2 = .05$. The pattern of the means associated with the interaction indicated that participants in the positive POV condition perceived a slight decrease in equality from time 1 ($M = 6.26$, $S.D. = .81$) to time 2 ($M = 6.08$, $S.D. = 1.20$) while those in the negative condition reported an increase from time 1 ($M = 4.45$, $S.D. = 1.28$) to time 2 ($M = 5.02$, $S.D. = 1.47$). Overall, though, the positive POV condition ($M = 6.17$, $S.D. = 1.01$) reported higher levels of equality than did those in the negative condition ($M = 4.74$, $S.D. = 1.38$) as indicated by the significant main effect. All other tests failed to produce significant results ($p > .10$).

Task-social orientation. This dimension was coded such that higher scores indicated a more social orientation towards the interaction and one's partner. Significant main effects for both POV, $F(1,71) = 15.55$, $p < .001$, $\eta^2 = .18$, and outcome value certainty, $F(1,71) = 5.93$, $p < .05$, $\eta^2 = .08$, along with a two-way POV by time interaction, $F(1,71) = 3.85$, $p < .05$, $\eta^2 = .05$, were produced by the univariate tests associated with this dimension. Inspection of the cell means associated with the interaction indicated a pattern similar to that described above for the equality dimension. The pattern indicated that participants in the positive POV condition perceived a slight decrease in their partner's social orientation from time 1 ($M = 4.82$, $S.D. = .99$) to time 2 ($M = 4.44$, $S.D. = 1.04$) while those in the negative condition reported a slight increase from time 1 ($M = 3.52$, $S.D. = 1.07$) to time 2 ($M = 3.74$, $S.D. = .97$). Consistent with the main effect for POV, participants in the positive POV condition ($M = 4.63$, $S.D. = 1.01$) reported their partners as having a more

social orientation than did those in the negative condition ($M = 3.63$, $S.D. = 1.02$). Participants in the high outcome value certainty condition ($M = 4.64$, $S.D. = .95$) also perceived their partner to be more socially-oriented than did those in the low outcome value certainty condition ($M = 4.08$, $S.D. = 1.18$). No other tests produced significant results.

Composure. The ANOVA associated with the composure dimension produced two significant main effects as well as two significant interactions. A main effect for time, $F(1,71) = 8.39$, $p < .005$, $\eta^2 = .11$, indicated that participants perceived that their partners communicated increased levels of composure from time 1 ($M = 5.12$, $S.D. = 1.20$) to time 2 ($M = 5.34$, $S.D. = 1.05$). The second main effect involved POV, $F(1,71) = 21.52$, $p < .001$, $\eta^2 = .23$, and showed that participants in the positive POV condition ($M = 5.52$, $S.D. = .91$) also perceived higher levels of composure than did those in the negative condition ($M = 4.49$, $S.D. = 1.25$). These main effects, however, had to be tempered by the accompanying interactions. The first interaction, a POV by time interaction, $F(1,71) = 7.05$, $p < .01$, $\eta^2 = .09$, was the result of the negative POV condition. While the means associated with the positive condition were consistent across time (time 1: $M = 5.51$, $S.D. = .92$; time 2: $M = 5.52$, $S.D. = .91$), the means associated with the negative condition indicated that those participants perceived an increase in composure from time 1 ($M = 4.10$, $S.D. = 1.26$) to time 2 ($M = 4.87$, $S.D. = 1.24$), although as indicated above, their overall level was still significantly less than those in the positive condition. The second interaction, outcome value certainty by time, $F(1,71) = 4.83$, $p < .05$, $\eta^2 = .06$, was more difficult to interpret. The cell means indicated that, for the high outcome value certainty

condition, the mean for time 1 ($M = 5.42$, $S.D. = 1.07$) was greater than that for time 2 ($M = 5.27$, $S.D. = 1.04$), illustrating a decreased perception of composure over time. The opposite pattern was apparent for the low outcome value certainty condition; the mean for time 1 ($M = 4.84$, $S.D. = 1.26$) was less than that for time 2 ($M = 5.40$, $S.D. = 1.06$), indicating an increased perception of composure. None of the remaining tests were significant.

Formality. This dimension was coded such that higher scores indicated less formality. Tests of this hypothesis produced two significant results. A significant main effect was produced for outcome value certainty, $F(1,71) = 7.22$, $p < .01$, $\eta^2 = .09$, and indicated that the high outcome value certainty condition ($M = 5.33$, $S.D. = 1.00$) perceived less formality than did the low outcome value certainty ($M = 4.98$, $S.D. = 1.27$). This main effect, however, had to be qualified by the significant POV by outcome value certainty interaction, $F(1,71) = 7.01$, $p < .01$, $\eta^2 = .09$. The cell means indicated that perceptions of formality were fairly consistent for outcome value certainty within the positive POV condition (high: $M = 5.26$, $S.D. = .99$; low: $M = 5.24$, $S.D. = 1.16$), while the high outcome value certainty cell ($M = 5.64$, $S.D. = 1.05$) indicated a higher level of formality than did the low outcome value certainty cell ($M = 4.27$, $S.D. = 1.24$) within the negative condition. The pattern of means suggests that, at least for the formality dimension, outcome value certainty exerts an influence in the presence of negative POVs but not when said values are positive.

Multivariate analysis of attempted influence and dominance. Bartlett's test of sphericity ($\chi^2 = 134.82$, $p < .001$) was significant, verifying that it was acceptable to treat

attempted influence and dominance as a composite. The results of the multivariate analysis produced only one significant main effect. A multivariate effect for POV, $F(1, 71) = 7.92$, $p < .01$, Wilks' $\lambda = .90$, was the only significant result to emerge from this test. Outcome value certainty, time, and all two-way and three-way interactions failed to produce any significant multivariate effects, with time being the only other factor to approach significance ($p < .10$).

Attempted influence. The accompanying univariate tests associated with attempted influence produced two significant main effects. The main effect for time, $F(1, 71) = 15.39$, $p < .001$, $\eta^2 = .18$, indicated that attempted influence increased over time across all conditions (time 1: $M = 2.88$, $S.D. = 1.08$; time 2: $M = 3.65$, $S.D. = 1.34$). The second main effect was for POV, $F(1, 71) = 4.51$, $p < .05$, $\eta^2 = .06$. The means associated with each condition showed participants in the positive POV condition ($M = 3.14$, $S.D. = 1.17$) perceived that their partners communicated less of this dimension than did those in the negative condition ($M = 3.59$, $S.D. = 1.27$). The interactions between outcome value certainty and time as well as between POV and outcome value certainty were the only other tests to approach significance ($p = .10$).

Dominance. The ANOVA associated with dominance produced only one significant main effect. The results indicated that participants in the positive POV condition ($M = 2.68$, $S.D. = 1.38$) perceived their partners to be significantly less dominant than those in the negative condition ($M = 3.58$, $S.D. = 1.69$), $F(1, 71) = 9.27$, $p < .005$, $\eta^2 = .12$. No other tests approached significance.

