

ATTACHMENT STYLES AND NEGATIVE AFFECT:
IDENTIFYING UNDERLYING PROCESSES

By

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CHAPTER I

INTRODUCTION

Marital Process

Intimate relationships have the potential to bring about increased health benefits, financial security, mental health, as well as great joy (Waite & Gallagher, 2000). Unfortunately, many couples never realize their hope of lifelong partnership. In fact, according to the U.S. Bureau of Census (2000), only 50 percent of families fit into the first time married category in the United States. Marital dissolution is a complex and difficult process that often comes at considerable cost to the entire family. Given the potential for negative outcomes, significant attention has been devoted to better understanding marital interactions and those processes which appear to be predictive of divorce.

Literature on couple relationships is replete with studies investigating processes associated with marital outcome, and researchers have boasted great success in identifying the interactional processes associated with marital distress (Bradbury & Karney, 2004; Gottman, 1994; Gottman, 1998; Gottman & Notarius, 2000). These findings are extremely important as marital distress is associated with numerous maladies including increases in stress hormones, physical ailments, psychopathology, and mortality (Burman & Margolin, 1992).

In particular negative affect has been found to have a profound effect on couple relationships. In fact, early researchers pointed toward negativity as the primary indicator of relational distress (Notarius, Benson, & Sloane, 1989). However, further inquiries have revealed that negativity alone is an insufficient predictor of relational dissolution (Gottman, 1994). Instead, Gottman determined high ratios of negative affect to positive affect to be highly significant. In other words, as long as couples were able to maintain high levels of positivity in interaction, displays of negative affect did not necessarily indicate distress. Interestingly, Griffin (1993) suggested that time spent in negative affective states might also be key to shedding light on dyadic interaction. Utilizing event history analysis, Griffin found several factors affecting the rate at which partners transitioned out of negative affect. The results revealed considerable gender differences influencing duration of negative affect. For instance, marital satisfaction, communication preferences, education, and prior negative affective states all affected women's total rates, whereas, education alone appeared to influence men's transition times. Building on the idea of flexibility in emotional states, Gottman et al. (2002) found that distressed couples indeed become "stuck" in negative affect, a phenomenon referred to as an "absorbing state." Leaving the absorbing state then becomes increasingly difficult.

Attachment and Affect Regulation

Given the clear connections between relationship distress and negative affect, it is important to gain a clearer understanding of the processes which leave couples vulnerable to specific emotional response patterns. To this end, an attachment perspective offers significant insight into individual and interpersonal differences in regards to emotion regulation. Attachment theory, first introduced by Bowlby (1982, 1973), describes an

innate need for a relationship which provides security and helps to alleviate distress. Despite the fact that Bowlby's theory was first introduced to describe the behavior of infants in relation to their caregivers, ideas relating to the attachment process have since been applied to intimate relationships in adulthood (Bartholomew & Horowitz, 1991; Hazan & Shaver, 1987). Attachment theorists expect that individuals will react to their partners based on past attachment experiences which determine their expectations, relational goals, behavioral regulation, and emotional responses.

Not surprisingly, several studies have demonstrated the propensity for insecurely attached individuals to report higher levels of negative affect (Alford, Lyddon, & Schrieber, 2006; Collins, 1996) as well as difficulty regulating negative arousal states (Mikulincer & Florian, 1998). Specifically, Danoski (2001) suggests that insecurely attached individuals have difficulty moving out of defensive affect. Despite significant research outlining the ways in which emotional expression and regulation are influenced by attachment style, less emphasis has been placed on how attachment styles may influence what Griffin (1993) refers to as "temporal patterning" or a dyadic pattern of emotional expression.

Physiological Reactivity

One possible explanation for this perceived difference in attachment related strategies for emotion regulation is physiological reactivity, in particular, the stress response system. The stress response system is primarily composed of two components: hypothalamic-pituitary-adrenal (HPA) axis and the activation of the locus ceruleus/autonomic nervous system (ANS; Gordis et al., 2006). The HPA axis is believed to be a slower acting response system as opposed to the faster acting catecholamine –

epinephrine, norepinephrine, and dopamine - component (Skosnik, Chatterton, Swisher, & Park, 2000). To date, studies identifying key aspects of the HPA axis as indicated by the presence of cortisol are extensive. However, invasive measures required in the past to study adrenergic activity relative to the sympathetic nervous system (SNS) have stalled research of the ANS, which is responsible for “fight or flight” response (Granger et al., 2006). More recently, noninvasive methods have been introduced opening up new possibilities for study. In addition, preliminary evidence has linked heightened levels of alpha-amylase to negative affectivity (Granger et al., 2006) demonstrating the potential value of utilizing this marker for the investigation of relational interaction.

