DOES DISCUSSING PROBLEMS ONLINE CHANGE THE NATURE OF

CO-RUMINATION AND ITS ASSOCIATED EFFECTS ON NEGATIVE AFFECT AND

PERCEIVED FRIENDSHIP QUALITY?

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Does Discussing Problems Online Change the Nature of Co-rumination and Its Associated

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ABSTRACT

Engagement in problem-focused discussions that direct attention to negative emotions predicts heightened depressive affect and feelings of closeness with friends (Rose, 2002). The goal of this study was to test whether the psychosocial correlates of such conversations are altered by engaging in those conversations through computer-mediated forms of communication and to identify mechanisms that may account for those differences. Fifty-three female friend pairs engaged in problem-focused discussions in an online or face-to-face context. Observers rated expressed negative affect and information disclosure. Self-reports of self-disclosure, true self-expression, and feelings of similarity were obtained. Although participants interacting online were rated as exchanging less information than those interacting face-to-face, they reported feeling more similar, engaging in more self-disclosure, and expressing fewer aspects of their true self. Discussing problems online was indirectly related to feelings of closeness through greater felt similarity. Implications for the study of computer-mediated communication and problem-focused talk are discussed.

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INTRODUCTION

Supportive interactions and relationships with friends and close others have been shown to promote healthy socioemotional development (Bolger, & Eckenrode, 1991; Uchino, Uno, & Holt-Lundstad, 1999). However, recent research has demonstrated that engaging in intimate and supportive exchanges with friends may have subsequent costs to people's mental health and well-being. In an attempt to provide and gain support, friends often discuss problems and related experiences of negative emotions. These problem-focused discussions have been shown to encourage excessive focus on the causes and consequences of one's problem and related negative emotional experiences, a process known as *co-rumination* (Rose, 2002). Research has shown co-rumination to be related to a unique set of positive and negative socioemotional outcomes. High levels of co-rumination lead to increased negative affect, and, interestingly, heightened feelings of closeness between friends and close others (Calmes & Roberts, 2008; Rose, 2002; Rose, Carlson, & Waller, 2007).

As co-rumination is a relatively new construct, research is sparse concerning contextual and interpersonal factors that may influence the relations that this process has with feelings of negative emotionality and closeness. Although it is likely that co-rumination typically occurs in face-to-face situations, the ubiquity and popularity of text based electronic communication provides another social context in which people could potentially co-ruminate with one another. Furthermore, research also indicates that face-to-face and online social networks overlap considerably suggesting that computer based forms of communication are at least one tool that friends use to engage in relationship related activities (Subrahmanyam et al., 2008). Current communication trends show that people are increasingly turning to text based methods for communicating with their peers and close others (e.g., instant messaging, texting; Raine, 2011;

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Zickuhr, 2010), and social networking via computer has become a common activity among adolescents and emergent adults (Raine, 2011; Subrahmanyam, Reich, Waechter, & Espinoza, 2008; Zickuhr, 2010).

Many of the interactions between friends that historically have taken place in face-to-face contexts may now be taking place in online situations. The pervasiveness and frequency with which textual communication is employed for social purposes suggest that many of the same topics that people discuss in face-to-face situations are likely also discussed in online situations. There is the potential that problem-focused discussions, which have, to date, only been studied in face-to-face contexts, also occur using electronic, text-based methods of communication. With so many interactions taking place as textual electronic communication, research is needed to better understand how interpersonal processes, such as co-rumination, vary by electronic and face-to-face contexts and how discussions in these contexts may differentially impact social and psychological outcomes. Moreover, studies of how communication medium affects the experience and impact of co-rumination may provide a better understanding of the precise behavioral mechanisms that elicit the emotional experiences associated with co-rumination. The current study examines differences between problem-focused discussions conducted in online and face-to-face contexts, specifically, whether emotional adjustment and perceived friendship quality immediately following the problem-focused conversation differ as a function of the conversational context, and whether or not these differences are mediated by variations in conversational content and felt intimacy during the interaction.

Problem-Focused Discussions: Sex-Specific Implications for Socioemotional Adjustment

Studies consistently find higher levels of emotional support and disclosure in female compared to male friendships (Allen & Hacoun, 1976; Bowman, 2008; Davidson & Duberman, 1982; Dindia & Allen, 1992). Despite a wealth of studies demonstrating the psychological and physiological benefits of interpersonal closeness and support (Uchino, Uno, & Holt-Lundstad, 1999), women still evidence higher levels of depression and anxiety than do men (Kessler et al., 1993; Pigott, 1999; Weissman & Klerman, 1977). Recent research on interpersonal interactions between friends has led to the development of the construct of co-rumination, which reconciles these seemingly paradoxical findings (Rose, 2002).

Co-rumination is an interpersonal process occurring in intimate dyadic conversations between friends, where interactive partners focus on the causes and experiences of emotional distress related to problems occurring in daily life (Rose, 2002). Thus, some have described co-rumination as a verbal manifestation of depressive rumination (Calmes & Roberts, 2008; Rose, 2002). Heightened levels of co-rumination typically predict increased depression and anxiety, while simultaneously predicting greater feelings of closeness between co-ruminative partners (Calmes & Roberts, 2008; Rose, 2002; Rose et al., 2007). Negative emotional experiences associated with co-rumination are often attributed to the ruminative nature of these interactions (Calmes & Roberts, 2008). Friends engaging in co-rumination encourage each other to continually discuss distressing issues surrounding personal problems often paying particular attention to the negative emotions associated with the problem (Rose, 2002). The persistent attention given to emotional distress, much like depressive rumination, has been shown to be positively related to concurrent and prospective levels of depression and anxiety in both children and adults (Calmes & Roberts, 2008; Rose, 2002). Despite indications that high quality

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friendships and social support predict enhanced emotional adjustment (Bolger & Eckenrode, 1991; Uchino et al., 1999), the propensity of friends to focus on negative experiences and continually revisit distressing issues during problem-focused discussions mitigates the positive effects of social support, leading to increases in experienced negative affect and emotional maladjustment (Rose, 2002).

In addition to the negative consequences, research has demonstrated some paradoxically beneficial aspects of co-rumination (Calmes & Roberts, 2008; Rose, 2002). Co-rumination has been shown to be related to heightened feelings of closeness and support between friends (Calmes & Roberts, 2008; Rose, 2002; Rose et al., 2007). As friends often share a number of intimate details when engaging in problem-focused discussions with one another, these enhanced feelings of closeness with one's friends are not particularly surprising. In an effort to validate a friend's emotional experiences, the individual encourages the friend to discuss problems in detail thereby accessing intimate details of the situation and their friends' emotional experiences (Rose, 2002). These well-intentioned attempts at consolation seemingly function in conjunction with increased levels of disclosure to enhance feelings of closeness, support, and friendship quality (Calmes & Roberts, 2008; Rose, 2002; Rose et al., 2007). Engagement in problem-focused discussions with friends has been shown to protect friendships from conflict and other relationship problems over time (Rose et al., 2007), which has been shown to be related to longer lasting and more intimate friendships (Laursen & Pursell, 2009).

Research has shown few gender differences in socioemotional outcomes associated with co-rumination during middle childhood years when close friendships are initially forming (Rose, 2002; Rose et al., 2007; Sullivan, 1953). However, as children progress into adolescence and further on into emergent adulthood, gender differences in the propensity to engage in co-

rumination and greater differences in the emotional effects of co-ruminating emerge and gain

magnitude (Rose et al., 2007). Adolescent and emergent adult females are more likely to engage

in co-rumination than are same-aged males (Calmes & Roberts, 2008; Rose et al., 2007).

Additionally, between middle childhood and early adulthood, links between co-rumination and

depression and anxiety become increasingly stronger, but only among females (Calmes &

Roberts, 2008; Kessler et al., 1993; Rose et al., 2007; Weissman & Klerman, 1977). Males, in

contrast, report experiencing heightened feelings of closeness toward their friends following

problem-focused discussions without subsequent increases in depression and anxiety (Calmes &

Roberts, 2008; Rose et al., 2007).

These findings parallel the results of studies of the progression of emotional adjustment

over time, which show increased internalizing problems for females, but not males, starting in

adolescence and progressing well into adulthood (Calmes & Roberts, 2008; Kessler et al., 1993).

Indeed, research indicates that the degree to which college-aged females engage in co-

rumination, at least in part, mediates relations between gender and depression (Calmes &

Roberts, 2008). Some researchers suggest that these gender differences are likely due to differing

communication styles typically employed by males and females (Calmes & Roberts, 2008; Rose

et al., 2007). While females tend to disclose more information concerning their emotional

experiences (Kring, & Gordon, 1998; Murstein, & Adler, 1995; Papini, Farmer, Clark, Micka, &

Barnett, 1990), males tend to be more task-oriented and relate to one another through shared

activities rather than intimate conversation (McNelles, & Connolly, 1999). Although males and

females both engage in problem-focused discussions, gender differences in the focus and content

of these conversations has been shown to have a significant impact on subsequent emotional

experiences (Calmes & Roberts, 2008; Rose et al., 2007). These findings, therefore, suggest that

situations and conversational contexts which have the potential to impact the manner of participation in problem-focused discussions also have the potential to influence socioemotional outcomes related to these discussions.

Online Interactions and Relations with Adjustment

Online forms of communication have shown immediate and long-term effects on emotional and social adjustment (Amichai-Hamburger, & McKenna, 2006; Caplan, & Tuner, 2007; McKenna, & Bargh, 1999; McKenna, & Green, 2002; McKenna, Green, & Gleason, 2002; Morgan, & Cotten, 2003). Recent experimental studies show that, compared with face-to-face conversations, conversations conducted via computer can have an immediate positive impact on experienced emotions and feelings toward one's interactive partner (Gross, 2009; McKenna, & Bargh, 1999; McKenna, & Green, 2002; McKenna et al., 2002). Studies, comparing adults conversing with previously unknown others over instant messenger to adults conversing face-to-face show that people experience higher levels of self-disclosure, greater feelings of closeness, and increased liking for partners when conversing on the computer than when conversing face-to-face (Amichai-Hamburger, & McKenna, 2006; McKenna, & Bargh, 1999; McKenna, & Green, 2002). Furthermore, adults engaging in conversations on the computer report an enhanced access to their "true selves" than adults interacting face-to-face (Chang, & Yeh, 2003; McKenna, & Bargh, 1999; McKenna, & Green, 2002). Overall, these findings suggest that engaging in computer mediated communication has an immediate positive influence on individuals' socioemotional adjustment. Although a number of mechanism have been proposed to explain these results (i.e. increased anonymity, perceived similarity, heightened control), to date, no studies have experimentally identified variables that significantly mediate the relations between computer mediated communication and these socioemotional outcomes.

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In addition, questionnaire data collected in adult populations demonstrate positive relations between the degree to which individuals interact socially on the computer and levels of psychological adjustment over time (Bessière, Kiesler, Kraut, & Boneva, 2008; Liu & Larose, 2008; McKenna, & Bargh, 1999; Morgan, & Cotten, 2003). Specifically, individuals reporting higher levels of computer-mediated communication tend to report decreased depression (Bessière et al., 2008; Morgan & Cotton, 2003), loneliness, and feelings of estrangement (McKenna, & Bargh, 1999), as well as increased college life satisfaction (Liu & Larose, 2008), self-acceptance, and sense of connectedness (McKenna, & Bargh, 1999). On the basis of these self-report studies, computer-mediated communication seems to benefit individuals' psychological adjustment over the course of time.

Interestingly, these effects have been found despite consistent evidence indicating that text based and online interaction methods require more time and reduce the number of ways in which individuals are able to express and receive information from their interactive partners (Caplan, & Tuner, 2007; Kiesler, Siegel, & McGuire, 1984; Ledbetter, & Larson, 2008), which presumably limit the extent to which one is able to accurately communicate with one's partner. The number of nonverbal cues, particularly those related to emotions, is drastically reduced if not entirely eliminated in most forms of online interaction (Caplan, & Tuner, 2007; Kiesler et al., 1984; Ledbetter, & Larson, 2008). Although some people interact using online utilities with video and audio capabilities (e.g., Skype, webcam, internet phones), currently, the most popular forms of online communication are text based with little or no audio or visual capabilities (Raine, 2011; Zickuhr, 2010).