CHAPTER 4

DISCUSSION

Summary of Research Findings

The primary purpose of the present study was to propose and test a model of relationship development in mediated environments. The model was based on theory and research examining the principle of inter-activity (Burgoon, Bonito et al., 1999), POV theory (Sunnafrank, 1986, 1990), and SIP theory (Walther & Burgoon, 1992; Walther, 1996). In addition, the concept of outcome value certainty was introduced in order to account for differences in judgments made during initial mediated interactions. The results of the present study provided empirical support for the proposed model.

Data examining predictions based on the principle of inter-activity provided strong support for the role of the experiential properties in socially-oriented mediated interactions. While the structural features examined in the present study (media and information richness, mediation) had a marginal impact overall on the individual experiential properties (involvement, mutuality, and individuation), one significant multivariate effect did surface, indicating that differences in media and information richness may be an important influence on the degree of involvement and mutuality experienced in mediated interactions. In turn, each experiential property proved to be important in the process of arriving at a POV. These findings were particularly important since previous research on POV had only established its role in relation to relational and communicative factors after interactants had derived their outcome value; no previous studies to date have examined process factors that may influence POVs.

Similarly, predictions derived from POV theory received strong support with most of the predicted associations surfacing as expected. Only the association involving one of the three information-seeking strategies (interrogation) failed to produce the proposed positive relationship with POV. Further clarification of the role of POV was provided by the correlations between uncertainty level and the relational and communicative factors as a function of POV valence. The pattern of the correlations was as predicted, with uncertainty level strongly associated with most of the aforementioned factors under conditions of a positive POV. On the other hand, counter to the prediction, uncertainty level was strongly associated with two of the information-seeking strategies (self-disclosure, relaxation of target) under conditions of a negative POV.

POV also surfaced as a potent predictor of relational development within the context of social information processing theory (Walther & Burgoon, 1992; Walther, 1996). The general pattern of findings indicated that initial interactions producing positive POVs resulted in more developed relationships across the nine relational dimensions examined than did those producing negative ones. A consistent significant effect for time across most of the relational dimensions provided support for the general framework set forth by Walther and Burgoon (1992), although some of the data suggests that subsequent interaction may benefit the negative POV group more than the positive outcome value group.

The data also suggest that the role of outcome value certainty may be an important one in initial mediated interactions. As predicted, more developed impressions were positively associated with more outcome value certainty. Furthermore, the more extreme

the POV, the more certain interactants reported they were of their judgment. This was also reflected in its association with the relational and communicative factors under conditions of positive and negative POVs, although the only difference in the pattern of correlations was its significant association with partner affiliative expressiveness under the positive POV condition. On the other hand, the importance of outcome value certainty appears to lessen over time. The data associated with the nine relational dimensions failed to produce any consistent significant findings regarding its role or continued importance in relational development.

The overall results indicate that the extent to which involvement, mutuality, and individuation are produced in mediated interactions has important implications for the POV arrived at by interactants as well as the certainty with which that outcome value is held. Furthermore, that outcome value is predictive of whether or not interactants will engage in a host of relational and communicative behaviors and, ultimately, how (or even whether or not) the relationship will develop. As such, the data provided substantial support for the proposed model and extends each of the aforementioned conceptual frameworks in unique and theoretically interesting directions. A detailed discussion of the implications of the findings for each theoretical framework follows.

Implications

Principle of Inter-activity

The Role of Structural Features. The principle of inter-activity argues that comparisons between Ftf and mediated communication formats should center on the features of each rather than on the overall format itself. The present study examined two

such features, specifically media and information richness and mediation, and their role in socially-oriented mediated interactions. The use of mediation did not produce a reduced sense of each property of interest. In fact, the data suggest that mediation played a minimal role in the present study. The use of mediation did not result in any significant decrements in the ability of participants to experience involvement, perceive mutuality, or develop an impression of their partner at a level that approximated Ftf interaction. In fact, in three of the comparisons, participants in at least one of the mediated conditions reported levels exceeding those reported by interactants in the Ftf condition. Consistent with research by Montes (1992) and others (e.g., Chilcoat & Dewine, 1985; Walther, 1996), the data suggest that the type of communication occurring over a format may be more important than the format itself.

The present study does provide some support for the role of media and information richness. While increased media and information richness did not produce incrementally higher levels of involvement, mutuality, or individuation, one noteworthy exception did surface. The contrast comparing the audio-only condition to the text-only condition produced a significant multivariate effect across the combination of empirical indicators of involvement and mutuality; across the four measures, interactants in the audio-only condition reported higher levels of involvement and mutuality than did those in the text-only condition. This finding is particularly important because of the conditions involved, specifically the two leanest formats examined in the present study. A brief examination of each one illustrates that they differ in important ways, which may have contributed to these findings.

The use of an audio-only, or audioconferencing, communication format allows interactants to still have access to some important facets of Ftf interaction, which for the most part are unavailable or occur more slowly in text-only formats. For instance, access to audio information likely allowed interactants in the present study to establish faster behavioral synchronization, provide immediate backchanneling cues, and engage in quicker turn-taking than would occur in a text-only condition; prior research in nonverbal communication has identified these factors as central to communicating interest, involvement, and mutuality in Ftf interactions (see, for example, Burgoon et al., 1996). Audio-only interactants were also able to avoid some of the drawbacks associated with Ftf interaction, and videoconferencing for that matter, by having the added advantage of not having to visually monitor their partners. Furthermore, they could also be less self-conscious during the interaction than those using richer communication formats (videoconferencing or Ftf), allowing them to focus more on the interaction at hand and direct more attention to their partner's messages. While the latter point can also be made about text-only formats, speaking is undeniably a different mode of communicating than is typing. In other words, the method used to enter messages into the system, in this case the interaction, is of a fundamentally different kind, not just degree.

Similarly, the audio-only condition may represent a media and information richness "threshold," which enabled interactants in the present study to communicate in a manner that approximates Ftf and requires similar conversational management resources and effort level. Below this threshold, however, interactants have to draw upon a different set of cognitive and behavioral resources (i.e., those used in reading and writing versus

listening and speaking) in order to successfully manage their interaction. It is important to note that while studies have traditionally treated text-only formats as one end of a linear continuum of media and information richness, as in the theories represented by the cues filtered out perspective, for these reasons it may be better represented as a departure from other communication formats.

The fact that no differences were produced for individuation is particularly noteworthy. On the surface it would appear that more cues should logically produce a more developed impression of another. That is, the cues should serve as the basis for attributions, which in turn produce the perception of a more developed impression. The data do not fully support this logic. In fact, the data suggest that while individuals in the Ftf condition reported the second highest level of impression development, it was the text-only condition that produced the most developed impression overall with the audio-only condition and the audiovisual, or videoconferencing, condition following Ftf.

