THE ILOCUTIONARY FORCE OF HURT AND SUPPORT IN YOUNG ADULT
ROMANTIC RELATIONSHIPS: MESSAGE FEATURE RATINGS, MESSAGE
PERCEPTIONS, AND PHYSIOLOGICAL STRESS

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by

Jennifer S. Johnson

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The dissertation of Jennifer S. Johnson was reviewed and approved* by the following:

Denise Haunani Solomon  
Professor of Communication Arts and Sciences  
Dissertation Advisor  
Chair of Committee

Roxanne Parrott  
Professor of Communication Arts and Sciences

Jon Nussbaum  
Professor of Communication Arts and Sciences

Sonia Cavigelli  
Professor of Biobehavioral Health

James P. Dillard  
Head and Professor of Communication Arts and Sciences

*Signatures are on file in the Graduate School
ABSTRACT

This dissertation is founded on the assumption that interpersonal communication experiences, especially as they relate to a person’s identity, are instrumental in physiological stress reactivity and recovery. Accordingly, the goal of the dissertation is to examine how features of interpersonal messages can vary in ways that impact stress.

As a starting point, Chapter 1 reviews literature on the components of identity and explores how communication shapes identity. Given the central role of communication in the formation and maintenance of identity, the remainder of the chapter describes how communication can threaten and support identity.

As a foundation for understanding the role of communication in the stress response, Chapter 2 describes the environmental, psychological, and physiological aspects of stress. Then, the chapter examines how identity disconfirming messages can initiate the stress response through the perception of threat and how identity confirming messages can reduce physiological stress by changing perceptions of a stressful situation.

In Chapter 3, illocutionary force, or the strength of a message, is identified as a theoretical mechanism for understanding how messages can impact physiological stress. The chapter begins by explicating illocutionary force. Then, the ways that message features and message perceptions can vary in force and impact the magnitude of the stress response are examined. Consistent with this logic, hypotheses specify the associations between perceived explicitness, argument strength, involvement, hurt, support, dominance, and affiliation and stress responses to interactions with a dating partner.
Chapter 4 describes the methods of a study designed to assess the impact of hurtful messages on stress reactivity. The chapter begins by discussing the procedures and results of a pilot study that evaluated the extent to which hurtful messages from a dating partner initiated a stress response. Then, the chapter describes the demographic characteristics of the participants who completed Study 1. Finally, Chapter 4 summarizes the self-report and observational measures used to test some of the hypotheses forwarded in Chapter 3.

Chapter 5 presents the results of Study 1 and discusses the implications for the study of hurtful messages. A series of regression analyses were conducted to test the relationships between the rated message features and stress reactivity to hurtful messages. Stress reactivity was operationalized in two ways: area under the curve with respect to increase and area under the curve with respect to ground. The results of the analyses provided partial support for the hypotheses. The perceived message features did not directly predict increases in physiological stress; however, there were significant interactions between the rated message feature, self-reported perceptions of hurt, and partner involvement for each rated message feature. The perceived message features also did not predict the stability of cortisol change after a hurtful interaction.

Chapter 6 presents methods and results of two pilot studies and the procedures used in Study 2 to assess the impact of supportive messages on stress recovery. First, the chapter describes a pilot study in which participants recalled recent stressful events to initiate the stress response. Second, the chapter describes the procedures used in the second pilot study and Study 2, in which participants completed a series of stressful tasks
to induce stress reactivity and then engaged in a conversation with a dating partner. Finally, the chapter explains the self-report and observational measured used in Study 2 to test some of the hypotheses forwarded in Chapter 3.

In Chapter 7, the results of Study 2 are presented. Rated explicitness, argument strength, and involvement all had a direct effect on recovery from the stressful tasks, providing support for the hypotheses. Observer ratings of supportiveness, dominance, and affiliation did not directly impact cortisol change.

Finally, Chapter 8 discusses the implications of both studies for understanding the impact of illocutionary force on physiological stress and the relationship between communication and stress. The chapter also explores the practical applications of the findings. Finally, the chapter concludes by examining the strengths and weaknesses of the dissertation.
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CHAPTER ONE

Interpersonal communication, symbolic interaction that occurs between two individuals (Roloff, 1981), is consequential in people’s everyday lives. Communication allows individuals to create, define, and maintain their relationships (see Berger & Calabrese, 1975; Duck, 1995; Stafford & Canary, 1991). Messages can be manipulated in a variety of ways to shape an individual’s identity and influence perceptions of life events (Jung & Hecht, 2004). Communication also allows individuals to pursue and reach interpersonal goals (Dillard, 1989; MacGeorge, 2001; Samp & Solomon, 1999). Thus, interpersonal communication influences an individual’s own perceptions and behavior, allows individuals to impact others, and has consequences for personal health and relational satisfaction (Heffner et al., 2006; Laurent & Powers, 2006; Powers, Pietromonaco, Gunlicks, & Sayer, 2006; Priem, McLaren, & Solomon, in press; Robles et al., 2006).

One way that interpersonal communication is consequential to personal health and well-being is through its effects on the stress response. For example, conflict communication can serve as a stressor in interpersonal relationships, and it is associated with significant increases in stress hormones (Laurent & Powers, 2006; Powers, Pietromonaco, Gunlicks, & Sayer, 2006). Heffner et al. (2006) found that wife demand/husband withdraw patterns in conflict interactions were associated with increased cortisol in wives. Similarly, high couple negativity during conflict is associated with maladaptive changes in stress hormones (Robles et al., 2006). In contrast, previous research has shown that expressing affection can decrease cortisol over the course of a
day and help individuals recover from stress more quickly (Floyd et al., 2007a; Floyd et al., 2007b).

Although previous research clarifies some of the general associations between communication and the stress response, the features of communication that lead to physiological change or affect the magnitude of the stress response remain less clear. Messages can be conveyed with more or less force as a function of explicitness, argument strength, and involvement cues, which can exacerbate or attenuate the stress provoked by a message. Relational messages that are communicated during an interaction, such as dominance and affiliation, may also impact stress reactivity during an interpersonal interaction. An examination of the ways that features of communication affect the stress response provide theoretical insight into how message production and processing influence stress and, ultimately, health.

The examination of how messages impact the stress response has practical social significance. An inability to resolve stress is associated with negative health consequences, including depression and anxiety, heart disorder, obesity, cancer, stroke, and immune disorders (Sapolsky, 1998). Furthermore, stress is associated with changes in immune function and increased susceptibility to and severity of inflammatory and infectious diseases (Kiecolt-Glaser, Glaser, Gravenstein, Malarkey, & Sheridan, 1996; Padget & Glaser, 2003). Communication has the ability to impact stress because language can define a life event as stressful, messages can act as a stimulus for stress, and communication can increase appraisals of threat or assist in adaptive reappraisals of stressful situations. Thus, interpersonal communication may be an important conduit for the attenuation and exacerbation of stress.
The goal of this dissertation is to locate interpersonal communication within the stress process by clarifying how various message features impact biological stress reactions. More specifically, I examine message features, which shape the force of a message, as communication qualities that increase or decrease the stress provoked by a message. Although the features can be indexed within any interpersonal interaction, this dissertation focuses on exchanges that threaten or support an individual’s identity. Examining both identity threatening and supporting communication allows me to examine the entire stress response, beginning with a perceived threat that initiated the stress response, followed by messages that attenuate stress.

The remainder of this chapter lays a foundation for the dissertation by explicating identity, considering how communication threatens identity, and discussing how communication can support identity. In doing so, I offer identity as a concept that unifies heretofore separate bodies of research on hurtful and supportive messages. Subsequent chapters elaborate and test my thinking about how features of hurtful and supportive interactions participate in the stress response.

Explicating Identity

Identity has been historically studied in terms of a person’s relationships with others (Yum, 1998), group memberships (Hogg, 1993), or roles (Banton, 1965). Scholars further distinguish between personal identities (those that are formed within the individual; Stryker, 1968) or social identities (those that are a construction of society; Tajfel & Turner, 1981). Generally, identity is defined as a construction of the self, based on perceived agreement about qualities of the self, which is formed through interactions
with others. Although variations in definitions of identity exist, scholars generally agree that a person’s identity is how he or she views him or herself and that the concepts of self and personal identity are universal (Hecht, Collier, & Ribeau, 1993).

One aspect of identity includes the roles a person ascribes to (Stryker, 1968, 1980, 1987). A role refers to patterns of social behavior that are appropriate to the expectations of others and the demands of the situation (Banton, 1965). According to identity theory, identity should be regarded as “a multifaceted and organized construct” (Hogg, Terry, & White, 1995, p. 256); the multiple components of the self are role identities. Role identities are self-conceptions that people apply to themselves based on the structural roles they occupy (Thoits, 1991). They develop through an active process that includes self-definition and reflected appraisals from others (Schlenker, 1985). In this way, individuals develop a sense of self through interactions with others, and identity varies to the extent that people occupy different roles. Role identities provide a sense of self because the roles imply characteristics that an individual possesses (Lindesmith & Strauss, 1956) and because roles provide a means by which other individuals interact and respond to a person (Burke & Reitzes, 1981). Perceptions that a person is effectively enacting a role can enhance feelings of self-esteem, whereas perceptions that roles are not adequately performed can decrease feelings of self-worth and produce psychological distress (Thoits, 1991). The experience of distress can further intensify when perceptions of others are incongruent with an individual’s view of self.

Another aspect of identity is based on group membership (Hogg & Abrams, 1988; Turner, 1991). Individuals form identities through membership in social categories such as gender, ethnicity, and political affiliation; group membership influences individuals’
beliefs, attitudes, and behavior toward other group members and non-members (Tajfel & Turner, 1979). Feelings of belonging to a social group define part of an individual’s self-concept because each group carries characteristics that are internalized by group members. Group membership describes and prescribes what an individual should think or feel, and how he or she should behave. Hogg, Terry, and White (1995) further argued that social identities are evaluative because they allow members to distinguish themselves from non-members of the group. Individuals are motivated to adopt strategies for achieving and maintaining in-group/out-group comparisons, sometimes leading to stereotyping, bias, racism, discrimination, and prejudice (Tajfel, 1959).

Research has also examined how identity can be a psychological self-regulatory system, which functions to process information, manage impressions, and behave appropriately (see the person-in-context perspective; Adams & Marshall, 1996). From this perspective, self and identity are characterized by four different foci: situational, social structural, biographical-historical, and intrapersonal (Gecas & Burke, 1995). The situational focus refers to the emergence and maintenance of the self in interpersonal interactions. The social structural focus emphasizes the consequences of role relationships and characteristics of social groups. The biographical-historical focus suggests that the self is constructed culturally and historically. The intrapersonal focus refers to the social-cognitive processes of personality and behavior (Adams & Marshall, 1996). This approach highlights how identity is constructed in a relational context. Macro-level relational influences, such as culture, institutional values, and ethnic membership, and micro-level influences, such as interpersonal communication and
routine daily interactions, affect identity. These macro- and micro-level relational influences are socially constructed and communicated.

One contemporary framework for understanding identity encompasses all of the previously discussed aspects of identity. The communication theory of identity states that identity resides both in social interaction and within the self. Identity is comprised of four layers that reflect the different aspects of an individual’s identity (Jung & Hecht, 2004). The **communal layer** includes identity that is shaped by group membership and group identity. Group members establish a group identity based on common characteristics, shared history, and collective experiences. The **relational layer** includes how identity is shaped through relationships with others, as well as how others view an individual (Hecht & Faulkner, 2000). This component of identity is mutually developed through social interaction because the roles and relationships that individuals engage in define who they are and what is expected of them, and because individuals shape how they enact identity based on feedback from others (Jung & Hecht). The **personal layer** of identity focuses on the individual; it is comprised of an individual’s self-concept, self-cognitions, and spiritual sense of self-being. Finally, identity is expressed through the **enactment layer** of identity, which emphasizes modes of communicating a sense of self to others through actions, symbol preference, and style (Jung & Hecht). The four layers of identity are interdependent, working together to encompass all of the components of the self. Sometimes the layers complement each other, enhancing stability in identity; however, the layers can also contradict each other, creating dissonance and distress.

Because communication is inherently linked to identity, communication has the ability to maintain and modify one’s sense of identity. Communication can contradict or
enhance an individual’s group identity, clarify the relationship with or perceptions of others, devalue or validate conceptions of self, and disconfirm or affirm expressions of identity. When communication experiences contradict or undermine a person’s identity, negative emotions, such as hurt, can be evoked; when communication aligns with and supports a person’s identity, positive emotions result. The following sections, in turn, elaborate on how communication threatens and bolsters identity.

How Communication Threatens Identity

Communication from others can be the catalyst for internal identity conflict by threatening an individual’s sense of self. In this section, I draw from a variety of literatures to explore how communication threatens identity. This discussion, which is informed by conceptions of identity and considers specific identity threats, culminates in a focus on hurtful messages as one prominent form of identity threatening communication.

Because one component of identity is an individual’s group membership, communication that derogates group membership can threaten identity. Social identity threat occurs when people believe that they may be treated negatively or devalued in a setting simply because of the particular social identity they hold (Abrams & Hogg, 1999). Social identity is the component of identity that includes an individual’s self-concept derived from membership in a social group and the value or emotional significance attached to that membership (Tajfel, 1981). The groups that shape identity are unique to each individual and may include ethnic or racial groups, political party, gender, or national identity. Communication can serve to threaten social identity when out-group
individuals attack the in-group’s social identity, causing negative feelings towards other groups, as is the case with bias, prejudice, and discrimination.

Stereotype threat, which is one component of social identity threat, includes people’s fear that their performance will be interpreted as inferior based on cultural stereotypes (Steele et al., 2002). For example, sexism, particularly as it relates to the devaluation of women, can influence an individual’s identity and lead to negative consequences in personal and professional realms (Ashcraft, 2002; Chapell & Overton, 2002). In an instructional setting, unequal treatment of men and women can result in a lack of interest and expectations for achievement in women (Adams, Garcia, Purdie-Vaughns, & Steele, 2006). Research has also shown that women who sense a stereotype threat experience increased physiological reactivity, decreased sense of belonging, and less desire to participate in the stereotyped activity (Murphy, Steele, & Gross, 2007).

Communication and behaviors that signal gender bias or sexism are associated with negative outcomes because they disconfirm an individual’s abilities or desires based on sex.

Another way in which an individual’s identity could be threatened is by devaluing relationships with other people. Relational devaluation is “the perception that another individual does not regard his or her relationship with the person to be as important, close, or valuable as the person desires” (Leary, Springer, Negel, Ansell, & Evans, 1998, p. 1225). The perception of relational devaluation can occur either due to explicit statements or implicit or unintended actions that are perceived as disconfirming the relationship. Leary et al. (1998) identified six major categories of rejection, including active disassociation, passive disassociation, criticism, betrayal, teasing, and feeling...
unappreciated, used, or taken for granted. Feeney (2004) found five categories that focus more explicitly on relationship devaluation. *Active disassociation* includes denying feelings of love or commitment or rejection of the other. *Passive disassociation* encompasses implicit rejection, ignoring the partner, or excluding the other from activities. The three final categories include *criticism, sexual infidelity, and deception*. These events are linked with identity because they imply a diminished evaluation of the relationship, and they threaten an individual’s sense of belonging.

In general, problematic events within a relationship can threaten an individual’s relational and personal identity. According to Samp and Solomon (1999), problematic events include uncharacteristically unfavorable events, which lead the actor to feel embarrassed and question him or herself. The negative behavior often leads the initiator to feel embarrassed and attempt to restore positive face and self-esteem. Consistent with this claim, Samp and Solomon reported that individuals show a heightened self-focus when addressing problematic events. The results suggest that negative events in a relationship not only threaten the relationship, but also the individual’s sense of self.

*Infidelity, defined as engaging in sexual or emotionally intimate acts with someone other than the relational partner (Thompson, 1984, 1983), is an especially strong threat to an individual’s relational identity. As many as 75% of men and 68% of women have engaged in dating infidelity (Wiederman & Hurd, 1999). Transgressions such as infidelity may threaten identity at a variety of levels because they signal a violation in the explicit or implicit relationship rules (Metts, 1994; Roloff & Cloven, 1994). Often the violation results in face threat, in that it contradicts the desired image that individuals present to others (Metts, 1997). Infidelity also threatens an individual’s relational identity.*
because it signals that the partner does not value the relationship or the person. Infidelity may also contradict communal identities to the extent that a partner’s unfaithful behaviors go against cultural standards of monogamy (Metts, 1994).

Finally, secret keeping, defined as the intentional concealment of private information, can be another source of relational identity threat. For many individuals, family provides one component of relational identity. The keeping of family secrets allows a family to develop and maintain a unique identity; however, keeping secrets from family members and others outside the family can also threaten an individual’s relational identity. Afifi and Olson (2005) found that coercive power used within a family unit can be used to persuade members to conceal sensitive family information from people outside of the family. Furthermore, concealing secrets decreased both feelings of closeness within the family and family members’ commitment to each other; these results suggest that being forced to keep family information secret can weaken the members’ relational identity. Concealment also leads to increased rumination, which increases feelings of dissonance and anxiety and has a negative impact individuals’ self-esteem (Afifi & Caughlin, 2006).

The identity threats discussed heretofore are all implicated in hurtful interpersonal interactions. The experience of hurt results from statements or behaviors that emotionally injure an individual in a social interaction (Folkes, 1982). Consistent with the assumption that hurt is a form of identity disconfirming messages, hurt feelings are associated with decreased self-esteem, doubts about competence, and a reduced sense of self-worth (Shaver, Schwartz, Kirson, & O’Connor, 1987; Vangelisti, Young, Carpenter-Theune, & Alexander, 2005). Moreover, experiencing hurt from one person can lead to problems in
future relationships, due to the damage it causes the individual’s sense of self (see Feeney, 2004). Hurtful messages can take the form of accusations (messages that imply or state fault or offense), evaluations (description of value, worth, or quality), informative messages (disclosure of feelings that involve the partner) directives (orders or commands), advice, expressions of desire (statements of preference), questions that denote interrogation, threats, jokes, and lies (Vangelisti, 1994).

Taken together, the body of literature suggests that hurtful messages are a form of communication in which a variety of identity threats are conveyed. Communal identity can be threatened by evaluative messages that express negative sentiments about an individual’s group membership. Threats to relational and personal identity, such as infidelity or secret keeping, also result in feelings of hurt or emotional injury. Furthermore, hurtful messages can impact an individual’s sense of self because they evoke a sense of injury by threatening positive mental models that individuals have for themselves. Overall, hurtful messages threaten identity at a variety of levels, leading to negative personal and relational consequences.

How Communication Supports Identity

Communication can validate or reinforce a person’s positive feelings about the self through emphasizing group membership, providing positive reflected appraisals, allowing individuals to express their identity, and confirming positive conceptions of the self. Identity support, a type of social support, is communication that makes individuals feel as though his or her identity is understood, accepted, and valued by others (Weisz & Wood, 2000). In this section, I draw from a variety of literatures to explore different ways
in which communication can be supportive, culminating in a focus on how support can bolster identity.

Communal membership can support identity through shared history and collective experiences. In fact, the direct effects model of social support posits that belonging to a social network provides support through the ongoing benefits of stability, predictability, and a sense of belonging (Cobb, 1976; Taylor, 1999). Belonging to a large and diverse social network that includes family, friends, and religious and community groups may also provide ongoing recognition of self-worth by emphasizing, confirming, and maintaining group membership and belonging. Belonging to social networks has been shown to impact support and is associated with positive health outcomes. For example, Choenarom, Williams, and Hagerty (2005) reported that increased perceived stress and a lower sense of belonging significantly affected the severity of depression over a nine month period, suggesting that a social network that can provide a sense of belonging has direct effects on health. Koopman, Hermanson, Diamond, Angell, and Spiegel (1998) stated that having a greater number of people in a cancer patient’s support system was associated with less mood disturbance in patients who had a high level of life stress.

Supportive communication can also come from a smaller number of close friends or loved ones who serve as confidants. The buffering model of social support claims that support acts as a shield for distressed individuals, protecting them from the negative health effects of stress (Cobb, 1976; Cohen & Wills, 1985). Support helps distressed individuals to redefine a stressful event so it is less threatening, to increase efficacy, and to take action to deal with the stressor (Cutrona, Russell, & Gardner, 2005). Consistent with the buffering model of social support, when individuals report having high quality
support relationships (i.e., close friends) there is a buffering effect for stressors including health problems, divorce, and unemployment (Linn & McGranahan, 1980). More specifically, research has shown that being able to confide in a boyfriend or husband protects women from negative life events, whereas non-romantic confidants fail to buffer women from severe negative life events (Brown et al., 1975; Paykel et al., 1980). Support for the buffering model highlights the importance of close and reliable individuals to increase self-efficacy and to help the individual deal with highly stressful life events (Cohen & Wills, 1985).

Therapeutic disclosure is a broad term for the process of discussing stressful events with another person in order to reduce distress. Disclosure of past traumatic events has beneficial effects, including improvements in overall health and immune function following the disclosure, regardless of whether the disclosure is verbal or written (for review see Pennebaker, 1989). Expression of emotion has been linked to immediate reductions in the stress response and increased immune function (Berry & Pennebaker, 1993). For example, the expression of negative emotions is associated with elevations of natural killer cell activity, which is a sign of increased immune function (Futterman, Kemeny, Shapiro, Polonsky, & Fahey, 1992). In fact, the health benefits due to emotional disclosure may be sustained long after the disclosure occurs. In particular, Pennebaker, Kiecolt-Glaser, and Glaser (1988) found differences in immunological function between the control and emotional disclosure groups as much as six weeks after emotional disclosures. In a study of antibody levels against the hepatitis B vaccine, Jabaaaij et al. (1993) reported that the impact of social support on antibody levels continued seven months after the initial measurement. Similarly, Petrie, Booth, Pennebaker, Davison, and
Thomas (in press) stated that participants in an emotional expression condition, as compared to a control group, showed higher antibody levels against hepatitis B over six months.

The use of narrative disclosure may be the most effective form of support when there is little or no solution to the stressful problem, because disclosure relieves stress through catharsis or self-understanding rather than problem solving (Stiles, 2002). Research examining situations such as cancer or bereavement have found that distressed individuals report that emotional support, which included providing an opportunity to express feelings and facilitating assimilation of the emotional event, is the most appreciated form of support (Ferrero, 1993; Jacobson, 1986; Taylor, 1990). In these situations, problem-solving discussions are unnecessary; instead, allowing distressed individuals to disclose about their thoughts and feelings while they create a coherent narrative of the situation may allow them to better understand their situation and increase their coping abilities.

Finally, provisions of support can decrease distress by validating positive aspects of an individual’s personal identity. Person-centered messages are messages that validate and legitimize the identity, emotions, and experiences of another (Burleson, 1982). Highly person-centered messages explicitly recognize the other’s emotional state and adapt the message accordingly, whereas messages of lower person-centeredness or sophistication deny or ignore the legitimacy of the other’s feelings. Research in a variety of contexts has consistently shown that messages high in person-centeredness are rated as more effective at reducing distress, more sensitive, and more helpful (Burleson, 2003).
Person-centered messages focus on validation of the positive aspects of an individual’s identity, leading to increased feelings of self-worth and self-esteem. One way person-centered messages support identity is by allowing distressed individuals to increase verbalization of positive and negative affect (Jones & Wirtz, 2006). Talking about both positive and negative feelings reinforces the appropriateness of the individual’s feelings. Person-centered messages also increase the distressed individual’s use of positive emotion, which exerts a direct influence on emotional improvement (Jones & Wirtz, 2006). Finally, person-centered messages communicate that the supporter understands the distressed individual’s feelings and truly cares about improving the stressful situation. An ongoing use of these messages increases trust within the relationship, leading to relational stability and increased well-being. In total, person-centered messages function in multiple ways to enhance a distressed individual’s feelings about himself or herself.

Taken together, previous research suggests a possible connection between support and identity. Although speculative, the supportive benefits of having a large social network may reflect the positive bolstering of a communal identity. From a buffering model perspective, supportive messages from a confidant may enhance an individual’s relational identity because supportive messages implicitly convey the support provider’s confidence in the distressed individual. Similarly, person-centered messages may strengthen an individual’s personal identity by emphasizing positive traits of the distressed individuals. Finally, disclosure of traumatic events may allow individuals to enact their identity; therefore, reducing distress.
Overview of the Current Project

The goal of this dissertation is to locate interpersonal communication within the stress process by clarifying how interpersonal communication impacts biological stress reactions. More specifically, I aim to understand how basic message features in identity disconfirming and confirming interactions influence an individual’s perceptions of an interaction and, in turn, the physiological stress response. Because communication and identity are linked, messages have the ability to threaten or support an individual’s identity. Thus, these two types of messages provide contexts for studying the effect of communication on stress. I focus on biological stress responses because the use of biological measurement provides a more precise and sensitive indicator of affective states with less subjectivity and perceptual bias than self-report and behavioral coding methods (Cacioppo 2002; Kinney, 2005; Nisbett & Wilson, 1977). Furthermore, because of the strong link between hormone production and health outcomes such as heart disorder, obesity, cancer, stroke (McEwen, 1999), the use of biological measures of stress sheds light on the role communication plays in mental and physical health.

Based on the limited amount of communication research utilizing biological stress measures, the next chapter provides a foundation for understanding stress and explores the mechanisms through which identity disconfirming messages increase stress and identity confirming messages decrease stress. In Chapter 3, I propose a series of hypotheses linking various message features to the stress response. In Chapter 4, I describe the methods of a study that was designed to test the impact of hurtful messages on the stress response. The results and discussion of Study 1 are summarized in Chapter
5. Chapter 6 describes the procedures and methods of the second study, designed to examine the effect of supportive messages on stress, and Chapter 7 provides the results and discussion of Study 2. Finally, Chapter 8 discusses the implications of the studies for understanding how messages features can impact stress in intimate relationships.
CHAPTER TWO

Past research on stress has mainly focused on the stress response as an organism’s adaptive response to a threat (Sapolsky, 1998). Most research on stress is grounded in the work of Hans Selye, who proposed that any system (human or animal) under stress responds in a three-stage process of alarm, adaptation, and exhaustion (Selye, 1974). Since the work of Selye, scholars have elaborated the model of stress to encompass uniquely human capacities. For example, the definition of a threat, which was historically examined as physical threats to survival, has been expanded to include anticipated or psychological threats (see Sapolski, 1998). Scholars have also adapted the conception of stress to include the role of emotions and appraisal processes (Lazarus, 1991). Although these changes have increased our understanding of the process of stress in individuals’ lives, research on stress has largely neglected the role of interpersonal communication in the exacerbation or attenuation of stress.

To address this shortcoming in previous research, this chapter locates interpersonal communication within the stress process. To lay the foundation for understanding the relationships between communication and stress, the first section explicates stress by integrating the environmental, psychological, and physiological aspects of stress. The subsequent section discusses the associations between stress and health. The final section explores the relationships between disconfirming and supportive communication and stress.
Explicating Stress

Stress has been conceptualized as a stimulus, a response, or a psychological relationship between a stimulus and a response. Stimulus definitions of stress focus on components of a person’s environment that create stress. Stimulus definitions vary from a threat in which an individual perceives potential danger, inhibition of task completion, noxious environmental stimuli, fear of failure (Weitz, 1970) or life changes that can create stress (Clum, 1976, p. 54). Another stimulus definition of stress focuses on stress as a situation in which, “environmental demands tax or exceed the adaptive capacity of an organism” (Cohen, Kessler, & Underwood Gordon, 1995, p. 3). Definitions that focus on stress as a response emphasize the body’s biological response to stimulus conditions (Dohrenwend & Shrout, 1985), or “the non-specific response of the body to any demand” (Selye, 1976, p. 55). Attempts to include both the stimulus and the response within the conception of stress define stress as “a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being” (Lazarus & Folkman, 1984, p. 19). Although these approaches differ in important ways, they point to three core features of stressful experiences. First, stress requires a stimulus, such as an event or environmental condition, to initiate the stress response. Second, stress involves psychological processes. Finally, stress initiates a physiological response that attempts to regulate the body’s systems. These facets of stress experiences are elaborated in the following sections.
**Environmental Components of Stress**

An environmental perspective on stress highlights how events or experiences within a person’s environment could create adaptive demands. The early focus of this tradition was on objective events that place demands on every human being, rather than individual subjective feelings of stress (Cohen, Kessler, & Underwood Gordon, 1995). According to the perspective, stress is a function of the number of potentially stressful life events an individual has experienced (Meyer, 1951). From this level of analysis, experiencing more stressful life events is associated with more difficulty adjusting after the events, which results in increased risk for disease.

Consistent with the perspective’s focus, stress is operationalized as the number of stressful events individuals experience. Early research reflecting the environmental stress perspective focused on how individuals adjusted to various life events. To do so, scholars utilized the *Schedule of Recent Experiences* to measure life events that could create stress. This inventory, which included events such as divorce, job loss, and death of a loved one, documented associations between stressful life events and diseases such as heart disease, skin disease, and others (Holmes & Masuda, 1974). As the perspective developed, the measurement scales were modified to include standardized ratings of the difficulty people have adjusting to each event; these ratings were called life change units. The introduction of life change units led researchers to examine the magnitude of stress or change, rather than simply whether the stress was positive or negative.

As research reflecting the environmental perspective continued, scholars began to integrate new perspectives on life events and update measures accordingly. Research shifted from discrete life events that create stress toward the long-term health
consequences of various stressors. Questions about the cumulative effects of multiple stressors within a shorter time interval (McGonagle & Kessler, 1990) and cumulative stressors, in general, have been considered (Dohrenwend & Shrout, 1985). Subjective elements were added to measurement scales by having individuals estimate the stressfulness of an event, creating more personalized assessments of stress than those provided by standardized life change units (Sarason, Johnson, & Siegel, 1978). Newer checklists were also adapted to include events that are applicable to various sub-populations, such as adolescents, college students, and the elderly (Cohen, Kessler, & Underwood Gordon, 1995).

By focusing on environmental stimuli that are stressful, this perspective reminds us that life events impact stress in ways that promote disease and illness. Life events could include a variety of discrete stressful events, daily acute stressors (Bolger, DeLongis, Kessler, & Schilling, 1989; Stone, Reed, & Neal, 1987), or the accumulation of multiple stressors (McGonagle & Kessler, 1990). In any case, stress occurs because environmental factors tax individuals and create a need for adaptation.

**Psychological Components of Stress**

Psychological stress focuses on appraisals, or individual evaluations of transactions with the environment, as the source of stress. Appraisal theory posits that cognitive systems continuously monitor the environment to evaluate the fit between an individual’s goals and external conditions (Lazarus, 1991). Primary appraisals, which occur almost instantaneously, include assessments about the degree to which conditions are favorable, unfavorable, or irrelevant to a person’s goals. Secondary appraisals
evaluate the person’s resources and options for coping with the situation. The appraisal process is adaptive because it allows individuals to monitor conditions in the environment so that they can cope or capitalize as required. Because the appraisal process explains emotional and physiological reactions, it can clarify the genesis of the stress response.

When conditions are perceived as incongruent with personal goals, people assess accountability for the event, their ability to improve the situation and adjust psychologically, and the future of the event (Smith, Haynes, Lazarus, & Pope, 1993). Based on this analysis, individuals can frame an incongruent goal situation as either a challenge that can be overcome or a threat to the self that will result in harm. When people frame a situation as a challenge, they acknowledge their ability to manage the stressor, which activates positive coping in the form of action to resolve the problem. When people perceive circumstances to be a threat, they frame the situation as one that will result in harm or one that they cannot overcome. In this case, judgments result in a lack of action to resolve the situation or an inability to cope effectively.

Appraisals elicit emotions, which orient people toward actions that can help them respond to the situation; the emotion and subsequent action depend on both primary and secondary appraisals (Fridja, 1986). In general, if a situation is appraised as consistent with personal goals, happiness will be experienced and this emotion will encourage the person to approach or engage the situation. When a situation is incongruent with goals, distinct primary and secondary appraisals will elicit distinct action tendencies. If people believe they can cope with unfavorable circumstances, they will feel hope and approach the situation (Smith, Haynes, Lazarus, & Pope, 1993). When goal interference is attributed to an external source or an injustice, an individual will feel anger and attack the
impediment. If people perceive that they have little ability to cope with the situation or they are uncertain of their abilities in the given situation, they will feel fear or anxiety and take action to fight against the situation or leave it (Lazarus, 1991). In these ways, emotions have action tendencies that orient people toward behavior.

The psychological perspective highlights how stress occurs due to appraisals, rather than physical factors such as temperature or life events. The focus of psychological stress is on the cognitions that produce feelings of stress. Thus, when different people encounter the same situation, they may each respond differently (stressed or not) based on how they evaluate that situation.

**Physiological Components of Stress**

Stress can be located among a myriad of physiological responses. The stress response involves multiple systems, working together, to mobilize energy to deal with a stressor. The sympathetic-adrenal-medullary axis (SAM) allows for an immediate response to the stressor. The hypothalamic-pituitary-axis (HPA) helps organisms (animals and humans) adapt to the increased demands of stressful situations and return the body to homeostasis or balance (Kirschbaum & Hellhammer, 1989). The systems are crucial in providing the body with energy to deal with the stressor and recover from the imbalance that stress causes.

The stress response begins when the brain senses a threat in the environment and activates the SAM. The brain sends a message through the spinal cord to the adrenal glands. The adrenal glands release epinephrine and norepinephrine, which quickens the heartbeat, raises the blood pressure, dilates the pupils, increases respiration, increases
metabolism, and increases metabolism. The SAM provides the initial response to the stressor and allows individuals to fight the stressor or flee from the situation.

Whereas the SAM provides immediate, quick energy to deal with the stressor, the HPA provides more long-term energy for continued stress. The HPA response begins when epinephrine and norepinephrine are released by the sympathetic nervous system. These neurotransmitters stimulate the hypothalamus to secrete CRF (corticotrophin releasing factor). The CRF triggers the pituitary gland to release ACTH, which is an adrenal stimulating pituitary hormone (Chrousos & Gold, 1992; Lovallo & Thomas, 2000). Finally, the adrenal cortex releases cortisol (in humans). During times of non-stress, people typically have about 15 distinct cortisol pulses within a 24-hour period (Kirschbaum & Hellhammer, 1989). The pulse volume is highest in the early morning and smallest in the evening. During times of stress, the release of cortisol increases.

The release of cortisol into the body provides resources to deal with the stressor. Specifically, the process breaks down fats into fatty acids for useable stored energy, mobilizes proteins, increases production of sugar to degrade protein, and increases serum glucose levels for more useable energy. Cortisol mobilizes energy to respond to the stressor by regulating the metabolism of glucose and increasing heart rate and blood pressure to transport nutrients and oxygen to parts of the body necessary to deal with stress (Chrousos & Gold, 1992; Lovallo & Thomas, 2000). Likewise, energy is diverted from systems such as the metabolic, digestive, and reproductive systems that are nonessential for dealing with the stressor (Sapolsky, 1998). In total, this process is delayed about 30 minutes after exposure to the stressor and allows more time and energy for individuals to deal with the stressor.
The physiological response is initiated to provide the resources to deal with short-term physical emergencies. Thus, the stress response is a necessary and healthy process that provides energy to the appropriate organs and muscles and allows individuals to respond to threatening situations.

Across the three perspectives on stress, there are key elements that define the experience of stress. An environmental stimulus is interpreted by an individual as threatening and initiates a biological response (see Biondi & Picardi, 1999). When stress is regulated, the process is adaptive because it provides individuals with the energy to deal with potentially dangerous events. When stress is unresolved, chronic stress places strains on the body’s systems leading to mental and physical health problems.

Stress and Health

The HPA and SAM both play regulatory roles in times of non-stress. Cortisol plays a role in regulating or impacting the immune system, the sympathetic-adrenal-medullary axis, the cardiovascular system, and affective and cognitive processes (Kudielka & Kirschbaum, 2005). In non-stressed individuals, cortisol is released in pulses throughout the day creating a circadian rhythm (also known as diurnal variation) that provides individuals with energy for daily functioning. Under times of stress, these systems work harder to maintain balance within the body (homeostasis or allostasis). During acute stress, stressors that are less severe or are of a shorter duration, the body is able to respond to the threat and then recover. Acute stressors include daily hassles, such as traffic, that initiate a stress response and then subside. When stress is chronic, including stressors that are of greater severity or duration than acute stressors, the strain on the body is more severe. Chronic stressors can be long-term situations, such as illness
or bereavement, or the accumulation of continued minor stressors, such as workplace stress. According to Linden, Earle, Gerin, and Christenfield (1997), as long as the source of stress (or stressor) is ongoing, increased hormone levels such as cortisol are necessary for coping. In healthy systems, adaptation occurs after the stressor is terminated and the system returns to a balanced state (homeostasis); however, if an individual does not adapt or the stress continues, cortisol levels remain high and the system sustains a ‘stressed’ state. The elevated stress levels associated with ongoing stress are what create the negative health and relationship consequences associated with stress.

*Stress and Physical Health Consequences*

Allostasis is a process of adaptation in response to stressors (McEwen, 2005); allostasis literally means maintaining stability through change (Sterling & Eyer, 1988). Multiple systems are involved in the process of adapting to stressful situations. The HPA and SAM are systems that protect the body and help the body adapt to challenges. The cost of allostasis or maintaining balance in the protective systems is called allostatic load. Allostatic load is the cumulative physiological wear and tear that results from repeated efforts by the body to adapt to stressors over time (McEwen & Seeman, 1999). There are three types of allostatic load that can result in health problems due to stress (McEwen, 2005). First, the frequency, magnitude, and repetition of stress can create allostatic load. Second, failed shut down causes allostatic load; this occurs when an individual does not recover from stress and the activation of physiological systems is sustained. Finally, an inadequate response creates allostatic load, because the challenge or stressor persists.
Any and all of these situations lead to increased physiological reactivity and allostatic load.

The cumulative effect of frequent stressors can impact health through increased allostatic load on the body. Daily stressors, such as child or spousal tensions, work deadlines, traffic, or role overload, are associated with negative mood (Bolger et al., 1989) and physical health problems (Larsen & Kasimatis, 1991). Holmes and Holmes (1970) found that daily stressors were associated with minor physical ailments, such as the common cold. Delongis, Folkman, and Lazarus (1988) also reported that daily hassles are associated with the incidence of sore throat, flu, headaches, and backaches. If the daily stressors occur regularly, they can become a source of chronic stress, leading to the more serious conditions associated with long-term activation of stress.