Attachment and Psychophysiology

In a review of psychophysiology research on adult attachment, Diamond (2004) describes the connection between emotional and physiological reactivity with specific attention placed on the ANS and HPA axis of the endocrine system. In addition, Diamond calls for future research examining the potential meditational role of psychophysiology on the affective components of attachment. Although researchers have begun to identify effects of cortisol on attachment strategies (Powers, Pietromonaco, Gunlicks, & Sayer, 2006), to our knowledge the influence of attachment on the activation of the ANS as evidenced by the release of catecholamines into the blood stream has yet to be addressed. In response to this gap in the literature, this study investigated the potential meditational role of SNS reactivity as evidenced by levels of alpha-amylase, an enzyme found in saliva which has been shown to measure stress-related adrenal activity (Chatterton et al., 1996; Chatterton et al., 1997; Granger et al., 2006; Nater et al., 2005).

Purpose

The purpose of this study was to identify how attachment styles may influence emotional patterning in adult romantic relationships, specifically affective flexibility and negativity as well as to explore the potential mediational role of adrenergic reactivity. Insecure and secure couples were compared during a marital interaction task which required a transition from a negative to a positive discussion topic. First, individuals were instructed to discuss a time when they felt hurt or offended by their partner and then after seven minutes were instructed to discuss a time when they felt loved or appreciated. Saliva samples were gathered at the beginning of the study and immediately following the conversation.

CHAPTER II

REVIEW OF LITERATURE

Theoretical Frameworks

Attachment Theory. Many theories aid in the investigation of close relationships and relational processes. Although a large number discuss the structural components associated with love, fewer offer insight into the process of connection (Barnes & Sternberg, 1997). Bowlby (1982, 1973) first introduced attachment theory as a child development theory which described a child's need for a responsive caregiver. Through this relationship, Bowlby suggested that the child begins to make relational assumptions based on interactions with his or her caregiver. Based on the idea that these relational expectations are purported to be relatively stable (Bowlby, 1982), couple researchers began to investigate attachment process in adult intimate relationships (Bartholomew & Horowitz, 1991; Hazan & Shaver, 1987). Attachment theorists expect that individuals will react to their partners based on past attachment experiences which determine their expectations, relational goals, emotional responses, and behavioral regulation. Hazan and Shaver (1987) were the first to suggest that the major concepts and assumptions developed by Bowlby and other attachment theorists (see Ainsworth, Blehar, Waters, & Walls, 1978) could be readily applied to romantic relationships. First, Hazan and Shaver suggested that the three attachment styles, or patterns of relating, introduced

by Ainsworth et al. (1978), *secure*, *anxious/ambivalent*, and *avoidant* could be assessed in adults. Hazan and Shaver found that a secure attachment was associated with trust, happiness, support, responsiveness, and intimacy in romantic relationships. Conversely, an avoidant attachment was primarily linked to a fear of closeness and high levels of distrust. Finally, anxious/ambivalent respondents reported experiencing emotional extremes and an intense need for closeness.

These styles describe not only strategies for relating to others, but are the product of underlying mental and affective representations known as working models (Bowlby, 1973; Collins & Allard, 2004). Bowlby described the working model as follows:

In the working model of the world that anyone builds, a key feature is his notion of who his attachment figures are, where they may be found, and how they may be expected to respond. Similarly, in the working model of the self that anyone builds a key feature is his notion of how acceptable or unacceptable he himself is in the eyes of his attachment figures (p. 203).

These inner representations are thought to be constructed through numerous early encounters with one's attachment figure and are purported to be relatively stable (Bowlby, 1973; Collins & Allard, 2004). Working models are complex structures which include a variety of elements, such as recollections of attachment-related experiences; beliefs, attitudes, and expectations; attachment-related goals and needs; as well as strategies and plans related to accomplishing attachment goals (Collins & Allard, 2004; Collins & Read, 1994). In stressful situations, the attachment system is activated (Bowlby, 1973), and the constructs in one's working model become particularly salient

(Collins & Allard, 2004). Overall, working models can be understood as internal structures which can be observed through recognizable attachment behaviors.

Bartholomew and Horowitz (1991) utilized the two dimensions of a working model, views of the self and others, to create four patterns of intimate relating. Categorizing self-image and perceived responsiveness of others as either positive or negative, Bartholomew and Horowitz conceptualized the following types: secure (self-positive, other-positive), preoccupied (self-negative, other-positive), dismissing (self-positive, other-negative), and fearful (self-negative, other-negative). According to Bartholomew and Horowitz, attachment styles were found to be correlated with social strategies for relating with others. Specifically, the insecure attachment styles were associated with relational problems. For example, the dismissing type was characterized in part by coldness, the fearful category by shyness, and the preoccupied style by dependency.

Following Bartholomew and Horowitz (1991), many attachment measures emerged rendering significant confusion over which to use in the study of relationships. In answer to this question, Brennan, Clark, and Shaver (1998) developed a comprehensive measure compiled from a literature review of attachment measures. Ultimately, they created the Experiences in Close Relationships Questionnaire (ERCQ) highlighting two dimensions: anxiety and avoidance which correspond to the foundational assumptions of the underlying working model.