On the other hand, the data do provide support for Walther's (1996) hyperpersonal perspective and Lea and Spears' (1992, 1995) SIDE model, which contend that in the absence of nonverbal cues, the cues that are available in a given communication format take on greater importance. It appears that interactants using leaner media may, as Walther (1996) points out, engage in attribution processes geared towards filling in missing information about their partners to a greater extent than do those using richer communication formats. In text-based formats, the written word takes on added importance. Early research by Asch (1946) lends credence to this speculation. His study on impression formation examined how slight changes in the words used for self-

description significantly altered perceptions. His findings showed that traits like “warm” and “cold” tend to be perceived as central traits by receivers and are used as the basis for attributional processes. This process allows interactants to act as cognitive misers (Fiske & Taylor, 1991) and draw conclusions about their partners with only limited information. The result is that interactants perceive they have a more developed sense of their partner as an individual.

Certain factors, however, may have also played a role in neutralizing the influence of the richer communication formats on individuation. First, the presence of more and richer social information provided by a format does not insure that it will be used or even needed during an interaction. The first interaction was not complex in nature and could have just as easily been conducted over any of the communication formats used in the present study with equal effectiveness. Recall that interactants were paired with same-sex partners rather than cross-sex ones, reducing the importance of some judgments of physical attractiveness. While some scholars have argued that physical attractiveness is an important predictor of relational development (e.g., Berscheid & Walster, 1983), it should be particularly important in initial interactions among cross-sex dyads rather than same-sex ones. This is not to argue that physical attractiveness is irrelevant in friendship, but rather that its role is heightened in potential romantic relationships.

Similarly, the increased number of cues may have simply provided interactants with redundant information, or information that was already available to them through other aspects of the communication process. For example, participants were aware that they would be interacting with a partner of the same-sex. They could have also easily inferred

that their partner was a college student and most likely similar to them in age. These types of judgments (gender, age, etc.) are usually the ones that richer communication formats allow interactants to have access to prior to beginning an interaction (Lea & Spears, 1995). Even the aforementioned judgment of partner attractiveness can be and is made based on limited cues, such as vocalic ones (Leathers, 1997). In the present study, the richer communication formats may have simply provided same-sex interactants with information that had very little impact in their evaluation of their partners above and beyond what the verbal information furnished. Future research may need to approach the role of media and information richness not by taking a “more is better approach” but rather by examining what type of information is being provided by the cues. Although this speculation may need to be tempered with caution, richer communication formats may benefit interactants attempting to acquaint themselves with another to the extent to which it provides unique and non-redundant social and contextual information about their partner.

The Role of Experiential Properties. The second aspect of the principle of interactivity under investigation was the extent to which interactivity in the form of the experiential properties was central to understanding relational development. While only one of the structural features was significantly associated with involvement and mutuality, the data clearly show that the properties of involvement, mutuality, and individuation play an important role in socially-oriented CMC. It was proposed that higher levels of both involvement and mutuality would be strongly associated with more positive POVs. The underlying logic was that since higher levels of each of these

properties indicated a positive regard for one's partner, that the engendering on more involvement and mutuality should be associated with more positive projections about a potential relationship with one's partner. The third property, individuation, was not predicted to be associated with these projections, but instead it was predicted to be associated with the certainty with which individuals hold their POVs. As noted earlier, this association was based on the notion that the impression one develops about another is independent of the valence attached to it.

The results provide strong support for this reasoning. The data illustrate that each of the three experiential properties is instrumental in socially-oriented mediated initial interactions, but not in the same manner. Overall, interactants reporting higher levels of involvement and mutuality also reported more positive POVs. Participant levels of involvement, perceived receptivity, perceived understanding, and perceived connectedness proved to be strongly associated with the POV each derived from the initial interaction. It appears, then, that communicating in a manner that elicits increased levels of each of these properties, irrespective of the communication format used, is instrumental in producing more positive predictions of the present and future relationship by one's partner, although the nature of influence is likely reciprocal.

This set of findings parallels those reported by Burgoon and colleagues' (1999) testing the principle of inter-activity in task-based interactions and extend those findings. Their results showed that higher levels of involvement and mutuality were correlated with more positive partner social judgments including credibility and task attraction. From the results of the present study, it can be argued that when an interactant arrives at a

POV about a partner, it is most likely reflects the influence of such judgments. The theoretical framework of both POV theory and URT, for example, assume that social judgments such as social attraction or liking are continuously being made as individuals attempt to reduce uncertainty about each other. It is only after an interactant arrives at an outcome value that POV theory attempts to differentiate situations in which he/she would continue to reduce uncertainty from those in which he/she would not. The results of the present study coupled with those reported by Burgoon, Bonito et al. (1999) suggest that involvement and mutuality may be directly associated with partner social judgments prior to the determination of an outcome value, while their continued association may rely on the valence of the outcome value. The results discussed below examining the association between POV, uncertainty level, and the relational and communicative factors assessed in the present study further bolster this interpretation of the role of involvement and mutuality.

Individuation, however, appears to be central in how strongly that prediction is held. As predicted, interactants who reported more developed impressions also reported more certainty of their POV. More importantly, the data suggest that this relationship is independent of the valence of the POV. Data examining the fourth hypothesis coupled with that examining the fifth hypothesis suggest that the higher the degree of impression development occurring during an initial mediated interaction, the more certain interactants are of their derived POV, and the more extreme that outcome value is. It appears that once an interactant arrives at a prediction based on whatever information is available to them about their partner, any further information may serve to polarize that

judgment. This association should hold as long as that “new” information is consistent with prior information. This is an important qualification since recent research argues that behavior that is incongruent with past behavior may increase uncertainty (Afifi & Burgoon, 2000). In this sense, incongruent behavior may serve as new information, reduce outcome value certainty, and increase general uncertainty levels. In the present study, however, confederates were instructed to remain consistent in their behavior, by creating either a positive or negative impression on their partners during both interactions, so the impressions developed as the interactions progressed were consistent across conditions.

Predicted Outcome Value Theory

POV theory proposes that the maximization of positive outcomes, not uncertainty reduction, is the primary goal of individuals in initial interactions (Sannafrank, 1986). Individuals attempt to formulate predictions about the potential rewardingness of the relationship and, once determined in the form of an outcome value, engage in communication behaviors consistent with the prediction. Positive POVs are predicted to lead to more communicative attempts to further reduce uncertainty while negative ones should lead to either reduced communication or attempts to terminate the interaction. According to POV theory, only under conditions of a positive POV should individuals' uncertainty level be associated with communication behavior and partner judgments.