For each system of the body, there are both short-term adaptive actions (homeostasis) that are protective and long-term effects that can be damaging (allostatic load). For the SAM, an example of allostasis is how adaptation is promoted by adjusting heart rate and blood pressure to sleeping, waking, physical exertion (Sterling & Eyer, 1988). Allostatic load in the SAM could occur when repeated surges of blood pressure in the face of job stress or the failure to shut off blood pressure surges increase the risk of arteriosclerosis or Type II diabetes (see McEwen, 1998). Another example of allostasis and allostatic load can be found in the HPA system. The HPA promotes allostasis through the production of the adrenal steroids that aid in metabolism; during times of non-stress, the system enhances food intake and provides energy when needed by the body. Over-activity of this system due to repeated HPA activity or a lack of recovery
from stress leads to allostatic load, increasing the risk of insulin resistance, Type II diabetes, abdominal obesity, arteriosclerosis, and hypertension (Bjorntorp, 1996; Brindley & Rolland, 1989). Over-activity of the HPA can also result in allostatic load that impacts cognitive function and can lead to neuronal and hippocampal atrophy (McEwen, 1998).

Elevated cortisol levels due to stress can also be a major contributor to allostatic load and health problems. Seeman and Robins (1994) found that elevated cortisol levels in Cushing’s patients are related to increased prevalence of arteriosclerosis, hypertension, diabetes, osteoporosis, reduced immune function, and life expectancy. Patients who receive corticosteroid therapy and, therefore, have higher cortisol levels, suffer from glaucoma, cataracts, muscle weakness, increased infections, cerebral atrophy, and high mortality from cardiovascular disease and infection (Seeman & Robins, 1994). Although this study examined patients who endure chronically-elevated cortisol levels due to health problems rather than stress, the results mirror that of healthy individuals who experience elevated cortisol levels due to ongoing stress. For example, Fleming et al. (1987) found that people who suffer from chronic stress due to living in crowded, urban areas show systematically slower cortisol recovery than those who do not. Likewise, Bell (1994) reported that continuous activation of stress systems leads to illnesses including depression, panic disorder, mania, phobic disorder, anxiety, irritable bowel, and ovarian cysts. Elevated cortisol levels may also cause hippocampal damage, impair hippocampus-dependent learning and memory in humans (McEwen et al. 1992), and accelerate cell damage in the nervous system (Sapolsky, 1996).
Allostasis and allostatic load are important components of stress for multiple reasons (McEwen, 2005). Theoretically, allostatic load allows researchers to understand the impact of cumulative daily hassles, as well as major stressful life events. The focus also takes into account the individual differences that exist in coping with stress. For example, individual differences in appraisals of threat create variation in people’s need for adaptation; as a result, individual differences, rather than features of events or situations, influence allostatic load. The focus on allostatic load also takes into consideration individual differences in the physical condition of the body; individuals in better physical condition experience less allostatic load than those with worse physical condition (McEwen, 1998).

Stress and Relationship Consequences

Stress is consistently reported as a major source of relational problems. The experience of a variety of stressors has been linked to higher rates of marital dissolution (Bahr, 1979; Gimbel & Booth, 1994) and more negative evaluations of marriage (Tesser & Beach, 1998). Moreover, diary studies have found that days on which participants report increased stress are associated with more negative ratings of marital interactions (Bolger, DeLongis, Kessler, & Wethington, 1989; Halford, Gravestock, Lowe & Scheldt, 1992). These findings highlight how stress can impact perceptions of the relationship, leading to less relationship satisfaction and stability.

Beyond the reduction of relationship satisfaction, stress can be a catalyst for negative relationship events, such as conflict, that a couple might not otherwise experience (Repetti, 1989). For example, Conger et al. (1990) found that economic
hardship creates increased stress and leads to increased instability and negativity in the relationship. In other words, stressors that are external to a couple can make individuals more reactive to events within the relationship. Reactivity becomes problematic for the relationship because individuals who are more stress reactive during conflict discussions are more likely to divorce than those who are less reactive. In particular, Kiecolt-Glaser, Bane, Glaser, and Malarkey (2003) found that divorced individuals have higher epinephrine levels during conflict discussions, throughout the day, and at night than individuals who remain married; in fact, increased ACTH levels (a hormone associated with stress) are predictive of marital trouble ten years later.

It is clear from previous research that living in a stressful environment makes people vulnerable to stress, hardship, and relational difficulties. Past research examining how couples and families deal with stress to maintain stability and satisfaction have typically focused on characteristics of the individuals or the environment. According to Karney and Bradbury (1995), research has examined the vulnerabilities to the negative effects of stress that people bring into a relationship, including demographic, personal, historical, and experiential characteristics or how events such as developmental transitions or economic hardship impact adaptation to stress. Although all of these features shape how stress impacts individuals and relationships, research has tended to neglect the role of communication in stress adaptation.

**Interpersonal Communication and Stress**

The environmental, psychological, and physical conceptions of stress highlighted thus far in this chapter provide a foundation for understanding the health consequences of stress and stressful situations. At the same time, these viewpoints overlook
communication as a process that can exacerbate stress or accelerate recovery. In the next section, I expand upon the discussion of identity disconfirming or hurtful messages and identity supportive messages to examine their roles in the stress process.

*Identity Disconfirmation as a Stress Process*

As stated in Chapter 1, messages that express discrimination, stereotyping, or prejudice all threaten an individual’s social identity (Abrams & Hogg, 1999). Similarly, communication can express devaluation of the relationship through infidelity, deception, and rejection, which is a threat to relational identity (Leary et al., 1998). Finally, hurtful communication can disconfirm an individual’s identity by devaluing a person’s thoughts or feelings and violating expectations within the relationship (Afifi & Metts, 1998; Vangelisti, 2001). As noted in Chapter 1, my focus is on hurtful messages as the form through which a variety of identity threats are conveyed. Regardless of the type of identity threat, disconfirming messages initiate stress because they signal a threat to an individual’s sense of self.

One reason that disconfirming or hurtful episodes may initiate stress is because they present a threat to an individual’s self and/or relational identity. As stated earlier in the chapter, the stress process begins when an individual perceives a threat to their well-being. Hurtful messages may signal threat in a variety of ways. First, hurtful messages signal a discrepancy between what an individual believes to be true and what others communicate, leading an individual to question him or herself or the relationship. Second, hurt signals an unfavorable situation that is incongruent with the person’s interaction goals (see Abrams & Hogg, 1999; Afifi & Metts, 1998; Leary et al., 1999;
Vangelisti, 2001), leading to perceptions of harm, loss, or an inability to cope with the stressful situation. Finally, a hurtful message can be appraised as a threat if it violates expectations for the relationship and creates uncertainty about the self, the partner, or the relationship.

Research on other social-evaluative threats also suggests hurtful interactions will be stressful. The perception of social and social-evaluative threat, as manipulated by a public speaking task, produces a significant cortisol response (Andrews et al., 2007; Dandeneau et al., 2007). Scholars suggest that speeches trigger the biological stress response because they signal uncontrollable threats to a speaker’s goal of maintaining his or her ‘social self’ (Dickerson & Kemeny, 2004; Gruenewald, Kemeny, Aziz, & Kahey, 2004). Other social-evaluative stimuli that can initiate a stress response include rejection, criticism, and exclusion (Dickerson & Kemeny; Stroud, Tanofsky-Kraff, Wilfley, & Salovey, 2000). Because hurt is thought to arise from feelings of rejection and devaluation in response to statements that evaluate, accuse, interrogate, or threaten, we would expect hurtful messages to elicit a stress response similar to reactions initiated by other social-evaluative threats.

Another way in which disconfirming or hurtful messages can impact the stress process is by influencing an individual’s appraisals of the situation. Previous research has found that individuals make appraisals about the helpfulness, supportiveness, and sensitivity of messages (Goldsmith, McDermott, & Alexander, 2000; Vangelisti & Young, 2000). Scholars have suggested that individuals also make appraisals about the degree to which events are positive, negative, or neutral, will result in harm or loss, and
are controllable (Taylor, 1999). When an individual appraises a situation to be negative or uncontrollable, or perceives it will result in harm or loss, a stress response is initiated.

Features of the messages and characteristics of the relationship can influence these appraisals. When more intense language is used in hurtful statements, it is more likely that the messages will be appraised negatively and create stress (Young, 2004). Appraising a hurtful message as intentional also increases the likelihood of experiencing stress (Vangelisti & Young, 2000). The frequency of which an individual is hurtful can also impact appraisals of the messages; people who receive hurtful messages more often are more likely to appraise messages negatively (see Vangelisti & Young, 2000). Finally, Young (2004) suggested that positive relationship characteristics, such as satisfaction and closeness, provide a lens through which actions are interpreted; individuals in a quality relationship are more likely to appraise hurtful messages in a manner that buffers them from stress.

The appraisal of threat, based on message features or relationship characteristics, leads to the initiation of the biological stress response. Although I know of no empirical evidence linking hurtful messages to physiological stress responses, the negative consequences of hurtful messages imply that individuals experience stress that they want to decrease. In particular, a typical response to hurt is distancing. Relational distancing is “a noticeable rift in an otherwise, or formally, intimate relationship” (Helgeson, Shaver, & Dyer, 1987, p. 224). Scholars have found that when people perceive a hurtful message as intentional, they indicate a greater distancing effect in their relationships, more intense feelings of hurt, and less satisfaction than people who perceive messages as unintentional (Vangelisti & Young, 2000). Furthermore, when the frequency of hurt is high, individuals
are more likely to distance themselves from the source of the hurt. Other relational outcomes associated with hurt include instability and relationship dissatisfaction (Lindahl, Clements, & Markman, 1998), decreased intimacy, and possibly dissolution (Leary & Springer, 2001; Vangelisti & Young, 2000).

Identity Confirmation as a Stress Process

As stated in Chapter 1, communication can also validate or affirm a threatened identity. Supportive communication can confirm an individual’s feelings about the self, the relational partner, or group membership. Support can decrease distress through the validation of feelings and thoughts (Burleson, 1982) or by facilitating the process of adaptive reappraisals of a stressful situation (Burleson & Goldsmith, 1998). Communication can also support identity and decrease stress through statements that increase a distressed individual’s self-efficacy and problem solving in a stressful situation (Cohen & Wills, 1985). Finally, a social support network can provide a sense of belonging and stability that affirms identity (Cobb, 1976). Communication is essential to identity support and stress reduction because it expresses group membership, strengthens self-esteem, and validates individual’s feelings about their self and the stressful situation.

Identity confirming messages can be a stimulus for the reduction of stress by de-emphasizing feelings of threat or inability to cope with a stressful situation. Appraisal theories assume that when an individual encounters an emotion-evoking situation, they evaluate the personal impact of the situation and their behavioral options (Lazarus, 1991). The appraisals of the situation shape both individuals’ emotional reaction to a situation and how they act upon their feelings. According to Frijda, Kuipers, and ter Schure (1989), fear and anxiety correspond with appraisals of negative events as uncertain,
modifiable, and uncontrollable, which generate an action tendency to protect oneself. Applying appraisal theory to social support suggests that a supporter can assist a distressed person by using communication to help him or her reappraise the stressful situation (Burleson & Goldsmith, 1998). In other words, communicative reappraisal can change a distressed person’s perception about a negative situation, therefore, leading to a reduction in stress.

This process begins by allowing a distressed person to disclose his or her feelings about a stressful situation, which the support provider then validates. As the distressed person discloses, the supporter asks questions to help him or her gain perspective on feelings and locate the feelings in a broader context (Burleson & Goldsmith, 1998). The supporter legitimizes feelings and empathizes, which creates an environment in which the distressed individual feels accepted and free to explore both positive and negative emotions. Throughout the process, the supporter directs the distressed individual to think about how the stressful event relates to personal goals and how he or she might cope with the situation. The reappraisal occurs through guided reflection on individual feelings, goals, and methods of dealing with the situation that are feasible, without one person ‘fixing’ the situation.

Reappraisal decreases the stress a person experiences by changing that individual’s appraisal of the situation and in turn, their emotions (Ross, Rodin, & Zimbardo, 1969; Lazarus, 1991; Smith & Pope, 1992). Because appraisals evoke emotions, a change in appraisal will result in the experience of different emotions and a different action tendency. Thus, reappraisals result in the reduction of physiological stress by revising perceptions of the stressful stimulus condition.
The reduction of physiological stress is accompanied by a myriad of positive health outcomes. Research indicates that the receipt of support is predictive of health and well-being (Cohen, Underwood, & Gottlieb, 2000; Helgeson & Cohen, 1996; Wills, 1985). Social support is associated with cardiovascular health, endocrine function, and healthy immune function (Uchino, Cacioppo, & Kiecolt-Glaser, 1996). Hanson, Isacsson, Janzon, and Lindell (1989) found that emotional support was the only form out of eight types of support that is significantly associated with mortality. Moreover, emotional support can affect feelings of satisfaction and intimacy (Samter, 1994).

Conclusion

In this chapter, I identified the role that communication plays in the exacerbation and attenuation of stress. In particular, I proposed that identity disconfirming messages increase stress by threatening an individual’s identity. I also posited that supportive messages can reduce stress by conveying a sense of belonging, promoting relational solidarity, reinforcing positive views of the self, or validating feelings, thoughts, and ideas. Communication is an essential part of interacting with one’s environment. It is clear from previous research that communication can both increase and decrease physiological markers of stress (for example, Floyd, 2005; Laurent & Powers, 2005). Given this conclusion, an expanded examination of how communication can impact stress is warranted. To do so, Chapter 3 examines message features that span communication contexts.
CHAPTER THREE

The previous chapter discussed the negative outcomes associated with stress and how communication can play a role in the induction or attenuation of stress. More specifically, I argued that messages that disconfirm an individual’s identity can increase physiological stress, whereas messages that support an individual’s identity can decrease stress. Although previous research has begun to examine the role that communication plays in the stress process (see Floyd, 2005; Floyd et al., 2005; Laurent & Powers, 2006; Powers et al., 2006), one limitation of this research is that it has overlooked the mechanisms through which communication leads to physiological change. To better understand the role of interpersonal communication in the stress process, communication scholars must explore how basic message features and perceptions can exacerbate or attenuate stress. Accordingly, this chapter considers how characteristics of interpersonal messages and perceptions vary in ways that impact stress. I begin by explaining how illocutionary force is conveyed by message features and increases the impact of messages. Then, I examine how people’s perceptions of an interaction can influence stress reactivity to the messages they receive.

Message Features, Illocutionary Force, and Stress Responses

Extant research examining how interactions with others may create or enhance stress are limited by a relatively simple conception of communication. For example, research on interpersonal conflict has found that individual personality traits and attributions impact cortisol reactions during conflict discussions (see Laurent & Powers, 2007; Powers, Pietromonaco, Gunlicks, & Sayer, 2006). This focus on traits of the individuals involved has lead researchers to overlook the role that communication plays...
in the stress response. Moreover, the type of interaction episode is positioned as the
stimulus event, and differences across instances of a communication episode are
neglected. I propose that how a communicator states his or her thoughts can impact the
type and intensity of the stress response experienced by his or her interaction partner. In
the following sections, I examine how the illocutionary force of a message and an
individual’s perception of an interaction impact stress.

Illocutionary Force

A locutionary act or speech act refers to the performance of an action through
speech; examples include asking or answering a question, giving information or a
warning, making an appeal, or giving a description (Austin, 1962). The act performed is
the illocution and the function it serves is the illocutionary force (Marmaridou, 2000).
Messages that serve functions such as making threats or giving warnings communicate
greater force than messages that request or describe. Messages with the same content can
convey varying amounts of force or strength. For example, the statements, “Will John
leave the room?” and “John will leave the room” contain the same content, but the second
message functions as an assertion, which expresses greater illocutionary force (Wee,
2004). Force can be conveyed through content, word order, stress, intonation, or
punctuation.

Illocutionary force is one way that communication can impact stress.
Contemporary scholars such as Mey (1993) have acknowledged the connection between
illocutionary force and biology. In particular, Mey argued that the processing of any
speech act is accompanied by a biological response. Some messages make people feel
happy, such as hearing a romantic partner say “I love you,” whereas other utterances
make people feel uneasy. The subjective feelings associated with communication are also
accompanied by a physiological response. Accordingly, messages with more
illocutionary force should initiate a greater physiological response.

Elements that are theorized to determine an utterance’s illocutionary force vary by
scholar and epistemological view. According to Austin, “the force with which an
utterance is associated emphasizes the role of the speaker and the way her utterances are
intended” (Marmaridou, 2000, p. 177). Other scholars have argued that the speaker’s
intent is not as important as the situational and interactive context in which the message
is stated (see Searle, 1976). Still others suggest that the specification of illocutionary
force relies partly on how the addressee responds to the message. In fact, the most
comprehensive determination of illocutionary force appears to be, “an emergent context
sensitive effect of the manipulation of prepositional content by speaker and addressee”
(Marmaridou, 2000, p. 204).

All of the perspectives acknowledge that the illocutionary force of any message
depends on the features of the message. For example, the statement, “I want you to do it”
has more force than, “I want you to do it, but I’m not asking you to do it.” In the first
sentence, the speaker is exerting direct force onto the receiver. Similarly, a promise exerts
less force than a warning or a threat. According to speech-act theory, illocutionary force
is comprised of seven factors, “the illocutionary point (the message), its mode of
achievement and degree of strength, its prepositional content, preparatory and sincerity
conditions, and the degree of strength of the sincerity conditions” (Dascal, 2003, p. 152).
Greater strength of a message conveys more commitment and greater attempts to get the
hearer to do or believe something (Searle & Vanderveken, 1985). Similarly, word choice and increased sincerity in one’s statement increases force. Thus, it is the manipulation of various components of a message that determines its illocutionary force.

Message Features that Affect Illocutionary Force

Although illocutionary force emerges in the interaction context, characteristics of the message have a profound influence on force and, thus, the impact of a message. In other words, messages with more illocutionary force are more likely to impact physiological reactivity. In the following sections, I highlight characteristics of messages that make a speech act more or less forceful: explicitness, argument strength, relational clarity, and involvement.

Explicitness. Explicitness is one communication characteristic that individuals use naturally in conversation and is relevant to all messages (Dillard & Kinney, 1994). Explicitness is, “the extent to which the goal of the source is revealed in the message itself” (Dillard & Kinney, 1994, p. 503). The difference between high and low explicitness can be seen in the difference between a direct request and a hint. Consider, for example, two messages: “please pass the salt” and “the food would be much better with salt.” The first statement directly expresses the speaker’s desire for salt, whereas the second statement requires the listener to infer that the speaker would like him or her to provide salt. Other versions of this message might make the speaker’s goal very obvious (“give me the salt”) or quite obscure (“did you get salt at the store today?”). Thus, explicitness is a linguistic feature of messages that encompasses the accessibility of the message’s intent.
Because explicitness is a message feature that conveys varying amounts of illocutionary force, it may be associated with an individual’s stress response. The definition of explicitness mirrors that of message intensity, which is “the strength or degree of emphasis with which a source states his attitudinal position toward a topic” (McEwen & Greenberg, 1970, p. 340). As message intensity increases, the impact on the receiver should also increase. In other words, the more explicit an utterance is, the more force it exerts on the listener. Importantly, increased force could have stress increasing or decreasing effects; the consequence of explicit messages depends on the content and context of the message.

When a negative content message is stated with greater explicitness, the illocutionary force of the message is likely to exacerbate stress. In the context of hurtful communication, it is assumed that more explicit messages create more impact on the receiver. Young (2004) posited that the intensity of a hurtful message influences the way people appraise it. Consistent with this assumption, Young found that the intensity of hurtful messages consistently predicted negative evaluations of the messages. Similarly, Dillard and Kinney (1994) found that explicit influence messages produced significant increases in skin conductance and heart rate, suggesting that explicit messages are linked with emotional arousal. Explicit messages contain more illocutionary force and can convey greater intentionality and dominance. Thus, explicitness conveyed in a negative context may increase physiological reactivity to a message.

In contrast, explicitness may also be associated with the attenuation of stress. Dillard, Kinney, and Cruz (1996) reported that more explicit messages were judged as more pleasant than less explicit messages; the authors argued that explicit messages
might signal affiliation in some contexts. Furthermore, research on marital adjustment has shown that expressing positive emotions explicitly is associated with positive marital interaction (Walsh, Baucom, Tyler, & Sayers, 1993).

Research on relationship talk, which includes content messages about the relationship, provides additional examples of how the physiological impact of explicitness can be context dependent. Relationship talk may include a variety of direct or indirect messages about an interpersonal relationship. The degree of perceived interdependence and commitment can be communicated through relationship talk (Knobloch & Solomon, 2003). Moreover, relationship talk allows partners to explore the status of their association (Baxter & Bullis, 1987), to negotiate transitions and critical relationship events (Baxter & Bullis, 1986; Emmers & Canary, 1996), and to make bids for increased or decreased intimacy (Owen, 1987). The illocutionary force of relationship talk increases as the talk becomes more explicit; however, the degree to which the force increases or decreases stress depends on the state of the relationship.

Because of the importance of relationship talk in the formation and maintenance of relationships, it can sometimes be stress provoking and sometimes stress-reducing. Individuals may disclose sensitive information that causes them to lose face or discover that their definition of the relationship differs significantly from that of their partner (Kunkel, Wilson, Olutowote, & Robson, 2003). If the content of relationship talk causes greater uncertainty or embarrassment, the increased force of the message could increase stress. In contrast, relationship talk can maintain or escalate the relationship between individuals by influencing people’s definition of the relationship and clarifying how committed or attached partners are (Baxter, 1987; Knapp & Taylor, 1980). If the talk
confirms the commitment of the partners, the illocutionary force of explicit relationship talk should attenuate stress.

In the context of identity disconfirming and identity confirming messages, explicit messages can function to make threats to identity or identity support more evident. As explicitness increases, so does the force of the message. Based on this logic, I propose that physiological reactivity associated with explicit messages will be context dependent. More formally:

**H1:** In interactions between college-aged dating partners, the explicitness of identity disconfirming messages is positively associated with stress.

**H2:** In interactions between college-aged dating partners, the explicitness of identity affirming messages is negatively associated with stress.

**Argument strength.** The argumentative strength of a message depends on the degree of elaboration or embellishment of statements. Embellishment occurs when individuals include additional comments, justifications, or explanations (Roloff, Janiszewski, McGrath, Burns, & Manrai, 1988). Importantly, argument strength is increased not through repetition of the same point, but rather by providing a diversity of reasons for supporting a claim. Thus, argument strength is apparent in the prominence or prevalence of evidence within a message or over the course of an interaction.

Argument strength as a message feature increases illocutionary force, because it makes the speech act more assertive. Argumentative statements convey greater strength in content, as well as greater sincerity. Furthermore, argumentative strength requires supportive evidence and strong conviction to the position (see Samp & Solomon, 2005).
Embellishment, providing greater description and support for points, is positively associated with the intensity of a speaker’s interaction goals (Samp & Solomon, 1999). Greater argument strength also increases an individual’s motivation to attend to and be influenced by the message (Eagly & Chaiken, 1993). This evidence suggests that argument strength increases the illocutionary force of a message; as in the case of explicitness, the stress implications of argumentative communication may be context dependent.

Research on demand/withdrawal patterns of communication provides an example of how argument strength can increase stress. Strong argument, shares characteristics with demand messages, because both are forceful messages. As the speaker increases the argument strength of the message, the demand of messages that complain, nag, or criticize, increases (Caughlin, 2002). The intensity of demand messages prompts some receivers to withdraw from the situation by disengaging or trying to avoid the situation. In particular, the demand/withdrawal pattern of communication is associated with increased reactivity to confrontation, including, increased self-reported stress (Malis & Roloff, 2006) and increased systolic blood pressure reactivity (Denton et al., 2001). Furthermore, demand messages are similar to identity disconfirming messages in that both can include negative comments and criticism. To the extent that argument strength functions like demand, argument strength should influence physiological reactivity in identity disconfirming interactions.

In contrast, more elaborate supportive messages may reduce stress. Research on advice giving provides one example of how increased argument strength could reduce distress. Advice can be perceived as a face threat, criticism, or an intrusion. The extent to
which face is threatened partially determines whether an individual will follow the advice given (see MacGeorge et al., 2002). Advice that is directive, informative, and responsive to the identity of the individual and the relationship is rated as helpful and effective support (Goldsmith, 2004). In contrast, blunt directives that don’t provide justifications for the recommended course of action run the risk of being bossy and insulting. Moreover, providing a variety of reasons that an individual should feel good about his or herself further supports the individual’s identity, leading to a decrease in stress.

Generally, argument is aimed at changing the other person’s behaviors, thoughts, or feelings, which could result in negative or positive outcomes. Messages that persuade people to think more negatively about themselves may create dissonance and, in turn, induce stress; this outcome will be magnified when those messages are backed by evidence. Conversely, argument strength can engender more positive feelings about the self when the messages being bolstered are identity confirming. Accordingly, I forward the following hypotheses:

H3: In interactions between college-aged dating partners, the argument strength of identity disconfirming messages is positively is associated with stress.

H4: In interactions between college-aged dating partners, the argument strength of identity affirming messages is negatively associated with stress.

Involvement. Involvement reflects the extent to which individuals are engaged with each other. Involvement includes “the degree to which participants are enmeshed in the topic, interpersonal relationship, and situation” (Coker & Burgoon, 1987, p. 463; Dillard, Palmer, & Kinney, 1995). Involvement is conveyed through word choice, such as
the use of intensifiers and vivid language, and nonverbal behaviors, such as the use of forward body lean and eye contact. According to Dillard et al. (1996), the degree of involvement in the conversation acts as an intensifier of the message, making the implications more forceful.

Relational framing theory provides evidence for the illocutionary force of involvement. The theory forwards involvement as a construct that intensifies relational messages (Dillard et al., 1996). As discussed earlier in the chapter, illocutionary force increases as a speaker becomes more sincere and committed to the message; as such, involvement inherently conveys illocutionary force. When a speaker becomes more involved in achieving the goals of the interaction, the message is intensified and the illocutionary force increases. Similarly, as a speaker conveys greater sincerity in his or her statements, involvement in the conversation increases. Therefore, as a speaker’s involvement increases, illocutionary force increases.

Because involvement inherently conveys more force, it can increase stress. One cue for involvement is immediacy, or indications of connection between interactional partners (Mehrabian, 1971). Although immediacy is generally a positive attribute, research has shown that excessive immediacy may function to increase stress. According to Rester and Edwards (2007), immediacy that is interpreted as unwarranted for the situation is associated with feeling offended and controlled. Thus, increased involvement in the conversation can increase negative feelings and stress, depending on how it is interpreted.

Conversely, involvement can convey liking and increased concern for the other person, resulting in a reduction of stress. Jones and Wirtz (2006) found that increased
involvement in the form of immediacy is associated with reports of feeling liked in emotional support encounters. Further, Jones and Guerrero (2001) reported that immediacy increases the perceived quality of comforting attempts. Beyond self-reported perceptions of immediacy, research has also shown that messages higher in immediacy are associated with decreased physiological reactivity. In particular, Ellis (1995) concluded that verbal immediacy is associated with a decrease in anxiety for high communication apprehension students. This body of research suggests that increased involvement in a conversation leads to positive feelings, more effective social support, and decreased stress.

Taken together, these lines of evidence suggest that the impact of involvement is dependent on the context in which the message is stated. In identity disconfirming contexts, involvement is likely to increase stress by making the message more intense and forceful. In the context of identity confirming messages, involvement further supports perceptions of liking and support, thereby reducing stress. Based on this logic, I forward the following hypotheses:

H5: In interactions between college-aged dating partners, a partner’s involvement during an identity disconfirming interaction is positively associated with stress.

H6: In interactions between college-aged dating partners, a partner’s involvement during an identity affirming interaction is negatively associated with stress.
The Role of Message Evaluations in the Stress Process

Thus far in this chapter, I have linked messages features to stress responses, based on the assumption that certain features increase illocutionary force, irrespective of the perceptions of the message recipient. Of course, message features are filtered through an individual’s perceptions of an interaction and these perceptions also shape stress responses. In this section of the chapter, I review the perception process, and I discuss how perception impacts the associations between identity disconfirming and confirming messages and stress.

The Perception Process

Perception is an active process wherein behavior is experienced and interpreted. It is an active process because individuals select certain cues to make sense out of their relationships, their self, and interactions. Through perception, individuals assign meaning to situations that occur in their environment. The process of perception involves selection, organization, and interpretation of people, events, and messages.

Because people cannot attend to all of the sensory data they have access to, attention is directed toward some details and away from others; both external and internal factors affect this selection process. Individuals selectively attend to some stimuli and not others because their mind cannot process all available stimuli. Generally, people attend to phenomena that stand out as especially intense or unusual. Beyond qualities of the situation that draw attention, individuals selectively attend to stimuli that address part of their identity (Mead, 1934). Individuals are more likely to attend to events or comments that reinforce current thoughts or feelings. Moreover, the self-fulfilling prophecy states that individuals are more likely to attend to stimuli that are in line with their expectations.
(Bargh, 1999). Thus, characteristics of the situation, motives to maintain consistency, and expectations for particular situations, interactions, or relationships impact what sensory information people process.

Once an individual has selected information to process, he or she must organize it in a meaningful way. Four major types of schemata, or cognitive structures, provide a means for individuals to organize and interpret interpersonal experiences (Kelly, 1955). Prototypes allow individuals to organize events, people, or messages by comparing them to the most representative example of a category (Fehr, 1993). The prototype helps individuals decide what category the stimulus fits in. Personal constructs organize information by deciding where a stimulus falls in relationship to a bipolar judgment (Kelly, 1955). For example, individuals place messages into categories based on whether they are kind or unkind, supportive or unsupportive, or controlling or non-controlling. Stereotypes provide a predictive generalization of a person or situation that individuals can use to predict what a person will or will not do or say. Finally, scripts, which include a guide to action or behaviors that are generally accepted or expected in a given situation, allow individuals to organize perception into appropriate courses of action. Prototypes, personal constructs, stereotypes, and scripts are all cognitive schemata that allow individuals to organize information, which permits interpretation.

Interpretation is the subjective process of explaining another person’s actions or attributing meaning to a person’s messages (Heider, 1958; Kelley, 1967). In this step of perception, individuals attach meaning to actions and messages of others. When people interpret, they think about why others say what they say, if there is support for their ideas, and what the message means to the individual. Interpretation varies based on the context
of the message and personal characteristics of both interactants. The meaning that individuals attribute to another’s message results in a corresponding response, which can include physiological and behavioral responses.

Scholars generally agree that selective perception allows individuals to attend to the events and messages that are relevant or important, without becoming overwhelmed by all of the stimuli they are presented with at any given time. Individuals want to be able to predict and explain behavior (for example, see Berger & Calabrese, 1975). To do so, people engage in selective perception by viewing interactions in a manner that creates or justifies their reality (Sherif & Cantril, 1945). Accordingly, individuals perceive the cues that are necessary to understand interactions, while ignoring other cues (see Burgoon, Burgoon, & Miller, 1981). Perception, therefore, introduces subjectivity into people’s experience of interactions and those subjective experiences also affect how people respond to the interaction.

*Message Evaluations in Identity-Relevant Interactions*

Individuals regularly experience negative or stressful situations that result from times in which another person’s comments violate their expectations or distressing situations create a need for social support. In either situation, arousal causes individuals to selectively attend to the most salient cues in the interaction (Easterbrook, 1959). Individuals make judgments about messages to better understand another person’s behavior or to reduce distress. Perceptions of hurt, support, dominance, affiliation, and other message features clarify the nature of the relationship between two people, as well as the implications of messages for an individual’s sense of self.
Perceptions of hurt. The experience of hurt is subjective because it varies as a function of relationship type, relationship quality, and frequency of expressed hurtful messages. Vangelisti and Crumley (1998) stated that when family members initiated a hurtful episode individuals experienced a more intense emotional response than if the hurt was initiated by a romantic partner. Relationship quality can also impact an individual’s perception of hurtful interactions; people who are satisfied with a relationship report less intense feelings of hurt and less distancing from the relationship when they experience a hurtful message from a partner (Vangelisti & Young, 2000). In addition, Vangelisti and Young determined that when people perceive that another person frequently hurts them, they are more likely to distance themselves from the source of the hurt. Interestingly, a study that examined both frequency and intentionality of hurt found that when a relational partner frequently and intentionally hurts an individual, the individual reports feeling little or no hurt. The pattern of effects varies; however, these studies highlight the subjective nature of the experience of hurt.

Although hurt is subjective, it is generally perceived as a threat because it injures or harms the individual’s sense of self. Whether a message threatens an individual’s social, relational, personal, or enacted identity, it signals an unfavorable situation that is incongruent with the person’s interaction goals (see Abrams & Hogg, 1999; Afifi & Metts, 1998; Leary et al., 1999; Vangelisti, 2001). Regardless of the type of identity threat, disconfirming messages signal a discrepancy between what an individual believes to be true and what others communicate. To the extent that such a discrepancy is hurtful, people are likely to experience stress. Thus, I forward the following hypothesis:
H7: In interactions between college-aged dating partners, the perception of hurt during an identity disconfirming interaction is associated with increased stress reactivity.

Perceptions of support. The experience of emotional support is also subjective and varies depending on relationship characteristics and the source of support. For example, Fletcher and Fitness (1990) showed that relationship quality was related to more positive cognitions and significantly affected nonverbal behaviors, such as facial expressions and posture. The characteristics of the support provider also impact an individual’s perception of the interaction. For example, Kunkel and Burleson (1999) found that men and women both rate highly person-centered messages as more sensitive and effective in comforting; however, both men and women state they would be more likely to turn to a woman for emotional support.

Regardless of contextual factors that shape perception, perceiving a relational partner as supportive results in positive outcomes. In a variety of contexts, emotional support is associated with decreased stress, and increased cardiovascular, endocrine, and immune function (Koopman et al., 1998; Uchino, Cacioppo, & Kiecolt-Glaser, 1996). Comforting communication can validate or affirm a threatened identity by confirming an individual’s feelings about the self, the relational partner, or group membership. Support can decrease distress through the validation of feelings and thoughts (Burleson, 1982) or by facilitating the process of adaptive reappraisals of a stressful situation (Burleson & Goldsmith, 1998). Based on the positive consequences of emotional support on stress, I forward the following hypothesis:
H8: In interactions between college-aged dating partners, the perception of support during an identity affirming interaction is associated with decreased stress reactivity.

*Perceptions of dominance.* Dominance can be defined as “the contrast between a threat and a promise or between forceful assertion and respectful request” (Dillard & Kinney, 1994, p. 503) or “the degree to which one actor attempts to regulate the behavior of another” (Dillard, Solomon, & Palmer, 1999, p. 53). Dominant messages convey a sense of relational control and the relative power of the speaker to the target. The extent to which an individual perceives dominance in an interaction depends on the cues the person attends to. Nonverbal indicators of dominance include relaxed facial expression (French & Raven, 1959), more direct eye contact (Aguinis, Simonsen, & Pierce, 1998), an elevated position, amount of time talking, and speech loudness, tempo, and pitch (Burgoon & Hoobler, 2002). Dominance is also conveyed by an increased number of conversational interruptions and greater facial expressiveness (Dunbar & Burgoon, 2005). Verbal expressions of dominance include statements that attempt to alter the behavior or beliefs of another. Dominance statements can vary from problem solving and compromise to the use of threats, insults, and physical force (Dunbar & Burgoon, 2005). Dominance may also be expressed through statements that are direct, rather than indirect (Falbo & Peplau, 1980; Rogers & Farace, 1975).

Dominant messages are more likely to convey increased force and, therefore, increase stress. Dillard and Kinney (1994) reported that dominant messages are more likely to be appraised as interfering with a person’s goals. Dillard and Harkness (1992)
found that messages high in both explicitness and dominance were associated with higher levels of surprise, annoyance, and anger. Dominance messages may be interpreted as a threat to identity by implying that the individual is unable to control or regulate the situation; in turn, that perceived threat would initiate a stress response. Based on this logic, I forward the following hypothesis:

H9: In interactions between college-aged dating partners, the perception of dominance during an identity disconfirming interaction is associated with increased stress reactivity.

Perceptions of affiliation. Affiliation has been defined in terms of intimacy (Argyle & Dean, 1965), immediacy (Mehrabian, 1971), or inclusion (Burgoon & Hale, 1984) between partners. According to Dillard, Palmer, and Kinney (1995), affiliation is a multifaceted construct, encompassing liking and involvement. Based on the complexity of affiliation, the impact of affiliative messages is dependent on the cues an individual attends to during an interaction. Affiliation can be expressed nonverbally through physical proximity, eye contact, body lean, smiling, and positive touch (Andersen, 1979). Moreover, affiliation can be communicated through verbal statements of liking, similarity, or closeness.

Affiliation conveys signs of similarity, positive affect, receptivity, equality, composure, and informality (Dillard, Solomon, & Palmer, 1999), which can further support positive feelings about the self. Affiliation can reinforce the relational component of an individual’s identity by communicating that the partner’s view of the person is congruent with his/her sense of self. By enhancing feelings of liking, friendship, and
connectedness, affiliation should be associated with decreased stress. More formally stated:

H10: In interactions between college-aged dating partners, the perception of affiliation during an identity affirming interaction is associated with decreased stress reactivity.

Conclusion

This chapter highlighted the predicted associations among message features, perceptions of an interaction, and stress. In particular, I examined explicitness, argument strength, and involvement as message features that vary in illocutionary force and therefore, impact stress. I also examined the effect of perceptions of hurt, support, dominance, and affiliation on stress reactivity. As a set, the hypotheses advanced in this chapter illustrate the importance of interpersonal communication within the experience of stress.

This dissertation is founded on the assumption that communication experiences, especially as they relate to a person’s identity, are instrumental in the experience of stress. I further argued that the magnitude of the impact of these messages on stress is influenced by illocutionary force as conveyed by particular message features or reflected in particular perceptions of messages. The hypotheses forwarded in this chapter are tested in two studies; one in which individuals engage in an identity disconfirming interaction with a dating partner, and a second study in which individuals engage in an identity affirming interaction. In Chapter 4, I explain the methods used in Study 1 to test the impact of explicitness (H1), argument strength (H3), involvement (H5), perceptions of
hurt (H7), and dominance (H9) on stress reactivity to an identity disconfirming interaction. Chapter 5 reports the results of the study. Chapter 6 describes the procedures used in Study 2 to examine the associations among explicitness (H2), argument strength (H4), involvement (H6), support (H8), dominance (H9), and affiliation (H10) and stress reactivity. Finally Chapter 7 describes the results of the study and discusses the implications for the understanding of support.
CHAPTER FOUR

In previous chapters, I claimed that interpersonal communication can impact stress through identity-relevant messages, and I forwarded a series of hypotheses specifying how message features and perceptions of an interaction impact stress. In this chapter, I describe an empirical study designed to test hypotheses 1, 3, 5, 7, and 9, which focus on the context of identity disconfirming interactions. The remaining hypotheses are evaluated in a second study described subsequently.