Recognizing the importance of non-verbal forms of communication for conveying emotional information, people attempt to circumvent limitations of text based computer

communication by employing emoticons to express their feelings; however these figures presumably are expressed more slowly and more intentionally. They are also somewhat cartoonish and less natural. Thus, people utilizing these text based methods of online communication have more difficulty assessing the emotions of their interactive partners (Engleberg, & Sjöberg, 2004; Ledbetter, & Larson, 2008). As a result, computer-mediated communication, compared with face-to-face conversation, is associated with increased uncertainty and dampened social presence during interactions (Tanis, & Postmes, 2007). While these conditions are associated with some negative social and emotional outcomes (i.e., dampened satisfaction with the medium, inefficient communication, mood loneliness; Hu, 2009; Tanis & Postmes, 2008), research also indicates that such constraints create a stronger orientation toward task completion and produce a greater sense of similarity and shared identity between interactive partners than those interacting face-to face (Amichai-Hamburger, & McKenna, 2006; Lea, Spears, & Watt, 2007; McKenna, & Bargh, 1999; Tanis, & Postmes, 2007). These differences have been shown to enhance, rather than hinder, adjustment (Bargh, & McKenna, 2004; Lea et al., 2007; McKenna, & Bargh, 1999; McKenna, & Green, 2002; Tanis & Postmes, 2007). Moreover, while forms of computer-mediated communication mostly limit the number of avenues by which partners can communicate during an interaction (e.g., no auditory information, no facial expressions, no posture cues), these limitations may be beneficial particularly when conversations involve emotionally distressing topics.

Research examining emotional contagion (i.e., one person's emotion state is influenced by another's emotional expression) would suggest that lack of emotion cues may have simultaneously positive and negative consequences for interpersonal interactions conducted online. Studies have shown that partners' emotional expressions affect the way individuals

appraise situations and signal to them how they should be feeling (Gump & Kulik, 1997). Limiting the emotion cues available during problem-focused discussions may reduce the impact of expressed negative emotions by limiting the extent to which each individual is exposed to negative emotionality expressed by their interactive partner, in turn leading to dampened experienced negative affect. It should be noted, however, that limiting emotion cues during positive exchanges is likely to reduce the extent to which positive affect is elicited during such exchanges. Thus, engaging in problem-focused discussions through computer-mediated communication should constrain emotional experiences during the interaction by limiting the extent to which each individual is able to express both positive and negative emotions thereby leading to dampened experienced negative emotionality following the interaction.

The Expected Effects of Problem-Focused Discussion in Online Mediums

In sum, friends engaging in problem-focused discussions have a tendency to pay excessive attention to negative emotions related to problems thereby increasing their experience of negative emotions following the interaction. Online communication has been shown to reduce the availability of visual and auditory forms of communication, including expressions of emotion. As a consequence, the extent to which one's negative emotions are reinforced by one's conversational partner is likely to be lower during an online interaction than in a face-to-face interaction. Moreover, as most forms of online communication require converting thought into text, reactions to friends' comments and disclosures, emotional expression may be less automatic and more planned in online communication than in face-to-face discourse. Thus, the negative emotions typically experienced following co-ruminative interactions are expected to be lessened when such conversations are conducted online due to reduced amount of negative expressions and more intentionality of responses.

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Furthermore, decreased emotion cues and an increase in planned responses may be related to a simultaneous increase in the extent to which conversation partners engage in problem-solving discourse as opposed to emotion-focused discourse. A stronger orientation toward task related information and diminished attention to emotion related information is one of the cited explanations for why males do not experience the same level of negative affect related to co-rumination as females (Calmes & Roberts, 2008; Rose et al., 2007). As online interactions constrain emotional expressivity, it was expected that these interactions would orient participants to more task relevant information, and that those engaging in co-rumination online would consequently experience fewer negative emotions when compared with those engaging in problem-focused discussions face-to-face.

In addition to influencing the way in which friends experience negative emotions related to problem-focused discussions, the feelings of closeness that friends share following co-ruminative activities may also be affected by interactions in online mediums. Co-ruminative interactions and interactions online have both been shown to be related to increased closeness following the interaction (Bargh, & McKenna, 2004; Calmes & Roberts, 2008; McKenna, & Bargh, 1999; McKenna, & Green, 2002; Rose et al., 2007). Researchers have shown that communication in online mediums and co-ruminative interactions are both related to heightened levels of disclosure leading to subsequent increases in closeness. As with any support seeking interaction, co-ruminative partners encourage each other to disclose intimate details about their feelings and problems (McKenna, & Green, 2002; Rose et al., 2007). In online situations however, people feel as if they have more control in how they present themselves and more often report that in online settings they are better able to express their true feelings (Bargh, & McKenna, 2004; Chang, & Yeh, 2003; McKenna & Bargh, 2000). In addition to increasing

disclosure, online interactions have been shown to deemphasize unique individual differences leading to increase feelings of similarity and closeness between partners (Bargh, & McKenna, 2004; Tanis & Postmes, 2007; Tanis & Postmes, 2008). Based on these findings, partners engaging in problem-focused discussions in online situations, when compared to partners in face-to-face situations, should show enhanced freedom to disclose personal information, greater inclination toward true self-expression, and a heightened sense of similarity with one's friend, resulting in stronger feelings of closeness.

The Current Study

The current study examined the impact of text based computer communication on social and emotional outcomes related to problem-focused discussions. To test these relations, female friend dyads engaged in problem-focused discussions either using an instant messaging program, MSN instant messenger, or conversing face-to-face. This study focused specifically on female college students as they demonstrate stronger emotional reactions to problem-focused discussions and have a greater tendency to focus on negative emotions in comparison to male college students (Calmes & Roberts, 2008). Due to this potential for stronger emotional reactions in female college students, it was expected that the effects of communication medium on co-rumination outcomes should be most evident in this population.

To identify the mechanisms affecting co-ruminative outcomes in online and face-to-face situations, a number of hypotheses regarding potential differences in communications patterns and related emotional experiences were tested. These hypotheses were derived from three premises: a) online and face-to-face interactions would engender different communicative patterns between interaction partners during a problem-focused discussion and would elicit different levels of felt intimacy (i.e., true self-expression, similarity to one's partner, and

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perceived self-disclosure), b) differences in communication patterns and felt intimacy would result in differences in emotional experiences and feelings of closeness with one's interactive partner following a problem-focused discussion, and c) online and face-to-face problem-focused discussions would elicit different levels of negative affect and feelings of closeness, and these effects would be mediated by differences in communicative patterns and felt intimacy.

Based on these premises and previous findings, it was predicted that participants engaging in problem-focused discussions via instant messenger would experience fewer negative emotions, and greater closeness with friends when compared to those in face-to-face problem-focused discussions. These relations were expected to be mediated by differences in conversational processes, with online communication leading to decreased levels of expressed negative affect, which in turn, would lead to decreased feelings of sadness and negative affect. Furthermore, those engaging in online problem-focused discussions compared with face-to-face discussions would show a heightened degree of solution-focused talk also leading to decreased feelings of negative affect and sadness. Finally, it was hypothesized that discussing one's problems online would be related to heightened feelings of true self-expression, perceived similarity, and self-disclosure which would in turn mediate relations between online communication and heightened feelings of closeness with one's partner. For a graphical representation of the hypothesized relations between predictors, outcomes, and mediating variables see Figures 1 and 2.

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┌─────────────────────────┐      -      ┌─────────────────────────┐      +      ┌─────────────────────────┐
│  Conversation Condition │─────────────▶│   Expression of         │─────────────▶│  Experienced            │
│ (Online or Face-to-Face)│             │   negative emotions     │             │  negative affect        │
└─────────────────────────┘             └─────────────────────────┘             └─────────────────────────┘
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┌─────────────────────────┐      +      ┌─────────────────────────┐      -      ┌─────────────────────────┐
│  Conversation Condition │─────────────▶│   Solution-oriented     │─────────────▶│  Experienced            │
│ (Online or Face-to-Face)│             │   discussion            │             │  Negative Affect        │
└─────────────────────────┘             └─────────────────────────┘             └─────────────────────────┘
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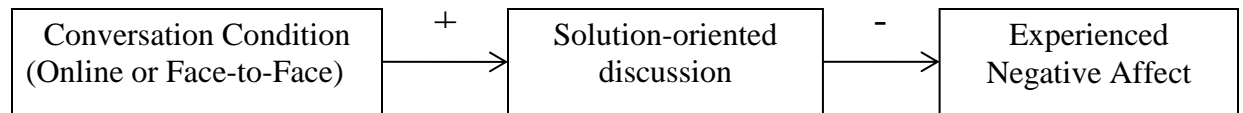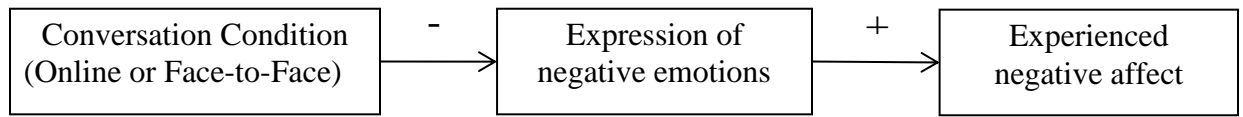
Figure 1. Mediation between conversational context and negative affect

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┌─────────────────────────┐      +      ┌─────────────────────────┐      +      ┌─────────────────────────┐
│  Conversation Condition │─────────────▶│   True self expression  │─────────────▶│  Closeness with         │
│ (Online or Face-to-Face)│             │                         │             │  Interactive Partner    │
└─────────────────────────┘             └─────────────────────────┘             └─────────────────────────┘
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┌─────────────────────────┐      +      ┌─────────────────────────┐      +      ┌─────────────────────────┐
│  Conversation Condition │─────────────▶│   Perceived similarity  │─────────────▶│  Closeness with         │
│ (Online or Face-to-Face)│             │                         │             │  Interactive Partner    │
└─────────────────────────┘             └─────────────────────────┘             └─────────────────────────┘
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┌─────────────────────────┐      +      ┌─────────────────────────┐      +      ┌─────────────────────────┐
│  Conversation Condition │─────────────▶│   Self-disclosure       │─────────────▶│  Closeness with         │
│ (Online or Face-to-Face)│             │                         │             │  Interactive Partner    │
└─────────────────────────┘             └─────────────────────────┘             └─────────────────────────┘
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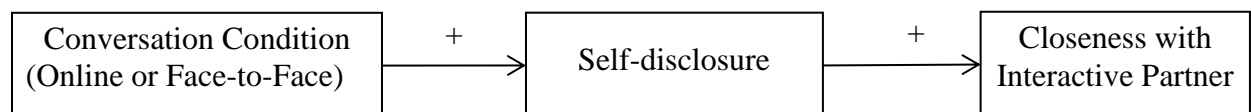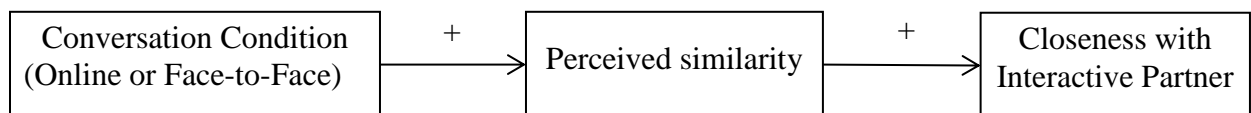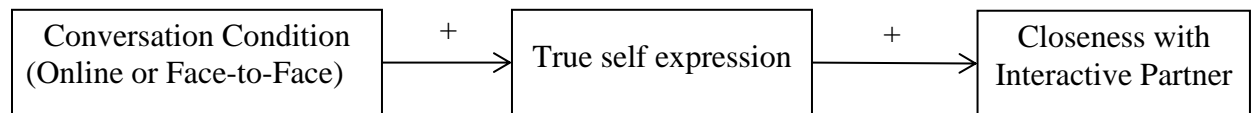*Figure 2. Mediation between conversational context and closeness*

METHODS

Participants

Power Analyses. Power analyses were conducted to determine the appropriate sample size for the current study. Past research comparing computer mediated and face-to-face communication has shown computer mediated communication to have a considerable impact on friendship quality and psychological adjustment variables similar to those used in this study (Green et al., 2005; Joinson, 2001; Sassenberg, Boos, & Rabung, 2005; Weisband & Atwater, 1999). Effect sizes in these studies have ranged from .28 to 2.22, with an average of 1.24. Using G*power software developed by Erdfelder, Faul, and Buchner (1996), it was determined that comparing two groups of 50 participants per group yields power of 1.00 to detect an effect of 1.24. With this sample size, there is power of .70 to detect a more conservative effect of .50.