The present study successfully extended POV theory to mediated interactions by examining its association with various factors identified in its theoretical framework. Hypotheses 6 and 7 addressed POV theory-derived predictions, and in hindsight,

probably should have been combined since hypothesis 6 essentially predicts a main effect for POV, while hypothesis 7 predicts a conditional relationship between it and uncertainty level; the results associated with each will be discussed together. The data examining these POV theory-derived predictions generally provided support for the role of POV and uncertainty level as set forth by the theory. POV was hypothesized to be positively associated with a set of relational and communicative factors. Of the eight factors assessed in the present study (amount of communication, intimacy of communication content, partner and self affiliative expressiveness, liking, and the information seeking strategies of interrogation, self-disclosure, and relaxation of target), six were associated with POV in the proposed manner. The data indicate that interactants holding more positive POVs perceived that they also contributed more as well as more intimate information in their interaction, their partner and themselves were more expressive in an affiliative manner, they liked their partners more, and they employed the information seeking strategy of target relaxation more than did those holding less positive ones. On the other hand, these same individuals did not report using increased levels of interrogation or self-disclosure in their interactions. Examining the role of uncertainty within POV processes produced further clarification of these associations.

An extension of this prediction proposed that the association between uncertainty level and these same factors should differ as a function of POV valence (hypothesis 7). As stated earlier, a major difference between URT and POV theory is that the latter makes the same predictions that prior makes but only under conditions of a positive POV; no association should exist under conditions of a negative POV. The data indicate that

when individuals hold a positive POV, as their level of uncertainty decreases, they contribute more as well as more intimate information, perceive they and their partners communicate in a more affiliative expressive manner, and like their partners more. Contrary to the predictions, though, individuals holding a negative POV reported that as their uncertainty level decreased, their use of self-disclosure and target relaxation as information seeking strategies increased, although the latter association did not differ significantly from that reported under positive POV.

Although these latter results are not consistent with the theory's predictions, they are consistent with problems reported in past POV studies involving information seeking strategies. Sunnfrank (1990), for example, reported similar difficulties involving information seeking strategies in a test of POV theory-derived predictions. In that study, self-disclosure was unassociated with uncertainty level irrespective of outcome value valence, and the association between interrogation and uncertainty level, under conditions of a negative POV, was significant and positive indicating that as uncertainty increased, the use of interrogation increased. He concluded that the association between POV, uncertainty level, and information seeking may be more complex than originally anticipated and should continue to be the focus of future research.

One explanation for the difficulties involving the information seeking strategies in the present study may lie in the impression manipulation. Recall that one of the modifications made to URT involved the specification of conditions under which uncertainty reduction processes were activated (Berger, 1979; Berger & Bradac, 1982). The conditions were that the other person provided some incentive value, there was some anticipation of

future interaction, and the other person acted in some deviant manner; it is this latter condition that will be focused upon. Recall also that one participant in each dyad was recruited to act as a confederate and manipulate the type of impression he/she tried to project. Participants were assigned equally to positive and negative manipulation conditions across all of the communication formats. It is possible that both conditions activated information seeking processes but not for the same reasons. While individuals in the positive POV condition may have engaged in information seeking behavior to further reduce uncertainty in anticipation of future interaction, those in the negative condition may have engaged in information seeking tendencies as a means of explaining their partner's deviant behavior. As such, the confederates in the positive impression condition were likely more forthcoming with information and, in general, more open, while those in the negative condition required more effort and attempts at eliciting disclosure.

Along the same lines, research by Kellermann (1995) characterizes initial interactions as being highly scripted and routinized. As such, these interactions bring with them a set of expectations as to how individuals will behave and the type of information to be exchanged. Furthermore, potential interactants have strong expectations about the degree of pleasantness that should exist between them during these interactions (Burgoon & Walther, 1993). Confederates in the negative condition essentially violated these expectations and increased the degree of uncertainty experienced by their partners. Supplemental analysis testing this speculation supports this contention indicating that negative impressions were associated with higher levels of uncertainty than were positive

impressions, $t(78) = 2.29, p < .01$. As Afifi and Burgoon (2000) recently reported, negative behavior takes on increased salience especially in initial interactions and makes interactants lose confidence in their ability to predict partner behavior. In the present study, it appears this may have happened and interactants engaged in the increased use of self-disclosure and target relaxation as a means of trying to increase their degree of certainty. Also noteworthy is that these two strategies are less direct means of seeking information in comparison to interrogation. In light of the negative behavior by one's partner, as well as the social norms that dictate initial interactions (Brown & Levinson, 1983), it may be that interactants preferred to use indirect means of eliciting information to a more direct one.

While the data clearly provide general support for POV and the applicability of its predictions to mediated interactions, a particular interest of the present study was to extend the POV construct by examining the role of the certainty with which it is held in initial interactions. As discussed earlier, individuation, outcome value certainty, and the extremity of the POV are clearly associated. A research question (Research Question 3) was asked regarding the role of outcome value certainty in the relationship between POV and the aforementioned relational and communicative factors. The data suggest that, across both positive and negative outcome values, individuals who were more certain of their derived POV also reported that they contributed more communication and were more expressive in a positive manner in their interactions. Interactants reporting positive POVs also reported that their partners were more affiliatively expressive, although this

association was not significantly different for that reported as a function of negative POV.

The pattern of associations involving outcome value certainty and affiliative expressiveness is suggestive of the behavioral patterns of reciprocity and compensation. The results appear to indicate that, under conditions of a positive POV, interactants who were more certain of their judgment perceived that they used higher levels of affiliative expressiveness and perceived that their partner reciprocated the behavior. Under conditions of a negative outcome value, however, interactants perceived that they also used higher levels of affiliative expressiveness but their partner did not reciprocate the behavior. In other words, interactants who arrived at a negative POV and were increasingly more certain of that value perceived they used higher levels of positive expressiveness to compensate for their partner's unwillingness to reciprocate the behavior. It appears that as interactants felt more sure of their judgments they attempted to communicate in a more positive, friendly, expressive manner. Partners, on the other hand, were perceived as such only under the POV condition.

Social Information Processing Theory

SIP assumes that individuals are motivated to develop relationships via CMC, much in the same manner as they are through Ftf means (Walther, 1996). The theory argues that, given enough time, relationships developed via CMC will begin to approximate the same level of development as those established through Ftf interaction (Walther & Burgoon, 1992; Walther, 1996). As such, the use of mediation is predicted to simply slow down the message exchange process and retard relational development in the early

stages, although this is overcome over time. The present study attempted to modify SIP by introducing the concept of POV into its framework to account for why some relationships develop and others do not in socially-oriented CMC.

The data examining the role of POV within the context of relational development clearly support its ability to differentiate between relationships that develop and those that do not. In general, relationships typified by a positive POV were consistently described as more developed across the nine relational dimensions examined. Specifically, interactants in these relationships reported higher levels of intimacy (immediacy/affection, similarity/depth, and receptivity/trust), equality, and composure, as well as less attempted influence and dominance, and a more social orientation across both interactions than did those by negative outcome values; the only dimension failing to produce a significant main effect for POV was formality. POV, however, did produce a significant interaction with outcome value certainty for this dimension.