Study 1 employed an interaction between dating partners to examine the effects of hurtful messages on physiological stress reactivity. To test the effects of identity disconfirming messages, participants were asked to identify traits or values central to their identity. They then engaged in an interaction with a romantic dating partner in which the partner disconfirmed one of the values or traits. Core traits and values were chosen as the focus of the conversation based on a theme analysis of diary entries of hurtful events in a relationship over a two-week period (McLaren & Solomon, 2008). The theme analysis showed that experiences of hurt often involved a relational partner expressing disagreement with a salient part of people’s identity. Relational partners were chosen because they are one of the most frequent sources of hurtful messages (see Leary et al., 1999). Thus, the study parameters were intended to create identity disconfirming interactions that would allow me to assess the hypothesized effects of message features and perception on variation in physiological reactions to the interaction. In the section that follows, I discuss the pilot study that was employed to assess the degree of stress induction in identity disconfirming interactions. Then, I describe the method and measures used in Study 1.
Pilot for Study 1

A pilot test of the procedures was conducted to determine the extent to which identity disconfirming messages increase physiological stress reactivity. Accordingly, the pilot test included a control group, which only received supportive messages from a partner, and a treatment group, which received identity disconfirming messages from a partner. The results of the pilot study were used to ensure that the treatment was sufficient to produce an increase in salivary cortisol and to test if the control group should be retained for the main study.

Method

Participants

The pilot sample consisted of 71 participants (28 males, 43 females). Of the 31 participants in the control group, 11 were male and 20 were female. Of the 40 participants in the treatment group, 17 were male and 23 were female. Participants ranged in age from 18 to 24 years old ($M = 20.01$, $SD = 1.12$). The majority of participants identified as Caucasian ($n = 66$), 1 was African American, 1 was Native American, 1 was Asian, 1 was Hispanic, and 1 reported ‘other.’ The majority of the participants were sophomores ($n = 26$) or juniors ($n = 24$), with 8 freshmen and 13 seniors.

All participants reported being in a geographically close dating relationship with the person they brought to the lab. The length of relationship involvement ranged from 1 month to 6.39 years ($M = 1.50$ years, $SD = 1.54$ years). Although the majority of participants had been in their dating relationship for more than 1 year, the reported chance of marriage varied among couples. Responses to the question, “at this point in time, what do you feel the chance is of your relationship leading to marriage or a similar
lifelong commitment?" ranged from 30% to 100% ($M = 76.70\%, SD = 23.85\%$), with 45% of the participants reporting a 70% or less chance of marriage and 27.5% reporting a 100% chance of marriage.

*Procedures*

Each participant was asked to bring their dating partner with them to the data collection session. Prior to the collection session, they received an email instructing them not to eat, drink caffeine or alcohol, or use tobacco products one hour prior to arrival at the lab and not to exercise on the day of participation (Kirschbaum & Hellhammer, 1989). Data collection sessions occurred between 2:00 p.m. and 8:00 p.m. to reduce the diurnal variation in cortisol. The participant completed all of the research procedures, including saliva collections and questionnaires. The partner served a confederate role and engaged the participant in a conversation. The following paragraphs describe the procedures that the participant and the partner engaged in.

*Participant pre-interaction procedures.* Upon arriving at the research lab, participants and their partner were separated for pre-interaction procedures. Participants were administered consent forms and were asked to complete a screening questionnaire indicating whether they had complied with the instructions to abstain from alcohol, caffeine, food, tobacco, and exercise prior to their appointment (see Appendix A). The questionnaire also asked participants about the use of prescription medication or hormonal contraceptives, the past diagnosis of depression or anxiety, and recent sleeping habits. The responses on the questionnaire were used when analyzing the salivary cortisol samples.
After the research assistant checked the screening form for compliance, the participant provided the first of three saliva samples. Cortisol can be measured from blood, urine, and/or saliva (Baum & Grunberg, 1995), with strong consistency between these types of measurements (Kirschbaum & Hellhammer, 1989); saliva samples were used because they are the least invasive. Saliva samples were collected using cryovials (Sarstedt), which are small plastic tubes with a screw-on top. Participants were instructed to pretend to chew to stimulate saliva production. When saliva pooled in the mouth, participants spit it into the tube. The first sample was used as a baseline measure of stress, which can establish increased adrenal activity on the day of data collection (Kirschbaum & Hellhammer, 1989).

Next, the participants completed a short demographic questionnaire (see Appendix B). The final question on the form asked participants to provide three traits or values that are important to who they are. Specifically, the question stated,

Many people have personal characteristics that are especially important to them. Although you probably have a lot of traits, beliefs, or attitudes that you could describe, we would like you to think about traits and values that you feel are central to who you are. These could be parts of your identity, personality traits, abilities, or values and beliefs.

The participant was asked to write one trait/value on three separate note cards.

The participants were then hooked up to a heart rate monitor (3992/3-IBI BioLog & DPS). Specifically, participants were shown a gender specific picture of where the heart rate sensors should be placed, while the researcher explained the process. The researcher then showed the participant on herself where the sensors should be placed, and
the participant was asked to follow along on him or herself. The participant then placed three sensors on their torso, while the researcher checked to ensure correct placement. Heart rate data were not reported in this dissertation.

Finally, the participant completed a questionnaire that included information about relational uncertainty, interdependence, and other relationship characteristics (see Appendix C); these data contributed to a different project.

*Partner pre-interaction procedures.* While the participant completed preliminary questionnaires, a second research assistant took the partner into another room to complete pre-interaction procedures. After providing informed consent, the partner was asked to complete the questionnaire collecting demographic information, as well as scales on relational uncertainty, interdependence, and other relationship characteristics for another project (see Appendix C).

Prior to the data collection session, participants were randomly assigned to either the treatment or the control condition. The control condition included two 5-minute conversations about the traits/values provided by the participant in which the partner was supportive. Consequently, the research assistant trained partners in the control condition to be supportive in both conversations by agreeing that the participant has the trait, discussing times when they showed the trait, expressing that it is an important trait, and generally agreeing with what the participant says. In the treatment condition, the partner was trained to be supportive during the first 5-minutes, but unsupportive or hurtful in the second 5-minutes. Specifically, the partners were trained to disagree that the participant has the trait, discuss times they did not show the trait, say that the trait isn’t important,
and generally disagree with the partner. For both conversations, partners were provided with prompt cards that reminded them of the training directions.

The partner was given the note cards with the traits/values that the participant selected written on them. The partner was asked to choose one trait to be supportive about, and another to be unsupportive; the third trait/value was discarded. Once the training was completed, the dyad was reunited for the conversations.

*Interaction*. Before beginning the two 5-minute conversations, the researcher explained that the pair would be discussing two of the traits that the participant provided earlier. The partner was instructed to begin by telling the participant which trait/value should be discussed first. The participant was instructed to discuss why the trait is important to him or her, what it means to him or her, and how it affects his or her actions. The dyad was told that a timer, set for 5 minutes, was their signal to switch to the second topic and that the researcher would not enter the room between conversations. Once the second 5-minute conversation was completed, the researcher entered the room and separated the dyad.

*Post-interaction procedures*. After the conversation, participants were told to rest for 10 minutes. They were asked to not lie down, fall asleep, or engage in any other activities, but to sit and relax (as suggested by Dr. Sheila West, Professor in Biobehavioral Health at the Pennsylvania State University). This procedure ensured a more valid and reliable measure of recovery after the interaction and minimized the effect that extraneous variables could have on later cortisol samples. After the ten-minute relaxation period, the heart rate monitor was removed and the participant was given a final questionnaire, which asked questions about the interaction.
Twenty minutes after the interaction, the participant was asked to provide the second salivary cortisol sample. The final sample was collected thirty minutes after the interaction. According to Powers, Pietromonaco, Gunlicks, and Sayer (2006), cortisol takes between 15 and 20 minutes to enter the saliva after being secreted by the adrenal gland. Other scholars have observed an increase in salivary cortisol 20 to 30 minutes after the onset of mild experimental stress (Fibiger, Evans, & Singer, 1986; Kirschbaum, Hellhammer, & Strasburger, 1989). Thus, the timing of the samples was chosen to measure the peak of salivary cortisol concentrations.

During the time the dyad was separated, partners were asked to complete a post-interaction questionnaire, which asked questions about their own feelings about the interaction, as well as how they perceived that their partner felt during the conversation (see Appendix D).

After the participant provided the final saliva sample, the dyad was reunited a final time for debriefing. The researcher explained the training provided to the partner and told the participant that the partner was asked to say things that may not reflect their true feelings. The researcher discussed the procedures with the participant until they stated that they were not upset. In addition, each participant was provided with information for counseling services on campus before leaving.

Sample Analysis

Immediately after collection, the saliva samples were refrigerated. Upon completion of the study the samples were centrifuged at 3000 rpm and frozen at –20 degrees Celsius for approximately two months. Research indicates that these procedures
do not detectably influence cortisol levels in the samples (Kirschbaum & Hellhammer, 1989).

Commercially available enzyme-linked immunoabsorbant assay (EIA) kits (Salimetrics) were used to determine the cortisol levels in the saliva. Just before analyzing samples, the saliva was thawed and centrifuged a second time to prepare the samples for analysis. In the EIA procedure using Salimetrics kits, 96-well plates are coated with antibodies to cortisol. Known amounts of human cortisol (as provided in the kit) called standards are added to the wells. During incubation, the unknown amount of cortisol from the saliva samples competes with the known amount for antibody binding sites. After incubation the unbound components are washed away and the remaining substance is cortisol that bound to the antibody. If large amounts of sample cortisol are present they will have bound to the antibody and very little standard cortisol will have bound. If little sample cortisol is present, more standard cortisol will have bound. Finally, a substrate is added that reacts with the enzyme-linked cortisol. The presence of cortisol creates color in the wells. A plate reader analyzes the optical density of the liquid to determine the presence of cortisol.

To minimize variability, all samples were assayed in duplicate and any samples with a coefficient of variation greater than 10% were rerun. The samples were also balanced across plates so that some control and some treatment samples were run on each plate. Intra-assay coefficients of variation ranged from 0.21 to 8.94, with an average of 2.45, indicating high internal reliability. Inter-assay coefficients of variation for the kits also show high reliability ($M = 3.75$).
Measures

**Stress.** The dependent variable used to test the hypotheses was salivary cortisol. Change scores that reflect the difference between the baseline measure and the post interaction measures were created. Change scores are commonly used in psychophysiological research because they provide greater ease in interpretation and because the results tend to be statistically equivalent to residual scores (raw scores corrected for baseline levels) (Diamond, Hicks, & Otter-Henderson, 2006; Llabre et al., 1991). In the pilot data, change scores were used to establish if the cortisol levels differed significantly from the baseline to the post-interaction measures.

*Perceptions of interaction.* Per hypotheses 7, 9, and 10, participants were presented with a stem that read, “During the conversation, my partner made me feel…” A list of 30 feelings, including the terms such as liked, confused, surprised, interested, dominated, attractive, and withdrawn followed. Participants rated how well the term described their feelings using a 5-point Likert-type item (1 = strongly disagree, 5 = strongly agree); (means and standard deviations for scale items used in the analyses are provided in Table 4-2).

**Hurt.** To measure the self-reported intensity of hurt, participants rated how hurtful the interaction was (1 = not at all hurtful, 7 = extremely hurtful), how much emotional pain it caused (1 = no emotional pain, 7 = intense emotional pain), and how hurt they felt overall (1 = not at all hurt, 7 = extremely hurt). Participants also rated the extent to which they agreed with the 5-point Likert-type item, “During this conversation, my partner made me feel hurt” (1 = strongly disagree, 5 = strongly agree). The 7-point items were
converted to their corresponding number on a 5-point scale, and the responses to the four items were averaged to create a single measure of hurt ($M = 2.37$, $SD = 1.12$, $\alpha = .93$).

Cortisol screening questions. A series of yes or no questions were asked prior to the collection of the baseline saliva sample to screen for behaviors that would artificially impact cortisol levels. The first four questions assessed behaviors the participant engaged in one hour prior to the session, including eating, drinking alcohol or caffeinated beverages, and smoking cigarettes. One question asked if the participant had exercised during the day of the appointment. Finally, four questions asked about the use of prescription medication or oral contraceptives and diagnoses of depression or anxiety.

Results

Preliminary Analyses

The pilot sample consisted of 71 participants (control $n = 31$, treatment $n = 40$), who provided three saliva samples (1 baseline and 2 after the interaction). A variety of preliminary analyses were conducted to evaluate cortisol levels as the dependent variable. First, the distribution of the cortisol measures was assessed for normality and skew. Baseline cortisol values ranged from $0.02 \mu g/mL$ (micrograms/milliliter) to $0.71 \mu g/mL$ ($M = 0.17$, $SD = 0.14$). Cortisol levels were considered an outlier if they were greater than 3 standard deviations from the mean, which is a value of $0.59 \mu g/mL$. One participant’s baseline cortisol was almost 4 standard deviations from the mean (0.71); therefore, I excluded that participant’s data from the analyses.

Next, I examined the participants’ behavior one hour before the research session. In this sample, 6 participants reported eating a meal, 2 reported drinking caffeine, 12 reported taking prescription medication, 9 reported being diagnosed with depression, and
5 reported being diagnosed with an anxiety disorder. *T*-tests comparing cortisol levels for individuals who engaged in these activities and those who did not indicated these variables significantly impacted cortisol (see Table 4-1). Consequently, the participants were excluded from analyses. None of the participants smoked cigarettes, engaged in physical activity, or drank alcohol before attending the research session. Although 24 participants reported using birth control, it did not show significant effects on the cortisol samples; therefore, those participants were retained in substantive analyses. The final sample used for substantive analyses was comprised of 48 participants because some individuals said ‘yes’ to multiple screening questions (control *n* = 18 (9 females, 9 males), treatment *n* = 30 (18 females, 12 males). A *t*-test confirmed that the control and treatment condition participants did not differ significantly in their baseline cortisol data, *t* (46) = -0.39, ns (control *M* = .17, *SD* = .14; treatment *M* = .18, *SD* = .13). There were also no significant sex differences in baseline cortisol levels, *t* (46) = 0.66, ns (females *M* = .17, *SD* = .14; males *M* = .19, *SD* = .13).

**Substantive Analyses**

The first goal of the pilot study was to assess the effectiveness of the hurt manipulation. Two different indicators were used to evaluate the extent to which hurt was manipulated effectively. First, the degree of hurt self-reported by participants in the treatment was compared to that of participants in the control group. As expected, participants in the control condition, in which the partner only provided supportive messages, reported significantly less hurt (*M* = 1.46, *SD* = 0.64), than participants in the intervention condition (*M* = 3.00, *SD* = 1.58) suggesting that partners were able to express hurtful messages, *t* (46) = 2.89, *p* < .01. Second, the impact of the experimental
manipulation on self-reported levels of other feelings and perceptions were examined (see Table 4-2). Specifically, participants in the treatment group reported more distancing, withdrawal, surprise, and confusion, and felt less liked, happy, and interested in the conversation, than the control group. Taken together, the results suggest that partners were able to convey disconfirming or hurtful messages during the interaction and that participants in the treatment group experienced the hurtful conversations as negative and hurtful.

The second goal of the pilot was to examine if the experimental treatment was associated with an increase in cortisol. Thus, I examined the impact of condition (control vs. treatment) on cortisol levels. To do so, I computed three change scores (cc1 = cortisol sample 2 – sample 1; cc2 = sample 3 – sample 2; and cc3 = sample 3 – sample 1). In subsequent analyses the change scores were used to understand the impact of condition on cortisol. T-test results showed that the experimental manipulation did not have a direct effect on cortisol levels or the change in cortisol (see Table 4-2).

To further probe the factors that influenced cortisol change, I examined the bivariate correlations among perceptions of the conversation and cortisol change. The correlations showed that the self-reported emotions and perceptions varied in their implications for cortisol change. Moreover, the effects of the experimental manipulation on self-reported reactions coupled with the correlations among those variables suggested statistical suppression. In particular, participants in the treatment condition reported more feelings of hurt and they perceived their partners as more distant; these variables shared a strong positive correlation ($r = .64, p < .01$), but they diverged in their associations with change in cortisol (hurt and cc1 $r = .19$, ns; hurt and cc3 $r = .21$, ns; distancing and cc1 $r$
This suggests that there may be two ways individuals can be hurtful: through hurtful messages and by being distant. Hurtful messages appear to increase stress hormones, possibly because it is more threatening to the individual. Being distant, although hurtful, is not associated with increased stress hormones, possibly because it is less threatening. When controlling for the effect of distancing, there is a positive correlation between hurt and cortisol change (cc1 $r = .31, p < .05$; cc3 $r = .35, p < .05$); therefore, I included distancing as a covariate in subsequent analyses.

I conducted a regression analysis to examine the impact of experimental condition, hurt, and perceptions of distancing on cortisol change from baseline to the final cortisol sample. The results showed that the measures accounted for a significant portion of the variance in cortisol change, $F(3, 42) = 4.04, R^2 = .47, p < .05$. Hurt was positively associated with cortisol change, $\beta = .61, p < .05$, and distancing was negatively associated with cortisol change, $\beta = -.37, p < .05$. Thus, I concluded that the experimental manipulation had the intended effect of increasing feelings of hurt, as well as other perceptions and emotions, relative to a control group, and these changes significantly predicted the change in cortisol.

The third goal of the pilot study was to decide whether the control group was necessary in the larger study. To assess whether the changes in cortisol were observable within the experimental condition, I regressed the change in cortisol onto feeling hurt and distancing using the sample of participants in the experimental condition. Despite the reduced sample size and corresponding loss of statistical power, these two variables did account for a significant portion of the variance in cortisol change from baseline to the
final sample in the experimental condition, $F(3, 28) = 4.67, R^2 = .26, p < .05$. The effect was driven by a positive association between cortisol change and hurt, $\beta = .67, p < .05$, and a negative association between cortisol change and distancing, $\beta = -.44, p < .01$. The same regression model did not explain a significant proportion of variance in cortisol change within the control group, $F(2, 16) = 0.38, R^2 = .05$, ns. Based on these results, I decided that the variation within the experimental group was sufficient to reveal significant associations between subjective reactions to messages and cortisol changes. Thus, I concluded that the control group could be eliminated in the research design used to test of the hypothesized associations among message features, message perceptions, and stress reactions to hurtful messages from a dating partner.

Study 1 Method

Based on the results of the pilot study, Study 1 includes only the treatment group in which the partners are trained to be supportive during the first 5-minute conversation and disconfirming during the second 5-minute conversation. This section describes the methods employed in the study.

Participants

Participants were recruited from a research pool that accompanied an introductory public speaking course at a large eastern university. Early in the semester, students were asked to complete a preliminary screening questionnaire that asked them if they were currently in a dating relationship and, if so, whether their partner was geographically close and able to come to the research lab with them. The sample for the study was generated from the pool of students who responded affirmatively to the screening questions. Participants earned 2% credit in the course for the completion of the study or
an alternative assignment. The students’ partners attended the research session as
volunteers, and they were not compensated for their participation. Both individuals
provided informed consent, and the partners could refuse to participate in research
procedures without penalty to the student. Because the partners were not compensated for
participation, they engaged in limited procedures, whereas the participants completed all
of the research procedures, including questionnaires and saliva samples.

The initial sample for the study included 152 participants (73 males, 79 females).
Of these, 140 identified as Caucasian, 2 were African American, 1 was Native American,
2 were Asian, 4 were Hispanic, 1 reported ‘other,’ and 2 did not respond to the question.
Participants ranged in age from 18 to 24, (M = 20.00, SD = 1.83). The majority of the
participants were sophomores (n = 51) or juniors (n = 67), with 7 freshmen and 26
seniors. The length of involvement in the dating relationship ranged from 1 month to 8
years (M = 1.75 years, SD = 1.46 years). Because the focus of the dissertation is on
hurtful interactions between dating partners, 2 dyads that reported being married were
excluded from further analyses. As discussed subsequently, participants were screened
for behaviors that would artificially impact cortisol levels, which resulted in a final
sample size of 91.

**Procedures**

The procedures were consistent with the pilot study method, with one exception.
All participants engaged in the identity disconfirming interaction and there was no
control group. Thus, all partners were trained to be supportive in the first 5-minute
conversation, and unsupportive or hurtful in the second 5-minute conversation. The
stressful stimuli (the hurtful message) occurred in the second conversation for all
participants to ensure that the timing of the cortisol measures remained constant for all participants. Saliva samples were all sampled at the same time intervals as in the pilot study.

The measures that were employed in the pilot study were collected in Study 1, including perceptions of hurt, perceptions of the interaction, and cortisol screening questions. To test hypotheses 1, 3, 5, 7, and 9, additional measures, described subsequently, were included in Study 1. All measures were evaluated for unidimensionality using confirmatory factor analyses (CFA; Hunter & Gerbing, 1982). All of the self-report measures used in the substantive analyses met the following criteria for goodness of fit: $\chi^2/df$ less than 3.00, CFI greater than .90, and RMSEA less than .10 (Browne & Cudeck, 1993; Kline, 1998).

**Self-report Measures**

*Rubin’s love scale.* Rubin’s love scale (1970) was used to assess the degree of love and commitment participants experienced in their relationship. Participants were asked to respond to 9 items that measured how true the participant believed the statement to be about their relationship (1 = *not at all true*, 9 = *definitely true*). Items included statements such as, “I would do anything for this person,” “One of my primary concerns is this person’s welfare,” “If I couldn’t be with this person, I would feel miserable,” and “It would be hard for me to get along without this person.” Responses to each question were averaged to create a single composite score for love ($\alpha = .78$, $M = 7.69$, $SD = 1.00$).

*Support effectiveness.* Four 7-point semantic differential scales were used to measure perceptions of support effectiveness. The questions asked participants to rate their partner’s behavior during the conversation on the following scales; appropriate-
inappropriate, effective-ineffective, sensitive-insensitive, and helpful-unhelpful. The responses to each question were averaged to create a composite measure of support effectiveness ($\alpha = .92$, $M = 2.29$, $SD = 1.35$).

Uncertainty. Knobloch and Solomon’s (1999) measure of relational uncertainty was used to assess the participants’ self, partner, and relationship uncertainty. Participants rated how certain they were about their own part in the relationship, their partner’s feelings about the relationship, and the relationship as a whole. Responses were recorded on a 6-point Likert-type scale (1 = completely or almost completely uncertain, 6 = almost or completely certain). The items were recoded so that higher values reflected greater uncertainty. The scores for items within subscales were averaged to form measures of self uncertainty ($M = 1.70$, $SD = 0.83$, $\alpha = .93$), partner uncertainty ($M = 1.50$, $SD = 0.61$, $\alpha = .87$), and relationship uncertainty ($M = 1.73$, $SD = 0.65$, $\alpha = .84$). The measures were used to assess uncertainty as a possible covariate in the models.

Relational messages. To assess the degree to which participants perceived various relational messages during the conversation, participants completed Burgoon and Hale’s (1984) measure of relational messages. Participants were asked to report how much their partner communicated certain messages (1 = strongly disagree, 7 = strongly agree). Subscales assessed the relational messages of involvement ($\alpha = .70$, $M = 5.14$, $SD = 1.12$), composure ($\alpha = .85$, $M = 5.24$, $SD = 1.20$), similarity ($\alpha = .73$, $M = 4.09$, $SD = 1.33$), informality ($\alpha = .87$, $M = 4.09$, $SD = 1.30$), sincerity ($\alpha = .87$, $M = 5.15$, $SD = 1.34$), dominance ($\alpha = .82$, $M = 3.28$, $SD = 1.41$) and affiliation ($\alpha = .77$, $M = 4.74$, $SD = 1.32$).

Perceptions of message features. A series of questions were created to assess the participants’ perception of their partner’s messages during the interaction. Participants
were asked to respond to 3 items that measured how explicit they believed their partner’s supportive messages were (1 = *strongly disagree*, 7 = *strongly agree*). Items included, “During the conversation, my partner made explicitly supportive comments,” “was clear about his or her opinion,” and “made directly supportive comments” \((M = 5.03, SD = 1.72, \alpha = .89)\). Three additional items were used to assess the perceived argument strength: “During the conversation, my partner gave reasons why I shouldn’t feel bad,” “elaborated on his or her feelings or opinions,” and “gave examples that supported his or her opinion” \((M = 4.42, SD = 1.82, \alpha = .86)\).

*Perception of performance.* After completing the tasks, participants were asked to report their perceptions of the tasks. Specifically, participants rated the degree of agreement with four 5-point Likert-type statements, which began with the phrase, “My performance on the tasks…” The items included, “Was not under my control,” “could have been better,” “was based on my skills,” and “was the result of forces I could not control” \((1 = *strongly disagree*, 5 = *strongly agree*)\). The first and fourth statements were recoded so that higher numbers reflected greater control over one’s performance. The scores for each item were averaged to create a composite measure of perception of performance \((M = 4.18, SD = 1.22, \alpha = .73)\).

*Typicality and realism.* Finally, participants indicated how typical the conversation was as compared to other conversations they have had with the same person (e.g., “This conversation was similar to others I’ve had with this person”). Participants rated their level of agreement with the four items \((1 = *strongly disagree*, 7 = *strongly agree*)\), which were averaged to form a measure of *typicality* \((M = 4.06, SD = 1.48, \alpha = .80)\). In addition, participants responded to a final item rating the extent to which they believed their conversation was *realistic* \((M = 4.35, SD = 1.95)\).
Rated Message Feature Measures

To operationalize the messages features and perceptions of the interaction, trained judges rated the communication of the partner during the second 5-minute conversation (see Appendix F). The partner was the focus of the rating because the goal of the dissertation is to examine how messages from dating partners can vary in ways that impact the other person’s stress response. For each message feature, a team of raters made global assessments of the degree of the message feature conveyed by the partner in the interaction. This procedure was used for a number of reasons. First, global ratings of the conversation were used rather than behavioral coding because the predictions made focused on overall features of the conversations rather than specific behaviors or words that occurred. Second, the message features are features that individuals process on a regular basis in everyday life; therefore, raters can provide insight on the message features without unitizing or behavioral coding (see Dillard, Wilson, Tusing, & Kinney, 1997). Single-item indicators were used because the message features are a unidimensional concept. Using a single-item that reflects exactly the construct of interest increases the face validity of the message, whereas using multiple indicators of the same concept can add noise to the data because of small differences the raters might perceive in synonyms. Finally, multiple raters were used to provide an observation of the message features as a generalized construct, rather than the perception of a single individual (e.g. Knobloch, Miller, Bond, & Mannone, 2007; Knobloch, Solomon, & Theiss, 2006).

Preparation for the rating tasks included four steps. First, videotape copies of the second 5-minutes of the interaction (the disconfirming part of the interaction) were created. Next, the ratings were divided into two sets; one set of ratings included support,
partner involvement, and explicitness and the other set included hurt, argument strength, dominance, and affiliation. Third, raters were divided into two teams so that each team made one set of judgments. A team of 4 judges rated the first set of codes; a team of 5 judges rated the second set of codes.

Teams of judges participated in training sessions together, but they worked independently to rate the interactions. At the beginning of the training, I met with the raters to discuss the content of each code and practice rating sample interactions. Judges were then given a small number of cases to rate on their own. When adequate reliability was achieved, raters completed approximately 25 cases per week. Throughout the semester, the teams of judges met weekly to re-watch interactions with low agreement on ratings, discuss the ratings together, and assess reliability. Disagreement between judges was resolved through discussion. Reliability was assessed after 10% of the cases were rated and decision rules were adjusted according to group discussion. Judges continued rating and meeting to assess reliability until they completed the entire sample. All raters were blind to the hypotheses.

For each rating, the judges were asked to assess the degree to which each message feature was present throughout the 5-minute interaction.

*Explicitness.* As stated in Chapter 3, explicitness is “the extent to which the goals of the source is revealed in the message itself” (Dillard & Kinney, 1994, p. 503). Coders were given directions that read:

Explicitness is the extent to which the goal of the source is revealed in the message itself. An example of a message with low explicitness would be a hint, whereas a message high in explicitness might be a direct request. The difference
is in how directly the speaker says what they are thinking. The more directly the speaker states a message, the more explicit it is. Explicitness is only conveyed through words.

After reading the description of explicitness, coders were asked to, “rate the degree of explicitness in the partner’s message” (1 = not at all explicit, 5 = extremely explicit) using a 5-point Likert scale. Coder’s ratings of the interactions were averaged to produce a single score for each interaction ($M = 3.64$, $SD = 1.05$, range 1 – 5, $\alpha = .88$).

*Argument strength.* As defined in Chapter 3, argument strength encompasses the degree of elaboration or embellishment included in a message. Messages high in argument strength include additional comments, justifications, and explanations (Roloff, Janiszewski, McGrath, Burns & Manrai, 1988). Accordingly, coders were instructed to think about both the amount and the strength of the arguments in the second 5-minute conversation. More specifically, coders were given the following directions:

The argument can be thought of as the position a person is taking during the interaction.

Argumentative communication includes elaborating on one’s position, acknowledging the adversary’s position, providing support evidence, and constructively asserting views. People who use high strength arguments will provide a variety of reasons for the way they feel, rather than repeating one idea, thought, or feeling over and over.

The ratings are based on how well articulated the speaker’s position or opinion is, how elaborately the position is discussed, and the variety of examples and
supporting materials used. Argument strength is increased by the prominence or prevalence of evidence over the course of an interaction.

Based on the information provided, coders rated the degree of argument strength in the partner’s message using a 5-point Likert scale (1 = no argument present, 5 = extremely strong argument). Coder’s ratings of the interactions were averaged to produce a single score for each interaction ($M = 2.67, SD = 0.63$, range $1 – 4.40$, $\alpha = .87$).

**Involvement.** Involvement reflects the degree to which individuals are engaged with each other or enmeshed in the conversation (Coker & Burgoon, 1987). Other scholars have conceptualized involvement as the degree of closeness interactional partner’s experience (Dillard, Palmer, & Kinney, 1995). Consistent with past research, coders were given a description that read:

Involvement is a feature that is conveyed nonverbally and ranges from withdrawn to engaged. Signs of involvement could include body orientation toward the participant, body leaned into the other or close positioning on the couch, eye contact, or head nodding. Involvement shows interest in what the other person is saying. If the partner is highly involved, you will sense that he/she is tracking what the other person is saying, responding appropriately for what has just been said, and asking probing questions for more information.

Based on the cues provided, coders rated the degree of involvement in the partner’s message using a 5-point Likert scale (1 = completely withdrawn, 5 = extremely involved). Coder’s ratings of the interactions were averaged to produce a single score for each interaction ($M = 3.92, SD = 0.61$, range $2 – 5$, $\alpha = .89$).
Dominance. As stated in Chapter 3, dominance can be defined as the degree to which one actor attempts to regulate the behavior of another. Based on this definition, coders were provided with the following description:

Dominant messages express feelings of control. When one person dominates another, that person has control or power over the other. Messages exhibit dominance to the extent that the speaker reveals the belief that she or he is higher or lower in power than the receiver. Dominance can be conveyed through nonverbal and verbal messages. Nonverbal indicators of dominance may include relaxed facial expression, more direct eye contact, and greater amount of time talking. Vocal cues for dominance may include faster rate of speech, lower pitch in voice, and speaking more loudly. Finally, dominance may also be associated with increased number of conversational interruptions, greater facial expressiveness, and statements that attempt to alter the behavior or beliefs of another.

Based on the cues described above, the coders were asked to rate the amount of dominance the partner displayed during the conversation on a 5-point Likert scale (1 = not at all dominant, 5 = extremely dominant). Coder’s ratings of the interactions were averaged to produce a single score for each interaction ($M = 2.48$, $SD = 0.74$, range $1 – 4.40$, $\alpha = .91$).

Affiliation. Affiliation includes feelings of affection and the degree of love or hate in the relationship. Because the interactions occurred between dating partners, coders were instructed to watch for specific cues that show liking, intimacy, or inclusion. Coders were also asked to code strictly based on the observable behaviors in the interaction and
not to assume affiliation because they are in a dating relationship. More specifically, coders were given directions that stated:

Affiliation can be communicated both verbally and nonverbally. It can be conveyed through signs of similarity, positive affect, receptivity, equality, and informality. It could also be expressed nonverbally through physical proximity, smiling, positive touch, and verbally through expressions liking or dislike. Minor cues for affiliation may include sitting close together or smiling at the other person. Moderate or strong cues for affiliation may include physical touch or statements of liking or love. The ratings should be given based on the number of cues and the intensity of them.

Based on the description and cues provided, the coders rated the degree of affiliation conveyed by the partner on a 5-point Likert scale (1 = not at all affiliative, 5 = extremely affiliative). Coder’s ratings of the interactions were averaged to produce a single score for each interaction ($M = 1.88$, $SD = 0.80$, range 1 – 5, $\alpha = .95$).

Message hurtfulness. As defined in Chapter 2, hurt is a feeling that results from being emotionally injured in a social interaction. Although study participants reported how hurtful the interaction was, I wanted to also examine the degree of hurtfulness of the partner’s message that is perceived by third party observers. Coders were asked to focus solely on features of the message and rate the degree of hurtfulness in the partner’s message on a 5-point Likert scale (1 = not at all hurtful, 5 = extremely hurtful). More specifically, coders were told that hurtful statements could include use of negative voice or mimicry of the other person, stating that the participant does not have an important trait, stating that a trait is not important, disagreeing with the participant’s comments,
name calling, negative statements of ‘should’ (i.e. you should do this…), and statements the convey certainty (i.e. you are not ___ or you always __). Coder’s ratings of the interactions were averaged to produce a single score for each interaction (\(M = 3.00, SD = 0.88, \) range 1 – 5, \(\alpha = .93\)).

**Stress Reactivity**

The physiological manifestation of hurt was operationalized as change in salivary cortisol. Two measures of cortisol change and reactivity were calculated, area under the curve with respect to increase (AUCI), and area under the curve with respect to ground (AUCG) (Pruessner, Kirschbaum, Meinlschmid, & Hellhammer, 2003). Area under the curve is used to analyze change over time. AUCI assesses overall intensity of change over time and can be used as a measure of sensitivity. AUCG measures whether changes occurred over time is reflected in total hormonal output; therefore, it indexes stability in cortisol change. These two estimates of area under the curve are computed as follows:

\[
AUC_{GI} = \frac{\sum_{i=1}^{n-1} \left( \frac{\text{S} \cdot \text{E}_i + \text{S} \cdot \text{E}_i}{2} \right) \cdot f_i}{2} \\
AUC_{G} = \left( \sum_{i=1}^{n-1} \left( \frac{\text{S} \cdot \text{E}_i + \text{S} \cdot \text{E}_i}{2} \right) \right) = (n - 1) \cdot \text{RE}_i
\]

Because the two computations reveal different information about cortisol change over time, each area under the curve measure was assessed as the dependent variable in separate analyses.
Table 4-1:  
*Descriptive Statistics for Sources of Error in Baseline Salivary Cortisol Measures*

<table>
<thead>
<tr>
<th></th>
<th>Reported ‘yes’</th>
<th>Reported ‘no’</th>
<th>$t$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eating a meal</td>
<td>.12 (.04)</td>
<td>.16 (.12)</td>
<td>0.70</td>
</tr>
<tr>
<td>Drinking Caffeine</td>
<td>.05 (.02)</td>
<td>.16 (.12)</td>
<td>5.19**</td>
</tr>
<tr>
<td>Prescription Medication</td>
<td>.13 (.07)</td>
<td>.16 (.13)</td>
<td>0.91</td>
</tr>
<tr>
<td>Depression</td>
<td>.10 (.04)</td>
<td>.18 (.13)</td>
<td>2.89**</td>
</tr>
<tr>
<td>Anxiety</td>
<td>.11 (.04)</td>
<td>.16 (.12)</td>
<td>2.18*</td>
</tr>
</tbody>
</table>

*Note.* Cell entries for ‘yes’ and ‘no’ are means; parenthetical values are standard deviations. Screening behaviors that participants did not engage in are not reported in the table.

* $p < .05$. ** $p < .001$. 
Table 4-2: *Descriptive Statistics for Conditions, Self-Report Data, and Cortisol Measures*

<table>
<thead>
<tr>
<th></th>
<th>Treatment</th>
<th>Control</th>
<th>( t )</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Self-Report Data:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hurt</td>
<td>3.00 (1.58)</td>
<td>1.46 (0.64)</td>
<td>-4.83**</td>
</tr>
<tr>
<td>Distancing</td>
<td>3.58 (1.91)</td>
<td>2.21 (1.32)</td>
<td>-3.00**</td>
</tr>
<tr>
<td>Interest</td>
<td>3.13 (1.18)</td>
<td>3.84 (0.90)</td>
<td>2.27*</td>
</tr>
<tr>
<td>Liked</td>
<td>2.84 (1.07)</td>
<td>4.11 (0.74)</td>
<td>4.54**</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>2.00 (1.03)</td>
<td>1.32 (0.58)</td>
<td>-2.99**</td>
</tr>
<tr>
<td>Surprised</td>
<td>3.48 (1.26)</td>
<td>2.16 (1.21)</td>
<td>-3.66**</td>
</tr>
<tr>
<td>Confused</td>
<td>2.94 (1.37)</td>
<td>1.53 (0.77)</td>
<td>-4.66**</td>
</tr>
<tr>
<td>Happy</td>
<td>2.32 (1.16)</td>
<td>4.00 (0.75)</td>
<td>6.21**</td>
</tr>
<tr>
<td><strong>Cortisol Data:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cortisol 1</td>
<td>.18 (.13)</td>
<td>.16 (.14)</td>
<td>-0.43</td>
</tr>
<tr>
<td>Cortisol 2</td>
<td>.14 (.09)</td>
<td>.16 (.12)</td>
<td>0.57</td>
</tr>
<tr>
<td>Cortisol 3</td>
<td>.13 (.08)</td>
<td>.16 (.12)</td>
<td>0.87</td>
</tr>
<tr>
<td>CC1</td>
<td>-.03 (.13)</td>
<td>.00 (.09)</td>
<td>0.98</td>
</tr>
<tr>
<td>CC2</td>
<td>-.01 (.04)</td>
<td>.00 (.03)</td>
<td>0.68</td>
</tr>
<tr>
<td>CC3</td>
<td>-.04 (.15)</td>
<td>.00 (.09)</td>
<td>1.13</td>
</tr>
</tbody>
</table>

*Note.* Cell entries for descriptive statistics are means, parenthetical values are SDs. CC entries represent cortisol change scores. For all entries treatment \( n = 29 \), control \( n = 17 \).