Furthermore, correlations between observed communicative practices, such as the ones to be examined in this study, and friendship quality and emotional adjustment variables have been shown to range from .18 to .34 (Schwartz-Mette & Rose, 2009). Power analyses were also conducted to determine the sample sizes necessary to detect similar effects in the current study. For a sample size of at least 100 participants, correlations with an absolute value equal to or greater than .20 are significant. Furthermore, with 100 participants, there is power (.80) to detect significant correlation equal to or greater than .28.

For testing mediation with multiple regression (Baron, & Kenny, 1986), power was assessed as the ability to identify significant parameters in the regression equation. For a sample size of 100 participants, there is sufficient power to detect a medium effect size ($f^2 = .15$) for a parameter (Power = .97) and sufficient power for detecting more moderate effects ($f^2 = .07$; Power = .75).

Final Sample. An initial sample of 112 female university students interacting in 56 same-sex dyads participated in the current study. A review of the video recordings/transcripts of the problem-focused discussions revealed that participants in three of the conversational dyads did not engage in problem-focused for the majority of the conversation. Thus, data from the six participants in these dyads were eliminated from analyses. The final sample consisted of 106 undergraduate students attending a four-year university in the upper-Midwest of the USA in the 2011 - 2012 school year. Participants in the sample were between the ages of 18 and 40 ($M =$ 19.01, $SD =$ 2.26). The ethnic makeup of the sample was 94.3% Caucasian, 3.8% Asian, 0.9% African-American/Black, and 0.9% other/non-specified. Of the final sample, 67.9% were in their first year of college, 22.6% were in their second year, 7.5% were in third year, 0.9% were in their fourth year, and 0.9% were returning students. Half the participants were recruited from the participant pool at NDSU via the SONA system on the Department of Psychology's website. Those signing up online were asked to register for a one hour time slot and to bring a female whom they considered to be a good friend.

Procedures

Each dyad was randomly assigned to the online or face-to-face condition prior to the participants' arrival at the lab. Members of each dyad were first asked to complete a series of questionnaires in separate rooms. Each member of the dyad filled out measures concerning basic demographic information, baseline emotion state, true self-concept, actual self-concept as well as three problem description sheets developed by Rose (2009), asking participants to detail a problem they have experienced recently or were experiencing at the time of the study. Following the completion of these pre-task measures, participants engaged in two separate conversations in one of two experimental conditions (i.e., face-to-face or over instant messenger). For both

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conditions, the pre-task conversation lasted 7 minutes and involved participants discussing potential plans they had for the end of the semester break. The second, experimental conversation involved participants discussing problems they were experiencing in their daily lives for 20 minutes either face-to-face or over instant messenger.

Face-to-Face Condition. Participants in the face-to-face condition were positioned across the table from one another in a room with three cameras; two positioned to capture each participant individually from the waist up, while a third captured the dyad as a whole. Initially, participants engaged in the pre-task conversation for 7 minutes. Following the preliminary conversation, a research assistant reentered the room and gave instructions to the participants for the experimental conversation. After the experimental conversation, one participant from each dyad was escorted to a separate room, and both dyad members were asked to complete the post-task questionnaires.

Online Condition. In the online condition, participants remained in separate rooms for the entirety of the experiment. Following the pre-task measures each participant was signed into MSN instant messenger using usernames and passwords created specifically for the study. Video recorders were focused on the participants from the waist up in an effort to make the two conditions equivalent. Research assistants confirmed that each participant was familiar with the instant messenger program before continuing. No participants indicated that they were unfamiliar with instant messenger. As in the face-to-face condition, the participants engaged in a 7 minute conversation concerning plans they may have for the end of the semester. Once the participants conversed for the allotted time, the research assistant reentered the room and gave the participants instructions for the experimental conversation. After the experimental conversation, participants remained in the separate rooms and completed post-task questionnaires.

Problem-Focused Conversation Task. Following the pre-task conversation, for both the face-to-face and online conditions, a research assistant provided each participant with a paper listing the three problems they had provided previously. After receiving their problems list, participants engaged in a 20 minute conversation concerning at least one of the problems listed on each of their sheets. After 18 minutes, a research assistant reentered the room to inform the participant that they had two minutes until the conversation's end, to ensure that participants' feelings were due the effects of conversation and not due to dissatisfaction with the conversation ending abruptly. At the conclusion of this discussion portion, the research assistant reentered the room(s) to administer the final set of questionnaires. Once the participants completed the final measures they were debriefed and thanked for their participation.

Measures

Pre-Task Questionnaires.

Demographics (Appendix A). Participants provide basic demographic information including their age, year in school, and length and quality of the relationship with their friend. Participants were also asked about their preferred and actual means of communication with the friend in the experiment as well as with friends in general.

Actual Self/True Self (Appendix B). To assess the degree to which participants behaved according to their "True" or "Actual" self-concept during the problem-focused discussions, participants completed the True/Actual self-concept measure used by Bargh et al. (2002). The measure consists of 20 neutrally normed, 20 positively normed, and 20 negatively normed trait words taken from Anderson's (1968) normative likeability rating scale. Participants were asked to choose 10 traits from the list that best represent their "True self" defined as "those characteristics that you possess and would like to express socially, but are not always able to, for

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whatever reason" and 10 words that described their actual self, which was defined as "those characteristics that you possess and are often able to express to others in social settings" (Bargh et al., 2002; Schelgel et al., 2009). Participants were instructed to circle the words that represented their true self, ranking them from 1 (*Most representative*) to 10 (*Less representative*) and underline words representing their actual self also ranking them 1 (*Most representative*) to 10 (*Less representative*) as well. Consistent with past use of this measure, participants were informed that qualities which they selected as aspects of their true self could not also be selected as an aspect of their actual self.

Following the problem-focused discussion portion of the study, participants were presented with the sixty descriptor traits from Anderson's normative likeability scale and asked to rate the extent to which they expressed each trait during the conversation on a 5-point scale ranging from 1 (*I did not express this trait at all*) to 5 (*I expressed this trait very much*). From this measure, a true self-expression score was calculated for each participant by averaging the ratings of the 10 traits identified as true self descriptors, while actual self-expression scores were calculated for each participant by averaging ratings for traits selected as characteristic of her actual self.

Problem Measure (Appendix C). Following procedures used in past studies of co-rumination (Rose, 2009), participants were asked to identify three problems experienced in their daily lives and answer questions regarding their significance, feelings, and other perceptions of their problems (Schwartz-Mette & Rose, 2009). Participants were given three copies of the "Problems" form used by Schwartz-Mette and Rose (2009). On each copy of the form, participants were asked to list a problem at the top and respond to questions regarding the problem on a 5-point scale from 1 (*Not at all*) to 5 (*Very much*).

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Coding of Problem-Focused Discussions (Appendix D). Trained coders watched/read the original interactions and rated the entire interaction concerning their general impressions of participants' affective experiences and informational contributions. Specifically, coders independently rated the degree to which participants dwelled on negative emotions regarding the problems, and the degree to which they focused on information surrounding the problem unrelated to affective experiences. After viewing the entire interaction, coders rated participants on a 5-point scale from 1 (*Not at all*) to 5 (*Very much*). Intraclass correlations for the coder-rated study variables were in the good range (Cicchetti, 1994) for dwelling on negative affect (ICC = .72) and information exchange (ICC = .64). When disagreements in the ratings occurred, raters re-watched the interaction and discussed their ratings until they came to an agreed upon score. These final scores were used as mediators for changes in affect related to the conversational condition.

Post-Task Questionnaires.

PANAS-X (Appendix E). The Positive and Negative Affect Schedule Expanded form (PANAS-X; Watson & Clark, 1994) is a commonly used measure of positive and negative affect. This scale lists 60 discrete emotions and asks participants to rate the degree to which they are currently experiencing each emotion on a 5-point scale ranging from 1 (*Very slight or not at all*) to 5 (*Extremely*). Scores on the PANAS-X can be broken into 13 different subscales (i.e., Negative Affect, Positive Affect, Fear, Hostility, Guilt, Sadness, Joviality, Self-Assurance, Attentiveness, Shyness, Fatigue, Serenity, and Surprise). For the purpose of the present study, only those subscales related to negative emotionality were considered (i.e., Negative Affect, Fear, Hostility, Guilt, Sadness). The PANAS-X was administered to participants prior to their conversations to establish baseline affect and then again following the conversation to assess the

degree to which their experiences of negative affect changed during the conversations. Change in affect from pre-conversation to post-conversation was a dependent variable in the current study. Cronbach's alphas for each subscale showed sufficient reliability (Negative Affect α = .82, .81, Fear α = .82, .75, Hostility α = .83, .82, Guilt α = .89, .90, and Sadness α = .71, .65, for pre-task and post-task administrations, respectively).

Quality of Relationships Inventory (Appendix F). Closeness was measured using the Quality of Relationship Inventory (QRI; Pierce, Sarason, & Sarason, 1991), which has been shown to be related to measures of co-rumination in past research (Calmes & Roberts, 2008). This scale includes three subscales assessing conflict, social support, and depth/closeness. As closeness is the primary dependent variables, only the depth/closeness subscale was administered in the current study. This scale consists of 8 items rated on a 5-point scale from 1 (*Not at all*) to 5 (*Very much*) concerning participants' closeness with their friend and the significance of the relationship. The measure demonstrated high reliability (α = .90). Final scores were calculated for each participant by averaging across the 8 items.

Similarity (Appendix G). Perceived similarity with one's partner was measured using a computerized applet based on Aron, Aron, and Smollan's Inclusion of Other in Self scale (IOS; 1992). This applet converts the widely used IOS from a 7-point measure with which participants chose from a series of pictures of overlapping circles the one which represents the level of similarity they have with a particular friend to a more continuous 200-point measure with which participants indicate the degree of similarity using a computerized indicator (Le, Moss, & Mashek, 2007). For this measure, two circles of different colors appeared on the screen, one labeled "self" and the second labeled "other." Participants were asked to indicate how similar they were to their friend by clicking on the circle labeled self and dragging it toward or away

from the circle labeled other until they feel that the degree of overlap represents the degree of similarity between them and their friend. Final similarity scores were calculated by the program in two ways. The first is based on the percentage of the "self" circle which is overlapped by the "other" circle. The second method was based on how close the "self" circle was to the "other" circle. As participants moved the circles away from one another, the applet assigned negative values from -1 to -100, while moving to circles over top of one another were assigned positive values up to 100. Touching, but non-overlapping circles received a value of zero.

Due to computer error, responses from five participants in five separate dyads were not recorded. All analyses involving this measure were conducted both excluding these participants and including the participants by allowing MPlus to estimate their data using the default Full Information Maximum Likelihood procedure (FIML). As the beta weights and significance values were virtually identical, analyses involving similarity included all available data including data from participants for whom similarity scores were not available.

Self-Disclosure (Appendix H). An adapted version of The Revised Self Disclosure Scale (Wheeless & Grotz, 1976) was used to measure participants' perceived levels of self-disclosure following their problem-focused discussions. This 19-item scale measured participants' general level of perceived disclosure as well as five distinct ways in which disclosure is manifested (i.e., intimacy, accuracy, amount (about self), valence, and intent to self-disclose). The intimacy in self-disclosures subscale assessed the degree to which participants felt their disclosures represented deep personal feelings with higher scores indicating more intimate disclosures. The disclosure accuracy subscale asked participants to rate how well they felt the messages they shared with their partner reflected their internal states and experiences. Disclosure amount represents the amount of information about the self that participants felt they disclosed to their

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partner. The valence of self-disclosure subscale concerns whether participants felt their disclosures were mostly negative or mostly positive with higher scores representing more positive disclosures. The intent to self-disclose subscale had participants rate the degree to which they felt they disclosed information in a controlled and intentional manner with higher scores indicating more control. Total self-disclosure on this measure represents the degree to which participants' disclosures were generally accurate, complete, positive, and intentional and was constructed by averaging items across all subscales. The original items were adapted to direct participants to reflect on their level of self-disclosure during the interaction that had just taken place rather than their general levels of self-disclosure with friends or family members. For this measure, participants rated the degree to which each of the item statements agreed with their actual behavior on a 5-point scale ranging from 1 (*Strongly disagree*) to 5 (*Strongly agree*). This scale demonstrated sufficient internal consistency for each of the five subscales comprising self-disclosure (Total Disclosure α = .63, intimacy α = .69, accuracy α = .56, amount (about self) α = .61, valence α = .59, and intent of self-disclosure α = .62).