Consistent effects for both time and its interaction with POV provide support for SIP. Interactants reported increases in intimacy (immediacy/affection, similarity/depth, and receptivity/trust) and composure along with less attempted influence, irrespective of POV valence. The data suggest, however, that relationships typified by initially negative outcome values are more likely to benefit from additional interaction than are those with positive ones. It appears that individuals in these latter relationships quickly perceive their interaction partners as desirable, and this judgment remains fairly consistent over time. Indeed, these individuals showed very little change in their perceptions of the interaction or their partner across both interactions. Those deriving negative POVs,

however, reported some increase in intimacy, equality, social orientation, and composure, although the overall levels of each remained significantly lower than those reported by their counterparts.

The data associated with outcome value certainty were also somewhat encouraging. Effects for outcome value certainty surfaced for task-social orientation, composure, and formality, indicating that individuals who more certain of their predictions perceived their partners as more socially-oriented and less formal, but also slightly less composed over time. This pattern is suggestive of the fact that outcome value certainty may be an important indicator of how individuals perceive their partner's approach to the interaction. Similarly, these findings appear to indicate that when individuals take a more social and informal approach to an interaction, their partners come away from those interactions feeling more confident of their judgments. Noteworthy, of course, is that this appears to be the case regardless of the valence of the POV.

Taken together, the overall results provide support for the incorporation of the POV construct to the theoretical framework of SIP to account for these findings. As reported above, SIP assumes that individuals are driven to develop relationships with others (Walther, 1996). The findings of the present study indicate that this assumption may need to be revised to state that individuals are driven to develop relationships with those whom they believe are or will be rewarding, either presently or in the future. Consistent with various reward-cost interpretations of the association between communication and relationship development (Altman & Taylor, 1973; Roloff, 1981; Thibaut & Kelley, 1959), the results reported here suggest that POV and, to a lesser extent, outcome value

certainty can significantly improve the precision of SIP-derived predictions, especially in socially-oriented CMC.

Limitations of the Present Study

The balance between testing of a theoretical model, in one instance, and its application outside the laboratory, on the other, is a precarious one. The goal of the present study laid clearly in the first domain. As a result, one limitation of the present study lies in the ability to extend its findings outside of the controlled environment of a laboratory. For instance, interactants in the present study were allowed to interact for a fairly fixed amount of time (approximately 15 minutes). It is more likely that an individual in a chatroom or some similar on-line environment would continue to interact with their partner for a longer period of time upon arriving at a positive POV, whereas one arriving at negative outcome values would interact for a shorter period. Such behavior would be consistent with POV. On the other hand, the amount of time allotted for each interaction reflects that reported elsewhere in similar studies (e.g., Burgoon, Bonito et al., 1999; Sunnafrank, 1990). The fact that the findings of the present study are consistent with these studies increases the confidence of their applicability outside of the laboratory.

Similarly, although only one of the structural features examined in the present study produced a significant multivariate effect on the variables of interest, this finding adds to an increasing body of literature investigating their effects on communication processes and outcomes. The lack of consistent univariate effects should not be interpreted as meaning that structural features are irrelevant to the communication process since the

principle of inter-activity identifies other features beyond those examined in the present study (see Burgoon, Bonito et al., 1999). Clearly, any single study is limited in what it can assess at any given time. The results of the structural features examined in the present study should be interpreted within the context of the larger principle under investigation. Only after repeated testing of the proposed model and the further examination of other structural features can a more complete assessment of the impact of structural features be made.

Another limitation could be that the participants in the present study might not be entirely representative of the type of individuals who frequent on-line environments. While the present study used a college-aged sample, other studies examining on-line behavior have reported a more diverse sample, both in terms of age and ethnicity (e.g., Parks & Floyd, 1996; Parks & Roberts, 1998; Utz, 2000). The use of equal numbers of males and females in the present study, however, might have been an advantage rather than a detriment as some Internet researchers have reported significant disparities between the number of males versus the number of females typically participating in on-line research (Jones, 1998; Parks & Floyd, 1996). Future studies examining the proposed model should focus on recruiting a more diverse sample to address these concerns.

Another potential limitation involves the nature of the data collected in the present study. All of the data were gathered through the use of self-report measures. The dangers of relying exclusively on self-report data have been well documented (e.g., Montgomery & Duck, 1991), with most criticisms centering on the degree to which interactant self-report responses match their actual behavior. On the one hand, these concerns are not

without merit. A substantial body of research has established that various factors affect the extent to which an individual's behaviors, for example, are consistent with his/her attitudes (see, for example, Eagly & Chaiken, 1993; Fishbein & Ajzen, 1972, 1975; Zanna, Olson, & Fazio, 1981). On the other hand, the decision to use self-report measures in the present study as a means of data gathering was guided in part by past research in order to insure comparability of the results. The use of post-interaction self-report data have long been used in uncertainty reduction research as well as that investigating POV theory (e.g., Sunnafrank, 1990). Tests of the principle of inter-activity have also primarily used questionnaire data in order to assess participant reactions following interactions (e.g., Bonito et al., 2000; Burgoon, Bengtsson et al., 1999; Burgoon, Bonito et al., 1999). However, measurement in the present study occurred immediately following actual interactions, whereas the criticism leveled by Montgomery and Duck (1991) centered on data collection asking participants to recall events in their distant past (e.g., accounts of past events). Participant reactions to the just completed interaction were still salient to them and recalled with minimal effort or bias due to time elapsed between the occurrence of the event and its assessment. As such, the use of this approach for gathering data was warranted. Future research assessing the principle of inter-activity as well as POV should augment the use of self-report questionnaires with additional coded behavioral indices such as the experiential properties, the information seeking strategies, and affiliative expressiveness in order to further validate each one.

Finally, the proposed model (in its present form) is applicable to what is commonly termed "zero history" relationships, or those in which interactants do not have any prior

knowledge of each other. Indeed, this was the goal of the present study. This, however, does not mean the model is inapplicable for understanding existing relationships. The present model, for instance, may be useful for understanding conflict episodes within existing relationships, and how these episodes affect subsequent interactions. In a similar manner, the present model can also be used to extend POV into the domain of task-based interactions by examining how the valence of a POV manifests itself in terms of task-related behaviors and perceptions. As discussed earlier, it is possible that POV can provide an acceptable explanation for how task-based workgroups develop a sense of cohesion among its members. Future research should investigate these uses for the proposed model.