* \( p < .05 \), ** \( p < .01 \).
CHAPTER FIVE

The methods described in Chapter 4 provided the data to test five of the hypotheses advanced in Chapter 3. In particular, I argued that in the context of identity disconfirming interactions, explicitness (H1), argument strength (H3), and involvement (H5) are positively associated with stress, and perceptions of hurt (H7), and dominance (H9) during an interaction are associated with an increase in stress. After describing a series of preliminary analyses, this chapter reports the tests of those five hypotheses.

Results

An alpha level of .05 was used for all statistical tests. As discussed subsequently, the final sample included 91 participants; therefore, the power to detect a small effect ($r = .10$; Cohen, Cohen, West, & Aiken, 2003) was approximately .25 and the power to detect a medium effect ($r = .30$) was approximately .92 (GPOWER; Erdfelder, Faul, & Buchner, 1996).

Preliminary Analyses

Four sets of preliminary analyses were conducted. The first analysis evaluated the extent to which hurt was manipulated effectively. A second set of preliminary analyses was conducted to assess possible sources of error within the cortisol measures. Finally, the validity of the coded variables was examined.

Manipulation Checks

Although the effectiveness of the hurt manipulation was established in the pilot study, additional manipulation checks were conducted in the main study to ensure that participants in the main study perceived the conversation as hurtful. First, I compared the
degree of hurt self-reported by participants in the main study and pilot control group. As expected, participants in the pilot control group, in which the partner only provided supportive messages, reported significantly less hurt ($M = 1.46$, $SD = 0.64$) than participants in the main study ($M = 3.23$, $SD = 1.48$), suggesting that partners were able to express hurtful messages, $t(178) = -4.83$, $p < .01$. The means suggest that the disconfirming conversations were more hurtful than the control conversations, but they were not highly hurtful. Second, I examined the number of individuals in the main study who identified the second conversation as more hurtful. Of the 150 participants who were assigned to the hurtful conversation, only 5 participants rated the first conversation as more hurtful and 5 did not indicate which conversation was the more hurtful. Because the cortisol measurements must all be taken within the same amount of time from the stressor, individuals who rated the first conversation as more hurtful ($n = 10$) were dropped from the final analyses.

To further assess the effectiveness of the hurt manipulation, I examined participant’s ratings of the two conversations to assess if the second conversation was perceived as significantly more hurtful than the first. After the conversation, participants were asked to complete four 7-point semantic differential questions about each of the conversations. The questions asked participants to rate the first conversation on the following scales; negative-positive, hurtful-supportive, satisfying-dissatisfying, and frustrating-calming. The questions were repeated for the second conversation. The satisfying-dissatisfying question was recoded so that higher numbers reflected more positive characteristics. Paired t-tests showed that the second conversation was perceived as more negative (convo1 $M = 6.42$, $SD = 0.94$; convo2 $M = 3.46$, $SD = 1.73$; $t(90) =$
15.35, \( p < .001 \), more hurtful (conv1 \( M = 6.48, \ SD = 0.84 \); convo2 \( M = 3.32, \ SD = 1.29 \); \( t(90) = 19.38, \ p < .001 \), more dissatisfying (conv1 \( M = 6.09, \ SD = 1.18 \); convo2 \( M = 3.41, \ SD = 1.54 \); \( t(90) = 13.20, \ p < .001 \), and more frustrating (conv1 \( M = 5.95, \ SD = 1.11 \); convo2 \( M = 2.91, \ SD = 1.32 \); \( t(90) = 16.50, \ p < .001 \). Although the hurtful interactions were not highly hurtful, they were significantly more hurtful than the control conversations. Furthermore, participants rated the second conversation as significantly more negative and hurtful than the first conversation. Because ethical constraints limit the degree of hurt that can be produced by experimental procedures, I concluded that the manipulation of hurt was sufficient for the purposes of the study.

Finally, to further assess the effectiveness of the hurt manipulation, I performed one-sample \( t \)-tests to determine if the participants perceived the interaction to be realistic. Two items were used as indicators of realism. A single-item, “this conversation seemed unrealistic,” was reverse-coded so that higher scores reflected perceptions of greater realism. The mean for the item (\( M = 4.35, \ SD = 1.95 \)) was significantly above the mid-point for the item (= 4), \( t(139) = 2.04, \ p < .05 \). A second item, “this conversation wasn’t typical for my partner and I,” was also reverse-coded so that higher scores reflected greater typicality of the conversation. The mean typicality ratings (\( M = 4.06, \ SD = 1.48 \)) were not significantly above the midpoint for the scale, \( t(139) = 0.46, \ ns \). The results suggest that the conversations were not typical interactions between the partners, but were still realistic.

**Preliminary Analyses of Cortisol**

The salivary cortisol was evaluated for sources of error that would affect the validity of the measures. First, the distribution of the cortisol measures was assessed for
normality and skew. Two participants were extreme outliers (more than 3 standard deviations from the mean; baseline $M = 0.23$, $SD = 0.37$, outlier 1 $M = 2.77$, outlier 2 $M = 1.35$) in baseline cortisol levels; therefore, those participants’ data were excluded from the analyses. The removal of the outliers created a more normal distribution in the measures.

Second, I examined the participants’ behavior one hour before the research session based on the screening question responses (see Table 5-1). In this sample, 3 participants reported eating a meal, 3 reported drinking caffeinated beverages, 35 participants reported taking prescription medication, 39 participants reported taking birth control, 8 individuals reported being diagnosed with depression and 10 reported being diagnosed with anxiety. None of the participants reported smoking cigarettes, engaging in physical activity, or drinking alcohol. T-tests comparing baseline cortisol levels for people who drank caffeinated beverages prior to attending the research session had significantly higher cortisol levels than those who did not, $t(89) = -2.18$, $p < .05$. Participants who reported being diagnosed with depression showed significantly lower baseline cortisol levels than those who were not, $t(89) = 3.10$, $p < .05$. Consequently, those participants were excluded from analyses. Although the t-tests did not show significant differences in baseline cortisol for those who did vs. did not take prescription medication and those who were and were not diagnosed with anxiety, previous research suggests that those factors could impact cortisol reactivity (Kirschbaum & Hellhammer, 1989). Thus, these participants were also excluded from substantive analyses, resulting in a final sample of 91 participants (47 males and 44 females).
Finally, I examined descriptive statistics for the cortisol measures. There were no significant sex differences in cortisol levels for any of the three time points, baseline, the first post-interaction, or the final post-interaction sample. The area under the curve with respect to ground (AUC\(_G\)), which measures the stability of the stress response, was negatively correlated with the love scale (\(r = -0.33, p < 0.01\)). The area under the curve with respect to increase (AUC\(_I\)), which measures the intensity of the stress response, was positively correlated with self-reported hurt (\(r = 0.21, p < 0.05\)). Thus, participants report greater commitment or intimacy in their relationship experience less stress over time, whereas individuals who report being hurt by the interaction experienced a greater spike in physiological stress. The results suggest that engaging in a hurtful interaction with a dating partner increases physiological stress; however, relationship satisfaction can buffer individuals from the stressful effects of a hurtful interaction. Neither AUC\(_G\) nor AUC\(_I\) were significantly correlated with the coded message features.

**Preliminary Analyses of the Rated Message Features**

To assess the validity of the coded variables, the correlations between the observer ratings of the interaction, similar self-report measures, and relationship characteristics were examined. The results substantiated the validity of the codes (see Table 5-2). For example, the observer ratings of partner involvement were positively correlated with self-reported perceptions of partner involvement and observer ratings of dominance were positively correlated with self-reported perceptions of dominance. Self-reported level of hurt experienced during the interaction was positively correlated with the observer ratings of hurt, explicitness, involvement, and dominance. Self-reported love in the relationship was also positively related to observer ratings of hurt. The results
suggest that the observer ratings of the interactions were similar to participants’ perceptions of the conversations and were an effective measure of message features.

Next, the bivariate correlations between the coded message features were evaluated. Within the set of coded variables, the hurt code was positively correlated with explicitness, argument strength, partner involvement, and dominance (see Table 5-3). Further, all of the codes were significantly correlated with one another, with the exception of explicitness and partner involvement.

Substantive Analyses

For each hypothesis, two tests were conducted; one hierarchical linear regression was performed on the AUC_G and one on the AUC_I. To evaluate the unique effect that the message features had on stress changes, I first assessed possible covariates. Because the AUC_G and the AUC_I measure unique characteristics of the stress response, the variables were analyzed separately. The section begins by testing the associations between AUC_G and the message features. Then, the impact of the messages features on AUC_I are discussed.

The bivariate correlations, discussed earlier, showed that the AUC_G variable was significantly and negatively correlated with the love scale, therefore, I evaluated love as a possible covariate. Using multiple regression analysis, I regressed the AUC_G onto love. The love variable ($\beta = -.30, p < .05$) accounted for a significant portion of the variance in the AUC_G, $F(1, 88) = 8.89, R^2 = .09, p < .05$. In the second step, the observer ratings were added, $F(5, 88) = 2.63, R^2_A = .04, p < .05$. Of the observer ratings, only explicitness reached significance ($\beta = -.21, p < .07$). The results suggest that the love variable should be retained as a covariate in substantive analyses involving AUC_G. Next, AUC_G was
regressed onto love and one of the coded message features (explicitness, involvement, argument strength, or dominance). In the second step, the interaction between love and each of the coded variables was added to the model. None of the coded variables predicted AUCG, nor interacted with love to predict AUCG (see Table 5-4).

AUCI was significantly and positively correlated with self-reported hurt; therefore, hurt was evaluated as a possible covariate. In a second multiple regression analysis, I regressed AUCI onto self-reported levels of hurt, \( F(1,88) = 2.90, R^2 = .03, p = .09 \). The association between hurt and AUCI approached significance (\( \beta = .18 \)). On step two of the analysis, the observer rating variables were added, \( F(6, 88) = 1.45, R^2 = .06, \) ns. Although the step was not significant, the associations between AUCI and the observer ratings suggested patterns of suppression in the data; specifically, partner involvement was negatively associated with increases in stress (\( \beta = -.24, p = .07 \)), whereas dominance was positively associated with increases in stress (\( \beta = .29, p = .06 \)).

The results of the regression analyses, taken together with the bivariate correlations between the observer ratings and the stress measures, suggested that partner involvement may be suppressing the relationships between the ratings and stress. Thus, self-reported hurt and partner involvement were covaried in the substantive analyses of AUCI.

To test the hypotheses forwarded in Chapter 3, AUCI was regressed onto self-reported hurt, partner involvement, and one of the coded message features. In the second step, all 2-way interactions were added to the model. In the third step, the 3-way interaction among hurt, involvement, and the coded variable was added to the model. The results for each of the hypotheses are reported in Table 5-5. For analyses with significant interactions, I followed the guidelines proposed by Aiken and West (1991) to evaluate the
nature of the interactions. Aiken and West stated that, in a model including main effects and interaction terms, the simple slope for one independent variable is an estimate of its relationship with the dependent variable when all other variables in the model have a value of zero. Thus, to evaluate the nature of an interaction, the distribution of the independent variables must be adjusted so that zero points are meaningful. To do so, I rescaled the covariate in the model by additive constants to compute the slopes for the coded variable at low, average, and high levels of the covariate. More specifically, I (a) centered the independent variables around their means (i.e., means = 0); (b) created two additional terms centered at one standard deviation below and one standard deviation above the mean of the covariate; (c) substituted one of the three covariate variables that were created in the original regression model; and (d) examined the slope of the coded variable when the covariate and the interaction term were included in the model. In the case of three-way interactions, the process was completed twice – once for each covariate in the model.

The first hypothesis predicted that in the context of identity disconfirming interactions, the explicitness of a partner’s messages is positively associated with stress. Step 1 of the regression analysis showed a significant association between AUC1 and hurt (see Table 5-5). On step 2, there were significant interactions between hurt and explicitness and between involvement and explicitness. Explicitness had a negative association with AUC1 when self-reported hurt was high (slope = -1.51, β = -.34, p < .05); however, explicitness was unrelated to increases in stress when hurt was moderate (slope = -.51, β = -.11, ns) or low (slope = .50, β = .11, ns). Further, explicitness was negatively associated with AUC1 when involvement was low (slope = -1.71, β = -.38, p < .05), but
was not significantly related to increases in stress when involvement was moderate (slope = -.51, $\beta = -.11$, ns) or high (slope = .70, $\beta = .16$, ns). The patterns of the slopes suggest that as hurt increases, explicit messages decrease stress and as involvement decreases, explicit messages decrease stress.

H3 predicted that in the context of identity disconfirming interactions, the argument strength of a partner’s messages is positively associated with stress. In step one, there was a positive association between hurt and AUC$_1$ (see Table 5-5). On step 2, the addition of the two-way interaction terms explained a significant portion of the variance in AUC$_1$. Results showed that there was a significant three-way interaction among hurt, involvement, and argument strength (see Table 5-6). At low and moderate levels of hurt, as involvement increases, the positive effect of argument strength on AUC$_1$ increases. In other words, argument strength increases stress more when the partner is more involved in the conversation. When hurt is high, argument strength has a negative relationship with AUC$_1$, regardless of level of involvement.

H5 predicted that in the context of identity disconfirming interactions, partner involvement is positively associated with stress. Because involvement was used as a covariate for the AUC$_1$, only the AUC$_G$ was used to evaluate this relationship, $F(2,88) = 4.40, R^2 = .09, p < .05$. Partner involvement in the interaction did not significantly predict stability of stress reactivity (AUC$_G$; $\beta = .03$, ns); however, love negatively predicted AUC$_G$ ($\beta = -.31, p < .05$). The interaction between love and partner involvement was not significant, $F(3, 88) = 2.94, R^2 \Delta = .00$, ns.

H7 predicted the observer ratings of the hurtfulness of the partner’s message would be associated with an increase in stress. The results showed that self-reported hurt,
observer ratings of hurt, and partner involvement do not predict a significant portion of
the variation in AUC\textsubscript{I}. Step two, in which the interaction terms were added to the model,
did predict a significant portion of the variance in AUC\textsubscript{I}, with the interaction between
self-reported hurt and observer ratings of hurt driving the association \((\beta = -1.46, p < .01)\).
Specifically, observer ratings of hurt are positively associated with increases in stress
when self-reported hurt is low \((slope = 1.77, \beta = .33, p < .05)\), and is negatively
associated with AUC\textsubscript{I} when self-reported hurt is high \((slope = -1.62, \beta = -.30, p < .05)\).

Finally, H9 anticipated that dominance from a partner would be positively
associated with stress. Step 1 of the regression analysis showed associations that
approached significance between hurt and AUC\textsubscript{I}, dominance and AUC\textsubscript{I}, and involvement
and AUC\textsubscript{I} \(\text{see Table 5-5)}\). One step two, the addition of the two-way interactions did not
explain a significant portion of the variance in AUC\textsubscript{I}; however, in step three there was a
significant three-way interaction among hurt, partner involvement, and dominance \(\text{see Table 5-7)}\). At moderate and high levels of involvement, the positive association between
dominance and AUC\textsubscript{I} becomes weaker as hurt increases. At low and moderate levels of
hurt, involvement strengthens the relationship between dominance and AUC\textsubscript{I}; however,
at high levels of hurt, the relationship between dominance and AUC\textsubscript{I} is not significant. In
other words, dominance predicts increases in stress \((AUC\textsubscript{I})\) when hurt is low and
involvement is moderate or high, and when hurt is moderate and involvement is high.

Discussion

The goal of this chapter was to examine how message features in an identity
disconfirming interaction with a dating partner impact biological stress reactivity. More
specifically, I predicted that in the context of identity disconfirming interactions,
explicitness (H1), argument strength (H3), involvement (H5) are positively associated with stress. Furthermore, perceptions of hurt (H7), and dominance (H9) during an interaction are associated with an increase in stress. I operationalized stress in two different ways: the area under the curve with respect to ground, which is a measure of stress reactivity stability, and the area under the curve with respect to increase, which is a measure of increases or spikes in physiological stress. To test the hypotheses, I had participants bring a dating partner into the lab to engage in a conversation about core traits or values. The partner was trained to be disconfirming while discussing the second trait or value, with the intent of evoking feelings of hurt in the participant. Independent coders watched the interactions and rated the degree of each message feature within the interaction, which became the independent variables in the substantive analyses.

Surprisingly, none of the message features significantly predicted stability in stress change (AUCG) directly or controlling for the amount of self-reported love or commitment in the relationship. Although speculative, there may be multiple explanations for the lack of findings. First, individuals who report higher levels of love in their relationship may discount their partner’s hurtful messages during the interaction. Similar to findings of Bradbury and Fincham (1990) that satisfied spouses are more likely to dismiss negative behavior or make external attributions to explain away the negative behavior, participants in a more satisfied relationship may subconsciously overlook the hurtful statements from their partner. A second possible explanation for the lack of significant results may be due to the nature of the hurt manipulation. Because the hurtful conversation is brief, it may be an acute or short-term stressor for the participant, but one that participants could recover from quickly because of the short duration. The AUCG
may not be the optimal way to measure stress reactivity in situations of acute stress because the stressor is not of large enough magnitude or length to create a sustained stress response.

The results suggest that message features, perceptions of the interaction, and stress reactivity are related in complex ways. As a general trend of the AUC\textsubscript{1} analyses, hurt was positively associated with stress increases, dominance approached a significant positive association with stress increase, and partner involvement is negatively associated with stress increases. A greater understanding of how message features impact physiological stress during an identity disconfirming conversation with a dating partner comes through the interactions between self-reported levels of hurt, the partner’s involvement in the conversation, and the message features. In general, involvement increased the relationship between the message features and stress reactivity when self-reported hurt was low or moderate.

*Implications*

This study expands on previous research on relational messages and hurt in multiple ways. First, the study helped to clarify the relationship between involvement and other message features. The results suggest that involvement may be an intensifier for dominance and argument strength in hurtful interactions. When self-reported hurt is low or moderate, involvement strengthens the impact of dominance and argument strength on stress reactivity. In other words, if partners are more involved, dominance and argument strength both increase stress; however, when the partner is not involved in the conversation dominance and argument strength do not significantly predict stress reactivity. The results appear to be consistent with an assumption from relational framing
theory (Dillard, Solomon, & Palmer, 1999; Dillard et al., 1996), which states that involvement is an intensifier variable.

The results also underscore how perceptions of messages within an interaction can change the impact of message features. First, patterns within the data suggest that perceptions of hurt may have a ceiling effect on stress reactivity. If an individual perceives the interaction as highly hurtful, the message features tend to have no additional affect on stress reactivity; however, if the interaction is perceived as less hurtful, the message features significantly increase physiological stress. In other words, when participants perceive their partner’s message as highly hurtful, the ways he or she states the message or interacts in the conversation have no additive effect. The results also suggest that message features that may not be perceived by individuals, but are apparent to outside observers are also stressful. For example, when individuals report low levels of hurt in the interaction, observer ratings of hurt still predict an increase in stress levels.

The findings further specify manifestations of hurt that have not been documented previously. I reasoned that hurt would result in a stress response in the body, similar to experiences of conflict or other negative emotions. Thus, participants’ physiological responses to the hurtful interactions were measured, in addition to their own reports of the intensity of hurt they experienced. The use of cortisol measures of stress allowed for an examination of the experience of hurt at both an emotional and biological level. Thus, this paper adds nuance to the understanding of hurt as established in prior work.

Finally, the present study also contributes to the methodology used to examine hurt. Instead of relying on self-report data of naturally occurring hurtful events, a
confederate engaged in hurtful communication in a laboratory interaction. Although this does limit the external validity of our study, it allowed for the examination of hurtful episodes in real time rather than through retrospective reports. Another strength of these procedures is that the measures of perceptions of the hurtful interaction should be less biased than studies where individuals recall events that they have already resolved or come to terms with.

Limitations

The conclusions are contextualized by the study’s strengths and weaknesses. One weakness of the study is its exclusive focus on college dating relationships, which limits my ability to generalize to other populations. Although the sample included relationships that averaged 1.75 years in duration, it is likely that college students do not interpret the relational messages conveyed during a hurtful interaction in the same manner as married couples. Future research should examine how relational messages impact hurt in other types of relationship.

A second limitation is imposed by the research design. In particular, these hurtful interactions were a result of our experiment and were not naturally occurring conversations. Although the procedures limited the external validity of the study, the present study is the first I know of to capture hurtful interactions as they unfold. Thus, I was able to capture both immediate biological reactions to hurt, as well as observer ratings of behaviors within the interaction.

In summary, the results for Study 1 show partial support for the hypotheses; however, the observed relationships were not as simple as originally posited. Contrary to H1, explicitness was negatively associated with AUC\textsubscript{1} when self-reported hurt was high.
and when partner involvement was low. Consistent with H3, argument strength was positively associated with increases in stress when hurt and involvement are moderate and high. Further, the impact of hurt depends on participants’ perceptions of hurt, such that observer ratings of hurt were positively associated with increases in stress when self-reported hurt is low, but observer ratings of hurt were negatively associated with AUC when self-reported hurt was high (H7). Finally, consistent with H9, dominance during an interaction was associated with an increase in stress when self-reported hurt and involvement were moderate or high.
Table 5-1

*Descriptive Statistics for Sources of Error in Baseline Salivary Cortisol Measures*

<table>
<thead>
<tr>
<th></th>
<th>Reported ‘yes’</th>
<th>Reported ‘no’</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eating a meal</td>
<td>.12 (.04)</td>
<td>.17 (.14)</td>
<td>1.40</td>
</tr>
<tr>
<td>Drinking Caffeine</td>
<td>.05 (.02)</td>
<td>.17 (.14)</td>
<td>-2.18*</td>
</tr>
<tr>
<td>Prescription Medication</td>
<td>.13 (.07)</td>
<td>.17 (.15)</td>
<td>-0.17</td>
</tr>
<tr>
<td>Birth Control</td>
<td>.15 (.06)</td>
<td>.16 (.14)</td>
<td>0.53</td>
</tr>
<tr>
<td>Depression</td>
<td>.10 (.04)</td>
<td>.18 (.14)</td>
<td>3.10**</td>
</tr>
<tr>
<td>Anxiety</td>
<td>.11 (.04)</td>
<td>.16 (.12)</td>
<td>0.58</td>
</tr>
</tbody>
</table>

*Note.* Cell entries for ‘yes’ and ‘no’ are mean cortisol levels; parenthetical values are standard deviations. The screening questionnaire also assessed smoking cigarettes, drinking alcohol, and exercising; however, none of the participants reported engaging in those behaviors.

* *p < .05. **p < .001.
Table 5-2

*Correlations Between Rated Message Features and Self-Reported Variables*

<table>
<thead>
<tr>
<th>Self-Reported Variables:</th>
<th>Partner Involvement</th>
<th>Affiliation Dominance</th>
<th>Disaffiliation</th>
<th>Love</th>
<th>Hurt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explicitness</td>
<td>.03</td>
<td>-.30**</td>
<td>.11</td>
<td>.26*</td>
<td>.04</td>
</tr>
<tr>
<td>Argument Strength</td>
<td>.19</td>
<td>.04</td>
<td>.16</td>
<td>.23*</td>
<td>.10</td>
</tr>
<tr>
<td>Involvement</td>
<td>.41**</td>
<td>.10</td>
<td>.32**</td>
<td>.25*</td>
<td>.11</td>
</tr>
<tr>
<td>Dominance</td>
<td>.30**</td>
<td>-.07</td>
<td>.34**</td>
<td>.26*</td>
<td>.10</td>
</tr>
<tr>
<td>Hurt</td>
<td>-.01</td>
<td>-.16</td>
<td>.12</td>
<td>.26*</td>
<td>.24*</td>
</tr>
</tbody>
</table>

* p < .05, **p < .01.
Table 5-3

*Bivariate Correlations Among Rated Message Features*

<table>
<thead>
<tr>
<th>Variable</th>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>V4</th>
<th>V5</th>
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<tbody>
<tr>
<td>V1: Explicitness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V2: Argument</td>
<td>.37***</td>
<td>.37***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V3: Involvement</td>
<td>.18</td>
<td>.44***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V4: Dominance</td>
<td>.39***</td>
<td>.50***</td>
<td>.50***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V5: Coded Hurt</td>
<td>.48***</td>
<td>.50***</td>
<td>.30***</td>
<td>.66***</td>
<td></td>
</tr>
</tbody>
</table>

* p < .05, **p < .01, ***p < .001.
Table 5-4

_The Regression of AUC_G on Love, Explicitness, Argument strength, Involvement, Hurt, and Dominance, and Their Interactions._

<table>
<thead>
<tr>
<th>Coded Variable:</th>
<th>Explicitness (H1)</th>
<th>Argument Strength (H3)</th>
<th>Involvement (H5)</th>
<th>Hurt (H7)</th>
<th>Dominance (H9)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1 R^2</td>
<td>.08</td>
<td>.09</td>
<td>.09</td>
<td>.10</td>
<td>.10</td>
</tr>
<tr>
<td>Love β</td>
<td>-.30**</td>
<td>-.30**</td>
<td>-.30**</td>
<td>-.33**</td>
<td>-.31**</td>
</tr>
<tr>
<td>Code β</td>
<td>-.15</td>
<td>-.00</td>
<td>.03</td>
<td>.09</td>
<td>.08</td>
</tr>
<tr>
<td>Step 2 ΔR^2</td>
<td>.02</td>
<td>.00</td>
<td>.00</td>
<td>.01</td>
<td>.01</td>
</tr>
<tr>
<td>Love*Code β</td>
<td>-.02</td>
<td>.01</td>
<td>.36</td>
<td>-.89</td>
<td>-.75</td>
</tr>
</tbody>
</table>

*Note. Cell entries for steps are R^2Δ values. Cell entries for variables are βs.*

*p < .05. **p < .01.
Table 5-5

*The Regression of AUC₁ on Self-Report Hurt, Involvement, Explicitness, Argument strength, Hurt, and Dominance, and Their Interactions.*

<table>
<thead>
<tr>
<th>Coded Variable:</th>
<th>Explicitness (H1)</th>
<th>Argument Strength (H3)</th>
<th>Hurt (H7)</th>
<th>Dominance (H9)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1 $R^2$</td>
<td>.05</td>
<td>.05</td>
<td>.05</td>
<td>.08†</td>
</tr>
<tr>
<td>Self-report Hurt $\beta$</td>
<td>.22*</td>
<td>.20†</td>
<td>.20†</td>
<td>.18†</td>
</tr>
<tr>
<td>Involvement $\beta$</td>
<td>-.11</td>
<td>-.15</td>
<td>-.12</td>
<td>-.22†</td>
</tr>
<tr>
<td>Code $\beta$</td>
<td>-.06</td>
<td>.07</td>
<td>.02</td>
<td>.21†</td>
</tr>
<tr>
<td>Step 2 $\Delta R^2$</td>
<td>.09*</td>
<td>.12*</td>
<td>.10*</td>
<td>.05</td>
</tr>
<tr>
<td>SR Hurt*Involvement</td>
<td>0.16</td>
<td>2.31†</td>
<td>0.76</td>
<td>0.48</td>
</tr>
<tr>
<td>SR Hurt*Code $\beta$</td>
<td>-1.06*</td>
<td>-2.30**</td>
<td>-1.46**</td>
<td>-0.84†</td>
</tr>
<tr>
<td>Involvement*Code $\beta$</td>
<td>2.92*</td>
<td>2.46*</td>
<td>1.45</td>
<td>1.87</td>
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<tr>
<td>Step 3 $\Delta R^2$</td>
<td>.02</td>
<td>.06*</td>
<td>.00</td>
<td>.05*</td>
</tr>
<tr>
<td>SR Hurt<em>Involvement</em>Code $\beta$</td>
<td>-8.51</td>
<td>-12.76**</td>
<td>-0.21</td>
<td>-10.48*</td>
</tr>
</tbody>
</table>

*Note.* Cell entries for steps are $R^2$Δ values. Cell entries for variables are $\beta$s.

†$p < .10$, *$p < .05$, **$p < .01$. 
Table 5-6

*The Slopes of Argument Strength as Part of its 3-way Interaction with Hurt and Involvement*

<table>
<thead>
<tr>
<th></th>
<th>Low Hurt</th>
<th>Average Hurt</th>
<th>High Hurt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Involvement</td>
<td>1.19</td>
<td>0.22</td>
<td>-0.76</td>
</tr>
<tr>
<td>Average Involvement</td>
<td>4.56**</td>
<td>1.94*</td>
<td>-0.68</td>
</tr>
<tr>
<td>High Involvement</td>
<td>7.93***</td>
<td>3.67**</td>
<td>-0.60</td>
</tr>
</tbody>
</table>

*Note.* Cell entries are slope values for argument strength at various combinations of self-reported hurt and partner involvement.

*p < .05, **p < .01, ***p < .001.*
Table 5-7

*The Slopes of Dominance as Part of its 3-way Interaction with Hurt and Involvement*

<table>
<thead>
<tr>
<th></th>
<th>Low Hurt</th>
<th>Average Hurt</th>
<th>High Hurt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Involvement</td>
<td>-0.26</td>
<td>0.45</td>
<td>1.15</td>
</tr>
<tr>
<td>Average Involvement</td>
<td>2.04*</td>
<td>1.36</td>
<td>0.68</td>
</tr>
<tr>
<td>High Involvement</td>
<td>4.34***</td>
<td>2.27**</td>
<td>0.21</td>
</tr>
</tbody>
</table>

*Note.* Cell entries are slope values for dominance at various combinations of self-reported hurt and partner involvement.

*p < .05, **p < .01, ***p < .001.*
CHAPTER SIX

The goal of the dissertation is to understand how interpersonal communication can impact stress through identity-relevant messages. In this chapter, I describe an empirical study designed to assess how message features and perceptions during an identity supportive interaction can impact stress. More specifically, hypotheses 2, 4, 6, 8, and 10 will be evaluated in this portion of the dissertation.

This chapter describes two pilot tests that inform Study 2. The goals of the first pilot study were to examine if physiological stress could be induced by the anticipation of coming to the research lab and by recalling currently stressful events. The second pilot improved on the weaknesses of the first pilot study by having participants engage in a series of stressful tasks. To test the effects of supportive messages in the final Study 2, participants engaged in an interaction with a romantic dating partner in which the partner was supportive or neutral when discussing the performance feedback the participant received on the tasks. In the sections that follow, I discuss 2 pilot studies that were employed to design a realistic and effective procedure for inducing physiological stress. Then, I provide the methods and measures that were used in the main study.

Pilot 1 for Study 2

Pilot 1 was conducted to assess if participants experience increased physiological stress due to coming to the research lab and if physiological stress can be induced by recalling currently stressful events. Accordingly, the pilot test included a treatment group, which completed a stressor questionnaire and a control group, which did not complete the stressor questionnaire. The results of the pilot study were used to ensure the treatment was sufficient to produce an increase in salivary cortisol.
Method

Participants

The pilot sample consisted of 54 participants (13 males, 41 females). Twenty-five participants were randomly assigned to the control group, whereas 29 participants were assigned to the treatment group. Participants ranged in age from 18 to 23 ($M = 19.76$, $SD = 1.01$). The majority of the participants identified as Caucasian ($n = 49$), 2 identified as African American, 1 was Native American, 1 was Hispanic, and 1 participant reported ‘other.’ The sample included 6 first-year students, 33 sophomores, 9 juniors, and 7 seniors. All participants reported being in a romantic relationship; 6 participants reported being in a causal dating relationship, 47 reported being in a serious dating relationship, and 1 participant was engaged. The reported length of the relationship ranged from 2 months to 6.42 years ($M = 1.85$ years, $SD = 1.45$ years).

Procedures

Prior to arriving for the research session, all participants were randomly assigned to the control or treatment group. Upon arrival, all participants provided informed consent and completed a screening questionnaire. The questionnaire assessed if individuals had engaged in behaviors that could artificially impact cortisol levels, including eating, drinking caffeine or alcohol, using tobacco products, brushing teeth, and exercising. The questionnaire also asked participants if they were on birth control or prescription medication and if they had been experiencing depression or an anxiety disorder. The answers to these questions were used to assess the validity of the cortisol samples. Finally, all participants provided a baseline saliva sample.
Procedures for treatment group. Next, participants in the treatment group completed a questionnaire that asked them to recall three personal stressors that were currently relevant in their daily life, but are not sources of stress related to the relational partner (see Appendix G). For each stressor, the participant also rated how long the stressor had been occurring and how intense the stressor was. After completing the survey, participants were instructed to sit quietly and think about their responses to the stressor questionnaire. They were also asked to not read, do homework, or engage in any other activities. This procedure was used to minimize factors that could artificially influence the trajectory of stress reactivity.

Participants provided a second saliva sample 20 minutes after completing the survey to measure the initial stress reactivity to the survey. A third sample was collected 30 minutes after the completion of the stressor survey to assess continued reactivity to the survey. A final sample was collected 40 minutes after the completion of the survey as a preliminary measure of stress recovery.

Procedures for the control group. Participants in the control group did not complete the stressor questionnaire. This provided two types of information. First, any changes in cortisol levels within the control group reflect reactivity to the anticipation of engaging in a research study and to coming to the lab. Second, the control group provided a comparison to the treatment group to assess whether the stressor survey increased participants physiological stress.

After providing the baseline sample, participants were asked to sit quietly, without engaging in any other behaviors, and think about anything they wanted. They provided a second saliva sample 20 minutes after the baseline sample to measure initial
stress reaction when arriving in the lab. The third sample was collected 30 minutes after
the baseline sample as another indicator of stress reactivity associated with being
introduced to the research procedures. The final sample was collected 40 minutes after
the baseline sample.

Between the third and fourth samples, all participants completed a thought listing
activity to assess what participants were thinking about during the resting periods, as well
as a questionnaire that included demographic questions and questions about their current
relationship and social support preferences (see Appendices C, H, & I). Because there is a
lag of 20 to 30 minutes before cortisol is measurable in saliva, the timing of the final
questionnaire ensured that the questions did not impact cortisol levels in the final sample.
After providing the final sample, all participants were debriefed and the goal of the study
was explained.

**Measures**

*A Stress. The dependent variable used to test the hypotheses was salivary cortisol.*
The saliva samples were analyzed using the EIA methods explained in Chapter 4. To
minimize variability, all samples were assayed in duplicate and any samples with a
coefficient greater than 10% were rerun. Intra-assay coefficients of variation ranged from
0.21 to 8.94, with an average of 2.45, indicating high internal reliability. Inter-assay
coefficients of variation for the kits also show high reliability (*M* = 3.75).

*Cortisol screening questions. A series of yes or no questions were asked prior to
the collection of the baseline saliva sample to screen for behaviors that would artificially
impact cortisol levels. The first four questions assessed behaviors the participant engaged
in one hour prior to the session, including eating, drinking alcohol or cafffeinated*
beverages, and smoking cigarettes. One question asked if the participant had exercised during the day of the appointment. Finally, four questions asked if the participant was taking prescription medication, on birth control, or had been diagnosed with depression or anxiety.

**Stressor questionnaire.** The questionnaire asked participants to list three stressors that were currently relevant to their daily life. For each stressor, participants were asked how long the stressful situation had been occurring and what aspect of life the stressor was related to. Participants also rated how stressful the situation currently was on a 10-point scale (0 = *not at all stressful*, 5 = *moderately stressful*, 10 = *extremely stressful*).

**Results**

**Preliminary Analyses**

A variety of preliminary analyses were conducted to evaluate cortisol levels as the dependent variable. First, the distribution of the cortisol measures was assessed for normality and skew. Baseline cortisol values ranged from 0.02 to 2.77 ($M = 0.23, SD = 0.37$). Cortisol levels were considered an outlier if they were greater than 3 standard deviations from the mean. One participant’s baseline cortisol was more than 3 standard deviations from the mean (2.77); therefore, I excluded that participant’s data from the analyses, creating a more normal distribution in baseline cortisol levels. There were no significant differences in baseline cortisol between the control and treatment groups, $t (52) = 0.15, ns$ (control $M = 0.19, SD = 0.17$; treatment $M = 0.18, SD = 0.09$). There were also no significant sex differences in any of the cortisol measures.

Next, I examined the participants’ behavior one hour before the research session. In this sample, 5 participants reported taking prescription medication, 30 participants
reported taking birth control, and 1 participant reported being diagnosed with an anxiety disorder. None of the participants reported eating, drinking caffeine or alcohol, using tobacco products, brushing their teeth, exercising, or being diagnosed with depression. T-tests comparing cortisol levels for individuals who engaged in these activities and those who did not indicated these variables did not significantly impact cortisol (medication $t (52) = 0.64$, ns; birth control $t (52) = -0.43$, ns; anxiety $t (52) = -0.90$, ns). Consequently, the participants were retained in subsequent analyses.

Finally, descriptive analyses were completed on the stressors that participants reported. Participants were asked to rate how stressful each situation reported was currently. Overall, responses ranged from 2.33 to 9.00 ($M = 6.33$, $SD = 1.68$). For stressor 1, responses ranged from 3 to 9 ($M = 7.15$, $SD = 2.28$). For stressor 2, responses ranged from 2 to 9 ($M = 5.79$, $SD = 2.33$). For stressor 3, responses ranged from 2 to 9 ($M = 5.85$, $SD = 2.28$). The results suggest that some participants were able to recall moderately to highly stressful events, whereas other participants recalled events that were minimally stressful.

### Substantive Analyses

The first goal of the pilot study was to assess if participants experienced an increase in physiological stress based on coming to the research session. To assess stress reactivity, I conducted a series of paired $t$-tests to examine the differences between the cortisol samples within the control group. Results showed that there was no significant difference between the baseline sample and the second sample, but stress significantly decreased from the baseline sample to the third and fourth samples (see Table 6-1). This suggests that participants’ stress levels remained fairly constant from anticipation of
coming to the lab to arriving at the lab, but after arriving at the lab participants’ stress levels declined.