RESULTS

Overview of Analyses

Prior to testing the direct and indirect effects of conversational condition on negative emotionality and perceived closeness, preliminary analyses were conducted to examine the distributional properties of the study variables, identify potential differences between the participants in the two conversational conditions, and identify variables which need to be controlled for in analyses. Linear regressions were then conducted testing: 1) the effects of condition on each of the final outcome variables (i.e., negative emotionality, closeness), 2) the effects of condition on the mediating variables (i.e., dwelling on negative affect, information exchange, true self-expression, similarity, self-disclosure), and 3) the effects of the mediating variables (i.e., dwelling on negative affect, information exchange, true self-expression, similarity, self-disclosure) on the final outcome variables (i.e., negative emotionality, closeness). Finally, the indirect effects of condition on experienced negative emotionality and closeness through the proposed mediators were tested using Sobel tests in Mplus.

As the participants in this study conversed in dyads, their data and responses were not independent of one another. The cluster function in MPlus was used to control for the effects of the dyad on participant responses. Each outcome variable was tested in separate analyses. Additionally, in analyses involving potential mediators, either as predictor or criterion variables, each mediator was also tested separately. For analyses involving negative emotionality outcomes, baseline levels of negative emotionality were mean centered and entered as control variables. Control and predictor variables were entered in the model in a single step for each analysis.

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Preliminary Analyses

Means and standard deviations for all self-report measures can be found in Table 1. Independent samples *t*-tests were conducted comparing participants in the online condition to those in the face-to-face condition. On average, participants in the face-to-face condition reported more true self-expression and were observed to have exchanged significantly more information than those in the online condition. Individuals in the online condition reported disclosing more information during their conversation than participants in the face-to-face condition. In addition to these significant effects, participants in the online condition felt marginally more similar to their friend following the conversation and were marginally more intentional in their disclosures. Notably, there were no significant differences in baseline levels of negative affect and negative emotionality across the two conditions.

Bivariate correlations were conducted to examine relations between friendship length, social and emotional adjustment, and observed conversational processes (i.e., information exchange, dwelling on negative affect; Tables 2 – 4). Table 2 presents the correlations between pre-task levels of negative emotions, post-task levels of negative emotions, and conversational processes. Not surprisingly, the PANAS-X subscales related to general negative affect, fear, hostility, guilt, and sadness were highly correlated with one another both pre-task (*r*s = .57 - .88) and post-task (*r*s =.42 - .83). Stability coefficients for these variables ranged from .57 - .68. Experienced negative affect did not correlate with observed conversational processes.

Table 3 presents correlations between closeness, similarity, true self-expression, and self-disclosure. Subscales of The Revised Self-Disclosure Scale demonstrated a wider range of intra-measure correlations (*r*s = .00 - .83). Total Disclosure, which is comprised of a combination of all items making up the other subscales, evidenced the strongest relations (*r*s = .21 - .83), while

Table 1. Descriptive Statistics and T-tests Comparing Online and Face-to-Face Conditions

Variable	Total sample		FTF		Online		t-test
	M	SD	M	SD	M	SD	
Age	19.01	2.26	18.80	1.00	19.23	3.07	-.99
Year in school	1.44	.76	1.37	.74	1.52	.75	-1.01
Friendship length (weeks)	32.65	46.64	38.28	53.48	26.90	38.11	1.24
Baseline negative affect	1.35	.43	1.32	.40	1.38	.46	-.65
Baseline fear	1.39	.53	1.36	.51	1.42	.55	-.57
Baseline hostility	1.23	.46	1.19	.31	1.27	.55	-.95
Baseline guilt	1.22	.50	1.18	.41	1.25	.58	-.76
Baseline sadness	1.38	.52	1.32	.47	1.44	.57	-1.19
Post-task negative affect	1.27	.37	1.25	.32	1.29	.42	-.61
Post-task fear	1.24	.37	1.22	.32	1.25	.41	-.38
Post-task hostility	1.16	.36	1.13	.26	1.19	.44	-.86
Post-task guilt	1.21	.49	1.18	.42	1.25	.56	-.77
Post-task sadness	1.33	.44	1.27	.43	1.40	.45	-1.52
Closeness	3.87	.65	3.89	.65	3.84	.66	.68
True self-expression	2.96	.61	3.07	.58	2.84	.63	2.00[*]
Similarity	62.26	31.64	55.88	39.24	69.02	18.95	-2.12[†]
Disclosure total	3.42	.32	3.41	.32	3.44	.33	-.50
Disclosure intimacy	3.24	.54	3.29	.50	3.19	.57	.97
Disclosure accuracy	3.90	.55	3.87	.58	3.94	.52	-.63
Disclosure amount	3.08	.40	2.99	.34	3.18	.44	-2.44[*]
Disclosure valence	3.34	.68	3.34	.64	3.33	.72	.05
Disclosure intent	3.78	.72	3.67	.77	3.91	.65	-1.77[†]
Dwelling on negative affect[a]	2.79	.80	2.73	.70	2.86	.89	-.79
Information exchange [a]	2.82	.57	2.98	.58	2.65	.51	2.93[**]

[†] $p < .10$. [*] $p < .05$. [**] $p < .01$. [***] $p < .001$.

Table 2. Correlations between Emotional Adjustment, and Conversational Processes

Correlations

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. Base negative affect	---											
2. Base fear	.88***	---										
3. Base hostility	.78***	.64***	---									
4. Base guilt	.80***	.62***	.77***	---								
5. Base sadness	.65***	.57***	.58***	.63***	---							
6. Post negative affect	.66***	.49***	.51***	.62***	.40***	---						
7. Post fear	.65***	.57***	.45***	.49***	.34***	.83***	---					
8. Post hostility	.63***	.42***	.59***	.65***	.39***	.79***	.63***	---				
9. Post guilt	.41**	.24**	.33***	.62***	.27**	.74***	.48***	.65***	---			
10. Post sadness	.38***	.33***	.29**	.42***	.68***	.56***	.48***	.42***	.44***	---		
11. Dwell on negative affect [a]	-.05	-.11	-.13	-.09	-.09	.02	.02	.09	-.01	-.07	---	
12. Information exchange [a]	.03	.03	.12	.05	.06	.07	.05	.01	.10	.05	-.07	---

[†] $p < .10.$ [*] $p < .05.$ [**] $p < .01.$ [***] $p < .001.$

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Table 3. Correlations between Closeness, True Self-Expression, Similarity, and Self-Disclosure

Variable					Correlations				
	1	2	3	4	5	6	7	8	9
1. Closeness	---								
2. True self-expression	.23*	---							
3. Similarity	.46***	.20*	---						
4. Total disclosure	.21*	.08	.13	---					
5. Disclosure intimacy	.23*	.20*	.10	.83***	---				
6. Disclosure accuracy	.14	-.03	.11	.76***	.46***	---			
7. Disclosure amount	.06	.00	.12	.29**	.28**	.00	---		
8. Disclosure valence	.01	-.02	.07	.23*	-.15	.11	-.12	---	
9. Disclosure intent	.00	-.12	-.08	.36***	.14	.32***	-.19†	-.13†	---

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

the disclosure valence subscale showed the weakest relations (rs = .10 to .21) overall. Although significantly correlating with closeness, felt intimacy variables (i.e. similarity, true self-expression, self-disclosure) did not significantly correlate with one another. Closeness with one's interactive partner was modestly related to true self-expression, feelings of similarity, total disclosure, and intimacy during disclosure.

Correlations were next examined to determine whether the negative affect and conversational processes variables were associated with closeness and the indices of felt intimacy (i.e., true self-expression, similarity, self-disclosure; see Table 4). Few relations reached statistical significance. True self-expression and intimacy in disclosures were both positively related to pre-task indicators of negative emotionality. Dwelling on negative affect was negatively related to closeness and disclosure accuracy. Information exchange was positively related to closeness and intimacy during disclosures. Closeness was negatively related to both post-task fear and hostility.

In addition to testing relations between proposed mediators and final outcome variables, bivariate correlations were also conducted to examine relations between friendship length and both the proposed mediators as well as final outcomes. These analyses were conducted in order to determine whether friendship length should be entered into regression analyses as a control variable. Length of friendship was negatively related to pre-task general negative affect (r = -.23, p < .05), pre-task hostility (r = -.19, p < .10), and post-task fear (r = -.19, p < .10), although the last two correlations were marginal. Additionally, friendship length was positively correlated with feelings of closeness (r = .39, p < .01) and marginally related to participants' tendency to dwell on negative affect (r = .18, p < .10). Thus, friendship length was controlled for in all subsequent analyses.

Table 4. Correlations between Emotional Adjustment, Closeness, Similarity, Self-Disclosure & Conversation Processes

Correlations

Variable	Closeness	True self-expression	Similarity	Total disclose	Intimate disclose	Accurate disclose	Disclose amount	Disclose valence	Disclose intent
1. Base negative affect	-.09	.23*	.00	.02	.17†	-.06	.05	-.16	-.06
2. Base fear	-.05	.25**	-.01	.05	.18†	-.02	.05	-.16	-.03
3. Base hostility	.06	.31***	.09	.19*	.29**	.12	.03	-.18†	.11
4. Base guilt	.03	.15	.02	.13	.23*	.07	.12	-.16†	-.05
5. Base sadness	.00	.21*	.04	.17†	.26**	.06	.23*	-.16†	-.03
6. Post negative affect	-.12	.15	-.02	-.03	.15	-.18†	-.02	-.15	-.02
7. Post fear	-.24*	.22*	-.01	-.17†	.02	-.26*	-.05	-.16†	-.09
8. Post hostility	-.21*	.12	-.04	.01	.12	-.12	-.06	-.07	.08
9. Post guilt	-.08	-.05	-.09	-.01	.10	-.11	.02	-.10	-.02
10. Post sadness	-.11	.07	-.01	-.01	.09	-.07	.16†	-.12	-.15
11. Dwell on negative affect [a]	-.26**	-.13	-.07	-.14	-.13	-.27*	.03	-.03	.16
12. Information exchange.[a]	.26**	.13	.12	.11	.26**	-.06	.07	-.08	-.10

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$. [a] Coder rated variables

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The Direct Effects of Condition on Feelings of Negative Emotionality and Closeness

Initial regression analyses were conducted to examine differences between conditions on post-task negative emotionality controlling for pre-task measures of negative emotionality and on feelings of closeness with one's partner following the conversation. The results of these analyses can be found in Table 5. Regressions revealed no significant association between conversational context and post-task feelings of negative emotionality. Similarly, whether participants engaged in problem-focused discussions online or face-to-face was unrelated to feelings of closeness following problem-focused discussions.