Conclusion

Despite these and other limitations, the present study contributes to the conceptual extension of three theoretical perspectives beyond the model proposed herein that future communication and relational scholars must consider. For scholars examining the principle of inter-activity, the present study illustrates that each of the experiential factors identified by it may play different roles within the same process. Future research may do well to further assess other processes and outcomes beyond those examined here to provide a clearer understanding of how these differences manifest themselves. For scholars examining POV theory, the present study attests to the theory's ability to account for communicative and relational processes relevant to socially-oriented initial interactions conducted through CMC. Future research in this area should focus on the other uncertainty reduction processes identified by Berger (1979; Berger & Bradac, 1982)

beyond interactive ones, such as passive and active ones, and how they influence processes and outcomes associated with POVs. For scholars interested in assessing SIP, the present study contributes to its theoretical precision by providing evidence supporting the addition of the POV construct to its explanatory calculus. Future research exploring predictions from this theory should attempt to replicate the results reported here. Furthermore, the present study also produced findings that suggest that scholars investigating the latter two perspectives may be well advised to include outcome value certainty in their research to further clarify the influence of POV on communication and relational processes and outcomes. Only through rigorous and repeated testing inside and outside of the laboratory can the proposed model be labeled as an acceptable explanation for how individuals decide whether or not future interaction will occur after an initial interaction in a mediated environment. Only then will the role of inter-activity and that of POV be clarified and understood in mediated interactions.

ENDNOTES

¹ For the purposes of the present review, information richness theory is grouped with social presence theory and the lack of cues hypothesis because all of them share a deterministic approach to the influence of the structural features on communicative processes.

² The three situations, which heighten an individual's desire to reduce uncertainty, are interactions in which: a partner acts in a deviant manner; a partner provides incentive value to do so; and there is a high possibility of continued future interaction with that partner (Berger, 1979).

³ Sunnafrank (1990) explained that conversational length was varied in order to increase the generalizability of the results. Subsequent statistical tests examining the variables of interest for differences due to conversational length resulted in main effects on nonverbal encouragement and content intimacy, although the actual increases were only slight. As a result, the author decided to collapse across the three conversational lengths for tests of the hypotheses.

⁴ It is worth repeating that while each facet, in and of itself, may be an indicator of positive regard, the engendering of high levels of each property may not always be beneficial to interactants. High levels may actually be detrimental in circumstances in which, for example, deception detection or resistance to compliance-gaining attempts are desired goals. High levels of mutuality with a communicator may hinder detection of deception by creating a positivity bias (Buller & Burgoon, 1996) or weaken compliance-gaining resistance by heightening judgments of communicator credibility and attraction.

⁵ In their examination of conversational involvement, Coker and Burgoon (1987) describe expressiveness in terms of the degree of animation and dynamism. The present study modifies that description to arrive at a definition for affiliative expressiveness by adding the need for the expressiveness to be positive in nature, inasmuch as expressiveness need not be positive, as evidenced in heated arguments where such behaviors may be elevated but not positive in nature.

⁶ Both the overall test and the specific contrast are reported only for the purposes of the readers.

⁷ Before settling on this approach, various preliminary analyses were conducted. A common approach for assessing collinearity is to conduct a series of regression analyses using only the predictor variables to assess their interrelationships. While correlations between predictors are commonly used as a means of examining the degree of collinearity present in a data set, Cohen and Cohen (1983) recommend that each variable be regressed on the remaining variables as a more accurate assessment tool. This analysis verified a substantial association between the predictor variables and the cross-product interaction term. A subsequent analysis was conducted using hierarchical entry of each of the predictor variables and the cross-product interaction term on the criterion variables of interest to assess the interpretability of the results, given the degree of collinearity present in the data. However, an examination of the tolerance level and variance inflation factor (VIF) associated with each predictor variable served as additional diagnostics and corroborated the presence of collinearity. This analysis also revealed suppression effects

on most of the analyses, most noticeably between uncertainty level and the cross-product interaction term.

⁸ A supplemental analysis conducted using the median of POV scores as the cut-off value for creating positive and negative groupings yielded near equivalent results. For the purposes of comparability, the decision was made to simply use the procedure outlined by Sunnafrank (1990).

APPENDIX A. PREDICTIONS FROM UNCERTAINTY REDUCTION AND PREDICTED OUTCOME VALUE THEORIES

(Adapted from Sunnafrank, 1986)

Axiom 1 (URT): Given high levels of uncertainty present at the outset of the entry phase, as amount of verbal communication increases, the level of uncertainty for each interactant in the relationship will decrease. As uncertainty is further reduced, the amount of verbal communication will increase.

Proposition 1 (POV): During the beginning stage of initial interactions, both the amount of verbal communication and uncertainty reduction increase. Further increases in amount of verbal communication occur when uncertainty reduction results in positive outcome values, whereas decreases in amount of verbal communication follows from negative predicted outcome values.

Axiom 2 (URT): As nonverbal affiliative expressiveness increases, uncertainty levels will decrease in an initial interaction situation. In addition, decreases in uncertainty level will cause increases in nonverbal affiliative expressiveness.

Proposition 2 (POV): During the beginning stage of initial interactions, increases in listener's nonverbal affiliative expressiveness produce reduction in their uncertainty levels. While this uncertainty results in positive predicted outcome values, further increases in nonverbal affiliative expressiveness occur. Uncertainty reduction associated with negative predicted outcome values produces decreases in nonverbal affiliative expressiveness.

Axiom 3 (URT): High levels of uncertainty cause increases in information-seeking behavior. As uncertainty levels decline, information-seeking behavior decreases.

Proposition 3 (POV): High levels of uncertainty in a relationship cause increased information-seeking behavior in beginning initial interactions. Decreased uncertainty, when associated with positive outcome values, produces increased information-seeking behavior. When associated with negative predicted outcome values, reduced uncertainty produces decreased information-seeking behavior.

Axiom 4 (URT): High levels of uncertainty cause decreases in intimacy level of communication content. Low levels of uncertainty produce high levels of intimacy.

Proposition 4 (POV): Given high levels of uncertainty present at the outset of initial interactions, communication content is low in intimacy. When subsequent uncertainty reduction is associated with positive predicted outcome values, intimacy level of communicative content increases. When uncertainty reduction is associated with negative predicted outcome values, intimacy level is maintained at or decreases to low levels.

APPENDIX A, continued

Axiom 5 (URT): High levels of uncertainty produce high rates of reciprocity. Low levels of uncertainty produce low reciprocity rates.

Proposition 5 (POV): During the beginning stage of initial interactions, high uncertainty levels are associated with high rates of reciprocity. When uncertainty reduction is associated with positive predicted outcome values, reciprocity rate declines. When uncertainty reduction is associated with negative predicted outcome values, greater decreases in reciprocity rate occur.

Axiom 6 (URT): Similarities between persons reduce uncertainty, whereas dissimilarities produce increases in uncertainty.

Proposition 6 (POV): Both similarities and dissimilarities between persons reduce uncertainty. Greater uncertainty reduction will result from similarities when dissimilarities reflect groupings that are not highly familiar to individuals.

Axiom 7 (URT): Increases in uncertainty level produce decreases in liking; decreases in uncertainty level produce increases in liking.

Proposition 7 (POV): When decreased uncertainty is associated with positive predicted outcome values, liking increases. When associated with negative predicted outcome values, liking decreases.

Conflicting Predictions

Hypothesis 1 (POV): Amount of verbal communication and information-seeking behavior are positively related.

Theorem 3 (URT): Amount of communication and information-seeking behavior are inversely related.