Couple Processes and Negative Affect

One of the primary variables of interest in relationship research is emotion. Patterns of emotion or the “emotional climate” of a relationship described as affective experiences and expressions (Caughlin & Huston, 2008), has been found across studies to

be a strong predictor of marital quality (e.g., Gottman & Levenson, 1992; 2002; Gottman, 1994). In fact, early researchers pointed toward negative affect as the primary indicator of relational distress (Notarius, Benson, & Sloane, 1989). Gottman and colleagues not only noted significant differences in affective displays for distressed versus nondistressed couples, but they also found greater rigidity in affective structures for distressed couples (Gottman, 1979). Specifically, evidence began to emerge which suggested that reciprocity of emotional displays may further separate distressed from nondistressed couples (Gottman, Markman, & Notarius, 1977; Griffin, 1993, 2003; Margolin & Wampold, 1981; Pasch, Bradbury, & Davila, 1997; Pike & Sillars, 1985). Gottman referred to these reciprocal sequences of negative affect as an “absorbing state” which becomes difficult to leave once entered (Gottman, 1994; Gottman et al., 2002).

Pike and Sillars (1985) explored nonverbal patterns during a conflict discussion for couples and found that when discussing highly salient conflicts, negative reciprocity increased substantially for distressed couples. In contrast, more satisfied couples appeared to remain consistent across discussions. Interestingly, although they observed negative verbal comments, most reciprocity occurred on the nonverbal level. Furthermore, Pasch et al. (1997) examined the interaction between negative affectivity and social support. Their results demonstrate gender differences in the ability to ask or give support to partners. Husbands appeared less capable of offering support during high negativity, and wives appeared to employ more negative strategies in seeking support or offering support when in a state of high negativity. In addition, partner negativity affected spousal behavior. Providing further evidence for negative reciprocity, increased hostility paired with low levels of defensiveness was predictive of higher conflict for husbands

and greater withdrawal for wives (Newton, Kiecolt-Glaser, Glaser, & Malarkey, 1995). Finally, Griffin (2003) found that distressed couples moved into negative affect more quickly and spent longer amounts of time in negative affective states.

Not only do these negative states appear to be difficult to bounce back from during conflict discussions, but Gottman and Levenson (1999b) also found that a couple's ability to recover from negative affect is extremely important to couple functioning. They found that the ability to bounce back after a conflict discussion as evidenced during a subsequent positive conversation had strikingly high predictive ability for future divorce. These patterns have clear devastating effects on couple relationships and also appear to be relatively stable over time (Gottman & Levenson, 1999a). Overall, negative affectivity, specifically flexibility and duration, appear to be important variables for the investigation of couple relationships. Accordingly, the incorporation of attachment style which has been linked not only to marital satisfaction and distress but also emotionality (Brennan & Shaver, 1995; Kobak & Hazan, 1991; Simpson, 1990) into the study of affective flexibility and negativity may be an important next step for research.

The Effects of Attachment Style on Romantic Relationships

Satisfaction and distress. Over the course of the last two decades, numerous studies have investigated the association between attachment styles and relational functioning (Banse, 2004; Brennan & Shaver, 1995; Feeney, 1994, 2002; Kobak & Hazan, 1991; Koski & Shaver, 1997; Simpson, 1990). These studies have repeatedly demonstrated the positive outcomes associated with a secure attachment style. As a framework, attachment theory has provided a multilevel snapshot accounting for the interplay between both individual and relationship level variables. Attachment theory suggests that “in order for

an adult relationship to be viewed as satisfying, the partners in the relationship presumably have to have their attachment-related needs largely met” (Koski & Shaver, 1997, p. 29). Following this assumption, numerous studies have investigated the association between attachment and relational satisfaction.

First, marital satisfaction has been found to vary according to individual attachment style. Numerous researchers have corroborated the findings of Hazan and Shaver’s (1987) influential study which identified many relational benefits associated with secure attachment. The literature has demonstrated that there is indeed a strong association between secure attachment and relationship satisfaction (Banse, 2004; Brennan & Shaver, 1995; Feeney, 1994, 2002; Kobak & Hazan, 1991; Simpson, 1990). Outcomes associated with secure attachment styles include greater self-reliance, spousal reliance, trust, affection, and positive affect (Brennan & Shaver, 1995; Simpson, 1990). In contrast, both anxious and avoidant attachment styles were characterized by negative interaction, affect, and attribution, and maladaptive coping strategies (Brennan & Shaver, 1995; Simpson, 1990).

In addition to testing the effects of attachment style on individual satisfaction scores, many investigations have also assessed how attachment style has affected satisfaction on a relational level (Banse, 2004; J.A. Feeney, 2002; Kobak & Hazan, 1991; Simpson, 1990). Gender differences have been reported to affect the relationship between attachment style and partner satisfaction (Banse, 2004; J.A. Feeney, 1994; Simpson, 1990). For example, anxiety in women has been shown to inversely relate with satisfaction reported by male partners (J.A. Feeney, 1994; Simpson, 1990). Similarly, avoidant males were associated with lower reports of satisfaction in female partners

(Simpson, 1990). Kobak and Hazan found that husbands' relationship security was challenged by wives' negativity during a problem solving session. The security of wives, on the other hand, appeared to be related to husbands' responsiveness during self-disclosure. Due to these consistent results, Banse (2004) recommended that researchers identify the ways in which the social construction of gender may attribute to the differences in attachment style on relationship satisfaction.