Direct Effects of Condition on Dwelling on Negative Affect, Information Exchange, True Self-Expression, Similarity, and Self-Disclosure

Results of regressions examining the effects of conversational condition on dwelling on negative affect, information exchange, true self-expression, similarity, and self-disclosure are presented in Table 6. Controlling for friendship length, these analyses revealed that conversational condition significantly impacted information exchange, feelings of similarity, and disclosure amount. Participants in the online condition were observed to exchange significantly less information about their problem than those in the face-to-face condition ($\beta = -.29$, $p < .01$). However, these individuals reported a stronger sense of similarity ($\beta = .23$, $p < .01$) and felt they engaged in greater self-disclosure ($\beta = .25$, $p < .01$) with their interactive partner following problem-focused discussions than participants in the face-to-face conversation condition. Interestingly, individuals in the face-to-face condition demonstrated marginally higher levels of true self-expression ($\beta = -.19$, $p = .057$) and reported marginally lower levels of disclosure intentionality ($\beta = .18$, $p < .10$) than those in the online condition. Observations of participants' tendencies to dwell on negative affect did not differ between the two conditions. Conversation

Table 5. *Standardized Coefficients and Variance Explained from Regression Analyses Testing the Direct Effects of Condition on Experienced Negative Affect and Closeness*

Predictor	Outcome variable					
	Negative affect	Fear	Hostility	Guilt	Sadness	Closeness
Pre-task assessment	.66***	.55***	.59***	.63***	.68***	N/A
Friendship length	.02	-.15**	.04	.04	.09	.41***
Face-to-face vs. online	.02	-.01	.03	.03	.08	.01
R^2	.43**	.34*	.35†	.39†	.47***	.17*

† $p < .10.$ * $p < .05.$ ** $p < .01.$ *** $p < .001.$
[a] Coder rated variables.
Note. Online/face-to-face is a dummy coded variable (0 = face-to-face experimental condition; 1 = online condition)

Table 6. The Direct Effects of Condition on Dwelling on Negative Affect, Information Exchange, True Self-Expression, Similarity, Total Disclosure, Disclosure Intimacy, Disclosure Accuracy, Disclosure Amount, Disclosure Valence, and Disclosure Intent

	Outcome variables									
Predictor	Dwell on negative affect [a]	Information exchange [a]	True self-expression [a]	Similarity	Total disclosure	Disclosure intimacy	Disclosure accuracy	Disclosure amount	Disclosure valence	Disclosure intent
Friendship length	.17	.14	.01	.14	.14	.13	.05	.11†	.07	.01
Face-to-face vs. online	.12	-.29***	-.19†	.23**	.07	-.08	.07	.25**	.00	.17†
R^2	.04	.12†	.04	.06†	.02	.03	.01	.07	.00	.03

† $p < .10.$ * $p < .05.$ ** $p < .01.$ *** $p < .001.$ [a] Coder rated variables.
Note. Online/face-to-face is a dummy coded variable (0 = face-to-face experimental condition; 1 = online condition)

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context was also unrelated to total disclosure, intimacy in self-disclosures, accuracy of self-disclosures, and the valence of self-disclosures.

The Effects of Dwelling on Negative Affect and Information Exchange on Feelings of Negative Emotionality Following Problem-Focused Discussions

Table 7 displays the results of regression analyses examining the prospective effects of observer rated dwelling on negative affect and information exchange on indicators of negative emotionality. Controlling for pre-task assessments of negative emotionality and friendship length, a single significant effect emerged from these regression analyses. Dwelling on negative affect was positively related to feelings of hostility ($\beta = .16$, $p < .05$) following problem-focused discussions. Information exchange was unrelated to negative emotionality following problem-focused discussions.

Relations Between True Self-Expression, Similarity, Self-Disclosure, and Feelings of Closeness

As can be seen in Table 8, several of the proposed mediators significantly predicted feelings of closeness with one's interactive partner following problem-focused discussions. Participants' ability to express aspects of their true self was positively related to feelings of closeness ($\beta = .21$, $p < .05$). Feelings of similarity with one's interactive partner following problem-focused discussions were positively related to feelings of closeness ($\beta = .42$, $p < .01$). Intimacy during self-disclosures ($\beta = .17$, $p < .10$) and total disclosure ($\beta = .15$, $p < .10$) were both positively, albeit marginally, related to feelings of closeness.

Table 7. The Direct Effects of Observed Conversational Processes on Experienced Negative Affect

Predictor	Negative affect	Fear	Hostility	Guilt	Sadness
			Outcome variable		
			Test of dwell on negative affect		
Pre-task assessment	.66***	.56***	.61***	.63***	.68***
Friendship length	.01	-.15**	.02	.07	.09
Dwelling on negative affect	.05	.11	.16*	.05	-.01
R^2	.43**	.35*	.37*	.39†	.46***
			Test of information exchange		
Pre-task assessment	.66***	.55***	.61***	.63***	.69***
Friendship length	.01	-.16**	.06	.02	.08
Information exchange	.03	.07	-.07	.04	-.02
R^2	.43**	.35*	.35†	.39†	.46***

† $p < .10.$ * $p < .05.$ ** $p < .01.$ *** $p < .001.$ [a] Coder rated variables.

Indirect Effects of Condition on Negative Emotionality Through Coder Rated Dwelling on

Negative Affect and Information Exchange

The effects of conversational condition on various indicators of negative emotionality

(i.e., general negative affect, fear, guilt, hostility, sadness) through conversational processes (i.e.,

dwelling on negative affect, information exchange) were tested. Models of these effects were

tested controlling for friendship length and pre-task measures of negative emotionality. The

proposed meditational effects of observed conversational processes on the relations between

discussion contexts on negative emotionality can be found in Figure 1. Separate models were

used to test each combination of mediator and outcome variable. Despite the numerous analyses

conducted to test these relations, none of the tests of mediation were significant. With regard to

observed conversational process, the two conversational conditions only differed in the amount

of information they exchanged concerning their problems. As information exchange was not

related to any form of negative emotionality, the lack of significance in meditational analyses is

not surprising.

Indirect Effects of Condition on Closeness Through True Self-Expression, Similarity, and

Self-Disclosure

In a final set of analyses, the proposed mediational models concerning the effects of

conversational condition on closeness through true self-expression, perception of similarity, and

self-disclosure can be found in Figure 2. Once again friendship length was entered as a control

variable in each model. Each potential mediating variable was entered in separate analyses

testing the indirect effect of condition on closeness. Of the proposed mediators, only two of

variables that were affected by conversational context were shown to also predict levels of

closeness following the conversation. True self-expression and feelings of similarity, which were

affected by conversational context, were each positively related to feelings of closeness

following problem-focused discussion. Other aspects of self-disclosure were either unaffected by

conversational context, were not related to feelings closeness towards one's interactive partner,

Table 8. The Direct Effects of True Self-Expression, Similarity and Self-Disclosure on Closeness

Predictor variables	R^2	β
Friendship length	.21**	.40***
True self-expression		.21*
Friendship length	.35**	.36***
Similarity		.43***
Friendship length	.19**	.39***
Total disclosure		.15†
Friendship length	.20**	.39***
Disclosure intimacy		.17†
Friendship length	.18*	.41***
Disclosure accuracy		.12
Friendship length	.17*	.41***
Disclosure amount		.03
Friendship length	.17*	.41***
Disclosure valence		-.02
Friendship length	.17*	.41***
Disclosure intent		-.01

†*p* < .10. **p* < .05. ***p* < .01. ****p* < .001.

or were not related to both context and closeness. Although not reported, analyses examining the mediational effect of all self-disclosure variables were conducted. None of the Sobel tests for the models testing self-disclosure variables as mediators of the relation between conversational context and feelings of closeness with one's interactive partner reached statistical significance.

The results of analyses testing the indirect effects of condition on closeness through true self-expression can be found in Figure 3. Although participants in the face-to-face conversation condition were better able to express their true selves ($\beta = -.19$, $p < .05$) and true self-expression was positively related to feelings of closeness ($\beta = .23$, $p < .05$), the Sobel test of the indirect effects was not statistically significant ($\beta = -.04$, $p = .19$).
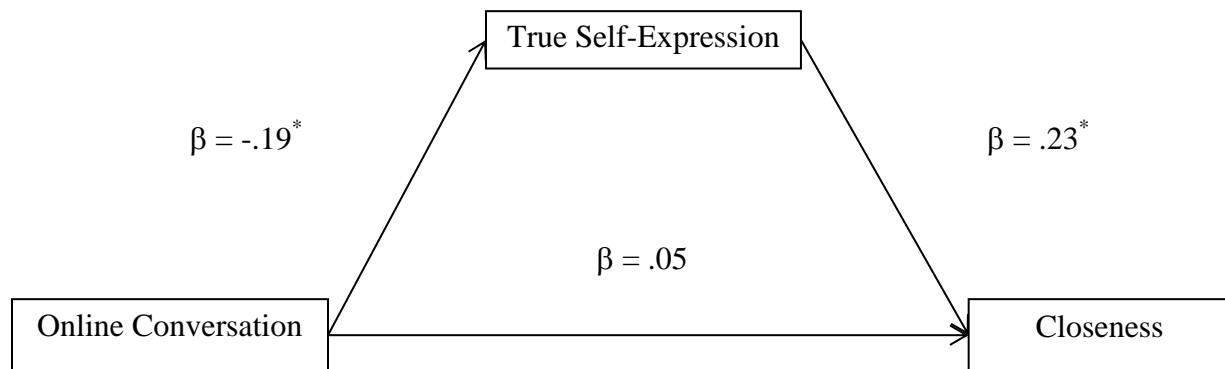

Figure 3. Indirect effects of online conversations on feelings of closeness through true self-expression ($\beta = -.04$ $p = .19$).

Figure 4 shows the results of tests of the indirect effects of conversational condition on closeness through felt similarity with one's interactive partner. Controlling for friendship length, the Sobel test of the indirect effects revealed that feelings of similarity mediated the relation between conversational condition and feelings of closeness ($\beta = .09$, $p < .01$). Discussing problems online lead to higher levels of felt similarity ($\beta = .20$, $p < .05$) which was positively related to feelings of closeness with one's interactive partner ($\beta = .45$, $p < .001$).
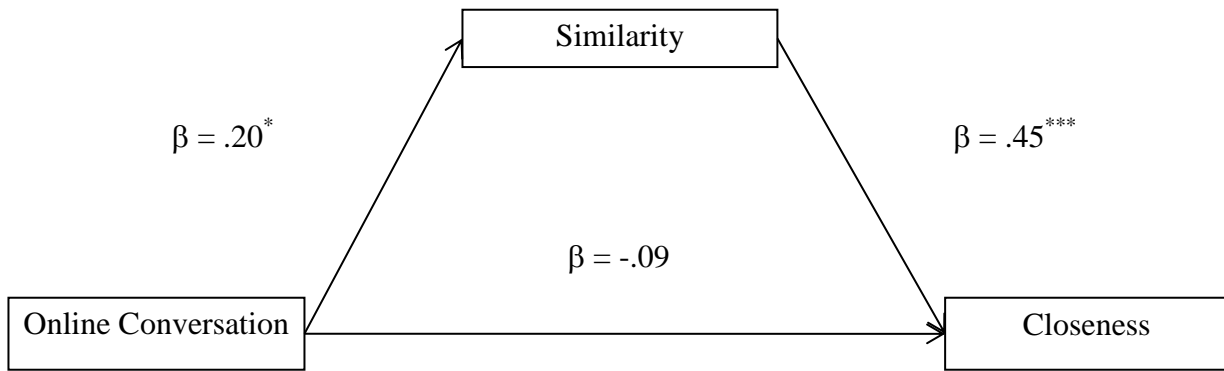
Figure 4. Indirect effects of online conversations on feelings of closeness through perceived similarity ($\beta = .09$ $p = .007$).

DISCUSSION

The current study is important to our understanding of interpersonal interactions and how these interactions come to influence individuals' social and emotional adjustment. By examining the impact of computer-mediated communication on socioemotional outcomes related to problem-focused discussion, the current study identified how conversational context influences interpersonal processes and how these changes relate to interpersonal adjustment. Using a combination of data collection methods allowed a multimodal examination of the effects of communication context and provided insights as to how problem-focused discussions come to influences individuals' sense of well-being. Most intriguing were the findings regarding experiences of intimacy and self-expression between partners and the effects that these qualities had on feeling of interpersonal closeness. Although few differences between conditions were found related to the emotional well-being of the participants in this study, analyses revealed that conversational context plays an important role in determining the interpersonal benefits received from engaging in problem-focused discussions.

Findings from the current study support the notion that problem-focused discussions conducted over instant messenger lead to more enhanced interpersonal well-being than discussing problems face-to-face. Similar to past research, it was shown that individuals in the online discussion condition felt that they disclosed higher amounts of information to their friend than participants conversing face-to-face. Furthermore, individuals in the online condition felt more similar to their friend than those conversing face-to-face and, notably, these increased feelings of similarity predicted higher levels of closeness following the conversation. The test of mediation, as predicted, revealed an indirect effect of computer-mediated problem-focused discussions on feelings of closeness through increased feelings of similarity toward one's

partner. Perceived closeness between interactive partners has been shown to increase after both computer-mediated communication and engagement in problem-focused discussion (Bargh, & McKenna, 2004; Calmes & Roberts, 2008; McKenna, & Bargh, 1999; McKenna, & Green, 2002; Rose et al., 2007). However, this study is the first to find that problem-focused discussions conducted through computer-mediated communication lead to enhanced feelings of interpersonal closeness by increasing the extent that conversing partners feel they are similar to one another. These findings are in line with theories of computer-mediated communication positing that a lack of interpersonal cues in online settings lead to a shared sense of identity during conversations (Tanis & Postmes, 2007). Potentially, the interpersonal benefits of problem-focused discussions may be enhanced if conducted in a conversational context that promotes feelings of similarity between partners, thereby helping to clarify to a certain extent the conversational conditions necessary for problem-focused discussions to affect individuals' feelings toward their friends.