The second goal of the study was to assess stress reactivity to the stressor questionnaire. A series of independent sample $t$-tests were conducted to examine differences in cortisol levels between the two conditions. The results showed that cortisol levels of the control and treatment groups did not significantly differ at any of the four time points (see Table 6-1). Taken together, the results suggest that neither coming to the lab nor completing the stressor questionnaire induced a physiological stress response. Based on these results, a new stress manipulation was created and tested in a second pilot study.

**Pilot 2 for Study 2**

Based on the results of the first pilot study, a new stress induction procedure was designed and tested in pilot 2. More specifically, participants competed against a confederate in a series of three tasks and were given negative feedback about their performance. The manipulation was created to include multiple factors shown in previous research to induce physiological stress, which included creating a situation that is novel, uncontrollable, and unpredictable, and completing motivated performance tasks that create a context of forced failure and social evaluation (see Dickerson & Kemeny, 2004; Kudielka, Hellhammer, Kirschbaum, 2007). This section describes the methods employed in the study.
Method

Participants

The pilot 2 sample included 16 participants (8 males, 8 females). Of these, 3 participants identified as African American, 12 were Caucasian, and 1 was Hispanic. Participants ranged in age from 19 to 22, \( (M = 20.50, SD = 0.97) \). The majority of the participants were sophomores \( (n = 8) \), with 4 juniors and 4 seniors. The length of involvement in the dating relationship ranged from 1 month to 2.61 years \( (M = 1.31 \text{ years}, SD = 0.76 \text{ years}) \). Responses to the question, “at this point in time, what do you feel the chance is of your relationship leading to marriage or a similar lifelong commitment?” ranged from 10% to 100% \( (M = 68.12\%, SD = 27.62\%) \), with 43.8% of the participants reporting a 70% or less chance of marriage.

Procedures

Each participant was asked to bring a dating partner with them to the research session. Prior to the session, they received an email instructing them not to eat, drink caffeine or alcohol, use tobacco products, or brush their teeth one hour prior to arrival at the lab and not to exercise on the day of participation (Kirschbaum & Hellhammer, 1989). The participant completed all of the research procedures, including saliva, stressor tasks, and questionnaires. To mirror the main study, the partners attended the session so that all of the procedures would be exactly the same between the control and treatment group in the main study, with the exception of engaging in the interaction. The partners completed a series of questionnaires, but did not provide saliva samples or complete the tasks.
Upon arriving at the research lab, participants and their partner were separated for the remainder of the study. Participants provided informed consent and were asked to complete a screening questionnaire indicating whether they had complied with the instructions to abstain from food, caffeine, alcohol, tobacco, and exercise prior to their appointment. The questionnaire also asked participants about the use of prescription medications, hormonal contraceptives, past diagnosis or current experience of depression or anxiety, and recent sleeping habits. The responses to the questions were used to analyze the cortisol data that was collected.

After completing the screening form, participants provided the first of six saliva samples. Saliva was collected using a salivette (Sarstedt); participants were asked to chew on a small piece of cotton for 1 minute. They were further instructed to move the cotton around in their mouth throughout the 1 minute. The research assistant timed the participant and asked them to spit the cotton into the plastic tube when the time was up. Next, participants completed a brief survey, which included demographic information and asked questions about relationship satisfaction and commitment (see Appendix J). When the participant had completed the survey, he or she was asked to sit at one of two laptops positioned on a table in the middle of the room.

While the participant completed the preliminary questionnaires and saliva sample, a second research assistant took the partner into another room to complete a separate set of procedures. After providing informed consent, the partner was asked to complete a questionnaire including demographic information, as well as scales on relationship characteristics (see Appendix J). When the partner was finished with the questionnaire, he or she was told that they were finished with all of the requirements; they were also
told that they could stay and wait for the participant to complete the remaining research procedures or they could leave.

Pre-task instructions. Once the participant was seated at the laptop, the research assistant left the room briefly and returned with the confederate, who was asked to sit across the table from the participant at the other laptop. The research assistant began the tasks by explaining that both individuals were students who were completing the study to earn research credit in the university’s introductory public speaking course. The research assistant then provided the following introduction to the stressor tasks:

During this part of the research session you will be competing against each other in a series of tasks. Each task is designed to assess a different part of your personality.

For each of the tasks, you will be scored on your performance. Because these tasks have been used in past research, guidelines have been set as to what an average, below-average, and above average performance on each task is. In order to earn your research credit you must perform at a certain level. Poor performance on any of the tasks will be interpreted as a lack of trying and you will not earn your research credit. This means you must take each part seriously and do your best.

During the tasks, you will be videotaped (show participants video cameras). After this session, the video will be used to further analyze your performance. Because your partners have both completed their surveys, they will be watching you complete the tasks from the control room.

The other researcher will also be watching from the control room and evaluating your performance. When you are finished with all of the tasks, she will give you feedback on how you preformed on each task relative to others who have completed the same tasks. You will then be asked to discuss your results with your dating partner.

The directions were designed to initiate a physiological stress response in multiple ways. First, research has shown that participating in motivated performance tasks increases physiological stress (see Dickerson & Kemeny, 2004). Anticipating a
competition involving unknown tasks against another student increases the motivation to perform the tasks, thus increasing the likelihood of stress reactivity. Further, stating that participants must perform at a certain level should also increase motivation to perform well. Second, research shows that situations that involve social evaluative threats to the individual create greater physiological responses than those that do not (Dickerson & Kemeny). Social evaluative threat was manipulated by telling participants their performance would be evaluated by the researcher, reminding participants that they were being videotaped and that their partner was watching, and stating that participants would have to discuss their results on the tasks with their dating partner.

The goal of each of the tasks was two-fold. Because physiological responses to psychological stressors vary greatly among individuals, a variety of tasks were designed to increase the chances of participants reacting to at least one of the tasks. Second, the tasks and the feedback provided after completing the tasks served as the topic of the interaction. Although none of the tasks included in the study have been used in previous research to assess personality traits, participants were told that each task assessed a different aspect of their personality to enhance participants perceived identity threat. This set up a context in which the dating partner could provide identity supportive messages during the interaction.

Task 1. The first task that participants engaged in was a number tracking task (NTT). The task required participants to connect consecutive numbers within a number matrix until they reached one of multiple highlighted boxes. The task has been used in past research to study the impact of implicit power motivation on salivary cortisol and testosterone (Schultheiss & Rohde, 2002; Wirth, Welsh, & Schultheiss, 2006). The NTT
forms include ‘winner’ and ‘loser’ forms. Undetectable to participants, the distance between the start number and the highlighted final number was 20 numbers shorter on the winning than the losing NTT forms. The task was rigged so that the participant would win the first of the three trails and the confederate would win the second and third trials. The NTT forms were obtained from Dr. Schultheiss, who designed the task.

After explaining how to complete the task, the research assistant told both participants that they would be competing against each other in a series of three number tracking tasks. The researcher then provided the following instructions:

In past research, this task has been linked to how motivated, ambitious, or hardworking a person is. The task is also an indicator of leadership ability. In general, individuals who do well on this task are more determined or hardworking than individuals who do not do well.

I will give each of you the form and when I say “start” begin connecting the consecutive numbers as quickly and accurately as possible. When you reach the highlighted final number, you must say “done.” When one person says done, the task is over and the other person must stop immediately. Whoever finishes first with the least mistakes will be the winner of the task. The loser will be scored based on the number of consecutive numbers that are correctly connected. Work as fast and accurately as possible.

After each trial, the researcher would check the forms for accuracy and provide feedback to the participants. The winner of the trial was told that they performed well; the loser of the trial was told that he or she would have to try harder on the next trials to earn the research credit.

The task was chosen for the study because it involves competition and reaction time. Previous research has suggested that a stress response is initiated when a situation is perceived as novel, uncontrollable, and unpredictable, and if the individual anticipates negative feedback (see Mason 1968). Because the forms were likely novel to the
participant and each form was different, the task should increase physiological stress. Further, the aspects of competition and performance under pressure likely increased perceptions of uncontrollability and unpredictability. Finally, the negative feedback given after poor performance should also add to the stressfulness of the task.

Task 2. For the second task, participants engaged in a timed typing task. The task was designed by the researcher for the purpose of this study. During the task participants were presented with negative, neutral, and positive words, one at a time, and asked to type the word as quickly and accurately as possible. At the beginning of the task, participants were told that previous research has shown that people take less time and type more accurately when they type words that are salient to their identity. Thus, reaction time to each of the words gives insight into the participant’s personality.

To begin the task, participants completed a pre-test, which was used to assess their natural typing speed. Participants were presented with a short paragraph about public speaking and were asked to type the paragraph as quickly and accurately as possible. Participants were told that the computer would begin timing when the first key was struck and would stop when the participant pressed the enter key. They were also told that their scores in the main task would be adjusted for their typing speed during the pre-test.

Before beginning the main task, participants were told:

The winner of this task is the person who types the most words, correctly, in the time limit. The winner of this task will be the judge of the last task, which is the mental math task, meaning they will not have to complete the mental math. This is the hardest task of the three you will do today and the loser of this will have to complete the mental math.

The directions were meant to further motivate participants to try hard to win the task.
During the main task, participants were presented with the list of words. Each word was presented on the screen with a text box below it. The participant was instructed to type the word and press ‘enter’ for the next word to appear. The words were timed so that as the participant typed more words, the words would appear on the screen for a shorter period of time before automatically moving on to the next word. This procedure was meant to force participants to continue typing faster or miss the words, resulting in a lower score on the task. Participants were given 90 seconds to type as many words as possible. When the time had expired, the research assistant told both individuals to stop. The researcher then counted the number of words the participant typed correctly in the time limit and announced the number. Next, the researcher went over to the confederate’s computer to count the number of words he or she typed correctly. The researcher announced that the confederate typed 2 more words correctly than the participant; therefore, the participant would have to complete the mental math in the final task and the confederate would be the judge of the task.

Task 3. The final task required the participant to complete mental math. This procedure has been used in previous research as part of the Trier Social Stress Test (a protocol used for the experimental induction of psychological stress) and has consistently been associated with increased physiological stress (see Kudielka, Hellhammer, & Kirschbaum, 2007). During the task, participants performed five 1-minute serial subtraction problems continuously for 5 minutes. To begin each 1-minute trial, the confederate provided the participant with two numbers. The participant was instructed that any error made would be corrected by the confederate and that he or she should continue again from the numbers provided in the beginning. The numbers provided to the
participant were 2023 minus 17, 688 minus 13, 955 minus 24, 1741 minus 37, and 593 minus 27. The sets of numbers were chosen to maintain maximal task involvement and difficulty for every participant (see Cacioppo et al., 1995).

Post-task procedures. Immediately after the participant completed the mental math task the participant and the confederate were told that the researcher would compile their results on the three tasks and give them the results when they were ready. The confederate was asked to leave the room and return to where he or she had been sitting to wait for their results. The participant was asked to complete a brief questionnaire about the tasks while the researcher put together his or her feedback (see Appendix K). The researcher then left the room to prepare the feedback for the participant.

After 3 minutes, the researcher re-entered the room where the participant was waiting and presented the feedback. The researcher explained that the tasks had been used in previous research over the past 20 to 30 years and had been shown to be reliable and valid measures of a person’s traits. The researcher then presented the performance feedback in a folder and explained the format of the results. The feedback supposedly tailored to the participant was written to indicate that the participant’s poor performance reflected negative personal qualities. Finally, the researcher instructed the participant to read the results well enough that he or she could explain their results to their partner during the conversation. Participants were told they would be given some time to review the feedback and then the partner would be brought in to begin the conversation.

Five additional saliva samples were collected after the feedback was presented to the participant. Because cortisol takes approximately 15 to 20 minutes to reach saliva after secretion from the adrenal glands (Stansbury & Gunnar, 1994) each sample actually
measures participant’s cortisol level from 15 to 20 minutes earlier. The second sample was collected 13 minutes post-feedback to measure stress reactivity during the tasks. The third sample was collected 23 minutes post-feedback to assess stress reactivity from the feedback. The fourth sample was collected at 33 minutes post feedback as an initial measure of recovery. The fifth and sixth samples were collected at 48 and 63 minutes post-feedback as final measures of stress recovery. The timing of the samples was chosen to ensure that both reactivity and recovery would be measured. Further, the second sample was collected at 13 minutes post-feedback, rather than at 10 minutes to maintain consistency in timing with the final study. In the main study, 13 minutes allowed 3 minutes for the participant to read the feedback, 2 minutes for the researcher to explain the directions for the conversation to the dyad, and 8 minutes for the dyad to complete the conversation, before the second saliva sample was collected.

After the participant provided the final saliva sample, the participant was debriefed. The researcher explained the goal of the study and why the conversation did not take place. The researcher also explained the procedures meant to induce a stress response, including the role of the confederate, the tasks, and the fabrication of the feedback. Finally, the researcher discussed how the tasks did not reflect the participants’ abilities or personality traits. The participant was allowed to ask questions until the purpose of the research procedures was understood and the participant stated that they were not upset.
Measures

Stress. The dependent variable used to assess if the manipulation was successful was salivary cortisol. Change scores that reflect the difference between the cortisol measures were created. Change scores are commonly used in psychophysiological research because they provide greater ease in interpretation and because the results tend to be statistically equivalent to residual scores (raw scores corrected for baseline levels) (Diamond, Hicks, Otter-Henderson, 2006; Llabre et al., 1991). In the pilot data, change scores were used to establish if the cortisol levels differed significantly between conditions and samples.

Cortisol screening questions. A series of yes or no questions were asked prior to the collection of the baseline saliva sample to screen for behaviors that would artificially impact cortisol levels. The first four questions assessed behaviors the participant engaged in one hour prior to the session, including eating, drinking alcohol or caffeine, and using tobacco products. One question asked in the participant had exercised during the day of the appointment. Finally, four questions asked if the participant was taking prescription medication or hormonal birth control, or had been diagnosed with depression or an anxiety disorder.

Results

Preliminary Analyses

A variety of preliminary analyses were conducted to evaluate the validity of the cortisol levels. First, the distribution of the cortisol measures was assessed for normality and skew. Baseline cortisol values ranged from 0.06 to 0.27 ($M = 0.14, SD = 0.07$). All of the baseline values were within 3 standard deviations of the mean, suggesting a lack of
outlier scores and relatively normal distribution. Second, participant behaviors before the research session were examined. None of the participants reported engaging in any of the screening question behaviors, with the exception of the use of hormonal birth control. Four participants reported taking hormonal birth control; however, *t*-test results showed that the use of birth control did not significantly impact the baseline cortisol levels, *t* (14) = 0.94, ns. Based on the preliminary analyses all of the participants were retained for the substantive analyses.

**Substantive Analyses**

The main goal of the pilot 2 study was to assess the effectiveness of the revised stress induction manipulation. Two different comparisons were used to evaluate if the manipulation significantly increased participants’ physiological stress levels. First, a mixed model repeated measures analysis of variance was conducted to examine if the pilot 2 treatment group experienced a greater increase in stress than the pilot 1 treatment group (who completed the stressor survey) and the pilot 1 control group (who only came to the lab). The analysis used a 4 (cortisol) x 3 (condition) model, with cortisol as the within-subjects factor, and Wilk’s criterion. The results showed a main effect for cortisol, *F*(3, 56) = 4.04, *p* < .05, partial η² = .18, and a main effect for condition, *F*(2, 58) = 9.92, *p* < .001, partial η² = .26. There was also a significant interaction between cortisol and condition, *F*(3, 56) = 5.00, *p* < .001, partial η² = .21. Participants in the pilot 1 control group and pilot 1 treatment group showed no significant change in cortisol over time, whereas the participants in the pilot 2 group experienced an increase in stress over time. Although the three groups did not differ significantly in baseline cortisol levels, the pilot 2 participants had significantly higher cortisol levels at samples 2, 3, and 4.
Second, paired $t$-tests were conducted to measure changes in cortisol levels from the baseline sample to the post-task samples within the treatment group (see Table 6-2). Results showed that stress levels significantly increased from the baseline sample to all of the post-task samples. Further, stress levels significantly decreased from the second to fourth samples and from the third to fourth samples. The results suggest that the manipulation increased stress in response to the tasks and participants began to recover from completing the tasks after the third sample.

Taken together, the substantive analyses suggest that the tasks did induce a significant physiological stress response and that the timing of the samples allowed both stress reactivity and recovery to be captured. Based on these results, the stress manipulation was utilized in the main Study 2.

Study 2 Method

The aim of Study 2 is to examine how message features and perceptions of a supportive interaction with a dating partner can reduce physiological stress. Accordingly, Study 2 utilizes the stress induction manipulation tested in pilot 2. To assess the impact that supportive messages can have on stress recovery, 2 groups were included in the main study. In these groups, the partner was trained to be either neutral or supportive during an 8-minute conversation about the participant’s feedback on the tasks.

Participants

Participants were recruited from a research pool that accompanied an introductory public speaking course at a large eastern university. Early in the semester, students were asked to complete a preliminary screening questionnaire that asked them if they were currently in a dating relationship and, if so, whether their partner was geographically
close and able to come to the research lab with them. They were also asked if they were currently taking prescription medication and if they had been diagnosed or were currently experiencing depression or an anxiety disorder. The sample for the study was generated from the pool of students who responded affirmatively to the questions about the dating partner and negatively to the remaining questions. Participants earned 2% credit in the course for the completion of the study or an alternative assignment. The students’ partners attended the research session as volunteers, and they were not compensated for their participation. Both individuals provided informed consent, and the partners could refuse to participate in research procedures without penalty to the student. Because the partners were not compensated for participation, they engaged in limited procedures, whereas the participants completed all of the research procedures, including questionnaires and saliva samples.

The Study 2 sample consisted of 96 participants (45 males, 51 females). Participants ranged in age from 18 to 34 ($M = 20.54$, $SD = 2.08$). The majority of the participants identified as Caucasian ($n = 79$), 6 identified as African American, 5 were Asian, and 6 were Hispanic. The sample included 8 first-year students, 18 sophomores, 43 juniors, and 27 seniors. All participants reported being in a romantic relationship; the reported length of the relationship ranged from 1 month to 4.62 years ($M = 1.55$ years, $SD = 1.73$ years). The reported chance of marriage ranged from 20 to 100% ($M = 74.41$, $SD = 21.01$).
**Procedures**

The procedures were consistent with the pilot 2 study method, with one exception – the addition of the conversation about the participant’s feedback. Prior to arriving for the research session, participants were randomly assigned to the neutral or supportive group. Both groups engaged in an 8-minute conversation about the participant’s performance feedback on the tasks. After the conversation, saliva samples were collected at the same time intervals as in the pilot 2 study. All other procedures remained the same.

*Partner pre-interaction procedures.* While the participant completed the stressor tasks, a second research assistant took the partner into another room to complete pre-interaction procedures. After providing informed consent, the partner was asked to complete a questionnaire collecting demographic information, as well as scales on relationship characteristics (see Appendix C). Once the partner had completed the survey, the research assistant explained that the participant was competing in a series of tasks against another student. He or she was also told that each of the tasks was meant to assess a different part of the participant’s personality and that when the tasks were completed the participant would be receiving negative feedback on his or her performance. Finally, the research assistant explained that the conversation would involve the dyad discussing how the participant felt while completing the tasks, what his or her feedback was, and how he or she felt about the feedback.

Partners in the neutral condition were instructed to be as neutral as possible during the conversation. The research assistant explained that being neutral meant not offering personal opinions, feelings, or thoughts during the conversation. Partners were further instructed that they could answer questions the participant asks, but to answer
briefly and then ask the participant a question to refocus the conversation away from the partner’s opinions. In addition, partners were told that they could ask questions and engage in the conversation as they normally would, with the exception of providing their own perspective.

Partners in the supportive condition were instructed to be as supportive as possible. Specifically, partners were trained to maintain eye contact, show nonverbal signs of listening, ask questions that probe how the tasks or feedback made the participant feel, validate the participant’s feelings, encourage the participant to elaborate on his or her feelings, try to get the participant to focus on positive aspects of him or herself, and communicate explicit statements that make the participant feel better about him or herself. The partners were also given examples of how each of these behaviors could be enacted.

*Interaction.* Once the tasks were completed, the feedback was given to the participant, and the participant was given 3 minutes to review the feedback, the dyad was reunited for the conversation. Before beginning the conversation, the researcher explained that the pair would be discussing how the participant felt about the tasks, what the participant’s feedback said, and how the participant felt about the feedback. The dyad was given a note card with prompt questions, which included, “what were your results on the tasks?”, “how did you compare to other college students?”, “how did you feel while completing the tasks?” and “how did you feel while you were reading your performance feedback on the tasks?” The dyad was told that the conversation would be 8 minutes and the researcher would time the conversation from the control room. Finally, they were told that when the time for the conversation was up, the researcher would knock on the door
and the dyad would move on to the final part of the study. Once the conversation was completed, the researcher entered the room and separated the dyad again.

*Post-interaction procedures.* Immediately following the conversation, the participant provided the second saliva sample. The researcher then explained that for the next part of the study, the participant would have to relax and think about the conversation he or she just engaged in. This procedure ensured a more valid and reliable measure of recovery after the interaction and minimized the effect that extraneous variables could have on later cortisol samples.

Salivary cortisol samples 3, 4, 5, and 6 were collected from the participant in the same time intervals as used in the pilot 2 study (see Table 6-3). Between samples 5 and 6, participants completed a final survey which included the thought listing activity and questions about the conversation (see Appendices I & L). Immediately following the conversation the partner completed also completed a questionnaire about their perceptions of the conversation (see Appendix M). After the final saliva sample was collected, the participant and partner provided informed consent to use the videotape of their conversation and the dyad was debriefed.

*Self-report Measures*

The measures that were employed in Study 1 were also collected in Study 2, including perceptions of the interaction, the cortisol screening questionnaire, and the coded explicitness, involvement, argument strength, dominance, and affiliation variables. Additional self-report measures were included in Study 2 as manipulation checks and possible covariates for the substantive analyses. All self-report measures were evaluated for unidimensionality using confirmatory factor analyses (CFA; Hunter & Gerbing,
1982). All of the measures used in the substantive analyses met the following criteria for goodness of fit: $\chi^2/df$ less than 3.00, CFI greater than .90, and RMSEA less than .10 (Browne & Cudeck, 1993; Kline, 1998).

Support effectiveness. Four 7-point semantic differential scales were used to measure perceptions of support effectiveness (Burleson & Samter, 1985; Jones & Burleson, 1997). The questions asked participants to rate their partner’s behavior during the conversation on the following scales; appropriate-inappropriate, effective-ineffective, sensitive-insensitive, and helpful-unhelpful. All of the items were recoded so that higher numbers reflected greater perceptions of support. The responses to each question were averaged to create a composite measure of support effectiveness ($\alpha = .92$, $M = 5.75$, $SD = 1.28$).

Perceptions of message features. A series of questions were created to assess the participants’ perception of their partner’s messages during the interaction. Participants were asked to respond to 3 items that measured how explicit they believed their partner’s supportive messages were (1 = strongly disagree, 7 = strongly agree). Items included, “During the conversation, my partner made explicitly supportive comments,” “was clear about his or her opinion,” and “made directly supportive comments” ($M = 5.03$, $SD = 1.72$, $\alpha = .89$). Three additional items were used to assess the perceived argument strength: “During the conversation, my partner gave reasons why I shouldn’t feel bad,” “elaborated on his or her feelings or opinions,” and “gave examples that supported his or her opinion” ($M = 4.42$, $SD = 1.82$, $\alpha = .86$).

Internal attribution for performance. After completing the tasks, participants were asked to report their perceptions of the tasks. Specifically, participants rated the degree of
agreement with four 5-point Likert-type statements, which began with the phrase, “My performance on the tasks…” The items included, “Was not under my control,” “could have been better,” “was based on my skills,” and “was the result of forces I could not control” (1 = strongly disagree, 5 = strongly agree). The first and fourth statements were recoded so that higher numbers reflected greater control over one’s performance. The scores for each item were averaged to create a composite measure of internal attribution for performance (M = 4.18, SD = 1.22, α = .73).

Rated Measures

For Study 2, six independent coders rated all of the message feature codes (see Table 6-4). The coders met weekly to re-watch cases with low reliability and disagreements were resolved through discussion. Because of the focus on supportive messages in Study 2, observer ratings of message supportiveness during the conversation were used as an additional independent variable.

Message supportiveness. Coders were asked to rate the degree to which the partner was supportive during the conversation. Specifically, coders were given a description that read:

Comforting includes verbal or nonverbal communication used to make a distressed individual feel cared for by others. Further, comforting includes verbal messages that are intended to alleviate or lessen the emotional distress of others. Supportive or comforting statements can include validation of one’s points, agreement with the other person’s feelings, statements, or thoughts, or providing positive evidence to ‘back up’ the other person’s statements.

Coders were also instructed that cues of support could include agreeing with the participant’s positive statements, disagreeing if the participant expresses negative feelings about the self, providing evidence of positive traits in the past, and positive touching.
Based on the description and cues, the coders were asked to rate the how supportive the partner was during the conversation on a 5-point Likert scale (1 = not at all supportive or neutral, 5 = extremely supportive). Coder’s ratings were averaged to produce a single score for each interaction ($M = 2.51$, $SD = 1.26$, $\alpha = .93$).
### Table 6-1

*Descriptive Statistics and Paired t-test Results for Cortisol Levels Between the Control and Treatment Groups in Pilot 1*

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>Treatment</th>
<th>Overall t</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Descriptive Statistics:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>.19 (.16)</td>
<td>.17 (.09)</td>
<td>0.31</td>
</tr>
<tr>
<td>Sample 2</td>
<td>.20 (.27)</td>
<td>.14 (.08)</td>
<td>1.00</td>
</tr>
<tr>
<td>Sample 3</td>
<td>.14 (.09)</td>
<td>.14 (.07)</td>
<td>0.01</td>
</tr>
<tr>
<td>Sample 4</td>
<td>.13 (.08)</td>
<td>.14 (.07)</td>
<td>-0.62</td>
</tr>
<tr>
<td><strong>Paired t-test:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline-2</td>
<td>2.68*</td>
<td>1.95†</td>
<td></td>
</tr>
<tr>
<td>Baseline-3</td>
<td>2.60*</td>
<td>1.88†</td>
<td></td>
</tr>
<tr>
<td>Baseline-4</td>
<td>2.38*</td>
<td>1.80†</td>
<td></td>
</tr>
<tr>
<td>Sample 2-3</td>
<td>0.80</td>
<td>1.47</td>
<td></td>
</tr>
<tr>
<td>Sample 2-4</td>
<td>0.39</td>
<td>1.23</td>
<td></td>
</tr>
<tr>
<td>Sample 3-4</td>
<td>-0.30</td>
<td>0.27</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* Cell entries for descriptive statistics are means, parenthetical values are SDs. Cell entries for paired t-test are t values.

† $p < .10$, * $p < .05$, ** $p < .01$. 
Table 6-2

*Descriptive Statistics and Paired t-test Results for Cortisol Levels in Pilot 2*

<table>
<thead>
<tr>
<th>Treatment Group</th>
<th>Descriptive Statistics:</th>
<th>Paired t-test:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baseline</td>
<td>.14 (.07)</td>
</tr>
<tr>
<td></td>
<td>Sample 2</td>
<td>.36 (.25)</td>
</tr>
<tr>
<td></td>
<td>Sample 3</td>
<td>.34 (.28)</td>
</tr>
<tr>
<td></td>
<td>Sample 4</td>
<td>.30 (.24)</td>
</tr>
<tr>
<td></td>
<td>Sample 5</td>
<td>.28 (.21)</td>
</tr>
</tbody>
</table>

Note. Cell entries for descriptive statistics are means, parenthetical values are SDs. Cell entries for paired t-test are t values.

† $p < .10$, * $p < .05$, ** $p < .01$. 
### Table 6-3

**Timing and Descriptive Statistics for Cortisol Samples**

<table>
<thead>
<tr>
<th>Cortisol Sample</th>
<th>Timing of Cortisol</th>
<th>Name of Sample</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cortisol level prior to arriving at lab</td>
<td>Baseline</td>
<td>.13 μg/mL (.06)</td>
</tr>
<tr>
<td>2</td>
<td>Cortisol level during the middle of the stress tasks</td>
<td>Reactivity</td>
<td>.28 μg/mL (.16)</td>
</tr>
<tr>
<td>3</td>
<td>Cortisol level after receiving feedback, but before conversation</td>
<td>Completion</td>
<td>.26 μg/mL (.16)</td>
</tr>
<tr>
<td>4</td>
<td>Cortisol level 20 minutes after conversation</td>
<td>Initial Recovery</td>
<td>.22 μg/mL (.13)</td>
</tr>
<tr>
<td>5</td>
<td>Cortisol level 35 minutes after conversation</td>
<td>Recovery 2</td>
<td>.18 μg/mL (.10)</td>
</tr>
<tr>
<td>6</td>
<td>Cortisol level 50 minutes after conversation</td>
<td>Final Recovery</td>
<td>.15 μg/mL (.09)</td>
</tr>
</tbody>
</table>
Table 6-4

*Reliability and Descriptive Statistics for the Rated Message Features in Study 2*

<table>
<thead>
<tr>
<th>Message Feature</th>
<th>α</th>
<th>Mean (SD)</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explicitness</td>
<td>.96</td>
<td>2.28 (1.16)</td>
<td>1 - 5</td>
</tr>
<tr>
<td>Argument Strength</td>
<td>.94</td>
<td>2.34 (1.10)</td>
<td>1 - 4</td>
</tr>
<tr>
<td>Involvement</td>
<td>.94</td>
<td>3.30 (1.04)</td>
<td>1 - 5</td>
</tr>
<tr>
<td>Dominance</td>
<td>.97</td>
<td>2.32 (1.12)</td>
<td>1 - 5</td>
</tr>
<tr>
<td>Affiliation</td>
<td>.95</td>
<td>2.27 (1.06)</td>
<td>1 - 5</td>
</tr>
</tbody>
</table>
CHAPTER SEVEN

The methods described in Chapter 6 provided the data to test six of the hypotheses advanced in Chapter 3. In particular, I argued that in the context of identity supportive interactions, perceived explicitness (H2), argument strength (H4), involvement (H6), support (H8), and affiliation (H10) are all negatively associated with stress. After describing a series of preliminary analyses, this chapter reports the tests of those six hypotheses.

Results

Preliminary Analyses of Cortisol

A variety of preliminary analyses were conducted to evaluate cortisol levels as the dependent variable for tests of the hypotheses. The salivary cortisol measures were evaluated for sources of error that would affect the validity of the measures. First the distribution of the cortisol measures was assessed for normality and skew. Three participants were extreme outliers in baseline cortisol levels (baseline $M = .14$, $SD = .08$, outlier 1 = .41, outlier 2 = .47, outlier 3 = .50); therefore, those participants’ data were excluded from the analyses. The removal of the outliers created a more normal distribution.

Second, I examined the participants’ behavior one hour before the research session based on the screening question responses. Although participants were prescreened for the use of prescription medication and being diagnosed with depression or an anxiety disorder, 3 individuals reported currently taking prescription medication and 1 participant reported being diagnosed with an anxiety disorder. Because of the possible impact these variables can have on cortisol reactivity, the 4 participants were
also excluded from substantive analyses. With the participants excluded from further analyses, the final sample was \( n = 89 \) (neutral group = 38, supportive group = 51).

Next, I examined sex differences in the cortisol measures. There were no significant sex differences in any of the six cortisol samples, with the exception of the second sample, \( t(87) = 2.10, p < .05 \). The results show that males were, on average, more reactive to the stressful stimuli (\( M = .31, SD = .16 \)) than were females (\( M = .24, SD = .15 \)).

To provide additional insight into the cortisol measures, I evaluated the bivariate correlations among the cortisol measures and self-reported relationship characteristics, as well as perceptions of the stressor tasks. The findings show that self-reported chance of marriage is negatively associated with baseline cortisol levels (\( r = -.32, p < .001 \)), whereas self-reported love is positively associated with reactivity to the stressful tasks (\( r = .21, p < .05 \)). With regards to perceptions of the task, individuals who internally attributed their poor performance experienced greater stress at all time points (baseline \( r = .19, p < .05 \), sample 2 \( r = .37, p < .001 \), sample 3 \( r = .35, p < .001 \), sample 4 \( r = .29, p < .01 \), sample 5 \( r = .26, p < .01 \), sample 6 \( r = .22, p < .05 \)). These findings suggest the need to evaluate internal attribution of performance as a possible covariate in substantive analyses.

Finally, the cortisol values for participants in the pilot study 2 were compared to cortisol values for participants in the main study to assess if engaging in communication with a romantic partner about the stressful tasks produced an increase in stress. Based on the timing of the cortisol samples, any reactivity to the conversation would be indicated by higher sample 4 cortisol levels in the treatment groups. The analysis of variance
results suggest that the act of communicating with a dating partner about the stressful
tasks did not result in increased stress (see Table 7-1).

_Preliminary Analyses of Rated Variables_

Three descriptive analyses were conducted to provide insight into the independent
variables. First, bivariate correlations among the coded variables were assessed (see
Table 7-2). With the exception of dominance, all of the coded variables shared positive
correlations. Dominance was positively associated with affiliation, argument strength,
and involvement. Second, the bivariate correlations among the coded variables and the
cortisol samples were evaluated. The coded variables were not significantly correlated
with any of the cortisol samples, with the exception of affiliation. Affiliation was
positively correlated with the initial recovery sample (4) \( r = .21, p < .05 \) and the final
sample \( r = .22, p < .05 \).

Finally, the relationships among the coded variables and corresponding self-
reported variables were assessed (see Table 7-3). The results speak to the validity of the
coded message features. For example, coded explicitness was positively associated with
self-reported explicitness. Coded argument strength was positively related to self-
reported argument strength. Coded involvement was positively corrected with self-
reported involvement. Coded emotional support was positively associated with self-
reported support. Coded affiliation was positively related to self-reported affiliation. The
only exception from this pattern was dominance, which was not significantly correlated
with any of the self-report measures, with the exception of a positive relationship with
self-reported argument strength.
Substantive Analyses

Analytic Plan

The analyses of the hypotheses focused on how messages features impact recovery after a stressful event. Because multiple cortisol samples were collected over the course of the study as indices of stress reactivity and recovery, quadratic growth modeling was used to plot the trajectories of participants’ stress responses and to predict variance in these stress trajectories based on various features of the partner’s messages during the interaction. The data were analyzed using HLM 6.0 software, which is designed to test multilevel models and accommodate nonindependent or nested data (Bryk & Raudenbush, 1992). One advantage of using this method as opposed to other repeated measure analysis is that it adjusts the cortisol responses for measurement error, thereby providing true cortisol responses for each person and enabling a more precise estimation of effects. The HLM model does this by breaking down the observed cortisol score into the ‘true’ component that measures the underlying latent construct and a random error component.

The multilevel model used to analyze this data included two levels. The level 1 model included three growth parameters, which characterize changes in cortisol trajectories over time. The level 2 model included the predictors used to explain variance in the level 1 parameters.

The level 1 model is represented by the following equation:

\[ Y_{ti} = \pi_{0i} + \pi_{1i} (\text{linear time}) + \pi_{2i} (\text{time})^2 + e_{ti} \]

In the level 1 model, \( Y_{ti} \) is the cortisol score \( t \) for individual \( i \). The remainder of the model specifies three growth parameters, plus random error. The intercept, \( \pi_{0i} \),
represents the predicted cortisol level when time is zero. The linear growth component,
\( \pi_{1i} \), is the linear rate of change in cortisol level at time zero. Because the polynomial
function is used in the model, the \( \pi_{1i} \) or the slope, is dependent on the time point at which
the intercept is centered. Therefore, it represents the instantaneous rate of change at that
time point. In other words, it is the slope of a tangent to the curve at time zero and
indicates how fast the curve is changing at that point. Finally, \( \pi_{2i} \) is the rate of change in
cortisol for the entire period of assessment, also known as the curvature of the growth
trajectory. According to Willett, Singer, and Martin (1998, p. 418), “the sign and size of
the curvature indicates the manner and degree to which the growth curve departs from a
straight line. If its value is 0, there is no curvature – the model is linear. If it is negative,
the curve decelerates over time… the greater the absolute value, the greater the
deceleration. If it is positive… growth would be accelerating over time.”

The unconditional level 2 model is specified as:

\[
\begin{align*}
\pi_{0i} &= \beta_{00} + r_{0i} \\
\pi_{1i} &= \beta_{10} + r_{1i} \\
\pi_{2i} &= \beta_{20} + r_{2i}
\end{align*}
\]

Predictors can be added to any of the equations based on the hypothesis being tested. For
example, \( \beta_{00} \) represents the value of the intercept or the mean cortisol level when time is
zero. A predictor added to this equation (\( \beta_{01} \)) would represent the between-person
differences in the intercept that are attributable to the additional variable. A variable
added to either of the slope equations (\( \pi_{1i} \), \( \pi_{2i} \)) would represent the within-person
differences in the linear growth rate or the growth trajectory that are attributable to the
additional variable.
To begin, I computed the intraclass correlation (ρ) for cortisol, which is the dependent variable in the study. The intraclass correlation calculates the proportion of total variance in the dependent variable that can be attributed to between-persons or within-person variance. An intraclass correlation closer to 1 indicates that most of the variance in the dependent variable is based on between-persons differences, whereas a correlation closer to 0 indicates that most of the variance in the dependent variable is based on within-person differences (Kreft & De Leeuw, 2002; Snijders & Bosker, 2003). The intraclass correlation for cortisol (ρ = .55) suggests that variation in cortisol change is partially a function of between-persons variation and partially due to within-person variation.

The focus of this study is intraindividual recovery in cortisol. Accordingly, the intercept was centered at the completion cortisol sample as a measure of mean cortisol after completing the stressor tasks and receiving feedback, but before the conversation. The message features were not included on the intercept because based on the timing of the sample the message features would not be expected to predict changes in cortisol. To measure change in cortisol over time, the message features were used to predict the instantaneous rate of change at completion (linear slope) and the trajectory of change over the course of the study (quadratic slope).

To control for individual differences in baseline cortisol and reactivity to the tasks, the first and second cortisol sample values were included on the linear and quadratic slopes. Including these variables ensured that differences in recovery were not a function of how stressed an individual was before the study or how much an individual reacted to the stressful tasks. Individual’s internal attribution of performance was also
included on the slopes as an additional possible covariate; however, it did not predict variation in cortisol after controlling for the baseline and reactivity cortisol levels and was therefore, not included in the final models.