Attachment style has also been shown to affect perceptions of spousal behavior (Collins & J.A. Feeney, 2004; B.C. Feeney, 2004; Kobak & Hazan, 1991). Specifically, insecure individuals have been found to filter their partner's behaviors through fears and insecurities associated with their attachment style. Their interpretation then affects their responses. This general pattern is believed to lower satisfaction for both members of the couple (Feeney, 2002). Johnson, Makinen, and Millikin (2001) have presented the idea that so-called "attachment injuries," or intrapsychic wounds occurring in attachment relationships, result in hyperactive attempts at self-protection. Combining these ideas, insecurities whether they result from a single poignant encounter or a broad collection of experiences directly influence one's perceptions of his or her relationship and relational interactions, thus affecting levels of felt security and subsequent behavior. Overall, attachment styles appear to be intricately woven into the fabric of relationships affecting perceptions of satisfaction at each level.

Working model: Social support and self perception. Satisfaction in couple relationships is characterized in part by partner support which has been proposed to be a predictor for marital functioning (Pasch & Bradbury, 1997) and is inextricably tied to one's working model, namely the perception of others. Attachment theorists have

suggested that support, responsiveness, and caregiving are central theoretical principles; as a result, researchers have devoted significant time investigating relational support through an attachment model. These studies have consistently revealed that the working model which informs attachment strategies affects perceptions of support and responsiveness in others (Carnelley, Pierdomonico, & Jaffe, 1996; Collins & Feeney, 2000, 2004; Gallo & Smith, 2001). These attributions were particularly salient when the situation was unclear (Collins & Feeney, 2004). In other words, when individuals were unable to tell whether their partners' behaviors were expressly negative or positive, they relied more heavily on working model explanations. In addition to shaping perceptions, working models also influence support offered to intimate partners. Collins and Feeney (2000) reported that avoidant individuals offered less support, whereas the support offered by anxious individuals was less positive.

As previously discussed, working models are most broadly described on two continuums, views of the self and views of others. Many studies have described the ways that perceptions of others affect relationships. However, the other dimension, self perception, is also important to note. Secure individuals due to positive ratings on both dimensions are believed to have a high self-worth (Bartholomew & Horowitz, 1991). Mikulincer (1995) has emphasized the complexity of self representations as found in a series of five studies. Although avoidant and secure individuals are both purported to share positive views of the self, Mikulincer found that secure individuals were more self-aware and realistic in their self-appraisal. As the working model is composed of collective experiences, interactions with one's spouse can also impact self-perception.

Feeney (2004) found support for this assumption showing that spousal support affects reports of self-worth.

Adult attachment and conflict. A significant amount of research has outlined the effects of conflict management strategies on satisfaction in marital relationships (e.g., Greef & De Bruyne, 2000; Roberts, 2000). An attachment perspective highlights the underlying processes which might predict higher levels of conflict, as well as the reasons for the adoption of certain conflict styles. Not surprisingly, conflict is considered to be a prime candidate for activation of attachment strategies due to levels of stress (Kobak & Duemmler, 1994). Moreover, attachment strategies are believed to be more pronounced during conflict exchanges (Pietromonaco & Feldman Barrett, 1997). Based on assumptions taken from the working model, securely attached individuals are expected to engage in more effective conflict discussion as they are less likely to perceive the conflict as a direct threat to either self or the relationship (Collins et al., 2006; Pistole & Arricale, 2003). This positive view of self and others is thought to provide the security necessary to express one's own thoughts and opinions and to listen to a potentially dissenting view. In support of this assumption, securely attached individuals have been found to participate in more constructive conflict management strategies such as higher levels of compromise and integration of ideas, low levels of contempt, and a general willingness to engage in conflict (Creasy & Ladd, 2005; Corcoran & Mallinckrodt, 2000; Pistole & Arricale, 2003),

In addition, secure attachment has been related to more vulnerable self-disclosure, higher levels of comfort with the vulnerability necessary to self-disclose, and flexibility in self-disclosing conversation (Keelan, Dion, & Dion, 1998; Mikulincer & Nachshon,

1991) all necessary components of effective problem solving. Interestingly, Mikulincer and Nachshon pointed to some similarities between anxious individuals and the secure attachment type in comparison to the avoidant group. These differences were noticed in terms of comfort and quantity of disclosure. Keelan et al. has proposed that differences between groups were more readily noticeable when differentiating the types of disclosure. According to their results, secure individuals communicated more emotionally relevant information. Uniquely, the authors also discovered that secure individuals were able to engage in self-disclosure in a manner that encouraged conversational partners to self-disclose also.

In contrast to those with secure attachment styles, insecurely attached individuals are more likely to adopt protective stances as the conflict is often appraised as a threat (Creasy & Ladd, 2005). This perception results in negative reinforcing feedback loops as individual behavioral responses occur in reaction to distressed affect. Indeed both anxious and avoidant individuals report high levels of negativity during conflict resolution tasks (Creasey, Kershaw, & Boston, 1999). These responses then act as the means by which insecure individuals regulate uncomfortable or undesirable affect ultimately, decreasing the likelihood of having their relational needs met (Pistole & Arricale, 2003).