Somewhat surprisingly, in this study, the indirect effect of online conversations on feelings of closeness emerged despite the lack of a direct effect of conversation context on feelings of closeness. It is possible that other, counter-acting interpersonal processes (e.g., use of deception, personality mismatch, dampened feelings of presence) and/or conversational processes (e.g., conversational self-focus, rehashing of problems, speculation about problems) that intervened inhibited feelings of closeness between friends. If online context heightens those processes which both amplify and diminish feelings of closeness, it would not be surprising that the sum effect of online communication context on perceived closeness was non-significant.

Indeed, findings suggested that engaging in problem-focused conversations online may reduce perceived closeness with one's friend by lowering participants' feelings of true self-

expression. Although the indirect effect was not significant, participants in the online condition reported lower levels of true self-expression than participants in the face-to-face conversation condition, and true self-expression was positive related to perceived closeness. That conversing online predicted lower levels of true self-expression was surprising. Using a reaction time task, Bargh et al., (2002) found that people are faster to identify aspects of their true self after conversing online with an unknown other than they are after conversing with an unknown other face-to-face. It is possible that although aspects of the true self may be more accessible at an unconscious level when conversing online, individuals may not feel they have the ability to fully express these traits without some form of face-to-face interaction. Perhaps it is the inability to explicitly present one's true self that makes it accessible at an unconscious level.

Findings regarding true self-expression also may have been counter to expectations due to testing these effects among dyads of friends. Much of the past research regarding computer-mediated communication has been conducted by examining dyadic and group interactions between previously unknown others, typically in a "get to know you" situation or group decision making task (McKenna & Green, 2002; McKenna et al., 2002; Tanis & Postmes, 2007; Tanis & Postmes, 2008). It is possible that the positive effects of online communication on true self-expression found in previous studies may be due to the relative unfamiliarity between interactive partners. The current study asked friends to interact in a more controlled environment and with a more specific purpose than what is typically done when experimentally testing the effects of computer-mediated communication. As friends are often more familiar with one another and have more established patterns of communication, removing their ability to express themselves through visual and audible expressions may have led to a dampened ability to express aspects of their true self. Considering that true self-expression was also related to higher levels feelings of

closeness, it will be important to further explore this relation between online conversations and true self-expression.

Conversation condition appeared to have a significant effect on the degree to which participants shared information about their problems in an effort to find an instrumental solution to the problem. However, the effects were in the opposite direction of what was originally hypothesized with participants in the face-to-face condition exchanging more information than participants in the online condition. Additionally, it was found that, contrary to predictions, the extent to which individuals focused on negative emotions regarding their problems did not differ as a function of conversation condition. Although these results are surprising, past studies have found that texted based forms of communication are limited in the amount of information expressed during a particular conversation, although emotion cues and non-verbal forms of communication are often cited as the most limited (Caplan, & Tuner, 2007; Kiesler et al., 1984; Ledbetter, & Larson, 2008). Taken together, these findings suggest computer-mediated communication limits the amount of solution oriented information that is exchanged and has little if any impact on the degree to which participants discuss negative emotions through the course of problem-focused discussions.

As participants were given the task of discussing their problems, it may be that during the conversation participants in both conditions prioritized discussing negative emotional experiences and that the medium with the informational constraints did not allow for the focus to move beyond the negative experience to a more instrumental solution oriented discussion. Furthermore, although participants may have produced similar amounts of negative statements in both the online and face-to-face conversation conditions, an examination of non-verbal cues

related to negative emotionality might reveal differences across the two conditions, which could be related to levels of negative emotionality following the conversations.

Despite the unexpected differences in levels of problem related information exchanged during the discussions, experienced negative emotions were, by and large, not significantly related to the observed conversational processes. Information exchange did not predict changes in negative emotionality, and participants' tendency to dwell on negative emotions during the conversation only predicted increased hostility and was unrelated to all other indicators of negative emotionality. In addition to this relative lack of change in negative emotions related to conversational processes, the current study found no effect of condition on participants' negative emotional experiences following problem-focused discussions. These findings are surprising in that research related to both computer-mediated communication and problem-focused discussion report significant changes in negative emotionality due to these types of conversations. As it was expected that the effects of the computer medium might counteract increased negative emotionality that typically results from problem-focused discussions, the results may indicate that the effects of problem-focused discussions on negative emotions are potent enough that the effect of context are not strong enough to overcome these effects. Further study is needed to identify other conversational mechanisms responsible for experienced negative emotions following problem-focused discussion and potential ways to alter these effects.

Implications and Future Directions

The findings from the current study provide new insights concerning the nature and function of interpersonal processes related to problem-focused discussions as well as the means by which computer-mediated communication comes to affect individuals' interpersonal well-being following conversations. This study has implications for the literature surrounding

computer-mediated communication as well as the study of problem-focused discussions and their effects. The results of this study show that the context in which problem-focused discussions occur has a significant impact on the processes used to communicate about problems to friends and that the effects of these interpersonal processes predict changes in the interpersonal well-being of the participants. Furthermore, it was also able to elucidate some of the conditional requirements need for problem-focused discussions to produce the oft found social effects, while also noting some of the limitations of computer-mediated communication to affect emotional experiences following conversations. That feelings of similarity enhance feelings of closeness following problem-focused discussions online could help explain the popularity and relatively rapid expansion of online socialization, as individuals are better able to turn to people who they feel can relate to them and their problems. Additionally, this may explain why certain individuals experiencing problems feel more comfortable discussing their issue online than discussing them in person (Chang, & Yeh, 2003). Lastly, results from this study may be used to help design strategies for individuals to safely discuss problems with friends, relatives, and close others that will maximize the interpersonal benefits of the conversation, while limiting the liabilities.

Further study needs to be conducted to examine the extent to which the effects found in the current study are gender specific or whether these processes and mechanisms identified in this study operate similarly in both males and females. Males tend to demonstrate different communication patterns and experience different emotional outcomes following problem-focused discussions than females (Calmes & Roberts, 2008; Kring, & Gordon, 1998; McNelles, & Connolly, 1999; Rose et al., 2007). Thus, it is important to examine, whether the effects noted in the current study reflect generalizable differences or whether these effects occur only in female populations. Furthermore, although instant messenger programs continue to be used for

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communication over the internet, other forms online communication that have more visual and audio components (i.e. facebook, skype, facetime) have grown in popularity in recent years (Raine, 2011; Zickuhr, 2010). An important extension of the current study would be to examine which visual and auditory components of conversation influence the emotional and interpersonal outcomes related to problem-focused discussions.

Furthermore, this study tested the effects of globally rated dwelling on negative affect and information exchange. A more comprehensive analysis of the data collected in this study will provide a more complete examination of these processes, as well as other conversational processes that may be at work during online and face-to-face problem-focused discussions. An examination of specific word usage, assessments of the severity of topics discussed, and analysis of statements concerning participants' own problems as well as statements concerning participants' friends' problems will provide more detailed information concerning conversational processes responsible for changes in both emotional and interpersonal well-being. The extent to which individuals focus on positive outcomes related to their problems, level of speculation about potential positive and negative consequences of future actions, and the degree to which individuals revisit their problems have each been shown to influence social and emotional outcomes related to problem-focused discussions (Rose, 2002). Conversational self-focus has been a conversational process that has also been examined related to problem talk, which has been shown to impact friendship quality, self-disclosure, negative emotionality, and general internalizing symptoms (Schwartz-Mette & Rose, 2009). A more extensive examination of these processes, including word usage and thought-unit analysis would bring added clarity to the ways in which these processes function within conversational partners.

Although this study used an experimental design to directly test the effects of computer-mediated communication on problem-focused discussions, it may be necessary to assess the effects of such conversations over a more extended period of time. Participants were asked to bring a friend to engage in these talks on a specific day at a specific time, without considering the extent to which these friends were already familiar with one another's problems. A more complete examination of the effects of problem-focused discussions in online and face-to-face contexts might use daily assessments of engagement in problem-focused discussions and related conversational process. Daily diary methodologies also have the advantage of assessing more natural forms of problem talk than the more contrived conversations that may have occurred in a laboratory setting.

Although power analyses revealed that 106 participants were sufficient to detect the moderate effects that are often typical in research surrounding both computer-mediated communication and problem-focused discussions, a larger sample may have revealed significant, but smaller effects. Moreover, as emotional expression in this study was broadly evaluated using a global code, an analysis of the emoticons used by participants in the online condition and the communicative facial expressions of participants in the face-to-face conditions might provide some insights as to how information conveyed during these conversations relates to non-verbal expressions of emotion and how these expressions relate to interpersonal and emotional outcomes following the discussions.

Finally, the current study focused primarily on experiences of negative affect and feelings of closeness after the conversations. Future studies should consider how these conversations influence positive emotional experiences, how participants feel specifically about their problems after the conversation, and how problem-focused discussions online and in person influence

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more global personal assessments of long term negative emotionality (i.e., depression, anxiety, loneliness), friendship quality, and general well-being. As one's propensity to engage in the various conversational processes related to problem-focused discussions (e.g., rehashing problems, speculating about problems, dwelling on negative affect, mutual encouragement of problem talk), may vary based on time, place, and type of problem, a more general measure of individuals' tendencies to engage in these process may provide a more complete assessment of how problem-focused discussion affect a person's adjustment over the long-term.

Conclusions

As interpersonal interactions continue to take place through computer-mediated forms of communication, it will become increasingly important to examine how and why various mediums affect interactions to better understand and promote adaptive forms of communication and communicative practices. The current study demonstrated the significant impact that computer-mediated communication could have on interpersonal processes and their related effects on feelings towards friends. The result was a better understanding of how people come to be affected by the medium in which they carry on conversations and a more nuanced understanding of the means by which outcomes related to problem-focused discussions come to affect participants in these discussions. Results of this study will aid researchers seeking to further expand research regarding both the effects of computer-mediated communication and the effects of engaging in problem-focused discussions.

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APPENDIX A. DEMOGRAPHICS

Age:_____
Please select one of the following:
Year in School: __ First Year __Second Year __Third Year __ Fourth Year __ Fifth Year
Please select one of the following:
What is your ethnicity?   1. Hispanic/Latino
                               2. Caucasian
                               3. African-American/Black
                               4. Asian
                               5. American Indian/Alaska Native
                               6. Native Hawaiian/Pacific Islander
                               7. Other (please specify)_____
Is English your first language? _____Yes   _____No

If not, what is your first language? _____

How long have you been speaking English? _____

Approximately How long have you known your friend? ___ Years   ___ Months   ___ Weeks

Approximately How long have you and the person who came with you today been friends?
___ Years   ___ Months   ___ Weeks

Which of the following categories best describes your friendship with the person you brought
with you today?
___Casual acquaintance   ___Friend   ___Good Friend   ___Very Best Friend

-How do you primarily communicate with friends? (Check All That Apply)
__ Talk in person   __ Talk (voice) on the Phone __ Text message via phone __ Email
__ Chat online (Iming) __ Post messages to online profile walls (i.e. facebook, Myspace)
__ Write letters __ Other Specify: _____

-How do you prefer to communicate with friends? (Check All That Apply)
__ Talk in person   __ Talk (voice) on the Phone __ Text message via phone __ Email
__ Chat online (Iming) __ Post messages to online profile walls (i.e. facebook, Myspace)
__ Write letters __ Other Specify: _____

-How do you primarily communicate with the friend with you today? (Check All That Apply)
__ Talk in person   __ Talk (voice) on the Phone __ Text message via phone __ Email
__ Chat online (Iming) __ Post messages to online profile walls (i.e. facebook, Myspace)
__ Write letters __ Other Specify: _____

-How do you prefer to communicate with the friend with you today? (Check All That Apply)
__ Talk in person   __ Talk (voice) on the Phone __ Text message via phone __ Email
__ Chat online (Iming) __ Post messages to online profile walls (i.e. facebook, Myspace)
__ Write letters __ Other Specify: _____

How many hours <u>per week</u> do you and your friend spend in face-to-face conversation?