Finally, for each model, the intercept and the slopes were estimated as random effects. The following equations represent the model that was used to test the impact of emotional support on cortisol change. Identical models were used for explicitness, argument strength, involvement, dominance, and affiliation by substituting each variable for emotional support.

Level 1:

\[ Y_{ti} = \pi_{0i} + \pi_{1i} \text{ (linear time)} + \pi_{2i} \text{ (time)}^2 + e_{ti} \]

Level 2:

\[ \pi_{0i} = \beta_{00} + r_{0i} \]
\[ \pi_{1i} = \beta_{10} + \beta_{11} \text{ (baseline cortisol)} + \beta_{12} \text{ (cortisol time 1)} + \beta_{13} \text{ (emotional support)} + r_{1i} \]
\[ \pi_{2i} = \beta_{20} + \beta_{21} \text{ (baseline cortisol)} + \beta_{22} \text{ (cortisol time 1)} + \beta_{23} \text{ (emotional support)} + r_{2i} \]

The results from Study 1 suggested that both the participant’s perception of the interaction and the degree of the partner’s involvement interacted with the message features to impact stress reactivity. Based on the results of Study 1, two additional models tested the effect of participant’s perception of support and involvement on the other message features. To see the unique effect that perceptions of support and involvement had, they were included in separate models. The following equations represent the two additional models including coded support. Identical models were used with explicitness,
argument strength, involvement, dominance, and affiliation by substituting for the emotional support variable.

Model 2: Impact of Perceptions of Support

Level 1:

\[ Y_{ti} = \pi_{0i} + \pi_{1i} \text{(linear time)} + \pi_{2i} \text{(time)}^2 + e_{ti} \]

Level 2:

\[ \pi_{0i} = \beta_{00} + r_{0i} \]
\[ \pi_{1i} = \beta_{10} + \beta_{11} \text{(baseline cortisol)} + \beta_{12} \text{(cortisol time 1)} + \beta_{13} \text{(emotional support)} + \beta_{14} \text{(support perception)} + r_{1i} \]
\[ \pi_{2i} = \beta_{20} + \beta_{21} \text{(baseline cortisol)} + \beta_{22} \text{(cortisol time 1)} + \beta_{23} \text{(emotional support)} + \beta_{24} \text{(support perception)} + r_{2i} \]

Model 3: Impact of Partner Involvement

Level 1:

\[ Y_{ti} = \pi_{0i} + \pi_{1i} \text{(linear time)} + \pi_{2i} \text{(time)}^2 + e_{ti} \]

Level 2:

\[ \pi_{0i} = \beta_{00} + r_{0i} \]
\[ \pi_{1i} = \beta_{10} + \beta_{11} \text{(baseline cortisol)} + \beta_{12} \text{(cortisol time 1)} + \beta_{13} \text{(emotional support)} + \beta_{14} \text{(involvement)} + r_{1i} \]
\[ \pi_{2i} = \beta_{20} + \beta_{21} \text{(baseline cortisol)} + \beta_{22} \text{(cortisol time 1)} + \beta_{23} \text{(emotional support)} + \beta_{24} \text{(involvement)} + r_{2i} \]

Hypothesis 2

H2 predicted that explicitness in the context of identity confirming messages, explicitness is negatively associated with stress. The results from Model 1 show that
when controlling for initial cortisol levels and reactivity to the tasks, rated explicitness
did not significantly predict the instantaneous rate of change after the completion of the
tasks; however, explicitness did predict the trajectory of cortisol change over the course
of the study (see Table 7-4). Because explicitness corresponded with a greater decline in
cortisol, H2 is supported.

To assess the additional impact of perceptions of support when explicitness is in
the model, Model 2 included self-reported perceptions of support on both the linear and
quadratic slope. The results showed that when self-reported perception of support was
included in the model, the impact of explicitness was even greater (see Figure 7-1).
Positive perceptions of support and higher levels of explicitness were negatively
associated with the instantaneous rate of change at completion of the tasks and the overall
trajectory of cortisol change. In other words, as positive perceptions of support and
explicitness increase, individuals experience less stress immediately and over the course
of the study.

Finally, in Model 3, explicitness and partner’s involvement were included on the
slopes to assess the impact of explicitness after accounting for variation in cortisol levels
based on involvement. When controlling for involvement, neither explicitness nor
involvement significantly predicted the rate of change in cortisol or the trajectory of
cortisol change.

Hypothesis 4

H4 predicted that argument strength is negatively associated with stress. The
findings indicated argument strength did not have a significant impact on the rate of
change in cortisol upon completion of the tasks, but it did predict the trajectory of cortisol
change (see Table 7-5). Individuals who received supportive messages with greater argument strength showed greater overall recovery from the stressful tasks (see Figure 7-2). Because argument strength had a direct effect on the trajectory of cortisol change, H4 was supported.

In Model 2, both argument strength and perception of support were included on the linear and quadratic slopes. The impact of argument strength on the trajectory of cortisol change remained significant when controlling for positive perceptions of support. In other words, the argument strength of the supportive message explained additional variation in stress recovery beyond stress recovery that was due to perceiving the partner’s support as positive. More specifically, the greatest recovery was achieved when individuals received supportive messages high in argument strength and perceived the support as positive (see Figure 7-3).

Finally, in Model 3, partner involvement and argument strength were included on the slopes. When controlling for involvement in Model 3, argument strength did not significantly predict the rate of change or the trajectory of cortisol change.

**Hypothesis 6**

H6 predicted that involvement is negatively associated with stress. In Model 1, involvement did not significantly predict the rate of change in cortisol upon completion of the task; however involvement did significantly impact the trajectory of cortisol change, providing support for H6 (see Table 7-6). Specifically, higher partner involvement was associated with greater stress recovery over the course of the study.

When self-reported perception of support was included in Model 2, the relationship between involvement and the trajectory of cortisol change remained...
significant (see Figure 7-4). More specifically, the greatest recovery was achieved through the combination of high perceived support and high partner involvement. The lowest level of recovery was experienced when both perceived support and partner involvement were low.

**Hypothesis 8**

H8 predicted that support during an identity affirming interaction is associated with decreased stress reactivity. Contrary to the prediction, emotional support during the interaction was not significantly associated with the rate of change upon completion of the tasks or the trajectory of cortisol change (see Table 7-7).

In Model 2, when perception of positive support was included in the model, coded emotional support was associated with stress recovery over the course of the study. In other words, third party ratings of supportiveness alone did not predict stress recovery; however, the combination of a partner engaging in supportive behavior and the participant perceiving the support as positive did predict greater stress recovery over the course of the study (see Figure 7-5). In Model 3, when involvement was included in the model, neither involvement nor support was related to changes in cortisol.

**Hypothesis 10**

Finally, H10 predicted that affiliation during an identity affirming interaction is associated with decreased stress reactivity. The hypothesis was not supported by Model 1. (see Table 7-8). When perception of support was included in Model 2, affiliation was still not significantly related to the rate of change or trajectory of cortisol change. In other words, affiliation did not have a direct affect on change in cortisol and the association
between affiliation and cortisol change remained nonsignificant when the participant’s perception of support was included in the model.

Surprisingly, when involvement was included in the model, involvement predicted greater cortisol recovery over time, but affiliation predicted less cortisol recovery over time. When partners showed high affiliation and low involvement stress recovery was the lowest, whereas when partners were not affiliative, but highly involved stress recovery was the greatest (see Figure 7-6).

Discussion

The goal of this chapter was to examine how message features in an identity affirming interaction with a dating partner impact biological stress reactivity. More specifically, I predicted that in the context of identity affirming interactions, rated explicitness (H2), argument strength (H4), involvement (H6) support (H8) and affiliation (H10) are associated with greater stress recovery and dominance is associated with less stress recovery. To test the hypotheses, participants engaged in a series of stressful tasks and received negative performance feedback. After receiving the feedback, participants engaged in a conversation about their performance with a dating partner. Independent coders watched the interactions and rated the degree of each message feature within the interaction, which became the independent variables in the substantive analyses.

The results suggest that both observer ratings of the message features and the participant’s perception of support during the interaction impact stress recovery after a stressful event. Some message features were not dependent on the participant’s perception of support to impact stress recovery. For example, explicitness, argument strength, and involvement all predicted greater stress recovery over time. Other features
of the interaction, such as observer ratings of support and affiliation only predicted cortisol recovery in combination with the degree of partner involvement or the participant’s perception of support. More specifically, observer ratings of support did not significantly predict cortisol recovery; however, when observer ratings of support and participants’ perception of support were included together in the model, both variables predicted greater cortisol recovery. Similarly, affiliation did not have a direct effect on cortisol recovery; however, when a partner’s involvement was included in the model, affiliation predicted less cortisol recovery.

**Implications**

This study expands on our theoretical understanding of support in multiple ways. First, the results highlight the impact that supportive messages can have on physiological stress. Emotional support has been defined as verbal messages that are intended to alleviate or lessen the emotional distress of others (Burleson, 1985). To examine how messages can reduce distress, previous research on emotional support has exclusively focused on self-reported measures of perceived support effectiveness and emotional improvement (for example see Burleson & Mortenson, 2003; Holmstrom, Burleson, & Jones, 2005; Jones & Burleson, 2003). The results of this study suggest that supportive messages can also have a physiological impact on individuals. Thus, supportive messages can impact both perceptions of distress and biological reactions to distress.

The findings also expand our understanding of features that are associated with effective support. Previous research has focused on person-centered messages, or messages that validate, legitimate, and encourage exploration of a distressed individual’s feelings, as the most effective way to decrease an individual’s distress. Although person-
centered messages are perceived as the most effective type of supportive message, this form of support requires greater comforting skill to provide the sophisticated messages. The results of this study suggest that a variety of mechanisms that predict stress recovery after a stressful event. For example, a partner’s involvement in the supportive interaction increases stress recovery; when discussing a stressful event with a dating partner, cues that convey interest and engagement help reduce stress. Similarly, supportive messages that are communicated directly or with evidence to back up the supporter’s statements also increase stress recovery. Thus, the results suggest that sophisticated supportive messages may not be required to reduce physiological stress.

The results also underscore how perceptions of support within an interaction can change the impact of message features. Some of the message features examined in the study did not have a direct effect on stress recovery, but did impact recovery when participants perceived the interaction to be supportive. For example, observer ratings of emotional support did not directly reduce stress; however, when supportive behaviors were perceived as supportive, participants experienced the greatest stress recovery. Even when observers rated supportive behaviors low, if participants perceived their partner was supportive, they experienced greater stress recovery than when support was not perceived. Other message features, such as explicitness and argument strength, were not dependent on the receiver’s perception of the interaction. Although speculative, one explanation for this difference may be the clarity of the supportive message; supportive messages that are conveyed explicitly and with greater argument strength are less ambiguous. Thus, an individual’s perception of the interaction may not provide additional predictive power.
The results also have implications for understanding the health of individuals in relationships. The inability to resolve stress is associated with negative health consequences, including depression and anxiety, heart disorder, obesity, cancer, stoke, and immune disorders due to the continual high levels of cortisol (Sapolsky, 1998). Previous research has consistently shown the social support can reduce stress, leading to positive health outcomes. For example, social support is associated with positive effects on cardiovascular health, endocrine function, and healthy immune function (Uchino, Cacioppo, & Kiecolt-Glaser, 1996). Moreover, Hanson, Isacsson, Janzon, and Lindell, (1989) found that emotional support was the only form of support of eight support measures that was significantly associated with mortality.

Although these studies document an association between social support and stress reduction, they do not identify the mechanism through which support reduce stress. Although speculative, the results of this study suggest that features of supportive messages may be one mechanism through which support leads to positive health outcomes. Support can be conveyed through multiple means including verbal and nonverbal communication. Based on the results of this study, the way that people communicate support impacts the receiver on a biological level. Given that excessive cortisol is linked with negative health outcomes, supportive messages that can reduce cortisol should also improve an individual’s mental and physical health.

**Strengths**

The present study contributes to the methodology used to examine supportive messages in multiple ways. First, the procedure utilized an interaction with a dating partner immediately following a stressful event to assess the impact of supportive
messages, rather than asking participants to respond to a hypothetical situation or an interaction with a confederate. Second, effectiveness of support was measured using both self-reported perceptions of support and physiological indicators of stress. The inclusion of biological measures provides an objective measure of stress reduction. Finally, the procedures allowed for the examination of basic message features and the influence that manipulating them within an interaction can have on physiological stress. This is the first study that has examined how characteristics of communication can impact individuals on a biological level.

Another strength of the study was the use of growth curve modeling to measure changes in cortisol over time. Growth modeling of the entire trajectory of stress provided critical insight into the impact of supportive messages on stress recovery beyond difference scores. The use of hierarchical models accounted for dependence in the cortisol scores and allowed for the examination of changes within individuals. Finally, this statistical technique adjusts the cortisol responses for measurement error by parsing the within and between-person variance, providing true cortisol responses for each person and enabling a more precise estimation of effects.

Limitations

The conclusions are contextualized by the study’s weaknesses. One weakness of the study is its exclusive focus on college dating relationships, which limits the ability to generalize to other populations. It is likely that college students would not react to the stressful tasks in the same manner or interpret the message features conveyed during the supportive interaction in the same manner as married couples. Future research should
examine how message features relate to physiological stress recovery in other relationship types.

A second limitation is imposed by the research design and the inherent individual differences in stress reactivity. Although the stress induced through completing the tasks may reflect stress induced through every day events, the study did not capture stress reactivity due to naturally occurring events in participant’s lives. Moreover, because stress reactivity is dependent on an individual’s perception of threat, people varied greatly in the intensity of reactivity to the tasks. By statistically controlling for variation in both initial cortisol levels and cortisol reactivity to the tasks, external validity was further compromised. Future studies should examine the ways in which individual differences impact the effect of support on physiological stress recovery.

In summary, the results for Study 2 show partial support for the hypotheses. Although none of the message features significantly influenced the instantaneous rate of change upon completion of the tasks, explicitness (H2), argument strength (H4), and involvement (H6) all predicted cortisol change over the course of the study. Individuals who received supportive messages higher in explicitness, argument strength, and involvement experienced greater stress recovery by the end of the study. When controlling for the effect of the participant’s perceptions of support during the interaction, observer ratings of support were positively associated with stress recovery over the course of the study (H8). Finally, contrary to H10, when controlling for partner’s involvement, affiliation predicted less stress recovery over the course of the study. Within the limitations of the study, the results lay the groundwork for future research on the impact of supportive messages on physiological stress recovery.
### Table 7-1

**Descriptive Statistics and ANOVA Results for Cortisol Levels Between the Control and Communication Groups**

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>Neutral</th>
<th>Supportive</th>
<th>Overall F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>.13 (.06)</td>
<td>.14 (.07)</td>
<td>.12 (.04)</td>
<td>1.64</td>
</tr>
<tr>
<td>Sample 2</td>
<td>.37 (.21)</td>
<td>.30 (.19)</td>
<td>.25 (.12)</td>
<td>4.39*</td>
</tr>
<tr>
<td>Sample 3</td>
<td>.34 (.23)</td>
<td>.28 (.17)</td>
<td>.24 (.15)</td>
<td>2.44</td>
</tr>
<tr>
<td>Sample 4</td>
<td>.29 (.20)</td>
<td>.23 (.13)</td>
<td>.21 (.14)</td>
<td>2.55</td>
</tr>
<tr>
<td>Sample 5</td>
<td>.23 (.14)</td>
<td>.19 (.09)</td>
<td>.17 (.11)</td>
<td>2.31</td>
</tr>
<tr>
<td>Sample 6</td>
<td>.19 (.10)</td>
<td>.16 (.07)</td>
<td>.15 (.09)</td>
<td>2.15</td>
</tr>
</tbody>
</table>

*Note.* The control group includes participants from pilot study 2 who did not engage in communication with their dating partner after completing the stressful tasks. The neutral and supportive groups both engaged in communication with their partners about their performance on the tasks. Cell entries for groups are mean cortisol, parenthetical values are SDs.

* *p < .05.*
### Table 7-2

*Bivariate Correlations among Rated Message Features*

<table>
<thead>
<tr>
<th>Variable</th>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>V4</th>
<th>V5</th>
<th>V6</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1: Explicitness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V2: Argument Strength</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V3: Involvement</td>
<td>.64***</td>
<td>.71***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V4: Emotional Support</td>
<td>.88***</td>
<td>.81***</td>
<td>.73***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V5: Dominance</td>
<td>.07</td>
<td>.31**</td>
<td>.38***</td>
<td>.02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V6: Affiliation</td>
<td>.44***</td>
<td>.33***</td>
<td>.50***</td>
<td>.52***</td>
<td>.19*</td>
<td></td>
</tr>
</tbody>
</table>

* p < .05, **p < .01, ***p < .001.
Table 7-3

_Correlations among Rated Message Features and Self-report Measures_

<table>
<thead>
<tr>
<th>Self-report measure:</th>
<th>Explicitness</th>
<th>Argument Strength</th>
<th>Involvement</th>
<th>Emotional Support</th>
<th>Dominance</th>
<th>Affiliation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explicitness</td>
<td>.63***</td>
<td>.66***</td>
<td>.41***</td>
<td>.37***</td>
<td>.22*</td>
<td>.23*</td>
</tr>
<tr>
<td>Argument Strength</td>
<td>.53***</td>
<td>.67***</td>
<td>.37***</td>
<td>.27**</td>
<td>.11</td>
<td>.27**</td>
</tr>
<tr>
<td>Involvement</td>
<td>.54***</td>
<td>.63***</td>
<td>.50***</td>
<td>.36***</td>
<td>.19*</td>
<td>.32**</td>
</tr>
<tr>
<td>Emotional Support</td>
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<td>.74***</td>
<td>.50***</td>
<td>.44***</td>
<td>.24*</td>
<td>.36***</td>
</tr>
<tr>
<td>Dominance</td>
<td>.03</td>
<td>.19*</td>
<td>.03</td>
<td>.04</td>
<td>-.07</td>
<td>-.05</td>
</tr>
<tr>
<td>Affiliation</td>
<td>.46***</td>
<td>.46***</td>
<td>.39***</td>
<td>.40***</td>
<td>.04</td>
<td>.40***</td>
</tr>
</tbody>
</table>

* _p < .05, **_p < .01, ***_p < .001.
Table 7-4

Explicitness, Perceptions of Support, and Partner Involvement Predicting Rate of Change and Trajectory of Cortisol

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cortisol at completion</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>.2534***</td>
<td>.2534***</td>
<td>.2534***</td>
</tr>
<tr>
<td><strong>Rate of change at completion</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>.0785***</td>
<td>.0844***</td>
<td>.0746***</td>
</tr>
<tr>
<td>Cortisol 1</td>
<td>-.2317***</td>
<td>-.2413***</td>
<td>-.2316***</td>
</tr>
<tr>
<td>Cortisol 2</td>
<td>-.1281***</td>
<td>-.1216***</td>
<td>-.1267***</td>
</tr>
<tr>
<td>Explicitness</td>
<td>-.0068</td>
<td>-.0016*</td>
<td>-.0018†</td>
</tr>
<tr>
<td>Perception of Support</td>
<td>-0.019*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Involvement</td>
<td></td>
<td></td>
<td>.0018</td>
</tr>
<tr>
<td><strong>Trajectory of cortisol change</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>-.0216***</td>
<td>-.0198***</td>
<td>-.0203***</td>
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<tr>
<td>Cortisol 1</td>
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<td>.0811***</td>
<td>.0840***</td>
</tr>
<tr>
<td>Cortisol 2</td>
<td>-.0212***</td>
<td>-.0190***</td>
<td>-.0220***</td>
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<tr>
<td>Explicitness</td>
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<td>-.0078**</td>
<td>-.0016</td>
</tr>
<tr>
<td>Perception of Support</td>
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<td></td>
</tr>
<tr>
<td>Involvement</td>
<td></td>
<td></td>
<td>-.0056</td>
</tr>
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</table>

*Note.* Model 1 includes only explicitness; Model 2 includes explicitness and perceptions of support; Model 3 includes explicitness and partner involvement, but not perceptions of support. The dependent variable in each model is cortisol. The cell entry for the intercept
at completion represents the cortisol level for person $i$ for the completion sample. The cell entries in the rate of change (linear slope) and trajectory of cortisol change (quadratic slope) categories represent within-person change in cortisol. Cell entries are model coefficients.

$^\dagger p < .10, \ast p < .05, \ast\ast p < .01, \ast\ast\ast p < .001.$
Table 7-5

*Argument Strength, Perceptions of Support, and Partner Involvement Predicting Rate of Change and Trajectory of Cortisol*

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cortisol at completion</strong></td>
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<td></td>
</tr>
<tr>
<td>Intercept</td>
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<td>.2534***</td>
<td>.2534***</td>
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<tr>
<td><strong>Rate of change at completion</strong></td>
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<td></td>
</tr>
<tr>
<td>Intercept</td>
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<td>.0828***</td>
<td>.0744***</td>
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<tr>
<td>Cortisol 1</td>
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<td>-.2345***</td>
<td>-.2258***</td>
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<td>Cortisol 2</td>
<td>-.1290***</td>
<td>-.1247***</td>
<td>-.1294***</td>
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<tr>
<td>Argument Strength</td>
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<td>-.0019</td>
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<td>Perception of Support</td>
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<td></td>
</tr>
<tr>
<td>Involvement</td>
<td></td>
<td>.0020</td>
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</tr>
<tr>
<td><strong>Trajectory of cortisol change</strong></td>
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<td></td>
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<tr>
<td>Intercept</td>
<td>-.0208***</td>
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<td>-.0204***</td>
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<td>.0846***</td>
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<td>Cortisol 2</td>
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<td>-.0203***</td>
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<td>Argument Strength</td>
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<tr>
<td>Involvement</td>
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<td>-.0020</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* Model 1 includes only argument strength; Model 2 includes argument strength and perceptions of support; Model 3 includes argument strength and partner involvement, but not perceptions of support. The dependent variable in each model is cortisol. The cell
entry for the intercept at completion represents the cortisol level for person \( i \) for the completion sample. The cell entries in the rate of change (linear slope) and trajectory of cortisol change (quadratic slope) categories represent within-person change in cortisol. Cell entries are model coefficients.

* \( p < .05 \), **\( p < .01 \), ***\( p < .001 \).
Table 7-6

*Involvement and Perceptions of Support Predicting Rate of Change and Trajectory of Cortisol*

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cortisol at completion</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
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<td>.2534***</td>
</tr>
<tr>
<td><strong>Rate of change at completion</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
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<td>.0797***</td>
</tr>
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<tr>
<td>Cortisol 2</td>
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<td>-.1247***</td>
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<tr>
<td>Involvement</td>
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<td>-.0014</td>
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<tr>
<td>Perception of Support</td>
<td>-.0014 †</td>
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<tr>
<td><strong>Trajectory of cortisol change</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>-.0203***</td>
<td>-.0182***</td>
</tr>
<tr>
<td>Cortisol 1</td>
<td>.0846***</td>
<td>.0822***</td>
</tr>
<tr>
<td>Cortisol 2</td>
<td>-.0222***</td>
<td>-.0202***</td>
</tr>
<tr>
<td>Involvement</td>
<td>-.0068*</td>
<td>-.0096**</td>
</tr>
<tr>
<td>Perception of Support</td>
<td></td>
<td>-.0060*</td>
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*Note.* Model 1 includes only involvement; Model 2 includes involvement and perceptions of support. The dependent variable in each model is cortisol. The cell entry for the intercept at completion represents the cortisol level for person *i* for the completion sample. The cell entries in the rate of change (linear slope) and trajectory of cortisol
change (quadratic slope) categories represent within-person change in cortisol. Cell entries are model coefficients.

\( ^{+} p < .10, * p < .05, **p < .01, ***p < .001. \)
Table 7-7

*Emotional Support, Perceptions of Support, and Partner Involvement Predicting Rate of Change and Trajectory of Cortisol*

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cortisol at completion</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>.2534***</td>
<td>.2534***</td>
<td>.2534***</td>
</tr>
<tr>
<td><strong>Rate of change at completion</strong></td>
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<tr>
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*Note.* Model 1 includes only coded emotional support; Model 2 includes coded emotional support and self-reported perceptions of support; Model 3 includes coded emotional support and partner involvement, but not self-reported perceptions of support. The dependent variable in each model is cortisol. The cell entry for the intercept at completion represents the cortisol level for person *i* for the completion sample. The cell
entries in the rate of change (linear slope) and trajectory of cortisol change (quadratic slope) categories represent within-person change in cortisol. Cell entries are model coefficients.

† $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$. 
Table 7-8

*Affiliation, Perceptions of Support, and Partner Involvement Predicting Rate of Change and Trajectory of Cortisol*

<table>
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<tr>
<th></th>
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</tbody>
</table>

*Note.* Model 1 includes only affiliation; Model 2 includes affiliation and perceptions of support; Model 3 includes affiliation and partner involvement, but not perceptions of support. The dependent variable in each model is cortisol. The cell entry for the intercept
at completion represents the cortisol level for person $i$ for the completion sample. The cell entries in the rate of change (linear slope) and trajectory of cortisol change (quadratic slope) categories represent within-person change in cortisol. Cell entries are model coefficients.

* $p < .05$, **$p < .01$, ***$p < .001$. 
Figure 7-1. Graph of the Impact of Perceived Support and Explicitness on Cortisol Change Over Time
Figure 7-2. Graph of the Impact of Argument Strength on Cortisol Change Over Time
Figure 7-3. Graph of the Impact of Perceived Support and Argument Strength on Change Over Time
Figure 7-4. Graph of Perceived Support and Partner Involvement Predicting Cortisol Changes Over Time
Figure 7-5. Graph of the Impact of Perceived Support and Coded Support on Cortisol Change Over Time
Figure 7-6. Graph of the Impact of Partner Involvement and Affiliation on Cortisol Change Over Time
CHAPTER EIGHT

In today’s society, the impact of stress on physical and psychological health has become a major concern. McEwen (1999) estimated the cost of stress and stress-related disorders to be approximately $200 billion a year in the United States. The inability to resolve stress is associated with negative health consequences, including depression and anxiety, heart disorder, obesity, cancer, stroke, changes in immune function, and increased susceptibility to and severity of inflammatory and infectious diseases (Kiecolt-Glaser, Glaser, Gravenstein, Malarkey, & Sheridan, 1996; Padget & Glaser, 2003; Sapolsky, 1998).

Research in variety of disciplines has examined traits and behaviors that are associated with stress reduction. For example, control over one’s environment or the perception of control has been shown to reduce stress (Langer & Rodin, 1976). Other research has found that an individual’s outlook on life can alter stress reactions; whereas optimists try to alter the stressor and perceptions of the situation, pessimists obsess over the stressor, feel less social support, and ruminate over life events that are not in their control (Everson et al., 1996; Maruta et al., 2000; Segerstrom et al., 1998). Furthermore, extant research has documented the positive relationship between social support and stress reduction. While a lack of support can become a source of stress (Dunkel-Schetter & Wortman, 1981), the receipt of support is associated with less stress, increased ability to cope with stressors, and positive effects on health and well-being including cardiovascular health, endocrine function, and healthy immune function (Dunkel-Schetter & Worman, 1981; Hanson, Isacsson, Janzon, & Lindell, 1989; Helgeson & Cohen, 1996; Taylor, 1999; Uchino, Cacioppo, & Kiecolt-Glaser, 1996).
Although stress is often associated with social experiences, scholars have only begun to understand the role that communication plays in creating or reducing stress. For example, interpersonal conflict is one potentially unpleasant communicative experience that can be a source of distress. Not only is conflict distressing, but it has been empirically linked to an increase in stress hormones (Laurent & Powers, 2006; Powers, Pietromonaco, Gunlicks, & Sayer, 2006). In contrast, expressing affection can decrease overall stress levels and help individuals recover from stress more quickly (Floyd et al., 2005a; Floyd et al., 2005b). While this work connects communication to stress, evidence in support of these general patterns is not complemented by a more precise understanding of the message features that exacerbate or alleviate stress.

To address the limitations of previous research, the goal of this dissertation was to examine the mechanisms through which communication impacts physiological stress. More specifically, I examined the role that explicitness, argument strength, involvement, dominance, and affiliation play in the exacerbation or attenuation of stress. Although these message features can be applied to any communication context, this dissertation focuses on hurtful or identity disconfirming and supportive messages as situations that can initiate physiological stress or aid in recovery after a stressful event.

I drew from literature on illocutionary force to explain how various features of a message could influence physiological stress. A locutionary act or speech act refers to the performance of an action through speech, such as examples include, asking or answering a question, giving information or a warning, making an appeal, or giving a description (Austin, 1962) and the function it serves is the illocutionary force (Marmaridou, 2000). The illocutionary force, or strength of the message, is influenced by message type, the
strength of the content, and the sincerity of the speaker (Dascal, 2003). Messages with greater illocutionary force convey more commitment in attempts to get the message receiver to do or believe something (Vanderveken, 1985). The impact of illocutionary force is also partially dependent on the context in which the message is stated. For example, expressing hurtful messages with greater force would likely lead to negative outcomes, whereas expressing supportive messages with greater force would lead to more positive outcomes.

Based on this logic, I developed specific predictions about message features that may convey greater force, therefore, impacting physiological stress. Specifically, I predicted that in the context of identity disconfirming messages, explicitness would be positively associated with stress (H1); however, in the context of identity confirming messages explicitness would be negatively associated with stress (H2). Similarly, I posited that in the context of identity disconfirming messages, argument strength would be positively associated with stress (H3), whereas argument strength would be negatively associated with stress in the context of identity confirming messages (H4). Finally, I predicted that involvement would be positively related to stress in the context of identity disconfirming messages (H5), but would be negatively associated with stress in the context of identity affirming messages (H6).

I also considered how perceptions of an interaction with a dating partner could vary in illocutionary force, leading to changes in physiological stress. Specifically, I predicted that the perception of hurt during an interaction would be associated with increased stress reactivity (H7) and that the perception of support during an interaction would be associated with decreased stress reactivity (H8). Because dominance conveys a
sense of relational control and power, I posited that the perception of dominance during an interaction would be associated with increased stress reactivity, regardless of the context of the message (H9). Finally, I forwarded affiliation as a characteristic of an interaction that would lead to greater stress recovery after a stressful event (H10).

Summary of Methods and Findings

To assess the impact of message features on both stress reactivity and stress recovery, I conducted two studies that used similar methods, but varied in the context of the interaction. Both studies included an interaction between college aged students in romantic dating relationships. In Study 1, the focus was on the degree to which hurtful messages initiated physiological stress. In Study 2, the goal was to examine how features of supportive messages vary in ways that facilitate recovery after a stressful event. In the following sections, I review the procedures and results of each study in turn.

Study 1

In Study 1, dyads engaged in two 5-minute conversations about two of the participant’s core traits or values. The dating partner was a confederate and was coached to be supportive in the first conversation and unsupportive or hurtful in the second conversation. Salivary cortisol was collected from the participant upon arrival at the session and twice after the conversation to assess increases in stress due to the interaction. The partner’s messages were coded for the degree of explicitness, argument strength, involvement, hurtfulness, and dominance during the hurtful conversation.

The results of Study 1 provided partial support for hypotheses 1, 3, 5, 7, and 9. Although explicitness, argument strength, involvement, hurtfulness, and dominance did not directly predict increases in physiological stress, there were significant interactions
for each message feature. Explicitness was negatively related to increases in stress when self-reported hurt was high and when partner involvement was low, providing partial support for H1. Argument strength increased stress reactivity to the hurtful messages when self-reported hurt was low or moderate and when partner involvement was moderate or high, providing partial support for H3. The relationship between involvement and stress predicted in H5 was not supported. Observer ratings of hurt were positively associated with increases with stress when self-reported hurt was low and was negatively associated with increases in stress when self-reported hurt was high (H7). Finally, H9 was partially supported through a significant interaction between dominance, partner involvement, and self-reported hurt; dominance predicted increases in stress when self-reported hurt was low and partner involvement was moderate or high and when self-reported hurt was moderate and partner involvement was high.

Although the variation in features of hurtful messages did not directly predict increases in stress as a result of the interaction, the results highlighted the important role that an individual’s perception of the conversation has on stress reactivity. In general, when individuals perceived the interaction as highly hurtful, the message features did not account for additional variance in stress reactivity. In contrast, when individuals did not perceive the interaction to be as hurtful, the combination of partner involvement and the message features significantly increased physiological stress reactivity to the messages.

Study 2

In Study 2, participants engaged in a series of three stressful tasks and received negative performance feedback following completion of the tasks. Then, the participants discussed their feelings about the tasks and their feedback with their dating partner.
Salivary cortisol was collected from the participant upon arrival at the session and five times after the conversation to assess stress reactivity to the tasks and stress recovery after the conversation. The partner’s messages were coded for the degree of explicitness, argument strength, involvement, supportiveness, dominance, and affiliation during the interaction.

The results of the study provided support for hypotheses 2, 4, and 6, but not hypotheses 8, 9, and 10. Explicitness (H2), argument strength (H4), and involvement (H6) had a direct effect on the trajectory of cortisol change, such that the message features all significantly increased stress recovery over the course of the study. In other words, participants who received supportive messages that conveyed greater explicitness, argument strength, or involvement experienced less stress by the end of the study than participants who received messages that were low in those message features. Observer ratings of support (H8), dominance (H9), and affiliation (H10) did not significantly impact the rate of change in cortisol upon completion of the tasks or the trajectory of cortisol change over the course of the study.

Implications

The findings of this dissertation highlight previously unknown information on the physiological outcomes that are associated with hurtful and supportive messages. With respect to each study, I explored the implications of the results within the given context and the strengths and limitations of each study. Here, I focus on issues that transcend the contexts of hurt and support. In the following sections, I consider the implications for illocutionary force, the links between communication and stress, and the practical implications of the findings.
Evidence of Illocutionary Force

Illocutionary force is a function of a speech act that varies in the strength of the message. By manipulating various features of a message, individuals can convey different levels of force, making the goal of the speaker more or less clear to the receiver. Illocutionary force can also impact the receiver’s biological response to the message. Mey (1993) argued that the processing of any speech act is accompanied by a biological response. Thus, illocutionary force provides a theoretical framework for understanding the impact of messages on physiology.

The results of this dissertation provide inconsistent evidence for the link between illocutionary force and physiological stress. The results of Study 2 suggest that message features can have a direct impact on the experience of stress. In the context of supportive messages, observer ratings of explicitness, argument strength, and involvement predicted greater stress recovery after a stressful event. I theorized that the explanation for the impact of these message features on biological stress is illocutionary force. Supportive messages that are conveyed directly and with evidence to back up the supporter’s point of view show greater sincerity and commitment to the message, therefore, increasing illocutionary force. Similarly, messages that communicate liking and interest in the distressed individual should strengthen the goal of the message.

In contrast, the results of Study 1 support the claim that illocutionary force is dependent on the situational and interactive context in which the message is stated (Searle, 1979). In the context of identity disconfirming or hurtful messages, dominance and argument strength only influenced physiological stress reactivity to the message when self-reported hurt was low or moderate and the partner’s involvement was high.
The findings suggest that the illocutionary force of messages is dependent not only upon the strength of the message, but also on the receiver’s perception of the message and the nonverbal behaviors that accompany the message.

Taken together, the results suggest that illocutionary force may be more important when the outcomes associated with the messages are dependent on interactions that develop over time. Generally, hurtful messages don’t need to evolve over the course of an interaction to be hurtful; one hurtful message can cause negative outcomes. Consistent with this claim, previous research has focused on the impact of hurtful utterances (for examples see Leary et al., 1999; Vangelisti, 2001). In this context, the illocutionary force of a single message may not be an important predictor of stress. In contrast, emotional support is a process which unfolds over the course of one or many interactions; one supportive message is not likely to reduce an individual’s distress, but multiple messages that reinforce positive characteristics of an individual can. Because a single supportive statement is likely not enough to reduce stress, the qualities of illocutionary force over the course of an interaction may be more relevant to understanding stress responses and support. Thus, the focus on global measures of the message features during an interaction may have been more suitable to studying supportive messages than hurtful messages. If Study 1 had examined the message features of a single hurtful utterance, the results may have better explained the role of force in physiological responses to hurtful messages.

The results of this dissertation extend the body of work on illocutionary force beyond the study of pragmatics to better understand the impact that force can have on individual’s reactions to a conversation. Although Mey (1993) proposed that force could
impact physiological responses, this dissertation is the only set of studies that I know of that has examined the claim.

Communication and Stress

This dissertation emphasizes the multitude of ways in which interpersonal communication can impact stress responses in the body. In Chapter 2, I proposed that communication could impact physiological stress because message can act as a stimulus for stress by increasing perceptions of threat or alleviate stress by assisting in adaptive reappraisals of stressful situations. In general, the results from both studies support this claim. Hurtful messages that undermine or devalue an individual’s identity are accompanied by increases in physiological stress. Supportive messages can facilitate physiological stress recovery by expressing positive feelings, showing interest and liking, and providing evidence of positive traits of the distressed individual.

The results from both studies highlight the importance of an individual’s perception of an interaction. In Study 1, the impact of the message features was only evident when individuals’ perceptions of the interaction were taken into account. Specifically, an individual’s stress reactivity to the hurtful message depended on the degree to which the individual perceived the message as hurtful and their partner as being involved. Surprisingly, when individual’s perceived their partner’s message as highly hurtful, explicitness, argument strength, and coded hurt were all associated with less stress reactivity to the message. Although speculative, the results may indicate that when an individual is unsure about how to interpret a message the message features provide clarification of the sender’s opinions, leading to increased stress.
In Study 2, the impact of the message features was more significant when individuals’ perception of supportiveness was accounted for. For example, explicitness was did not directly predict the rate of change of cortisol upon completion of the tasks; however, the positive effect of explicit messages was evident when perception of support was included in the model. Similarly, the impact of explicitness, argument strength, involvement, and coded support on the trajectory of cortisol change over the course of the study was accentuated when self-reported perceptions of support were included in the model. Taken together, the results highlight the interplay between observable features of a message and the perception of the receiver in the experience of stress.