More specifically, those with an avoidant attachment style were more likely to be domineering in conflict discussions, presumably to end the discussion quickly (Creasey & Ladd, 2005). Alternatively, Shi (2003) found that avoidant individuals also have a tendency give in to their partner's desires in order to mitigate discomfort and end the conversation. Finally, avoidant individuals displayed low levels of warmth and support

during a conversation considered to be a significant conflict in dating relationships (Simpson, Rholes, & Phillips, 1996).

Beyond conflict strategies associated with avoidant individuals, anxious individuals also displayed unique conflict management tactics. For example, anxious individuals were correlated with higher levels of contempt (Creasey & Ladd, 2005), blame, threats, and negativity (Feeney, Noller, & Callan, 1994). Furthermore, anxious individuals reported more frequent and higher intensity conflict than did secure and avoidant individuals (Creasey, Kershaw, & Boston, 1999). Overall, the results of these studies suggest that attachment styles have strong predictive ability for conflict management strategies thus providing insight into couple dynamics and providing a unique context for the exploration of negative processes.

Adult attachment and affect regulation. In addition to predicting conflict management strategies, attachment theory also lends insight to the process of emotion regulation. In fact, attachment styles have been found to be predictive of emotional response (Collins, 1996). As mentioned previously, emotionality and more specifically, negative emotionality is predictive of couple satisfaction and dissolution. Therefore, an attachment perspective serves as an ideal vantage point from which to further explore affect regulation and its subsequent effects on couple interactions.

Based on a positive image of self and others, secure individuals have been found to demonstrate more productive emotion regulatory processes (Kobak & Hazan, 1991). These individuals have learned that they are capable of self-soothing and that attempts at eliciting support from others are successful resulting in greater emotional openness and higher levels of vulnerability (Mikulincer, Shaver, & Pereg, 2003). Oftentimes,

maintaining effective modulation of emotion becomes more challenging when one becomes angry. In response to an anger provoking situation, secure individuals demonstrated more appropriate and adaptive responses to anger as well as a more positive appraisal of partner's intentions (Mikulincer, 1998). Optimistic attributional appraisals are linked to lower levels of distress (Collins et al., 2006). Thus, fitting with expectations, secure individuals have also been shown to experience significantly higher levels of positive affect (Alford et al., 2006; Simpson, 1990), lower levels of negative affect (Feeney, 1998), and more effective problem solving strategies than insecurely attached individuals (Mikulincer et al, 2003).

In contrast, insecurely attached individuals have more difficulty regulating emotion due to fears associated with their working model. For instance, because anxious individuals rely on their partners for feelings of self worth, they attempt to maintain proximity for fear of being rejected or abandoned (Collins, 1996). On the other hand, avoidant individuals report discomfort with intimacy and closeness with others. Instead of reporting discomfort, they strive to maintain their independence (Shaver & Mikulincer, 2007). As a result of these fears, the emotion regulation strategies employed by insecurely attached individuals are effective short term in alleviating distress, but have long term maladaptive effects on interpersonal functioning (Wei et al., 2005). Further evidence has indicated that partners of insecurely attached individuals demonstrated lower levels of satisfaction in their relationships (Banse, 2004; Kane et al., 2007).

Looking specifically at differences in the dimensions of attachment insecurity, studies indicate that the anxiously attached have increased levels of distress (Alford et al., 2006; Kemp & Neimeyer, 1999), experience higher levels of anxiety (Brennan et al.,

1998), and are more emotionally expressive (Bartholomew & Horowitz, 1991; Kemp & Neimeyer, 1999). Beyond negative emotionality, anxious individuals also have been shown to have lower self-worth (Mikulincer, 1995). Attempts to mitigate this negative self concept primarily include maintaining proximity to others utilizing a demanding and domineering relational style (Bartholomew & Horowitz, 1991).

The regulation strategy of anxiously attached individuals has been conceptualized by Shaver and Mikulincer (2007) as hyperactivating. Stated another way, anxiously attached individuals are overly attentive to attachment threats, and consequently, tend to inflate perceived risks and fervently monitor the attachment figures availability. Although this strategy is occasionally effective in redirecting the attention of attachment figures (Cassidy & Berlin, 1994), the overarching effects are clearly self-defeating. In fact, Campbell et al. (2005) found that anxious individuals perceived higher levels of conflicts and conflict severity with romantic partners during daily interactions. Moreover, during a conflict discussion, anxious individuals displayed high levels of distress regardless of partner positivity.