    ___ 0 – 3 hours

    ___ 3 hours, 1 minute – 6 hours

    ___ 6 hours, 1 minute – 9 hours

    ___ 9 hours, 1 minute – 12 hours

    ___ 12 hours, 1 minute – 15 hours

    ___ 15 hours, 1 minute – 18 hours

    ___ 18 hours, 1 minute – 21 hours

    ___ 21 hours, 1 minute – 24 hours

    ___ 24 hours, 1 minute – 27 hours

    ___ 27 hours, 1 minute – 30 hours

    ___ more than 30 hours

How many hours per week do you and your friend spend texting each other?

    ___ 0 – 3 hours

    ___ 3 hours, 1 minute – 6 hours

    ___ 6 hours, 1 minute – 9 hours

    ___ 9 hours, 1 minute – 12 hours

    ___ 12 hours, 1 minute – 15 hours

    ___ 15 hours, 1 minute – 18 hours

    ___ 18 hours, 1 minute – 21 hours

    ___ 21 hours, 1 minute – 24 hours

    ___ 24 hours, 1 minute – 27 hours

    ___ 27 hours, 1 minute – 30 hours

    ___ more than 30 hours

How many hours per week do you and your friend spend chatting together on-line?

       ___ 0 – 3 hours

       ___ 3 hours, 1 minute – 6 hours

       ___ 6 hours, 1 minute – 9 hours

       ___ 9 hours, 1 minute – 12 hours

       ___ 12 hours, 1 minute – 15 hours

       ___ 15 hours, 1 minute – 18 hours

       ___ 18 hours, 1 minute – 21 hours

       ___ 21 hours, 1 minute – 24 hours

       ___ 24 hours, 1 minute – 27 hours

       ___ 27 hours, 1 minute – 30 hours

       ___ more than 30 hours

How many hours per week do you and your friend spend e-mailing each other?

       ___ 0 – 3 hours

       ___ 3 hours, 1 minute – 6 hours

       ___ 6 hours, 1 minute – 9 hours

       ___ 9 hours, 1 minute – 12 hours

       ___ 12 hours, 1 minute – 15 hours

       ___ 15 hours, 1 minute – 18 hours

       ___ 18 hours, 1 minute – 21 hours

       ___ 21 hours, 1 minute – 24 hours

       ___ 24 hours, 1 minute – 27 hours

       ___ 27 hours, 1 minute – 30 hours

       ___ more than 30 hours

How many hours per week do you and your friend spend talking on the phone?

     ___ 0 – 3 hours

     ___ 3 hours, 1 minute – 6 hours

     ___ 6 hours, 1 minute – 9 hours

     ___ 9 hours, 1 minute – 12 hours

     ___ 12 hours, 1 minute – 15 hours

     ___ 15 hours, 1 minute – 18 hours

     ___ 18 hours, 1 minute – 21 hours

     ___ 21 hours, 1 minute – 24 hours

     ___ 24 hours, 1 minute – 27 hours

     ___ 27 hours, 1 minute – 30 hours

     ___ more than 30 hours

How many hours per week do you spend in face-to-face conversation with friends in general?

     ___ 0 – 3 hours

     ___ 3 hours, 1 minute – 6 hours

     ___ 6 hours, 1 minute – 9 hours

     ___ 9 hours, 1 minute – 12 hours

     ___ 12 hours, 1 minute – 15 hours

     ___ 15 hours, 1 minute – 18 hours

     ___ 18 hours, 1 minute – 21 hours

     ___ 21 hours, 1 minute – 24 hours

     ___ 24 hours, 1 minute – 27 hours

     ___ 27 hours, 1 minute – 30 hours

     ___ more than 30 hours

How many hours per week do you spend texting with friends in general?

   ___ 0 – 3 hours

   ___ 3 hours, 1 minute – 6 hours

   ___ 6 hours, 1 minute – 9 hours

   ___ 9 hours, 1 minute – 12 hours

   ___ 12 hours, 1 minute – 15 hours

   ___ 15 hours, 1 minute – 18 hours

   ___ 18 hours, 1 minute – 21 hours

   ___ 21 hours, 1 minute – 24 hours

   ___ 24 hours, 1 minute – 27 hours

   ___ 27 hours, 1 minute – 30 hours

   ___ more than 30 hours

How many hours per week do you spend chatting on-line with friends in general?

   ___ 0 – 3 hours

   ___ 3 hours, 1 minute – 6 hours

   ___ 6 hours, 1 minute – 9 hours

   ___ 9 hours, 1 minute – 12 hours

   ___ 12 hours, 1 minute – 15 hours

   ___ 15 hours, 1 minute – 18 hours

   ___ 18 hours, 1 minute – 21 hours

   ___ 21 hours, 1 minute – 24 hours

   ___ 24 hours, 1 minute – 27 hours

   ___ 27 hours, 1 minute – 30 hours

   ___ more than 30 hours

How many hours per week do you spend e-mailing friends in general?

    ___ 0 – 3 hours

    ___ 3 hours, 1 minute – 6 hours

    ___ 6 hours, 1 minute – 9 hours

    ___ 9 hours, 1 minute – 12 hours

    ___ 12 hours, 1 minute – 15 hours

    ___ 15 hours, 1 minute – 18 hours

    ___ 18 hours, 1 minute – 21 hours

    ___ 21 hours, 1 minute – 24 hours

    ___ 24 hours, 1 minute – 27 hours

    ___ 27 hours, 1 minute – 30 hours

    ___ more than 30 hours

How many hours per week do you spend talking on the phone with friends in general?

    ___ 0 – 3 hours

    ___ 3 hours, 1 minute – 6 hours

    ___ 6 hours, 1 minute – 9 hours

    ___ 9 hours, 1 minute – 12 hours

    ___ 12 hours, 1 minute – 15 hours

    ___ 15 hours, 1 minute – 18 hours

    ___ 18 hours, 1 minute – 21 hours

    ___ 21 hours, 1 minute – 24 hours

    ___ 24 hours, 1 minute – 27 hours

    ___ 27 hours, 1 minute – 30 hours

    ___ more than 30 hours

APPENDIX B. TRUE/ACTUAL SELF MEASURE

Below is a list of 60 personality traits. Please circle 10 which you think describe your true self and underline 10 that describe your actual self.

- For the true self items, think of those characteristics that you possess but are not always able to express socially for whatever reason. Think about those traits you are only able to express around those people closest to you.
- For the actual self items, think of those characteristics that you possess and are often able to express around nearly all other people in social settings. **IMPORTANT NOTE: The same word cannot be used for both True and Actual Self. If you circle one characteristic you should not also underline it and if you underline it you should not also circle it.** After identifying 10 True Self traits rank them from 1(most like me) to 10(least like me). After identifying 10 Actual Self traits again rank them from 1(most like me) to 10(least like me).

___ Sincere	___ Soft-Spoken	___ Rebellious
___ Opinionated	___ Serious	___ Anxious
___ Intelligent	___ Self-Critical	___ Adventurous
___ Happy	___ Sentimental	___ Sarcastic
___ Pessimistic	___ Possessive	___ Artistic
___ Open-Minded	___ Sensitive	___ Nervous
___ Humorous	___ Relaxed	___ Gossipy
___ Complaining	___ Perfectionist	___ Wholesome
___ Tender	___ Worrier	___ Superficial
___ Talkative	___ Cautious	___ Nosey
___ Proud	___ Outgoing	___ Easygoing
___ Lazy	___ Fearless	___ Energetic
___ Friendly	___ Superstitious	___ Romantic
___ Silly	___ Quiet	___ Sociable
___ Witty	___ Irritable	___ Careful
___ Curious	___ Aggressive	___ Depressed
___ Entertaining	___ Emotional	___ Jealous
___ Gullible	___ Lonely	___ Conceited
___ Self-Confident	___ Moody	___ Truthful
___ Argumentative	___ Unintelligent	___ Patient

True/Actual Self Representation

The next section of questions concerns how you feel you presented yourself during the conversation you had with your friend. Please rate the degree to which you feel you expressed each personality listed final discussion period of the study from 1 Not at All to 5 Very Much.

Please rate the following on a scale of 1 to 5 with:
1 = Not at All   2 = A little Bit   3 = Somewhat   4 = Quite a Bit   5 = Very Much

Friendly	1	2	3	4	5
Silly	1	2	3	4	5
Witty	1	2	3	4	5
Curious	1	2	3	4	5
Entertaining	1	2	3	4	5
Gullible	1	2	3	4	5
Self-Confident	1	2	3	4	5
Argumentative	1	2	3	4	5
Soft-Spoken	1	2	3	4	5
Serious	1	2	3	4	5
Self-Critical	1	2	3	4	5
Sentimental	1	2	3	4	5
Possessive	1	2	3	4	5
Sensitive	1	2	3	4	5
Relaxed	1	2	3	4	5
Perfectionist	1	2	3	4	5

Pessimistic	1	2	3	4	5
Open-Minded	1	2	3	4	5
Humorous	1	2	3	4	5
Complaining	1	2	3	4	5
Tender	1	2	3	4	5
Talkative	1	2	3	4	5
Self-Confident	1	2	3	4	5
Argumentative	1	2	3	4	5
Soft-Spoken	1	2	3	4	5
Serious	1	2	3	4	5
Self-Critical	1	2	3	4	5
Sentimental	1	2	3	4	5
Possessive	1	2	3	4	5
Sensitive	1	2	3	4	5

APPENDIX C. PROBLEMS

List a problem that you have and answer the following questions about the problem.

PROBLEM:_____

1. How upsetting is this problem?

1	2	3	4	5
Not at All Upsetting				Very Upsetting

2. How important is this problem?

1	2	3	4	5
Not at All Important				Very Important

3. How hard would it be to solve this problem?

1	2	3	4	5
Not at All Hard				Very Hard

4. How hard would it be to feel better about this problem?

1	2	3	4	5
Not at All Hard				Very Hard

5. How much do you want to feel better about this problem?

1	2	3	4	5
Not At All				Very Much

6. How much do you want this problem not to bother you?

1	2	3	4	5
Not At All				Very Much

7. How much do you want to not be upset about this problem?

1	2	3	4	5
Not At All				Very Much

Problems

Now that you have discussed _____ (problem inserted) _____ .
Please rate how you currently feel about this problem. (If you did not discuss this problem still complete this measure concerning your feelings about the problem)

1. How upsetting is this problem?

1	2	3	4	5
Not at All Upsetting				Very Upsetting

2. How important is this problem?

1	2	3	4	5
Not at All Important				Very Important

3. How hard would it be to solve this problem?

1	2	3	4	5
Not at All Hard				Very Hard

4. How hard would it be to feel better about this problem?

1	2	3	4	5
Not at All Hard				Very Hard

5. How much do you want to feel better about this problem?

1	2	3	4	5
Not At All				Very Much

6. How much do you want this problem not to bother you?

1	2	3	4	5
Not At All				Very Much

7. How much do you want to not be upset about this problem?

1	2	3	4	5
Not At All				Very Much

APPENDIX D. CODING OVERVIEW

The project will involve two data collection methods: observation and survey. This manual describes the methods to be employed by research assistants when transcribing and coding face-to-face and online interactions.

For this project, research assistants will code the information from a global interaction standpoint. It should be noted that assistants will code for variables not to be used in the master's thesis. These codes are denoted using ([*]).

"Global Coding" will result in co-rumination[*], informational contribution, and expressed affect scores for each friendship dyad. These scores will be computed using 5-point scales representing various aspects of co-rumination[*], information exchange, and expressions of positive[*] and negative affect. Global ratings will be made for each member of the dyad and the dyad as a unitary entity[*]. Coders will use general rating scales to assess the participants' overall co-rumination[*], affective experiences, and informational contribution. Ratings will be made for each individual and for the dyad as a unit. These ratings will consist of raters general impressions concerning the participants' discussion after reviewing the interaction in its entirety. Ratings will be made considering each participant's contributions/behaviors as well as the dyad as a unitary entity*. Ratings will be made using a single 5-point scale representing the degree to which the individual and the dyad as a whole engaged in each activity.