This dissertation also contributed to existing knowledge about the role of involvement in individual’s reactions to interactions. According to relational framing theory, expressions of involvement function as an intensifier of relational messages such as affiliation and dominance (Dillard, Solomon, & Samp, 1996). The results of this dissertation provide support for this claim. In the context of hurtful messages, involvement strengthened the impact of argument strength and dominance on stress reactivity. In the context of supportive messages, when a partner’s involvement was accounted for, dominance is associated with less stress recovery. Surprisingly, in Study 2, when involvement was included in the model, affiliation was negatively associated with stress recovery. In previous research, immediacy that is interpreted as unwarranted for the situation is associated with feeling offended or controlled (Rester & Edwards, 2007). Although speculative, the combination of involvement and affiliation cues may have been perceived as excessive or unexpected given the situation, leading to increased stress.
Finally, the results also suggest some of the ways in which patterns of communication in relationships may impact individuals physiologically. The inability to recover from stress can lead to allostatic load or ‘wear and tear’ on the body. From a communication perspective, interpersonal messages within a romantic relationship could create a cumulative stressor that would increase an individual’s allostatic load or facilitate the stress recovery process therefore, decreasing allostatic load. If individuals remain in a relationship in which their partner is routinely hurtful, the pattern of communication could have serious biological consequences. Future research should focus on how communication over the course of a relationship impacts individuals physiologically.

Identity, Communication, and Physiology

The procedures utilized in both studies provide some insight into the associations among identity, communication, and stress. In Study 1, the focus of the hurtful conversation was the participants’ self-reported core traits or values. In Study 2, the performance feedback on the stressful tasks commented negatively on a variety of personal traits. The results of the studies suggest that identity disconfirming messages can initiate a physiological stress response; however, the magnitude of the response varies between individuals. One possible explanation for this may be the centrality of the traits to a person’s identity. In Study 1, some participants could list core traits more easily than others, suggesting that some participants are more aware of traits or values that are important to their identity. Other participants needed prompting to identify aspects of their identity. It is likely that when messages threaten core aspects of an individual’s identity a greater stress response would be initiated. If core components of an individual’s
identity are not salient to them, the messages intended to discount or disconfirm identity may not initiate as much of a stress response.

The results also highlight the possible connections between identity uncertainty and stress responses. Individuals who have a strong sense of who they are may not be as reactive to messages that threaten their identity. On the other hand, individuals who are uncertain about their identity or abilities may look to others for validation of their identity and may be more reactive when given negative feedback about personal traits. Future research should examine the how identity uncertainty impacts the relationship between messages and the stress response.

An additional question that arises from the dissertation is the role of identity in the effectiveness of support attempts. In Study 2, some individuals’ stress reactivity increased after receiving negative feedback about their personality, whereas others’ stress did not increase significantly. The results suggest that when the feedback disconfirmed aspects of the individual’s identity that were salient to them, their stress increased; however the study did not examine whether the salience of the feedback was related to the effectiveness of partner’s attempts to reduce the participant’s distress. Future research could examine how the identity relevance of a stressor impacts support provider’s ability to reduce physiological stress.

Overall, the results highlight the connections between physiology and identity. Our identity can shape how we respond, both behaviorally and physiologically to a variety of everyday situations. Some individuals are more hurt and have a larger physiological response to identity disconfirming messages. Aspects of an individual’s identity can influence if they perceive a message or situation as a threat or a challenge.
and their appraisals of coping. Personality traits can impact an individual’s resilience to stress. At the same time, it is possible that physiological responses to situations can influence identity over time. For example, many students become physiologically stressed before giving an in-class speech; the physiological arousal can inhibit the individual’s ability to perform well on the speech. If this occurs repeatedly over time, the individual may come to think of him or herself as a poor public speaker. Although the stretch from communication apprehension to hurtful and supportive messages may be far, it is possible that physiology could drive individuals to behave or react in certain ways that would reinforce or change aspects of their identity.

Practical Implications

Beyond the theoretical contributions of this dissertation, the results also have implications for health and effective support. Given the prevalence of hurtful messages in romantic relationships, the observed associations among message features, perceptions of an interaction, and cortisol reactivity may provide insight into the biological consequences of hurt. In Study 1, the message features did not predict stability in cortisol change, but they did predict the intensity of cortisol increases. Although a substantive amount of research has shown that the sustained increase of stress hormones leads to negative physical and mental health consequences (Bolger et al., 1989; Holmes & Masuda, 1974; McGonagle & Kessler, 1990; Stone et al., 1987), a meta-analysis of studies that analyzed the relationship between stress and the immune system suggests that even acute, brief stressors can impact the immune system (Segerstrom & Miller, 2004). Although speculative, frequent experiences of hurt could act as a cumulative stressor on an individual, leading to negative health outcomes. In contrast, the results of Study 2
suggest that features of supportive messages may be a mechanism through which support leads to positive health outcomes.

The findings also expand our understanding of features that are associated with effective support. Although previous research has focused on person-centered messages, or messages that validate, legitimize, and encourage exploration of a distressed individual’s feelings, as the most effective way to decrease an individual’s distress, the results of Study 2 suggest alternative tactics that individuals can use to reduce another’s stress. For example, when discussing a stressful event with a dating partner, cues that convey interest and engagement help reduce stress. Similarly, supportive messages that are communicated directly or with evidence to back up the supporter’s statements also increase stress recovery. Unlike the sophistication required to produce person-centered messages, conveying support explicitly and being engaged in the supportive interaction require very little training or practice.

Although speculative, the results may also provide insight into the link between physiology and relational consequences. From an evolutionary perspective, human behavior can be explained by genetic makeup and changes in hormones. For example, attraction to a potential partner is a function of the release of hormones such as dopamine and norepinephrine (Fisher, 2004). Previous research has also shown that people who report feelings of love in early stages of relationships show greater activity in the region of the brain that is associated with rewards and motivation, whereas individuals in enduring relationships showed more activity in the region of the brain with more receptors for a hormone associated with attachment (Aron et al., 2005). Based on the results of Study 2, it is possible that we love someone who supports us because they
reduce stress hormones, leading to the experience of positive feelings. In contrast, hurt may be a cumulative stressor in relationships that increase stress hormones leading to negative relational consequences. This dissertation contributes to our understanding of the relationships between negative and positive communication behaviors and changes in stress hormones. Further research from a psychobiological perspective may uncover additional links between cognition, physiology, behavior, and relational outcomes.

**Strengths and Limitations**

Although the findings of this dissertation contributed to a greater understanding of the mechanisms that impact biological stress in hurtful and supportive interactions, the results are contextualized by the strengths and the limitations of the dissertation. By using salivary cortisol as a measure of stress reactivity and recovery, the results present an objective assessment of how communication impacts physiological stress and provides a link between communication and health outcomes. In addition, the statistical techniques utilized in both studies allowed for greater insight into stress reactivity and recovery over time.

An additional strength of this dissertation is the methodological contribution the studies made. In Study 2, the stressful tasks were produced based on practical methodological stress inducing tasks, but were modified to create interpersonal stressors that were tied to identity. The creation of the new tasks allowed for an examination of identity related stress that was not possible with conventional stress tasks. Further, both studies used interactional methods to observe hurtful and supportive messages as they unfold, rather than relying solely on self-reported perceptions of the interactions or delayed retrospective reports. Study 1 was the first study that I know of to manipulate and
observe hurt in real time. The methods allowed unique insight into the impact of message features during interactions with dating partners.

The experimental research design was also a limitation of the dissertation. In study 1, the hurtful interactions were a result of experimental manipulation and were not naturally occurring conversations. Furthermore, the mean ratings of hurt in the treatment condition, versus the control condition, suggest that the interactions were only moderately hurtful. Moreover, because of the limited variation in hurt and the limited number of cortisol samples collected, I was not able to test for non-linear associations in the data. In study 2, stress reactivity was a function of completing a series of stressful tasks, rather than naturally occurring events in participant’s lives. Because stress reactivity is dependent on an individual’s perception of threat, people varied in the intensity of reactivity to the tasks. Thus, the procedures in both studies limited the external validity of the dissertation.

Another limitation of this dissertation was its exclusive focus on non-marital college-aged dating couples. It is likely that college students do not interpret the message features in a hurtful or supportive interaction in the same manner as other populations. Because the studies included a limited age range, the results are limited in their generalizability. Future research should examine the relationships between message features and physiological stress in a more random sample and with participants spanning various age groups and in different types of relationship. It is plausible that individuals with greater life experience would interpret messages from others differently than younger individuals. Research could also examine the impact that greater relationship length or intimacy has on an individual’s interpretation of message features and
subsequent stress outcomes. Finally, research should assess differences between interactions between friends versus romantic partners.

Finally, the dissertation did not examine the impact of culture on the results. There are multiple ways in which culture could influence the results of both studies. First, individuals in a collectivist culture, rather than an individualistic culture may be more hurt by disconfirming messages from a romantic partner. Culture may also influence the degree to which supportive messages from others reduces stress in the context of identity threatening messages. Similarly, culture may impact how individuals respond to the stressful tasks in Study 2 because the tasks focused on competition and performance, as well as identity threats. Second, the dissertation focused on college students who are part of a college culture. The results of both studies would likely vary if the participants were non-college students. Future research should examine how culture impacts individuals’ responses to both hurtful and supportive messages.

Conclusion

The focus of this dissertation was on how features of interpersonal messages impact physiological stress. To do so, I examined how explicitness, argument strength, involvement, dominance, and affiliation impact salivary cortisol levels as a reaction to both hurtful and supportive interactions. Although the results were inconsistent between studies, the results provide a foundation for understanding how messages can vary in ways that impact people on a biological level. The findings also contributed to the theoretical understanding of both hurt and emotional support.
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*Journal of Social and Personal Relationships, 22, 416-432.*


Appendix A

Cortisol Screening Questionnaire

**Please answer the following questions honestly.** You will not be penalized for your answers and you will receive your course credit regardless of your answers. These questions allow us to understand the analysis of your saliva better and it is very important that we know the truth about the following behaviors.

In the **PAST HOUR** have you: (circle one)

1. Smoked a cigarette or other tobacco product?    Yes  No
2. Engaged in physical activity?        Yes  No
3. Eaten a meal?             Yes  No
4. Drank one or more alcoholic beverages?  Yes  No
5. Drank one or more soft drinks or cola beverages?  Yes  No

Are you currently taking any prescription medication besides birth control ? (circle one)

**Yes**  **No**

Please list what the medication is for: _______________________________
Please list the name of the medication (if you can remember) ____________________________

Are you currently on hormone contraceptives (i.e. the birth control pill or shot)? (circle one)   **Yes**  **No**

Have you taken Tylenol, Advil, or Asprin in the last 48 hours?  **Yes**  **No**

In the past 24 hours, how much stress have you experienced? Please circle the degree of stress you have experienced ranging from 0 = no stress, 10 = extreme stress.

<table>
<thead>
<tr>
<th>No stress</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>extreme stress</th>
</tr>
</thead>
</table>
What is the time you regularly go to sleep at night? ________
What time did you go to sleep last night? _____________
What time did you wake up this morning? _____________

Have you ever been diagnosed with depression?    Yes  No
Are you currently experiencing depression?       Yes  No
Have you ever been diagnosed with an anxiety disorder?  Yes  No
Are you currently experiencing an anxiety disorder? Yes  No
Appendix B
Study 1 Participant Demographic Survey

1. What is your ethnicity? Please mark all that apply:
   - __ African American
   - __ Asian
   - __ Caucasian / White
   - __ Hispanic
   - __ Native American
   - __ Other ___________________

2. What is your sex? Circle One: Male  Female  Transgendered  Other: _______

3. What is your age? _____________

4. What is your year in college? Circle One: Freshman  Sophomore  Junior  Senior

5. How many people would you consider to be good friends of yours? (list number) ______

6. How many romantic relationships have you had in your lifetime? _________________

7. How many sexual partners have you had in your lifetime? _________________

8. Which term best describes the person who you brought to the lab with you? Circle One.
   - Romantic Interest/Partner
   - Friend

9. How long have you been dating this person? _________________________________

Core Traits and Values

Many people have personal characteristics that are especially important to them. Although you probably have a lot of traits, beliefs, or attitudes that you could describe, we would like you to think about traits and values that you feel are central to who you are. These could be parts of your identity, personality traits, abilities, or values and beliefs.

On the lines below, list the three traits or values that you see as most important to who you are.

____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________
Appendix C  
Study 1 Participant and Partner Pre-interaction Questionnaire  
1. Which of the following best characterizes the status of your relationship with this person?  
   *Please mark one:*  
   ____ Strangers  
   ____ Acquaintances  
   ____ Casual dating partners  
   ____ Serious dating partners  
   ____ Engaged to be married  
   ____ Married  
2. How long have you been romantically involved with or interested in your current partner? *Fill in numbers on the lines below.*  
   _____ days   _____ weeks   _____ months   _____ years  
3. What is the sex of this person? *Please mark one:*  
   Male  Female  
4. What was the age of this person on his/her last birthday in years? *Fill in the number or circle Don’t know.*  
   __________  Don’t Know  
5. Would you consider this a long-distance relationship? (circle one) Yes  No  
   *If no, please continue on to the next section.*  
   a. If yes, when you and your partner visit each other, how do you travel and how long does it take? ______________________  
   b. How often do you see each other in a typical month? ______________________  
   c. How long ago was the last time you saw this person? ______________________  
   d. How much time do you spend communicating with this person in each of the following ways in a typical week? *Please fill in the amount of time on the lines.*  
   _____ Phone  _____ Instant Messenger  _____ E-mail  ____ Face to face
In the following section, we have listed a number of statements addressing different facets of involvement in dating relationships. We would like you to rate how certain you are about the degree of involvement that you have in your romantic relationship. Please note: We are not asking you to rate how much involvement there is in your dating relationship, but rather how certain you are about whatever degree of involvement you perceive. It might help you first consider how much each form of involvement is present in your dating relationship, and then evaluate how certain you are about that perception.

For these judgments you should use the following scale:

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completely or almost certain</td>
<td>Mostly certain</td>
<td>Slightly certain</td>
<td>Slightly more certain</td>
<td>Mostly uncertain</td>
<td>Completely uncertain</td>
</tr>
</tbody>
</table>

We would like to know how certain you are about YOUR OWN INVOLVEMENT in your relationship.

HOW CERTAIN ARE YOU ABOUT…..

1. Whether or not you want the relationship to work out in the long run? 1 2 3 4 5 6
2. Whether or not you want the relationship to last? 1 2 3 4 5 6
3. How much you like your partner? 1 2 3 4 5 6
4. How important the relationship is to you? 1 2 3 4 5 6
5. How much you are romantically interested in your partner? 1 2 3 4 5 6
6. Whether or not you are ready to commit to your partner? 1 2 3 4 5 6

Next, we would like to know how certain you are about YOUR PARTNER’S INVOLVEMENT in your relationship.

HOW CERTAIN ARE YOU ABOUT…..

1. Whether or not your partner is ready to commit to you? 1 2 3 4 5 6
2. How committed your partner is to the relationship? 1 2 3 4 5 6
3. Whether or not your partner wants to be with you in the long run? 1 2 3 4 5 6
4. How important the relationship is to your partner? 1 2 3 4 5 6
5. Whether or not your partner wants the relationship to work out in the long run? 1 2 3 4 5 6
6. How much your partner is attracted to you? 1 2 3 4 5 6

Next, we would like to know how certain you are about facets of YOUR RELATIONSHIP, in general.

HOW CERTAIN ARE YOU ABOUT…..

1. Whether or not the relationship will work out in the long run? 1 2 3 4 5 6
2. Whether or not you and your partner feel the same way about each other? 1 2 3 4 5 6
3. Whether or not you and your partner will stay together? 1 2 3 4 5 6
4. Whether or not the relationship is a romantic one? 1 2 3 4 5 6
5. The boundaries for appropriate and/or inappropriate behavior in the relationship? 1 2 3 4 5 6
6. Whether or not your partner likes you as much as you like him/her? 1 2 3 4 5 6
7. Whether or not it is a romantic or a platonic relationship? 1 2 3 4 5 6
8. How you can or cannot behave around your partner? 1 2 3 4 5 6
Please mark the number that best indicates your agreement with each statement.

<table>
<thead>
<tr>
<th></th>
<th>STRONGLY DISAGREE</th>
<th></th>
<th>STRONGLY AGREE</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>This person influences the amount of time I spend with other people</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>I am very committed to maintaining this relationship</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>This person interferes with whether I achieve the everyday goals I set for myself</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>This person helps me in my efforts to make plans</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>This relationship is very important to me</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>I would make a great effort to maintain my relationship with this person</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>This person influences how much time I devote to my school work</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>8</td>
<td>This person interferes with the amount of time I spend with my friends</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>9</td>
<td>This person helps me to do the things I need to do each day</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>10</td>
<td>I do not expect this relationship to last very long</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>11</td>
<td>This person influences whether I achieve the everyday goals I set for myself</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>12</td>
<td>This person interferes with my ability to use my time well</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>13</td>
<td>This person helps me in my efforts to spend time with my friends</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>14</td>
<td>I would like this relationship to last a lifetime</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>15</td>
<td>I am attached to this person</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>16</td>
<td>I am committed to my relationship</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>17</td>
<td>This person influences my ability to use my time well</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>18</td>
<td>This person interferes with how much time I devote to my school work</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>19</td>
<td>This person helps me to achieve the everyday goals I set for myself</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>20</td>
<td>I am likely to end my relationship in the near future</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>21</td>
<td>This person influences whether I do the things I need to do each day</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>22</td>
<td>This person interferes with the things I need to do each day</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>23</td>
<td>This person helps me to use my time well</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>24</td>
<td>It is typical of him/her to hurt my feelings.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>25</td>
<td>This person often hurts my feelings</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>26</td>
<td>This person frequently hurts my feelings</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>27</td>
<td>I expect this person to hurt my feelings</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>28</td>
<td>It doesn’t surprise me when this person hurts my feelings</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

For the next set of questions, we would like you to think about your current relationship with this person, and use the following words and phrases to describe it. For example, if you think that your relationship during the last two weeks has been very exciting, put an X in the space right next to the word "exciting." If you think it has been very boring, put an X in the space right next to "boring." If you think it has been somewhere in between, put an X where you think it belongs.

AT THE PRESENT TIME, THIS RELATIONSHIP IS . . .

1. exciting ___ ___ ___ ___ ___________________ boring
2. chaotic ___ ___ ___ ___ ___________________ stable
3. calm ________ __ __ __ __ ____________ turbulent
4. exhilarating _______ ___ ___ __________________ mundane
5. tumultuous ______ ______ ______ ______ ______ running smoothly
6. dull ______ ______ ______ ______ ______ stimulating
7. uneventful ______ ______ ______ ______ ______ thrilling
8. unpredictable ______ ______ ______ ______ ______ predictable
9. peaceful ______ ______ ______ ______ ______ stressful

For the next set of questions, we would like you to think about your relationship with this person, and use the following words and phrases to describe it. For example, if you think that your relationship during the last two months has been very miserable, put an X in the space right next to the word "miserable." If you think it has been very enjoyable, put an X in the space right next to "enjoyable." If you think it has been somewhere in between, put an X where you think it belongs.

Please put an X on every line, between each pair of words.

1. miserable ______ ______ ______ ______ ______ enjoyable
2. hopeful ______ ______ ______ ______ ______ discouraging
3. free ______ ______ ______ ______ ______ tied down
4. empty ______ ______ ______ ______ ______ full
5. interesting ______ ______ ______ ______ ______ boring
6. rewarding ______ ______ ______ ______ ______ disappointing
7. doesn’t give ______ ______ ______ ______ ______ brings out the best in me
     me much chance
8. lonely ______ ______ ______ ______ ______ friendly
9. hard ______ ______ ______ ______ ______ easy
10. worthwhile ______ ______ ______ ______ ______ useless

11. All things considered, how satisfied or dissatisfied have you been with your relationship with this person over the last two months? (Place an X in the space that best describes how satisfied you have been.)

   completely satisfied           neutral           completely
dissatisfied
______________  ___________  ___________
______________  ___________  ___________  ___________
Please mark the number that indicates how you feel about each statement.

1. I feel that I could confide in this person about virtually everything
2. I would do anything for this person
3. If I couldn’t be with this person, I would feel miserable
4. If I am lonely, my first thought is to seek this person out
5. One of my primary concerns is this person’s welfare
6. I would forgive this person for practically anything
7. I feel responsible for this person’s well being
8. I would enjoy being confided in by this person
9. It would be hard for me to get along without this person
10. At this point in time, what do you feel the chance is of your relationship leading to marriage or a similar lifelong commitment?

0% 10 20 30 40 50 60 70 80 90 100%

You are now finished with the first questionnaire. Please let the research assistant know that you are finished with the questionnaire.
Appendix D
Study 1 Participant Post-interaction Questionnaire

1. Describe in your own words how it felt to discuss core values or traits with your romantic partner.

2. During the conversations, were there things you wish your partner had done or said differently? If so, what do you wish your partner had done or said?
Sometimes conversations with a romantic partner can be very positive and sometimes less positive. Please rate your discussion of each value/trait on the following scales. Use the following words and phrases to describe each conversation. For example, if you think that the conversation was satisfying, put an X in the space right next to the word "satisfying." If you think it was very dissatisfying, put an X in the space right next to "dissatisfying." If you think it has been somewhere in between, put an X where you think it belongs.

The first conversation was…

1. Negative _____ _____ _____ _____ _______ Positive
2. Hurtful _____ _____ _____ _____ _______ Supportive
3. Satisfying _____ _____ _____ _____ _______ Dissatisfying
4. Frustrating _____ _____ _____ _____ _______ Calming

The second conversation was…

1. Negative _____ _____ _____ _____ _______ Positive
2. Hurtful _____ _____ _____ _____ _______ Supportive
3. Satisfying _____ _____ _____ _____ _______ Dissatisfying
4. Frustrating _____ _____ _____ _____ _______ Calming

Now we would like to ask you some more questions about the conversation that you found most negative, hurtful, or dissatisfying. Reflecting on your scores to the previous questions, which conversation was the LEAST positive, supportive, or satisfying? Circle One

The first conversation The second conversation

Please answer the remaining questions by focusing on the conversation that you reported was the least positive, support, or satisfying.

1. How hurtful was this conversation?
   Not at all Hurtful 1 2 3 4 5 6 7 Extremely Hurtful

2. How much emotional pain did this conversation cause you?
   No emotional pain 1 2 3 4 5 6 7 Intense Emotional Pain

3. How hurt did you feel overall while discussing the trait/value with your partner?
   Not at all hurt 1 2 3 4 5 6 7 Extremely Hurt
4. When your partner discussed the trait/value with you, to what extent did you think he/she intended to hurt you?

Not Intentional  1  2  3  4  5  6  7  Extremely Intentional

Please respond to the following questions using this scale:

1    2  3    4       5
Strongly       Strongly
Disagree        Agree

During the conversation, my partner made me feel…
1. Hurt………………………………………………………………………………..
2. Dominated………………………………………………………………………..
3. Negative Regard………………………………………………………………
4. Angry……………………………………………………………………………..
5. Submissive……………………………………………………………………….
6. Engaged…………………………………………………………………………
7. Sad ………………………………………………………………………………
8. Withdrawn………………………………………………………………………
9. Persuaded………………………………………………………………………
10. Worthless……………………………………………………………………….
11. Interested………………………………………………………………………
12. Concession………………………………………………………………………
13. Happy …………………………………………………………………………..
14. Influenced………………………………………………………………………
15. Hopeless ………………………………………………………………………..
16. Positive regard………………………………………………………………
17. Compliant………………………………………………………………………
18. Surprised……………………………………………………………………….
19. Controlled………………………………………………………………………
20. Fearful …………………………………………………………………………..
21. Yielding………………………………………………………………………..
22. Jealous …………………………………………………………………………
23. Affectionate……………………………………………………………………
24. Confused ………………………………………………………………………
25. Disaffectionate………………………………………………………………
26. Liked……………………………………………………………………………
27. Attractive………………………………………………………………………
28. Uncertain about our relationship ……………………………………………
29. Disliked……………………………………………………………………….
Please circle the number that reflects how much you agree or disagree with each statement. The scale ranges from complete disagreement to complete agreement.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>strongly disagree</td>
<td>moderately disagree</td>
<td>disagree</td>
<td>undecided</td>
<td>agree</td>
<td>moderately agree</td>
<td>strongly agree</td>
</tr>
</tbody>
</table>

My partner.....
1. Was intensely involved in our conversation............ 1 2 3 4 5 6 7
2. Did not want a deeper relationship..................... 1 2 3 4 5 6 7
3. Was not attracted to me........................................ 1 2 3 4 5 6 7
4. Seemed to find the conversation stimulating.............. 1 2 3 4 5 6 7
5. Communicated coldness rather than warmth................. 1 2 3 4 5 6 7
6. Created a sense of distance between us..................... 1 2 3 4 5 6 7
7. Acted bored by our conversation.............................. 1 2 3 4 5 6 7
8. Was interested in talking to me............................... 1 2 3 4 5 6 7
9. Made me feel similar to him/her.............................. 1 2 3 4 5 6 7
10. Tried to move the conversation to a deeper level......... 1 2 3 4 5 6 7
11. Desired further communication............................... 1 2 3 4 5 6 7
12. Seemed to care if I liked him/her........................... 1 2 3 4 5 6 7
13. Was sincere.......................................................... 1 2 3 4 5 6 7
14. Was interested in talking........................................ 1 2 3 4 5 6 7
15. Wanted me to trust him/her...................................... 1 2 3 4 5 6 7
16. Was willing to listen............................................. 1 2 3 4 5 6 7
17. Was open to my ideas............................................. 1 2 3 4 5 6 7
18. Was honest in communicating with me........................ 1 2 3 4 5 6 7
19. Felt very tense talking to me................................... 1 2 3 4 5 6 7
20. Was calm and poised............................................... 1 2 3 4 5 6 7
21. Was relaxed talking to me....................................... 1 2 3 4 5 6 7
22. Was nervous in my presence.................................... 1 2 3 4 5 6 7
23. Was comfortable interacting with me........................ 1 2 3 4 5 6 7
24. Made interaction informal....................................... 1 2 3 4 5 6 7
25. Wanted the discussion to be casual........................... 1 2 3 4 5 6 7
26. Wanted the discussion to be informal........................ 1 2 3 4 5 6 7
For the following questions, please rate the extent to which you feel each term was characteristic of your conversation.

<table>
<thead>
<tr>
<th>Term</th>
<th>No Dominance</th>
<th>No Submission</th>
<th>No Persuasion</th>
<th>No Concession</th>
<th>No Influence</th>
<th>No Compliance</th>
<th>No Controlling</th>
<th>No Yielding</th>
<th>No Affection</th>
<th>No Disaffection</th>
<th>No Liking</th>
<th>No Disliking</th>
<th>No Attraction</th>
<th>No Aversion</th>
<th>No Positive regard</th>
<th>No Negative regard</th>
<th>No Engagement</th>
<th>No Withdrawl</th>
<th>No Interest</th>
<th>No Disinterest</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 2 3 4 5 6 7</td>
<td>1 2 3 4 5 6 7</td>
<td>1 2 3 4 5 6 7</td>
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<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

For the following questions please circle the number that reflects how much you agree or disagree with each statement. The scale ranges from complete disagreement to complete agreement.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>strongly disagree</td>
<td>moderately disagree</td>
<td>disagree</td>
<td>undecided</td>
<td>agree</td>
<td>moderately agree</td>
<td>strongly agree</td>
</tr>
</tbody>
</table>

This conversation…

1. Was similar to others I’ve had with this person……….. 1 2 3 4 5 6 7
2. Felt natural .............................................. 1 2 3 4 5 6 7
3. Wasn’t typical for my partner and I....................... 1 2 3 4 5 6 7
4. Seemed unrealistic........................................... 1 2 3 4 5 6 7
5. Happens often in our relationship......................... 1 2 3 4 5 6 7
6. Made me think about my relationship with him/her....... 1 2 3 4 5 6 7
7. Was relevant to our relationship........................... 1 2 3 4 5 6 7
8. Was about our relationship................................. 1 2 3 4 5 6 7
9. Included information about our relationship............. 1 2 3 4 5 6 7
Please respond to the next four items using this scale:

1  2  3  4  5
Strongly Disagree       Strongly Agree

During the conversation, I thought that...

1. My partner was trying to hurt me.................................................................
2. My partner intended to hurt my feelings......................................................
3. It was an accident; my partner did not mean to hurt my feelings....................

You are now done with the survey. Please let the researcher know that you are finished. Thank you for your participation!
Appendix E
Study 1 Partner Post-interaction Questionnaire

*In the conversation you just had with your partner, you were asked to discuss two of your partner’s goals or values. We would like to know your impressions of your own behavior in those two conversations, as well as how you think each conversation made your partner feel.*

**Please focus on the FIRST conversation you had with your partner.**

1. What was the value or trait that your partner discussed with you: ___________________

2. Describe in your own words what it felt like to have this conversation with your partner.

_Sometimes people communicate in ways that are very positive and sometimes less positive. Please rate your own communication behavior during the first conversation you had with your partner. Use the following words and phrases to describe your behavior. For example, if you think that you were very negative, put an X in the space right next to the word “negative.” If you think that you were very positive, put an X in the space right next to “positive.” If you think your behavior was somewhere in between, put an X where you think it belongs._

*The first conversation was...*

1. Negative ____ ____ ____ ____ ____ ____ Positive
2. Hurtful ____ ____ ____ ____ ____ ____ Supportive
3. Satisfying ____ ____ ____ ____ ____ ____ Dissatisfying
4. Frustrating ____ ____ ____ ____ ____ ____ Calming

The next set of questions asks you to consider how the conversation with your partner you’re your partner feel. Again, please focus on your **FIRST** conversation with your partner.

1. How hurtful was this conversation to your partner?
   Not at all Hurtful 1 2 3 4 5 6 7 Extremely Hurtful

2. How much emotional pain do you think the conversation caused your partner?
   No emotional pain 1 2 3 4 5 6 7 Intense Emotional Pain

3. How hurt do you think your partner felt overall while discussing the trait/value with you?
   Not at all hurt 1 2 3 4 5 6 7 Extremely Hurt
Focusing on the FIRST conversation, please respond to the following questions using this scale:

![Scale Image]

During the conversation, my partner felt…
1. Hurt
2. Angry
3. Sad
4. Worthless
5. Happy
6.Hopeless
7. Surprised
8. Fearful
9. Jealous
10. Confused
11. Uncertain about our relationship

For the following questions please circle the number that reflects how much you agree or disagree with each statement. The scale ranges from complete disagreement to complete agreement.

This conversation…
12. Was similar to others I’ve had with this person
13. Felt natural
14. Wasn’t typical for my partner and I
15. Seemed unrealistic
16. Happens often in our relationship
17. Made me think about my relationship with him/her
18. Was relevant to our relationship
19. Was about our relationship
20. Included information about our relationship
Now, please focus on the SECOND conversation you had with your partner.

1. What was the value or trait that your partner discussed with you: ___________________

2. Describe in your own words what it felt like to have this conversation with your partner.

Sometimes people communicate in ways that are very positive and sometimes less positive. Please rate your own communication behavior during the second conversation you had with your partner. Use the following words and phrases to describe your behavior. For example, if you think that you were very negative, put an X in the space right next to the word “negative.” If you think that you were very positive, put an X in the space right next to “positive.” If you think your behavior was somewhere in between, put an X where you think it belongs.

The second conversation was...

1. Negative ____ ____ ____ ____ ____ ____ ____ Positive
2. Hurtful ____ ____ ____ ____ ____ ____ ____ Supportive
3. Satisfying ____ ____ ____ ____ ____ ____ ____ Dissatisfying
4. Frustrating ____ ____ ____ ____ ____ ____ ____ Calming

The next set of questions asks you to consider how the conversation with your partner made your partner feel. Again, please focus on your SECOND conversation with your partner.

1. How hurtful was this conversation to your partner?
   
   Not at all Hurtful 1 2 3 4 5 6 7 Extremely Hurtful

2. How much emotional pain do you think the conversation caused your partner?
   
   No emotional pain 1 2 3 4 5 6 7 Intense Emotional Pain

3. How hurt do you think your partner felt overall while discussing the trait/value with you?
   
   Not at all hurt 1 2 3 4 5 6 7 Extremely Hurt
Focusing on the **SECOND** conversation, please respond to the following questions using this scale:

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<th>1</th>
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<tbody>
<tr>
<td>Strongly Disagree</td>
<td>2</td>
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<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

During the conversation, my partner felt…

1. Hurt…………………………………………………………………………………………..
2. Angry…………………………………………………………………………………………
3. Sad …………………………………………………………………………………………
4. Worthless……………………………………………………………………………………
5. Happy ………………………………………………………………………………………
6. Hopeless ……………………………………………………………………………………
7. Surprised …………………………………………………………………………………….
8. Fearful ………………………………………………………………………………………
9. Jealous ……………………………………………………………………………………..
10. Confused …………………………………………………………………………………..
11. Uncertain about our relationship ……………………………………………………

For the following questions please **circle** the number that reflects how much you agree or disagree with each statement. The scale ranges from complete disagreement to complete agreement.

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<th>1</th>
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<tbody>
<tr>
<td>strongly disagree</td>
<td>moderately disagree</td>
<td>disagree</td>
<td>undecided</td>
<td>agree</td>
<td>moderately agree</td>
<td>strongly agree</td>
</tr>
</tbody>
</table>

This conversation…

12. Was similar to others I’ve had with this person……… 1 2 3 4 5 6 7
13. Felt natural ……………………………………………………………… 1 2 3 4 5 6 7
14. Wasn’t typical for my partner and I……………………… 1 2 3 4 5 6 7
15. Seemed unrealistic………………………………………………………… 1 2 3 4 5 6 7
16. Happens often in our relationship…………………….. 1 2 3 4 5 6 7
17. Made me think about my relationship with him/her………. 1 2 3 4 5 6 7
18. Was relevant to our relationship…………………………... 1 2 3 4 5 6 7
19. Was about our relationship…………………………………… 1 2 3 4 5 6 7
20. Included information about our relationship………………. 1 2 3 4 5 6 7
Appendix F
Coder Directions for Message Features

Explicitness of Supportive Messages

*(begin each rating session by reviewing the information presented in this handout)*

Your goal in this task is to rate the degree of explicitness the partner uses to support the participant. Please follow these directions to code effectively.

- Code during times when you know you will be able to view the videotapes without distractions. Be prepared to concentrate on the coding task. This task is complex and you will be able to do your best when you are not interrupted.
- Make sure you have the following materials on hand: video, copies of the rating sheets, and this rating manual.
- Begin by recording the dyad number on the rating form.
- Watch the entire conversation once, in full.
- Read over the description of the code listed below.
- Watch the conversation again, keeping the code in mind as you watch.
- Rate each of the following items using the scales outlined below:

The rating is about the extent to which a partner directly or indirectly uses supportive messages. The rating requires you to make a decision about the degree to which people’s utterances are explicit or implicit.

Explicitness is the extent to which the goal of the source is revealed in the message itself. An example of a message with low explicitness would be a hint, whereas a message high in explicitness might be a direct request. The difference is the how directly the speaker says what they are thinking. The more directly the speaker states a message, the more explicit it is.

Explicitness is only conveyed through words.
Explicit messages are direct, straightforward, and to the point with respect to support. The speaker makes his or her feelings very clear, obvious, and definite. In other words, the listener does not have to choose among multiple interpretations to decide if the partner is being supportive.

Please rate the degree of explicitness in the partner’s supportive messages

1 – not at all explicit – or no supportive messages
2 – minimally explicit
3 – moderately explicit
4 – very much explicit
5 – extremely explicit

Supportive messages could be low in explicitness if they lack conviction, or only partially recognize the other person’s perspective or feelings.

Moderately explicit supportive messages can leave the receiver wondering what the partner meant. They could be interpreted as very nice or neutral statements. If you can interpret the supportive messages in multiple ways, it should be coded as either a 2 or 3.

Extremely explicit supportive messages would clearly acknowledge the other person’s feelings or comment positively on the person’s abilities, traits, etc. If there is no doubt that the partner is being supportive, it should be coded as a 5. If there is still some room for interpretation or the message is not fully clear, it should be coded as a 4.
Coding for Argument Strength

(bEGIN EACH RATING SESSION BY REVIEWING THE INFORMATION PRESENTED IN THIS HANDOUT)

Your goal in this task is to rate the degree of argument strength the partner uses in the interaction.

Please follow these directions to code effectively.

- Begin by recording the dyad number on the rating form.
- Watch the entire interaction once, without coding anything.
- Read over the description of the code listed below.
- Watch the conversation again, keeping the code in mind as you watch.
- Rate each of the levels of argument strength using the scales outlined below:

Argumentative communication includes elaborating on one’s position, acknowledging the adversary’s position, providing support evidence, and constructively asserting views. People who use high strength arguments will provide a variety of reasons for the way they feel, rather than repeating one idea, thought, or feeling over and over.

The argument can be thought of as the position a person is taking during the interaction.

1 – no argument presented
2 – weak argument
3 – moderately strong argument
4 –
5 – extremely strong argument

The ratings are based on how well articulated the speaker’s position or opinion is, how elaborately the position is discussed, and the variety of examples and supporting materials used.

Argument strength is increased by the prominence or prevalence of evidence over the course of an interaction.

A rating of 1 should be given if the partner does not really take a position or have a clear argument. If you cannot distinguish what his or her main position or opinion is, you should rate the interaction a “1.” A rating of two should be given if the partner provides only one or two reasons for the way they feel and do not elaborate or provide examples to support their position.
For example, the participant may say something negative about himself or herself. If the partner responds by saying, “that isn’t true” without much elaboration, a rating of 2 should be given.

A rating of 3 should be given if the partner elaborates on their position by providing examples and support to back up their position. A rating of 4 should be given when the partner provides diversity of reasons and support to back up their claim, rather than restating the same points. A score of a 5 should only be given if the individual shows a variety of reasons for the way they feel and elaborate on most, if not all, of the reasons. An interaction that scores a “5” on argument strength should persuade the listener believe or agree with the speaker’s position or opinion.
Coding for Partner Involvement
(beging each rating session by reviewing the information presented in this handout)

Your goal in this task is to rate the degree to which the partner is involved in the interaction.

Please follow these directions to code effectively.

- Code during times when you know you will be able to view the videotapes without distractions. Be prepared to concentrate on the coding task. This task is complex and you will be able to do your best when you are not interrupted.
- Make sure you have the following materials on hand: video, copies of the rating sheets, and this rating manual.
- Begin by recording the dyad number on the rating form.
- Watch the entire interaction once, without coding anything
- Read over the descriptions of each code listed below
- Watch the conversation again, keeping each code in mind as you watch
- Rate each of the following items using the scales outlined below:

Involvement reflects the degree to which individuals are engaged with each other or enmeshed in the conversation. It is a feature that is conveyed nonverbally and ranges from withdrawn to engaged.