Hypothesis 2 (POV): Nonverbal affiliative expressiveness and information-seeking behavior are positively related.

Theorem 8 (URT): Nonverbal affiliative expressiveness and information-seeking behavior are inversely related.

Hypothesis 3 (POV): Intimacy level of communication content and information-seeking behavior are positively related.

Theorem 12 (URT): Intimacy level of communication content and information-seeking behavior are inversely related.

APPENDIX A, continued

Hypothesis 4 (POV): Information-seeking behavior and reciprocity rate are inversely related when predicted outcome values are positive, and positively related when predicted outcome values are negative.

Theorem 16 (URT): Information-seeking behavior and reciprocity rate are positively related.

Hypothesis 5 (POV): Information-seeking behavior and liking are positively related.

Theorem 17 (URT): Information-seeking behavior and liking are negatively related.

Hypothesis 6 (POV): Amount of verbal communication and reciprocity rate are inversely related when predicted outcome values are positive, and positively related when predicted outcome values are negative.

Theorem 4 (URT): Amount of communication and reciprocity rate are inversely related.

Hypothesis 7 (POV): Nonverbal affiliative expressiveness and reciprocity rate are inversely related when predicted outcome values are positive, and positively when predicted outcome values are negative.

Theorem 9 (URT): Nonverbal affiliative expressiveness and reciprocity rate are inversely related.

Hypothesis 8 (POV): Intimacy level of communication content and reciprocity rate are inversely related when predicted outcome values are positive, and positively related when predicted outcome values are negative.

Theorem 13 (URT): Intimacy level of communication content and reciprocity rate are inversely related.

Hypothesis 9 (POV): Reciprocity rate and liking are inversely related when predicted outcome values are positive, and positively related when predicted outcome values are negative.

Theorem 19 (URT): Reciprocity rate and liking are negatively related.

Concordant Predictions

Hypothesis 10 (POV): Amount of verbal communication and nonverbal affiliative expressiveness are positively related (URT Theorem 1).

APPENDIX A, continued

Hypothesis 11 (POV): Amount of verbal communication and intimacy of communication content are positively related (URT Theorem 2).

Hypothesis 12 (POV): Amount of verbal communication and liking are positively related (URT Theorem 5).

Hypothesis 13 (POV): Nonverbal affiliative expressiveness and intimacy of communication content are positively related (URT Theorem 7).

Hypothesis 14 (POV): Nonverbal affiliative expressiveness and liking are positively related (URT Theorem 10).

Hypothesis 15 (POV): Intimacy of communication content and liking are positively related (URT Theorem 14).

APPENDIX B. INTERACTION INVOLVEMENT ITEMS**Interaction Involvement (Cronbach's $\alpha = .90$)**

1. My partner was highly involved in the interaction.
2. My partner was detached from our interaction.
3. My partner was attentive to our discussion.
4. My partner created a sense of distance between us in our interaction.
5. My partner was open to my questions and comments in our interaction.
6. My partner was attuned to our interaction.
7. My partner was engaged in our interaction.

Note: All items anchored by “Strongly Disagree” (1) and “Strongly Agree” (7).

APPENDIX C. INSTRUMENTS USED TO MEASURE MUTUALITY

Perceived Receptivity (Cronbach's $\alpha = .74$)

1. My partner was open to my ideas.
2. My partner was interested in talking to me.
3. My partner was responsive to my comments.

Perceived Understanding (Cronbach's $\alpha = .95$)

1. I feel the interaction was a good experience.
2. It felt pleasant interacting with my partner.
3. I did not enjoy interacting with my partner.
4. I feel accepted by my partner.
5. Overall, I feel the interaction was satisfying.
6. I left the interaction feeling I was important.
7. Overall, I feel happy with the interaction.

Perceived Connectedness

Aron, Aron, and Smollan's (1992) single-item Inclusion of Self in Other graphical measure as adapted by Bernieri (1999) and described in text.

Note: Perceived receptivity and perceived understanding items were anchored by "Strongly Disagree" (1) and "Strongly Agree" (7).

APPENDIX D. PREDICTED OUTCOME VALUE AND OUTCOME VALUE

CERTAINTY MEASURES

Directions: For the following questions, we would like you to assume that future circumstances are such that a continuing association with your partner will occur. Please make NO assumptions about why you will engage in this continuing relationship. For example, do NOT assume that this relationship is due to class assignments, or the desires of yourself or your partner. Simply assume that you will engage in an association that will involve spending time communicating with your partner on an ongoing basis.

We are interested in obtaining your evaluations of this assumed future relationship. Specifically, we want you to estimate how favorable this association will be for YOU. We would like you to make these estimates by comparing the future of this relationship with your usual expectations for continuing relationships. For example, while you may expect this relationship would be generally favorable, it may not appear to be as favorable as you would usually expect. In this case, we would want you to indicate that your expectations for the relationship are less positive than normal. Finally, after each statement you will also be asked to indicate how certain you are of your judgment.

1. In general, how positive will this future relationship with your partner be for you?

- much more positive than I would normally expect.
 more positive than I would normally expect.
 slightly more positive than I would normally expect.
 slightly less positive than I would normally expect.
 less positive than I would normally expect.
 much less positive than I would normally expect.

- 1a. Please indicate how sure you are of your response:

Very Unsure 1 2 3 4 5 6 Very Sure

2. Considering your expectations about your partner's general patterns of behavior, how positive will this future relationship be for you?

- much more positive than I would normally expect.
 more positive than I would normally expect.
 slightly more positive than I would normally expect.
 slightly less positive than I would normally expect.
 less positive than I would normally expect.
 much less positive than I would normally expect.

- 2a. Please indicate how sure you are of your response:

Very Unsure 1 2 3 4 5 6 Very Sure

APPENDIX D, continued

3. Considering your general expectations about how your partner may behave toward you in the future, how positive will this relationship be for you?

- much more positive than I would normally expect.
 more positive than I would normally expect.
 slightly more positive than I would normally expect.
 slightly less positive than I would normally expect.
 less positive than I would normally expect.
 much less positive than I would normally expect.

3a. Please indicate how sure you are of your response:

Very Unsure 1 2 3 4 5 6 Very Sure

4. Considering your general expectations about the types of conversations that may occur in this relationship, how positive will this relationship be for you?

- much more positive than I would normally expect.
 more positive than I would normally expect.
 slightly more positive than I would normally expect.
 slightly less positive than I would normally expect.
 less positive than I would normally expect.
 much less positive than I would normally expect.

4a. Please indicate how sure you are of your response:

Very Unsure 1 2 3 4 5 6 Very Sure

5. Considering your general expectations about how your partner may respond to what you do and say, how positive will this future relationship be for you?

- much more positive than I would normally expect.
 more positive than I would normally expect.
 slightly more positive than I would normally expect.
 slightly less positive than I would normally expect.
 less positive than I would normally expect.
 much less positive than I would normally expect.