Multiple studies have outlined the tendency for avoidantly attached individuals to display increased negativity during stressful activities (e.g., Campbell et al., 2001; Rholes, Simpson, & Oriña, 1999). Rholes et al. (1999) conducted a cleverly designed study aimed at identifying affect during social support seeking attempts. Individuals were told that they would be participating in an anxiety provoking situation while in the presence of a romantic partner. In the 5 minutes that elapsed before supposedly beginning the task, avoidantly attached women displayed high levels of anger toward their partners specifically when they were more distressed or received low levels of support from their

partners. Further, avoidantly attached men reacted to the stressful waiting period with greater anger particularly when their partners were upset or sought support from them. Campbell et al. (2001) found that in addition to avoidant individuals displaying higher levels of negativity during a stressful interaction, their partners also responded with increased levels of negativity assumedly in response to their regulation strategies.

In response to intense negativity, Shaver and Mikulincer (2007) have described the inhibitory strategies employed by avoidant individuals. They reason that avoidant individuals have learned that expression of negative emotions and vulnerability will not be well received. In response, these individuals then attempt to avoid negative emotional responses by denying the threat and overly relying on their own abilities (Wei et al., 2005). Threats to their self-perception or attempts to initiate more intimacy than is comfortable may be met with anger or attacks motivated toward maintaining felt security and alleviating attachment distress (Mikulincer et al., 2003).

Although Shaver and Mikulincer suggest that avoidant individuals pre-emptively alter their cognitive appraisal of an event to be less distressing, other researchers have suggested that this process occurs retroactively. Specifically, Pietromonaco and Feldman Barrett (1997) furthered understanding of the avoidant attachment styles by exploring daily interactions as opposed to the more typical retrospective analysis. They found that avoidant individuals experienced emotions as intense as anxious individuals immediately after a stressful interaction. They purport that avoidant individuals are more likely to block out their emotions over time which may account for differences in findings for retrospective studies which generally have found that avoidant individuals report lower levels of distress. Regardless of whether avoidant individuals attempt to avoid intense

emotionality through pre-emptively altering their perceptions or this process occurs retroactively, their partners tend to react with more negativity in response to the avoidant strategies. Overall, not only do attachment styles predict individual emotional experience in relationships, they also directly impact partner's emotional experiences and satisfaction in relationships.

Adult attachment and psychophysiology. Relational dynamics play a key role in psychophysiological reactivity (Kiecolt-Glaser & Newton, 2001). Additionally, affect is inextricably tied to dyadic interactions and physiological variables (e.g., Gottman, 1994; Gottman & Levenson, 1992). As research has continued to outline the connections between relationship variables and physiology, many theorists have begun to utilize biological markers in the study of romantic relationships. As a result, attachment theory provides a marriage between dyadic interactions and emotion regulation creating a ripe context for psychobiological research.

Although a number of attachment theorists have begun to implement physiological measures in the study couple interaction (e.g., Carpenter & Kirkpatrick, 1996; Diamond & Hicks, 2005; Kim, 2006; Laurent & Powers, 2007; Mikulincer, 1998; Powers et al., 2006; Roisman, 2007), inclusion of these measures is still relatively new to this field of study. As such, a majority of the research has focused predominately on parasympathetic activity and the HPA axis of the stress response system since they have been suggested to indicative of homeostatic functioning (Diamond, 2001).

Only two studies were located that directly link cortisol levels to adult attachment (Laurent & Powers, 2007; Powers et al., 2006). Powers and colleagues investigated cortisol levels at multiple points during a conflict discussion. Their findings provide

empirical validation of the supposed mechanisms involved in the emotion regulation process as it relates to adult attachment. Specifically, individuals' classification as being insecurely attached predicted greater stress reactivity especially for men. Gender differences were expected based on previous individual level research, and the results of this study corroborate these assumptions. Next, Laurent and Powers (2007) found cross-partner effects related to emotionality in addition to finding that both anxious and avoidant attachment predicted higher levels of cortisol. Overall, attachment style appears to be related not only to personal stress reactivity but also affects the partner's stress reactivity.

The other part of the stress response system the ANS, has also been investigated with specific attention placed on the parasympathetic activity. For instance, Diamond and Hicks (2005) found that vagal tone, associated with attachment security, played a mediating role in attenuating negative emotionality. Futher, Roisman (2007) investigated the role of the ANS activity on hyperactivation and deactivating strategies as indicated by the Adult Attachment Interview. These findings indicate that hyperactive strategies were associated with increased heart rate whereas; deactivating strategies were associated with increased electrodermal measures. Interestingly, hyperactivating strategies were not related to the parasympathetic measure (respiration sinus arrhythmia; RSA) pointing to the potential for SNS activity although direct measures were not collected during this study. Finally, few studies have examined heart rate and blood pressure as they relate to adult attachment. Carpenter and Kirkpatrick found that both avoidant and anxious individuals showed higher levels of physiological arousal when their partners were present for a stress task. In contrast, Kim (2006) found that one measure of physiological

reactivity (rate-pressure product [RPP] which is the product of heart rate and systolic blood pressure) appeared to be lower for avoidant individuals. Indeed, there was an indirect relationship between negative affect and RPP. Given the lack of direct measures of SNS reactivity in relation to adult attachment research, this study will investigate potential biological markers for adrenergic activity.