Signs of involvement could include:

- body orientation toward the participant
- body leaned into the other or close positioning on the couch
- eye contact
- head nodding.

Involvement shows interest in what the other person is saying. If the partner is highly involved, you will sense that they are:

- tracking what the other person is saying
- responding appropriately for what has just been said
- asking probing questions for more information.
1 – not at all involved - withdrawn
2 – minimally involved
3 – moderately involved
4 – very much involved
5 – extremely involved

Use a rating of “1” for conversations in which the partner shows no involvement in the conversation. A rating of a “4” should be used if the partner shows no interest in the conversation, maintains very little eye contact, and is not at all engaged with the participant, but is not actively removing themselves from the conversation.

For the ratings of 2, 3, 4 & 5, the frequency and intensity of cues should inform your decision. Use of rating of 2 if the partner has some eye contact, nods in agreement to what is being said, but does not seem overly interested in the conversation. Use a rating of 3 if the partner asks some questions of the participant, but is not consistent in his or her involvement. Use a rating of 4 if the partner adds to the conversation (which is in line with what the participant is saying), asks questions and responds to statements appropriately most of the time. A rating of 4 should include nonverbal cues of involvement at least 50% of the time.

Use a rating of “5” for conversations in which the partner is extremely involved. A rating of “5” should be used when the partner is involved through all or almost all of the conversation. The partner should maintain eye contact, show nonverbal signs of interest, and be focused on the conversation and that participant.
Hurt Coding

(begin each rating session by reviewing the information presented in this handout)

Your goal in this task is to rate the degree to which the partner expresses hurtful communication. Please follow these directions to code effectively.

- Code during times when you know you will be able to view the videotapes without distractions. Be prepared to concentrate on the coding task. This task is complex and you will be able to do your best when you are not interrupted.

- Make sure you have the following materials on hand: video, copies of the rating sheets, and this rating manual.

- Begin by recording the dyad number on the rating form.

- Read over the descriptions of each code listed below

- Watch the 2nd conversation once keeping the codes in mind and taking notes, but not coding
- Watch the conversation again, signing numbers to each of the codes

Hurtfulness of the Partner’s Messages

Rate the message of the partner during the conversation on the following scale:

1 – not at all hurtful
2 –
3 – moderately hurtful
4 –
5 – extremely hurtful

Hurt is a feeling that results from being emotionally injured in a social interaction. Hurtful messages convey that another individual does not regard his or her relationship with the person to be as important, close, or valuable as the person desires.

Hurtful statements could include:
- use of negative voice or mimicry of the other person
- stating that the participant does not have an important trait
- stating that a trait is not important
- disagreeing with the participant’s comments
- name calling
- negative statements of ‘should’ (i.e. you should do this…)
- statements the convey certainty (i.e. you are not ___ or you always ___)

Use a rating of “1” for conversations in which the partner does not communicate any hurtful messages. For example, the partner does not state something contrary to the participant’s statements, feelings, or beliefs.
Use a rating of “5” for conversations in which are extremely hurtful. A rating of 5 should be used when the partner expresses multiple hurtful statements and the majority of the conversation is hurtful.

When coding, try not to think about how hurt you would feel if you were receiving the message, but rather, evaluate the extent to which the characteristics or content of the message are hurtful.
Coding for Emotional Support
(begin each rating session by reviewing the information presented in this handout)

Your goal in this task is to rate the degree to which the partner engages supportive behaviors. Please follow these directions to code effectively:

- Code during times when you know you will be able to view the videotapes without distractions. Be prepared to concentrate on the coding task. This task is complex and you will be able to do your best when you are not interrupted.

- Make sure you have the following materials on hand: video, copies of the rating sheets, and this rating manual.

- Begin by recording the dyad number on the rating form.

- Watch the conversation in full.

- Read over the descriptions of the code listed below.

- Watch the conversation again, keeping each code in mind as you watch.

- Rate each of the following items using the scales outlined below:

  **Emotional Support – verbal and nonverbal**

  Rate the degree to which partner is supportive during the conversation on the following scale:

  1 – not at all supportive
  2 –
  3 – moderately supportive
  4 –
  5 – extremely supportive

  Comforting includes verbal or nonverbal communication used to make a distressed individual feel cared for by others. Further, comforting includes verbal messages that are intended to alleviate or lessen the emotional distress of others. Supportive or comforting statements can include validation of one’s points, agreement with the other person’s feelings, statements, or thoughts, or providing positive evidence to ‘back up’ the other person’s statements.

  - Comforting communication could include:
    - agreeing with the participants positive statements
    - disagreeing if the participant expresses negative feelings about the self
    - providing evidence of positive traits in the past
    - positive touching (i.e. rubbing the partners arm or holding hands)

  Use a rating of “1” for conversations in which the partner does not express emotional support. For example, he/she disagrees with the partner or is neutral during the conversation (not affirming or disconfirming).
Conversations that are a “2” on emotional support might include nonverbal signs of support, but not verbal statements of support.

Conversations that are a “3” should include some verbal statements of support. A rating of 3 is given when the partner is supportive for parts of the interaction, but not most of the interaction.

Use a rating of ‘4’ for conversations in which the partner is supportive most, but not all of the conversation.

Use a rating of “5” for conversations in which the partner is extremely supportive. A rating of “5” should be used when the partner is verbally and nonverbally supportive. The partner continually expresses supportive statements beyond simple agreement with the participant’s comments. The partner should also be engaged, including eye contact and body orientation toward the participant.
Coding for Dominance
(begin each rating session by reviewing the information presented in this handout)

Your goal in this task is to rate the degree to which the partner is dominating in the interaction. Please follow these directions to code effectively.

- Begin by recording the dyad number on the rating form.
- Watch the entire interaction once, without coding anything.
- Read over the description of the code listed below.
- Watch the conversation again, keeping the code in mind as you watch.
- Rate each of the amount of dominance using the scales outlined below:

Dominance can be defined as the degree to which one actor attempts to regulate the behavior of another. This is usually accomplished by attempting to control or direct the recipient’s thoughts or behaviors. Dominant messages express feelings of control. When one person dominates another, that person has control or power over the other. Messages exhibit dominance to the extent that the speaker reveals the belief that she or he is higher or lower in power than the hearer. Dominance can be conveyed through nonverbal and verbal messages.

Nonverbal indicators of dominance:
- relaxed facial expression
- more direct eye contact
- greater amount of time talking

Vocal cues for dominance:
- Faster rate of speech
- Lower pitch in voice
- Speaking more loudly

Dominance is also associated with:
- increased number of conversational interruptions
- greater facial expressiveness
- Verbal expressions of dominance include statements that attempt to alter the behavior or beliefs of another.

Statements that demean an individual or imply the other is not intelligent, such as, “yeah, whatever” are dominating statements. Statements that try to persuade the other person to believe what they believe or feel the way they feel convey dominance. Examples might be strongly disagreeing with what the participant is saying in a negative manner (i.e. “that’s not true” – in a condescending tone)

Please rate the degree to which the partner shows dominance during the interaction.
1 – not at all dominant
2 –
3 – moderately dominant
4 –
5 – extremely dominant
Coding for Affiliative Behavior

(begin each rating session by reviewing the information presented in this handout)

Your goal in this task is to rate the degree to which the partner engages in affiliative behaviors. Please follow these directions to code effectively.

- Begin by recording the dyad number on the rating form.
- Watch the conversation in full
- Read over the description of the code listed below
- Watch the conversation again, keeping each code in mind as you watch
- Rate each of the following items using the scales outlined below:

Affiliation includes feelings of affection and the degree of love or hate in the relationship. The feature ranges from disaffiliation (dislike) to affiliation (liking). It can be conveyed through signs of similarity, positive affect, receptivity, equality, and informality. It could also be expressed nonverbally through physical proximity, smiling, positive touch, and verbally through expressions liking or dislike.

During the interaction, watch for specific cues that show liking, intimacy, or inclusion. We can assume that the dyad likes each other because they are dating, but don’t let that influence your coding. Code strictly based on behaviors you see in this interaction.

Minor cues:
- Sitting close together
- Smiling at the other person (not nervous smiles or laughter)

Moderate to strong cues:
- Physical touch – moderate (touch on the leg or arm) stronger (holding hands, stroking, kiss, hug)
- Statements of liking or love – ‘I love you’ ‘You are so good at that’

The ratings should be given based on the number of cues and the intensity of them. For example sitting close together and smiling once might be a “2” but smiling throughout could be a “3”

1 – not at all affiliative
2 – mildly affiliative
3 – moderately affiliative
4 – very affiliative
5 – extremely affiliative
Appendix G

Personal Stressors Questionnaire

Sometimes individuals experience situations, events, or conversations with others that are negative, stressful, or uncomfortable. Stress can come from school, work, or personal relationships with family, friends, or dating partner. We would like you to think about events that are currently stressful in your life.

On the lines below, please list the three situations that are currently the most stressful to you:

1. 
2. 
3. 

Now, we would like you to complete a series of questions about each of the stressors individually. Please think about the first stressor and answer the questions according to how that situation makes you feel.

Stressor #1: (list the stressor here) __________________________________________________________

Take a moment to visualize the stressful situation or event. We would like you to relive the event and the stressful feelings associated with it in your mind. Visualize the details of the event. Think about why the situation was stressful to you. Try to recreate the feelings you felt and your state of mind during this situation as much as possible. Who was involved in the situation? If others were involved, what did they say or do to increase your stress? Think about only this stressor while you answer the following questions:

1. how long has this situation been stressful to you? Fill in numbers that best apply on the lines below – you do not have to use all of the blanks.
   _____ days   _____ weeks   _____ months   _____ years

2. what aspect of your life is the stressor related to: (check all that apply)
   ___ school
   ___ work
   ___ family relationships
   ___ friendship
   ___ romantic relationship
   ___ other: (please specify) ____________________________________________

For the following questions, please mark the number that best indicates your agreement with each statement.

1  2  3  4  5  6
STONGLY DISAGREE STRONGLY AGREE

3. This stressor threatens my relationships with others
4. This stressor interferes with my daily life
5. I worry about this stressor a great deal
6. This stressor is a situation that I can control
7. This stressor presents a challenge that I can overcome
8. It is my fault that this stressor happened
9. I am uncertain if I can cope with this stressor
10. This stressor will continue no matter what I do about it
11. I think about the stressor often
12. Other people are to blame for this stressful situation occurring
13. It is possible that something positive will come out of this stressful situation
14. I brought this situation on myself

15. Please rate how stressful this situation is in your life currently: Circle One

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<td>Not at all stressful</td>
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<td>Extremely stressful</td>
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Stressor # 2 (list the stressor here): _________________________________________________

Now we would like you to think about the second stressful situation you listed. Take a moment to visualize the stressful situation or event. We would like you to relive the event and the stressful feelings associated with it in your mind. Visualize the details of the event. Think about why the situation was stressful to you. Try to recreate the feelings you felt and your state of mind during this situation as much as possible. Who was involved in the situation? If others were involved, what did they say or do to increase your stress? Think about only this stressor while you answer the following questions:

1. How long has this situation been stressful to you? Fill in numbers that best apply on the lines below – you do not have to use all of the blanks.
   
   _____ days   _____ weeks   _____ months   _____ years

2. What aspect of your life is the stressor related to: (check all that apply)
   
   ___ school
   ___ work
   ___ family relationships
   ___ friendship
   ___ romantic relationship
   ___ other: (please specify) ____________________________

For the following questions, please mark the number that best indicates your agreement with each statement.

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<tr>
<td>STRONGLY DISAGREE</td>
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<td>STONGLY AGREE</td>
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</table>
3. This stressor threatens my relationships with others
4. This stressor interferes with my daily life
5. I worry about this stressor a great deal
6. This stressor is a situation that I can control
7. This stressor presents a challenge that I can overcome
8. It is my fault that this stressor happened
9. I am uncertain if I can cope with this stressor
10. This stressor will continue no matter what I do about it
11. I think about the stressor often
12. Other people are to blame for this stressful situation occurring
13. It is possible that something positive will come out of this stressful situation
14. I brought this situation on myself

15. Please rate how stressful this situation is in your life currently: *Circle One*

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<tr>
<td>Not at all stressful</td>
<td>Moderately stressful</td>
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**Stressor # 3 (list the stressor here): _____________________________________________**

Finally, we would like you to think about the third stressful situation you listed. Take a moment to visualize the stressful situation or event. We would like you to relive the event and the stressful feelings associated with it in your mind. Visualize the details of the event. Think about why the situation was stressful to you. Try to recreate the feelings you felt and your state of mind during this situation as much as possible. Who was involved in the situation? If others were involved, what did they say or do to increase your stress? Think about only this stressor while you answer the following questions:

1. How long has this situation been stressful to you? *Fill in numbers that best apply on the lines below – you do not have to use all of the blanks.*
   
   _____ days _____ weeks _____ months _____ years

2. What aspect of your life is the stressor related to: *check all that apply)*

   __ school
   __ work
   __ family relationships
   __ friendship
   __ romantic relationship
   __ other: *(please specify)_________________________________________________________

For the following questions, please mark the number that best indicates your agreement with each statement.

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<tr>
<td>STRONGLY DISAGREE</td>
<td>STRONGLY AGREE</td>
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</table>
3. This stressor threatens my relationships with others
4. This stressor interferes with my daily life
5. I worry about this stressor a great deal
6. This stressor is a situation that I can control
7. This stressor presents a challenge that I can overcome
8. It is my fault that this stressor happened
9. I am uncertain if I can cope with this stressor
10. This stressor will continue no matter what I do about it
11. I think about the stressor often
12. Other people are to blame for this stressful situation occurring
13. It is possible that something positive will come out of this stressful situation
14. I brought this situation on myself

15. Please rate how stressful this situation is in your life currently: Circle One

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<tr>
<td>Not at all stressful</td>
<td>Moderately stressful</td>
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Finally, we would like you to use the space remaining on the page to create a worst case scenario narrative about the three stressful situations you chose. Explain, in detail, if you had to resolve all of these situations tomorrow:

1. how would you feel and
2. what would you need to do to resolve all of them?

Please be as vivid as possible in your description.

Please rate the amount of stress you experienced while recreating your three most stressful situations Circle One

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<td>No stress</td>
<td>moderate stress</td>
<td>extreme stress</td>
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Appendix H
Study 2, Pilot 1 Participant Final Questionnaire

Please answer the following questions about yourself.

1. What is your ethnicity? *Please mark all that apply:*
   - [ ] African American
   - [ ] Asian
   - [ ] Caucasian / White
   - [ ] Hispanic
   - [ ] Native American
   - [ ] Other: ____________________

2. What is your sex? *Circle One:*
   - Male
   - Female
   - Transgendered
   - Other: ______

3. What is your sexual orientation? *Circle One:*
   - Straight
   - Gay
   - Bisexual

4. What is your age? _____________

5. What is your year in college? *Circle One:*
   - Freshman
   - Sophomore
   - Junior
   - Senior

6. How many people would you consider to be good friends of yours? *(list number)*
   _____________

7. How many romantic relationships have you had in your lifetime? _________________

8. How many sexual partners have you had in your lifetime? _________________
The questions in this scale ask you about your feelings and thoughts during THE LAST MONTH. In each case, you will circle the number that represents HOW OFTEN you felt or thought a certain way. Although some of the questions are similar, there are differences between them and you should treat each one as a separate question. The best approach is to answer fairly quickly. That is, don’t try to count up the number of times you felt a particular way, but rather indicate the alternative that seems like a reasonable estimate.

<table>
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<tr>
<th></th>
<th>Never</th>
<th>Almost Never</th>
<th>Sometimes</th>
<th>Fairly Often</th>
<th>Very Often</th>
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<td>13.</td>
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<td>14.</td>
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</table>

1. In the last month, how often have you been upset because of something that happened unexpectedly?
2. In the last month, how often have you felt that you were unable to control the important things in your life?
3. In the last month, how often have you felt nervous and “stressed”?
4. In the last month, how often have you dealt successfully with day to day problems and annoyances?
5. In the last month, how often have you felt that you were effectively coping with important changes that were occurring in your life?
6. In the last month, how often have you felt confident about your ability to handle your personal problems?
7. In the last month, how often have you felt that things were going your way?
8. In the last month, how often have you found that you could not cope with all the things that you had to do?
9. In the last month, how often have you been able to control irritations in your life?
10. In the last month, how often have you felt that you were on top of things?
11. In the last month, how often have you been angered because of things that happened that were outside of your control?
12. In the last month, how often have you found yourself thinking about things that you have to accomplish?
13. In the last month, how often have you been able to control the way you spend your time?
14. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?
Everyone has problems that they need to deal with or times when they need to be cheered up. The following statements describe things that other people sometimes do when we have a problem or feel badly.

We would like to know how much you want or prefer your partner to do these behaviors when you have a problem or feel badly, regardless of what they actually do to support you. If you don’t like the behavior described in the statement, choose a number near the “not at all” end of the scale. If you really like your partner to react in the way described by a statement, choose a number near the “very much” end of the scale.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Not at all</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Very Much</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Ask me questions about the details of my problem</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>Give me insight into my problem</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>Give me suggestions about how to solve my problem</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>Offer time, effort, or money to help solve my problem</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>Try to understand my point of view about problems that I have</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>Show me affection, such as hugging me, when I am upset</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
<td>Tell me how he or she cares about me when I am upset</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8</td>
<td>Listen attentively</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>and show sympathy and understanding when I am upset</td>
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<td>9</td>
<td>Offer to do something with me, like going for a walk or taking me out, when I am upset</td>
<td>1 2 3 4 5</td>
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<td>10</td>
<td>Compliment or reassure me that I can handle things when I am upset</td>
<td>1 2 3 4 5</td>
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<tr>
<td>11</td>
<td>Hint or suggest that I control my feelings when I am upset</td>
<td>1 2 3 4 5</td>
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<td>12</td>
<td>Tell me that there is nothing I can do about my problems</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
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<tr>
<td>13</td>
<td>Make light of my feelings when I am upset</td>
<td>1 2 3 4 5</td>
<td></td>
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<tr>
<td>14</td>
<td>Tell me that my problems are not serious</td>
<td>1 2 3 4 5</td>
<td></td>
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<tr>
<td>15</td>
<td>Remind me of other people’s problems that are worse than mine</td>
<td>1 2 3 4 5</td>
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<td>16</td>
<td>Change the topic when I bring up my problems</td>
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<tr>
<td>17</td>
<td>Ignore me when I am upset or mention that I am upset</td>
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<td>18</td>
<td>Criticize the way I handle my problems</td>
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<td>19</td>
<td>Express his/her irritation with me when I am upset</td>
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<td>20</td>
<td>Encourage me to do something, like getting drunk or watching TV, to escape the way I am feeling.</td>
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The following sections ask the same question, but we would like you to now think about how your dating partner **ACTUALLY behaves** (regardless of whether you prefer or like it or not) when have a problem or are feeling bad.

Your answers may be the same as in the previous section; however, they may be different. If your partner does not behave in the way described, circle a number near the “not at all” end of the scale. If your partner does react in the way described by a statement, choose a number near the “very much” end of the scale.

<table>
<thead>
<tr>
<th></th>
<th>Not at all</th>
<th>Very Much</th>
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<tr>
<td>Ask me questions about the details of my problem</td>
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<td>Give me insight into my problem</td>
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<td>Give me suggestions about how to solve my problem</td>
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<td>Offer time, effort, or money to help solve my problem</td>
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<td>Try to understand my point of view about problems that I have</td>
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<td>Show me affection, such as hugging me, when I am upset</td>
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<td>Tell me how he or she cares about me when I am upset</td>
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<td>Listen attentively and show sympathy and understanding when I am upset</td>
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<td>Offer to do something with me, like going for a walk or taking me out, when I am upset</td>
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<td>Compliment or reassure me that I can handle things when I am upset</td>
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<tr>
<td>Hint or suggest that I control my feelings when I am upset</td>
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<tr>
<td>Tell me that there is nothing I can do about my problems</td>
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<td>Make light of my feelings when I am upset</td>
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<td>Tell me that my problems are not serious</td>
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<td>Remind me of other people’s problems that are worse than mine</td>
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<td>Change the topic when I bring up my problems</td>
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<td>Ignore me when I am upset or mention that I am upset</td>
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<td>Criticize the way I handle my problems</td>
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<td>Express his/her irritation with me when I am upset</td>
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<tr>
<td>Encourage me to do something, like getting drunk or watching TV, to escape the way I am feeling.</td>
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Appendix I

**Thought Listing**

Because you have now been sitting alone thinking, we would like you to tell us what you were thinking about during this time.

Please describe the things you have been thinking about since you completed the tasks or the conversation with your partner. Please include all of your thoughts, whether they were related to the study or not. Please include enough information that others can understand your thoughts during this resting time.

You can list them or put them in bullet point format. Please try to include all of your thoughts, even if they seem random.
Appendix J
Study 2 Participant and Partner Pre-interaction Survey

Please answer the following questions about yourself.

1. What is your ethnicity? Please mark all that apply:
   ____ African American   ____ Native American   ____ Hispanic
   ____ Caucasian / White   ____ Asian   ____ Other

2. What is your sex? Circle One: Male   Female   Transgendered   Other:
   ______________

3. What is your sexual orientation? Check One
   ____ Heterosexual   ____ Lesbian   ____ Uncertain
   ____ Bisexual   ____ Gay   ____ Other

4. What is your age in years? _____________

5. What is your year in college? Circle One: Freshman   Sophomore   Junior   Senior

6. How many people would you consider to be good friends of yours? (list number)
   _____________

7. How many romantic relationships have you had in your lifetime? _________________

8. How many sexual partners have you had in your lifetime? _________________

9. How many days in the last month have you experienced cold or flu symptoms?
   ______ (out of 30)

10. How many times in the last month (30 days) have you had a doctor’s appointment?
    ____________

11. Which of the following best characterizes the status of your relationship with the person
    that you brought to complete the research with you? Please mark one:
    ____ Strangers   ____ Serious dating partners
    ____ Acquaintances   ____ Engaged to be married
    ____ Casual dating partners   ____ Married

12. How long have you been romantically involved with or interested in this person? Fill in
    numbers on the lines below.
    _____ days   _____ weeks   _____ months   _____ years

13. Would you consider this a long-distance relationship? (circle one) Yes   No
For the purpose of this survey, we would like you to think about your current romantic dating partner.

Please put the initials (not the full name) of that person here: __________

Please answer the following questions based on your current dating partner (who’s initials you listed above)

For the next set of questions, we would like you to think about your current relationship with this person, and use the following words and phrases to describe it. For example, if you think that your relationship during the last two weeks has been very exciting, put an X in the space right next to the word "exciting." If you think it has been very boring, put an X in the space right next to "boring." If you think it has been somewhere in between, put an X where you think it belongs.

1. miserable ___ ___ ___ ___ ___ ___ ___ enjoyable
2. hopeful ___ ___ ___ ___ ___ ___ ___ discouraging
3. free ___ ___ ___ ___ ___ ___ ___ tied down
4. empty ___ ___ ___ ___ ___ ___ ___ full
5. interesting ___ ___ ___ ___ ___ ___ ___ boring
6. rewarding ___ ___ ___ ___ ___ ___ ___ disappointing
7. doesn’t give ___ ___ ___ ___ ___ ___ ___ brings out the best in me much chance
8. lonely ___ ___ ___ ___ ___ ___ ___ friendly
9. hard ___ ___ ___ ___ ___ ___ ___ easy
10. worthwhile ___ ___ ___ ___ ___ ___ ___ useless

AT THE PRESENT TIME, THIS RELATIONSHIP IS . . .

1. exciting ___ ___ ___ ___ ___ ___ ___ boring
2. chaotic ___ ___ ___ ___ ___ ___ ___ stable
3. calm ___ ___ ___ ___ ___ ___ ___ turbulent
4. exhilarating ___ ___ ___ ___ ___ ___ ___ mundane
5. tumultuous ___ ___ ___ ___ ___ ___ ___ running smoothly
6. dull ___ ___ ___ ___ ___ ___ ___ stimulating
7. uneventful ___ ___ ___ ___ ___ ___ ___ thrilling
8. unpredictable ___ ___ ___ ___ ___ ___ ___ predictable
9. peaceful ___ ___ ___ ___ ___ ___ ___ stressful
10. supportive _____ _____ _____ _____ _____ _____ unsupportive

11. All things considered, how satisfied or dissatisfied have you been with your relationship with this person over the last two months? (Place an X in the space that best describes how satisfied you have been.)

completely satisfied neutral completely dissatisfied

Please mark the number that indicates how you feel about each statement.

1               2               3               4               5               6               7               8               9
Not at all true Moderately true Definitely true

11. I feel that I could confide in this person about virtually everything 1 2 3 4 5 6 7 8 9
12. I would do anything for this person 1 2 3 4 5 6 7 8 9
13. If I couldn’t be with this person, I would feel miserable 1 2 3 4 5 6 7 8 9
14. If I am lonely, my first thought is to seek this person out 1 2 3 4 5 6 7 8 9
15. One of my primary concerns is this person’s welfare 1 2 3 4 5 6 7 8 9
16. I would forgive this person for practically anything 1 2 3 4 5 6 7 8 9
17. I feel responsible for this person’s well being 1 2 3 4 5 6 7 8 9
18. I would enjoy being confided in by this person 1 2 3 4 5 6 7 8 9
19. It would be hard for me to get along without this person 1 2 3 4 5 6 7 8 9

20. At this point in time, what do you feel the chance is of your relationship leading to marriage or a similar lifelong commitment?

0% 10 20 30 40 50 60 70 80 90 100%

YOU ARE NOW FINISHED WITH THIS PART OF THE RESEARCH.

PLEASE TELL THE RESEARCHER YOU ARE FINISHED.
Participant Post-task Questionnaire

For the following questions please circle the number that reflects how much you agree or disagree with each statement. The scale ranges from complete disagreement to complete agreement.

1. strongly disagree  2. moderately disagree  3. disagree  4. undecided  5. agree  6. moderately agree  7. strongly agree

The tasks I completed …
1. made me question my abilities………………………… 1 2 3 4 5 6 7
2. were a challenge I could overcome…………………… 1 2 3 4 5 6 7
3. were overwhelming……………………………………… 1 2 3 4 5 6 7
4. made me frustrated ……………………………………… 1 2 3 4 5 6 7
5. were unpredictable ……………………………………… 1 2 3 4 5 6 7

My performance on the tasks…
6. Was not under my control……………………………. 1 2 3 4 5 6 7
7. Could have been better…………………………….. 1 2 3 4 5 6 7
8. Was based on my skills ………………………………. 1 2 3 4 5 6 7
9. Was a result of forces I could not control …………… 1 2 3 4 5 6 7

After the tasks, I feel…
1. stressed………………………………………………… 1 2 3 4 5 6 7
2. less depressed…………………………………………… 1 2 3 4 5 6 7
3. irritated………………………………………………… 1 2 3 4 5 6 7
4. better about myself…………………………………… 1 2 3 4 5 6 7
5. more optimistic ………………………………………… 1 2 3 4 5 6 7
6. helpless………………………………………………… 1 2 3 4 5 6 7
7. embarrassed…………………………………………… 1 2 3 4 5 6 7
Please respond to the following questions based on the tasks you completed:

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<th></th>
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<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Strongly Disagree</td>
<td></td>
<td></td>
<td></td>
<td>Strongly Agree</td>
</tr>
</tbody>
</table>

During the tasks, I felt…
1. Hurt………………………………………………………………………………..
2. Dominated………………………………………………………………………
3. Angry……………………………………………………………………………
4. Submissive……………………………………………………………………
5. Engaged………………………………………………………………………..
6. Sad ………………………………………………………………………………
7. Withdrawn……………………………………………………………………..
8. Worthless……………………………………………………………………...
9. Interested……………………………………………………………………..
10. Happy …………………………………………………………………………
11. Hopeless…………………………………………………………………….
12. Surprised ……………………………………………………………………
13. Fearful ………………………………………………………………………
14. Jealous ………………………………………………………………………
15. Confused …………………………………………………………………….
Appendix L
Study 2 Participant Post-interaction Survey

Sometimes conversations with a romantic partner can be very positive and sometimes less positive. Please rate your discussion of each stressor on the following scales. Use the following words and phrases to describe each conversation. For example, if you think that the conversation was satisfying, put an X in the space right next to the word “satisfying.” If you think it was very dissatisfying, put an X in the space right next to “dissatisfying.” If you think it has been somewhere in between, put an X where you think it belongs.

The conversation was…

Please respond to the following questions using this scale:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
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<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Strongly Disagree</td>
<td></td>
<td></td>
<td></td>
<td>Strongly Agree</td>
</tr>
</tbody>
</table>

During the conversation, my partner made me feel...

1. Hurt
2. Dominated
3. Negative Regard
4. Angry
5. Submissive
6. Engaged
7. Supported
8. Sad
9. Withdrawn
10. Persuaded
11. Worthless
12. Interested
13. Concession
14. Happy
15. Influenced
16. Cared for
17. Hopeless
18. Positive regard
19. Compliant
20. Surprised
21. Controlled
22. Fearful
23. Yielding
24. Jealous
25. Validated
26. Affectionate
27. Confused
28. Disaffectionate
29. Liked
30. Attractive
31. Uncertain about our relationship
32. Disliked
33. Aversion

Please circle the number that reflects how much you agree or disagree with each statement. The scale ranges from complete disagreement to complete agreement.

<table>
<thead>
<tr>
<th></th>
<th>strongly disagree</th>
<th>moderately disagree</th>
<th>disagree</th>
<th>undecided</th>
<th>agree</th>
<th>moderately agree</th>
<th>strongly agree</th>
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<tbody>
<tr>
<td>1</td>
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<td></td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
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</tbody>
</table>

My partner.....

1. Was intensely involved in our conversation
2. Did not want a deeper relationship
3. Was not attracted to me
4. Seemed to find the conversation stimulating
5. Communicated coldness rather than warmth
6. Created a sense of distance between us
7. Acted bored by our conversation
8. Was interested in talking to me
9. Made me feel similar to him/her
10. Tried to move the conversation to a deeper level
11. Desired further communication
12. Seemed to care if I liked him/her
13. Was sincere
14. Wanted me to trust him/her
15. Was willing to listen
16. Was open to my ideas
17. Was honest in communicating with me
18. Felt very tense talking to me
19. Was calm and poised................................................. 1 2 3 4 5 6 7
20. Was relaxed talking to me........................................... 1 2 3 4 5 6 7
21. Was nervous in my presence...................................... 1 2 3 4 5 6 7
22. Was comfortable interacting with me............................ 1 2 3 4 5 6 7
23. Made interaction informal........................................ 1 2 3 4 5 6 7
24. Wanted the discussion to be casual.............................. 1 2 3 4 5 6 7
25. Wanted the discussion to be informal............................ 1 2 3 4 5 6 7
26. Attempted to persuade me......................................... 1 2 3 4 5 6 7
27. Did not attempt to influence me.................................... 1 2 3 4 5 6 7
28. Tried to control the interaction.................................. 1 2 3 4 5 6 7
29. Tried to gain my approval......................................... 1 2 3 4 5 6 7
30. Didn’t try to win my favor........................................ 1 2 3 4 5 6 7
31. Had the upper hand in the conversation....................... 1 2 3 4 5 6 7
32. Considered us equals.............................................. 1 2 3 4 5 6 7
33. Did not treat me as an equal..................................... 1 2 3 4 5 6 7
34. Wanted to cooperate .............................................. 1 2 3 4 5 6 7
35. Wanted to stick to the main purpose............................ 1 2 3 4 5 6 7
36. Was more interested in social conversation than the task at hand 1 2 3 4 5 6 7

My partner (‘s).... disagree ------------ agree
1. Wanted to talk about the items on the card rather than my feelings 1 2 3 4 5 6 7
2. Behaved in the way I expected most people to behave..................1 2 3 4 5 6 7
3. Engaged in normal conversational behavior.............................1 2 3 4 5 6 7
4. Behavior was unusual..................................................1 2 3 4 5 6 7
5. Behavior was undesirable................................................1 2 3 4 5 6 7
6. Manner of communicating was very unpleasant........................1 2 3 4 5 6 7

Please circle the number that reflects how much you agree or disagree with each statement. The scale ranges from complete disagreement to complete agreement.

During the conversation, my partner:
1. Made explicitly supportive comments
2. Was clear about his or her opinion
3. Made directly supportive comments
4. Gave reasons why I shouldn’t feel bad
5. Elaborated on his or her feelings or opinions
6. Gave examples that supported his or her opinion

Please rate your partner’s behavior during the conversation on the following scales. Use the following words and phrases to describe his or her behavior.

During the conversation, my partner’s behavior was…

1. Appropriate ________ ________ ________ ________ ________ ________ Inappropriate
2. Effective ____ ____ ____ ____ ____ ____ ____ Ineffective


1. How supportive was the conversation?
Not at all Supportive 1 2 3 4 5 6 7 Extremely Supportive

2. How much did your partner make you feel better?
Not at all better 1 2 3 4 5 6 7 Extremely better

3. How much did your partner validate your feelings?
Not at all 1 2 3 4 5 6 7 Extremely

4. To what extent was your partner’s level of support normal or expected for your relationship, based on past experiences?
Not at all 1 2 3 4 5 6 7 Extremely Expected

5. To what extent did your partner provide your ideal or preferred type of support?
Not at all 1 2 3 4 5 6 7 Extremely

The questions in this scale ask you about your feelings and thoughts during THE LAST MONTH. In each case, you will be circle the number that represents HOW OFTEN you felt or thought a certain way. Although some of the questions are similar, there are differences between them and you should treat each one as a separate question. The best approach is to answer fairly quickly. That is, don’t try to count up the number of times you felt a particular way, but rather indicate the alternative that seems like a reasonable estimate.

<table>
<thead>
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<th>2</th>
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<th>4</th>
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<tr>
<td>Often</td>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
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1. In the last month, how often have you been upset because of something that happened unexpectedly?
2. In the last month, how often have you felt that you were unable to control the important things in your life?
3. In the last month, how often have you felt nervous and “stressed”?
4. In the last month, how often have you dealt successfully with day to day problems and annoyances?
5. In the last month, how often have you felt that you were effectively coping with important changes that were occurring in your life?
6. In the last month, how often have you felt confident about your ability to handle your personal problems?
7. In the last month, how often have you felt that things were going your way?
8. In the last month, how often have you found that you could not cope with all the things that you had to do?
9. In the last month, how often have you been able to control irritations in your life?
10. In the last month, how often have you felt that you were on top of things?
11. In the last month, how often have you been angered because of things that happened that were outside of your control?
12. In the last month, how often have you found yourself thinking about things that you have to accomplish?
13. In the last month, how often have you been able to control the way you spend your time?
14. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?
Appendix M
Study 2 Partner Post-interaction Questionnaire

_Sometimes conversations with a romantic partner can be very positive and sometimes less positive. Please rate your discussion of each stressor on the following scales. Use the following words and phrases to describe each conversation. For example, if you think that the conversation was satisfying, put an X in the space right next to the word “satisfying.” If you think it was very dissatisfying, put an X in the space right next to “dissatisfying.” If you think it has been somewhere in between, put an X where you think it belongs._

The conversation was…

1. Negative ____ ____ ____ ____ ____ ____      Positive
2. Hurtful ____ ____ ____ ____ ____ ____      Supportive
3. Satisfying ____ ____ ____ ____ ____ ____      Dissatisfying
4. Frustrating ____ ____ ____ ____ ____ ____      Calming

_For the following questions please circle the number that reflects how much you agree or disagree with each statement with respect to the CONVERSATION. The scale ranges from complete disagreement to complete agreement._

1    2                      3                    4                    5                  6                  7
strongly          moderately        disagree        undecided         agree     moderately strongly
disagree          disagree              agree   agree

This conversation…
1. Reduced my partner’s stress about the situation we discussed……….   1    2    3    4    5    6    7
2. Was similar to others I’ve had with this person………… 1    2    3    4   5    6    7
3. Felt natural …………………………………………….. 1    2    3    4 5    6    7
4. Wasn’t typical for my partner and I…………………….   1    2    3    4 5    6    7
5. Seemed unrealistic………………………………………   1    2    3    4 5    6    7
6. Happens often in our relationship……………………….   1    2    3    4 5    6    7
7. Made me think about my relationship with him/her…….     1    2    3    4    5    6    7

_Please respond to the following questions using this scale:_

1 2         3 4 5
Strongly Disagree    Strongly Agree

_During the conversation, my partner made me feel…_
1. Hurt……………………………………………………………………………
2. Dominated…………………………………………………………………………
3. Negative Regard………………………………………………………………….
4. Angry
5. Submissive
6. Engaged
7. Supported
8. Sad
9. Withdrawn
10. Persuaded
11. Worthless
12. Interested
13. Concession
14. Happy
15. Influenced
16. Cared for
17. Hopeless
18. Positive regard
19. Compliant
20. Surprised
21. Controlled
22. Fearful
23. Yielding
24. Jealous
25. Validated
26. Affectionate
27. Confused
28. Disaffectionate

29. Liked

30. Attractive

31. Uncertain about our relationship

32. Disliked

33. Aversion
VITA

Jennifer S. Johnson

The Pennsylvania State University
Department of Communication Arts and Sciences
234 Sparks Building
University Park, PA 16802
170 Northbrook Lane
State College, PA 16803
jsp206@psu.edu

Education

Ph.D., The Pennsylvania State University
Department of Communication Arts and Sciences
Chair: Dr. Denise Haunani Solomon
Committee: Dr. Jon Nussbaum, Dr. Roxanne Parrott, Dr. Sonia Cavigelli
Dissertation Title: The illocutionary force of hurt and support in young adult
romantic relationships: Message feature ratings, message perceptions, and
physiological stress

May 2009

M.A., University of Wisconsin-Milwaukee
Department of Communication

May 2003

B.A., University of Wisconsin-Milwaukee
Department of Psychology
Minor: Communication

December 2001
Magna Cum Laude

Academic and Professional Experience

Lecturer
The Pennsylvania State University
2004 – present

Advisor
The Pennsylvania State University
Summer 2007

Instructor
Winona State University
2003 - 2004

Teaching Assistant
University of Wisconsin - Milwaukee
2001 – 2003