Procedures Overview for Collecting Observational Data

After providing participants with a complete description of the current study and obtaining informed consent to participate, participants will be seated in two different rooms to complete a series of questionnaires primarily regarding demographic information, information concerning their friendship, baseline emotional well-being, true and actual self descriptors, time spent communicating online, and three problems they are currently experiencing (See Appendix C). Prior to moving on to the conversation portion of the study, the experimenter will say to the participant:

"You wrote down three problems and you answered questions about them. Would you feel comfortable talking with your friend about at least one of these three problems?"

• (If participant answers yes) "OK, in one of the next parts of the study, you will talk with your friend about one or more of these three problems that you feel comfortable discussing. I will provide you with a list of these problems when the time comes. "

• (If participant answers no) "OK, let me get you other questionnaires. On at least one of these sheets, you should write out one problem that you feel comfortable talking about with your friend and answering questions related to this problem"

In the face-to-face condition, participants will be brought together in a single room arranged with two chairs seated on opposite sides of a table and equipped with three video cameras. Two of the cameras will be focused on one of the two dyad partners, capturing that participant's body position and movements from the waist up. The third camera will be placed so as to capture both participants in a single wide angle shot.

In the online condition, participants will remain in their separate rooms following the completion of the initial set of measures. The research assistant will reenter each participant's room and sign the participant into MSN instant messenger using a username and password created specifically for this study. Before conversing online, the research assistant will ask the participants if they are familiar with MSN instant messenger or other similar instant messenging programs. If participants are not familiar with instant messenging programs, the research assistant will give the participant a brief tutorial demonstrating how one sends messages, and the other functions such as emoticons. Research assistants will record which participants required a tutorial. For this condition, the observation will consist of transcripts saved from MSN instant messenger program.

For both conditions, the observation will consist of the friends: (a) discussing end of semester plans and (b) talking about problems.

The experimenter will give the friends instructions making these points:

-Next you are going to discuss plans that you may have for the end of the semester.

-You can talk about any aspect you want about your end of the semester plans, such as what you are planning to do for fun or for work, where you might live, and/or where you might travel.

-You will have 7 minutes to discuss these plans, and then I will come back to the room when it is time to move on to the next part of the project.

At the conclusion of the 7 minutes, in both conditions, the research assistant will provide the participants with a list of the three problems they had previously provided, printed on a single sheet of paper. Once the participants have received these sheets, they will be told that the next portion of the study involves a 20 minute discussion of the problems.

Next, the experimenter will describe the problem talk segment using the following points:

-It's time to move onto the next part of the study. This part of the study involves talking about problems.

-Remember how you each came up with three problems? These are the problems you listed and will talk about at least one of them now. (Hand the problem-talk sheet to the appropriate participant. Each card should have one participant's name on it and the list of three problems e.g., "Mary's Problem.")

-You should talk about one of each friend's problems, but it doesn't matter whose problem you talk about first.

-You can talk about anything you want to about the problems.

-You can talk about the problems as long as you want for up to 20 minutes. I will come back at about 18 minutes to let you know that your time is almost up.

-If you are done talking about the problems before I come back, you can talk about something else or you can work on these mind teaser puzzles if you want to. (There will be brain teaser puzzles on the table or by the computer that the participants are sitting at.)

After 20 minutes, the researcher will return to the room. The participants will then complete questionnaires regarding their interaction and current emotional state. Participants in the face-to-face condition will be moved to separate rooms before completing these questionnaires, while participants in the online discussion condition will fill out questionnaires on the computer they were working on. Following the completion of the final questionnaires, the participants will be debriefed and sent home.

Global Coding

Global coding will be conducted for both problem talk conditions of this study. To assign their ratings, coders will read the transcript while watching/looking at the interaction before assigning global codes. Coders will be allowed to review the transcript and watch the interaction as many times as necessary prior to assigning their global ratings. Scores will be provided for each individual as well as the dyad on the whole.

Scores will also be assigned to measure the degree to which each aspect of co-rumination is present in the problem-focused discussions:

1. mutual encouragement of problem talk*

2. rehashing problems*

3. speculating about problems*

4. dwelling on negative affect

5. positive outlook[*]

6. informational exchange

A global co-rumination score will also be provided by raters.

Coders will make their ratings on a 5-point scale with 1 representing "not at all/very little" and 5 representing "very much."

More detailed information about global coding is given in the following sections.

Global Coding: Assigning Global Codes

The following four aspects of problem-focused discussions will be coded using the following 5-point scale:

1: Not at all / very little

2: A little

3: A moderate amount

4: A lot

5: Very much

*1) Mutual encouragement of problem talk: One or both members of the dyad keeps the problem talk going instead of talking about other issues. One or both may also try to get the other to talk about the problem again after the topic has been switched.

Alice: We have been talking about this forever! Oh well, it's okay.

Jane: I know; it's important. So what happened with [the problem] yesterday?

*2) Rehashing problems: One or both members of the dyad talks about the problems or parts of the problems over and over again.

Zoe: I mean I know I've said this already, but she freaking *stole* his wallet!!

Willow: She freaking stole it. And remember how she said she didn't do it?

*3) Speculating about problems: One or both members of the dyad ponders the origins of the problem or parts of the problem, why people did what they did, what may happen as a result, etc.

Jennifer: Why do you think he did that? He can't be that mean.

Sarah: I don't know. I mean, maybe he was having a bad day?

4) <u>Dwelling on negative affect</u>: One or both members of the dyad focuses on the experience of negative emotions like feeling worried, nervous, irritated, sad, anxious, angry, depressed, low, scared, distressed, anguished, shameful, embarrassed, frustrated, etc.

Tara: It sucks man. It really sucks.

Cinder: Seriously. You must feel like crap.

[*]<u>5) Positive Outlook</u>: This scale concerns the degree to which the conversations of the participants focus on positive emotional experiences. One or both members of the dyad focus on positive experiences or potential opportunities stemming from their problem. This could consist of humorous stories being told to help "lighten the mood" or encouragement expressing the expectation of future success or happiness.

Aspen: Just wait. Eventually you'll feel better and see that breaking up was a good thing.

Haley: Yeah, I actually have been starting to feel a little better.

<u>6) Informational exchange</u>: One or both members of dyad provide information or make instrumental suggestions in relation the problems in general. Such as

Caroline: Then I left and went to the store.

Cora: You could have come over to my place and talked.

<u>General Score*</u>

Additionally, a single co-rumination score will be assigned to each dyad using the same 5-point scale listed above. This score will reflect the coder's general sense of the combination of the four aspect scores and will take into account the total time spent talking about problems.

Additional Notes*

Similar to other interpersonal processes (e.g., conflict or support), co-rumination is best conceptualized as occurring along a continuum. That is, conversations cannot simply be labeled

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as "co-rumination" or "not co-rumination." Instead conversations vary in the degree to which they involve the different aspects of co-rumination:

Some conversations involving problems may not involve co-rumination. For example, a youth may tell a friend that he is free on Friday night because his girlfriend broke up with him, and then the friends begin to make plans for Friday without discussing the break up further. (<u>low co-rumination score</u>)

On the other hand, a youth might tell her friend that she is free on Friday because her boyfriend broke up with her, and, in this case, the friend prompts the youth with questions, the girls rehash details of the break up, speculate about the causes and social repercussions of the break up, and talk a lot about how bad the youth feels. (<u>high co-rumination score</u>)

Furthermore, it is possible for a conversation to involve some co-rumination (a moderate amount) but not as much as the extreme *example*. For instance, the conversation might involve some aspects of co-rumination (e.g., speculating) but not others (e.g., dwelling on negative feelings) or involve all aspects of co-rumination at a lower intensity than in the extreme example.

A moderate score for particular aspects of co-rumination may be obtained in one of two ways. For example, one youth may exhibit a large amount (e.g., a "4" or "5") of one aspect while the other youth exhibits a small amount (a "1" or "2"). In this case a moderate score of "3" may be given for the dyad on that particular aspect. Alternatively, both youth may exhibit moderate amounts of a particular aspect. In this case, the dyad may also score a "3" for that particular aspect.

--Information from the Frequency Coding can be used in analyses to take into account the degree to which each friend spends time talking about problems and whose problems are the focus of conversations.

Global Coding: Assigning a Global Co-Rumination Score*

Dyads receive two overall co-rumination scores.

As stated, after reading the transcript and watching the interaction, coders assign a single, general co-rumination score.

In addition, another co-rumination score is computed using the four coded aspects of co-rumination plus information from the Frequency Coding.

Specifically, these four scores are used:

1. mutual encouragement of problem talk (1-5 score from Likert scale)

2. rehashing problems (1-5 score from Likert scale)

3. speculating about problems (1-5 score from Likert scale)

4. dwelling on negative affect (1-5 score from Likert scale)

The above four scores are standardized within the sample and averaged to create an overall co-rumination score.

APPENDIX E. PANAS-X

This scale consists of a number of words and phrases that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate <u>to what extent you feel this way right now</u>. Use the following scale to record your answers.

1	2	3	4	5
very slightly or not at all	a little	moderately	quite a bit	extremely

____ cheerful

____ disgusted

____ attentive

____ bashful

____ sluggish

____ daring

____ surprised

____ strong

____ scornful

____ relaxed

____ irritable

____ delighted

____ inspired

____ fearless

____ disgusted with self

____ sad

____ calm

____ afraid

____ tired

____ amazed

____ shaky

____ happy

____ timid

____ alone

____ alert

____ upset

____ angry

____ bold

____ blue

____ shy

____ active

____ guilty

____ joyful

____ nervous

____ lonely

____ sleepy

____ excited

____ hostile

____ proud

____ jittery

____ lively

____ ashamed

____ at ease

____ scared

____ drowsy

____ angry at self

____ enthusiastic

____ downhearted

____ sheepish

____ distressed

____ blameworthy

____ determined

____ frightened

____ astonished

____ interested

____ loathing

____ confident

____ energetic

____ concentrating

____ dissatisfied with self

APPENDIX F. CLOSENESS MEASURE FROM QUALITY OF RELATIONSHIPS

INVENTORY

Please rate the following statements about your friendship with the friend you brought with your friend on a scale of 1 to 5 with:

1 = Not at All   2 = A little Bit   3 = Somewhat   4 = Quite a Bit   5 = Very Much

1. How significant is this relationship in your life?
2. How much do you depend on this person?
3. How close will your relationship be with this person in 10 years?
4. How positive a role does this person play in your life?
5. How responsible do you feel for this person's well-being?
6. How much would you miss this person if the two of you could not see or talk with each other for a month?
7. If you could have only a small number of social relationships, how much would you want your contact with this person to be among them?
8. How considerate is this person of your needs?

APPENDIX G. SIMILARITY MEASURE COMPUTER APPLET

Le, Moss, & Mashek 2007 http://www.haverford.edu/psych/ble/continuous_ios

APPENDIX H. SELF–DISCLOSURE SCALE

The next section of questions concerns how you expressed yourself during the final conversation of the study. Please rate these statements according to the following scale ranging from 1 strongly disagree to 5 strongly agree.

<u>Please rate the following on a scale of 1 to 5 with:</u>
1 = strongly disagree   2 = disagree   3 = neutral   4 = agree   5 = strongly agree

Depth or intimacy
1. I felt like I talked about myself for fairly long periods of time.
2. I disclosed intimate, personal things about myself without hesitation.
3. Once I got started, I intimately and fully reveal myself in my self-disclosures.
4. I did not talk about myself much. (R)
5. I feel that at times I did not control myself in disclosing personal or intimate things.
6. I discussed my feelings I had often.
7. Once I got started, my self-disclosure lasted a long time.

Accuracy
8. My statements about my feelings, emotions, and experiences were always accurate self-perceptions.
9. I was not always honest in my self-disclosures. (R)
10. I felt completely sincere when I revealed my own thoughts, feelings and experiences.
11. I disclosed who I really am, openly, fully, and intimately.

Amount (about self)
12. My conversation lasted the least time when I discussed myself. (R)
13. I often talked about myself.
14. My statements of my feelings were usually brief.

Valence
15. On the whole, my disclosures about myself were more negative than positive. (R)
16. I revealed more undesirable things about myself than desirable things. (R)
17. I disclosed negative things about myself. (R)

Intent
18. When I express my personal feelings, I was always aware what I was doing and saying.
19. When I was self-disclosing, I was consciously aware of what I was revealing.