Stress Response System

The stress response system is primarily composed of two physiological systems: the corticotrophin-releasing hormone (CRH) from the HPA axis which signals the release of glucocorticoids (including cortisol) and the locus coeruleus (LC) norepinephrine (sympathetic)/autonomic nervous system which triggers the release of catecholamines (epinephrine, norepinephrine, and dopamine; Levitan & Kaczmarek, 2002). When working properly, the stress response system is meant to help individuals respond adaptively to either general or specific stressors through a series of interrelated and counteracting forces (Chrousos & Gold, 1992). The sympathetic system is activated by a perceived challenge requiring a response, whereas, the CRH system is signalled in reaction to a situation deemed outside of the individual's control resulting in a redirection of efforts toward conservation (Henry, 1992). As such, the stress response system is inextricably connected with emotional, behavioral, and cognitive responses and when dysregulated can be linked to numerous psychological maladies (Chrousos & Gold, 1992).

For the purposes of this study, the autonomic nervous system, specifically, the sympathetic component is of primary interest. The autonomic nervous system is comprised of the sympathetic and parasympathetic systems. The SNS is responsible for

the effects leading to the “fight-or-flight” response. In contrast, the parasympathetic system helps to maintain and store energy and is often referred to as the “rest-and-digest” component. Although attention will be directed at sympathetic activity as a component of the stress response system, any activation of the SNS also affects the parasympathetic branch of the autonomic nervous system. Thus, instead of referring to distinct roles of each branch, it is more accurate to discuss which system is dominant during a given interaction (Proctor & Carpenter, 2007).

The activation of the LC-NE/autonomic nervous system, located in the brain stem, leads to the release of norepinephrine into a series of densely interconnected neurons. Norepinephrine activates in part the amygdala which aids in the emotional appraisal of the stressor (Chrousos & Gold, 1992). Next, innervation of sympathetic nerves stimulates the sympathetic adrenal medullary system which is responsible for the release of epinephrine and norepinephrine respectively (Henry, 1992). The term "adrenergic" is applied to those nerve fibers of the SNS that release norepinephrine (and possibly small amounts of epinephrine) at a synapse when a nerve impulse passes. Consequently, the response to adrenergic receptor activation results in the defensive reaction commonly referred to as the “fight-or-flight” response (Cannon, 1914). In pursuit of attenuating the stressor, the activation of norepinephrine may result in a narrowed focus on the current threat (Henry, 1992). The activation of the SNS results in numerous effects such as increased heart rate, blood pressure, and pupil dilation (Cannon, 1914; Levitan & Kaczmarek, 2002). Overall, the SNS plays a key role in the stress response system, and yet, has received considerably less attention than the HPA axis in

the literature primarily due to inaccessibility of markers. However, new research has delivered some promising candidates as biological indicators of sympathetic activity.

Biological indicators

Alpha amylase. Despite the fact that catecholamines can be readily detected in saliva, the transfer of norepinephrine from the blood to saliva takes approximately one hour (Kennedy et al., 2001). Further, norepinephrine levels remain stable for a relatively short amount of time rendering measurement difficult and expensive. Therefore, in the past, the measure of catecholamines as an index of sympathetic activity has been possible only through blood samples. In place of this more difficult measure, most have opted to study more peripheral measures or the resulting effects of this activation (i.e., heart rate, blood pressure, and skin conductance). Still, this medium requires sophisticated equipment. As a result, researchers set out to identify an alternative substitute marker for the study of plasma catecholamines.

The search began with an investigation of the effects of the ANS on salivary gland secretion. Findings have shown that salivary gland secretion is innervated by both the sympathetic and parasympathetic nervous systems albeit with differing effects. Although, the sympathetic and parasympathetic nervous systems are inextricably connected creating difficulty in isolating single functions, generally, sympathetic stimulation appears to increase salivary proteins, while parasympathetic stimulation increases salivary fluid (Proctor & Carpenter, 2007). A variety of animal studies have linked the salivary protein alpha amylase to ANS activity and sympathetic nerve stimulation (Asking & Gjorstrup, 1987; Schneyers & Hall, 1991; Skov et al., 1988; Speirs et al., 1974). As a result of these findings, researchers have suggested salivary

protein levels may be a reliable method of assessing sympathetic activity (Gallacher & Peterson, 1983). Of specific interest is alpha amylase, an enzyme generally present in the saliva in high concentrations that has the primary purpose of aiding in digestion as well as serving a protective function in preventing the build up of bacteria (Granger et al., 2006).

On the basis of previous oral biological research, along with animal studies that lend support to the possible connection between salivary alpha amylase and adrenergic activity, many researchers began testing alpha amylase levels in humans. Physical activity is one known stimulus for the release of catecholamines, and as expected, also appears to increase levels of salivary alpha amylase. For instance, several studies have demonstrated the effects of running on alpha amylase levels (Borgeat, Chagon, & Legault, 1984; Gilman et al., 1979; Nexo, Hansen & Konradsen, 1988) as well as cycling (Li & Gleeson, 2004). For both mediums of exercise, alpha amylase levels rose significantly providing further impetus for exploration.