5a. Please indicate how sure you are of your response:

Very Unsure 1 2 3 4 5 6 Very Sure

APPENDIX D, continued

6. Considering your general expectations about your partner's interests, how positive will this future relationship be for you?

much more positive than I would normally expect.
 more positive than I would normally expect.
 slightly more positive than I would normally expect.
 slightly less positive than I would normally expect.
 less positive than I would normally expect.
 much less positive than I would normally expect.

- 6a. Please indicate how sure you are of your response:

Very Unsure 1 2 3 4 5 6 Very Sure

7. Considering your general expectations about your partner's likes and dislikes, how positive will this future relationship be for you?

much more positive than I would normally expect.
 more positive than I would normally expect.
 slightly more positive than I would normally expect.
 slightly less positive than I would normally expect.
 less positive than I would normally expect.
 much less positive than I would normally expect.

- 7a. Please indicate how sure you are of your response:

Very Unsure 1 2 3 4 5 6 Very Sure

8. Considering your general expectations your partner's attitudes and values, how positive will this future relationship be for you?

much more positive than I would normally expect.
 more positive than I would normally expect.
 slightly more positive than I would normally expect.
 slightly less positive than I would normally expect.
 less positive than I would normally expect.
 much less positive than I would normally expect.

- 8a. Please indicate how sure you are of your response:

Very Unsure 1 2 3 4 5 6 Very Sure

APPENDIX D, continued

9. Considering your general expectations about how your partner feels about you, how positive will this future relationship be for you?

- much more positive than I would normally expect.
- more positive than I would normally expect.
- slightly more positive than I would normally expect.
- slightly less positive than I would normally expect.
- less positive than I would normally expect.
- much less positive than I would normally expect.

9a. Please indicate how sure you are of your response:

Very Unsure 1 2 3 4 5 6 Very Sure

10. Overall, given your general expectations about your partner, how positive will this future relationship be for you?

- much more positive than I would normally expect.
- more positive than I would normally expect.
- slightly more positive than I would normally expect.
- slightly less positive than I would normally expect.
- less positive than I would normally expect.
- much less positive than I would normally expect.

10a. Please indicate how sure you are of your response:

Very Unsure 1 2 3 4 5 6 Very Sure

Note: Items 1-10 measure Predicted Outcome Value (Cronbach's $\alpha = .94$), whereas items

1a-10a measure Outcome Value Certainty (Cronbach's $\alpha = .93$).

APPENDIX E. MEASURES OF RELATIONAL AND COMMUNICATIVE FACTORS**Amount of Communication (Cronbach's $\alpha = .71$)**

1. In your opinion, how much did you contribute to the communication during the interaction?
2. In your opinion, how much communication overall occurred during the interaction?
3. Compared to other initial interactions you have been involved in, how would you rate your contribution to the interaction?

Intimacy of Communication Content (Cronbach's $\alpha = .86$)

1. Compared to other initial interaction you have been involved in, please indicate the overall amount of information you revealed about yourself in this interaction.
2. Compared to other initial interaction you have been involved in, please indicate the intimacy of the information you revealed about yourself in this interaction.
3. Compared to other initial interaction you have been involved in. please indicate the amount of personal information you revealed about yourself in this interaction.

Global Affiliative Expressiveness (Cronbach's $\alpha = .92$. for self-version; Cronbach's $\alpha = .90$, for partner version)

1. I was enthusiastic in how I communicated with my partner.
2. I was expressive in a positive manner with my partner.
3. I would describe my communication as energetic.
4. I would describe my communication as animated.

APPENDIX E, continued

Information Seeking Strategy/Interrogation (Cronbach's $\alpha = .56$)

1. I asked my partner questions about him/herself.
2. I did not ask my partner any follow-up questions after they disclosed personal information to me. (R)

Information Seeking Strategy/Disclosure (Cronbach's $\alpha = .84$)

1. I purposely shared information about myself in hopes my partner would do the same (e.g., name, attitudes, etc.).
2. I communicated information about myself that I hoped my partner would tell me about him/herself.

Information Seeking Strategy/Relaxation of Target (Cronbach's $\alpha = .35$)

1. I did not encourage my partner to relax. (R)
2. I attempted to get my partner to loosen up.*

Liking (4 items from McCroskey and McCain, 1974) (Cronbach's $\alpha = .83$)

1. I think he/she could be a friend of mine.
2. It would be difficult to meet and talk with him/her. (R)
3. He/she would not fit into my circle of friends. (R)
4. We could never establish a personal friendship with each other. (R)

Note: Amount of communication and intimacy of communication content items anchored by "Very Little Amount" (1) and "Very Large Amount" (7); all other items anchored by "Strongly Disagree" (1) and "Strongly Agree" (7). (R) indicates recoding required.

* Item removed from analysis due to low scale reliability.

APPENDIX F. RELATIONAL DEVELOPMENT MEASURES**Immediacy/Affection (Cronbach's $\alpha = .86$)**

1. My partner wanted me to like him/her.
2. My partner acted bored by our interaction. (R)
3. My partner communicated coldness rather than warmth. (R)
4. My partner showed no desire for further communication. (R)

Similarity/Depth (Cronbach's $\alpha = .78$)

1. My partner tried to establish common ground.
2. My partner tried to move the conversation to a deeper level.
3. My partner was interested in finding things we had in common.
4. My partner kept the interaction at an impersonal level. (R)

Receptivity/Trust (Cronbach's $\alpha = .83$)

1. My partner was sincere in his/her communication.
2. My partner wanted me to trust him/her.
3. My partner tried to understand me.

Equality (Cronbach's $\alpha = .82$)

1. My partner considered us equals.
2. My partner did not treat me as an equal. (R)
3. My partner wanted to cooperate with me.

APPENDIX F, continued

Task-Social Orientation (Cronbach's $\alpha = .72$)

1. My partner was interested in keeping the interaction social.
2. My partner wanted to stick to the main purpose of the interaction. (R)
3. My partner was very task-oriented. (R)
4. My partner wanted to simply complete the interaction. (R)

Composure (Cronbach's $\alpha = .77$)

1. My partner seemed tense in communicating with me. (R)
2. My partner projected a composed demeanor.
3. My partner appeared comfortable interacting with me.

Formality (Cronbach's $\alpha = .63$)

1. My partner wanted the interaction to be informal.
2. My partner took a causal approach to the interaction.
3. My partner made the interaction business-like. (R)

Attempted Influence (Walther & Burgoon, 1992) (Cronbach's $\alpha = .77$)

1. My partner was in control of the interaction.
2. My partner tried to influence me.
3. My partner tried to gain my approval.

Dominance (Cronbach's $\alpha = .76$)

1. My partner was assertive with me.
2. My partner dominated the interaction.
3. My partner had the upper hand in the interaction.

APPENDIX F, continued

Note: All items were anchored by “Strongly Disagree” (1) and “Strongly Agree” (7).

Items identified with (R) required recoding. Reliabilities reported are averaged across both interactions.

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