Beyond physical stress, psychological stress also has been shown to have pronounced effects on alpha amylase levels (Bosch et al. 1996; 1998; Nater et al., 2005; Skosnik et al., 2000). In fact, Bosch and associates (1998) found that not only did alpha amylase levels increase with psychosocial stress but also appeared to correlate to the number and intensity of stressors. Moreover, these results are distinct from nonstress situations. For example, Nater and colleagues (2005) found significant differences in stress versus resting conditions in their study related to a psychosocial stress test. These increases appear to remain significant separate of salivary flow rate (Bosch et al., 1996).

Taken together, these findings clearly indicate the efficacy of alpha amylase as a stress marker.

Despite findings linking salivary alpha amylase to psychosocial stress generally, the underlying mechanism associated with the release of alpha amylase warrant further discussion. In effort to shed light on this process, Chatterton and associates investigated the hypothesis that alpha amylase could serve as a substitute marker for catecholamine release in both physical and psychosocial stress situations (Chatterton et al., 1996; Chatterton et al., 1997). They conducted several studies in which subjects were assigned to varying conditions including temperature differences, aerobic exercise, and an examination which acted as a psychosocial stressor (Chatterton et al., 1996). In each condition, alpha amylase levels rose significantly in response to the stressor. Further, alpha amylase levels for subjects in the examination and physical stress conditions were significantly correlated with levels of norepinephrine as examined through blood samples pointing toward the likely validity of alpha amylase as a surrogate marker. In confirmation, another study showed exposure to a psychosocial stressor yielded high levels of salivary alpha amylase in a patterned response which correlated with norepinephrine (Roheleder et al., 2006).

In addition to measuring plasma catecholamine levels, another way to examine the validity of alpha amylase as a marker of adrenergic activity is through pharmacological stimulation and blockade studies. In other words, if alpha amylase is directly related to the release of norepinephrine, then distributing pharmacological treatments that either increase the release of norepinephrine or bind to receptors inhibiting the uptake of norepinephrine should have reciprocal effects on salivary alpha

amylase. More than thirty years ago Speirs and colleagues conducted an exploratory study with a small sample to determine the effects of β adrenergic stimulation as well as a β blocker on alpha amylase levels (Speirs et al., 1974). As expected, when subjects were either immersed in cold water (a situation known to promote sympathetic stimulation) or given a pharmacological stimulator (e.g., isoprenaline), alpha amylase levels rose significantly. In contrast, the administration of a β blocker, propranolol, reduced levels of salivary alpha amylase along with heart rate and blood pressure, both peripheral measures of sympathetic activity. More recently, Van Stegeren et al. conducted a double blind comparison study to identify the effects of propranolol on salivary alpha amylase (Van Stegeren et al., 2006). The β blocker lowered alpha amylase levels as well as heart rate and blood pressure both during a rest condition as well as during an emotionally disturbing activity. In summary, these studies establish a direct link between norepinephrine levels and the production of alpha amylase.

Another key finding to emerge from the Chatterton studies is that alpha amylase levels do not correlate with cortisol levels (Chatterton et al, 1996). The stressors elicited more immediate alpha amylase increases while the emergence of higher cortisol levels was more delayed. This observation is not surprising as the HPA axis response is slower acting than the autonomic nervous system. This finding has been replicated in response to a commonly utilized social stress test further distinguishing alpha amylase from cortisol and solidifying it as a separate marker of the stress response system (Nater et al., 2006).

Only one study appears to raise questions as to the accuracy of salivary alpha amylase as a marker for catecholamine release (Nater et al., 2006). Although there does

not seem to be debate about alpha amylase as a reliable marker for the activation of autonomic nervous system, alpha amylase levels were not significantly correlated with plasma catecholamine levels. One potential reason for the lack of significance could be due to low power resulting from a relatively small sample size. Another possible explanation has been introduced by Elhert and associates. They reported that the administration of yohimbine, an alpha-2 adrenergic receptor antagonist, resulted in elevated levels of peripheral norepinephrine, epinephrine, and salivary alpha amylase (Elhert et al., 2006). The effects of yohimbine are seen in both the central and peripheral nervous system. Although salivary alpha amylase levels did not correlate with peripheral norepinephrine, they purport that instead it correlates with central norepinephrine. Because peripheral norepinephrine comes from two sources, the adrenal gland (medulla) above the kidney and spill-over from the central nervous system, levels of central and peripheral norepinephrine do not have to be the same. In fact, peripheral norepinephrine acts as a hormone while central norepinephrine acts as a neurotransmitter (Levitan & Kaczmarek, 2002). Thus, it is possible that salivary alpha amylase is an indicator of central norepinephrine which would explain the divergence in Nater's findings.

A final argument for the validity of alpha amylase as a marker of adrenergic activity can be derived from findings correlating alpha amylase reactivity with cardiovascular measures (Bosch et al., 2003; Nater et al., 2006) and skin conductance levels (El-Sheik et al., 2008). Bosch et al. found that alpha-amylase levels rose significantly with psychosocial stress and additionally were correlated to a shortened pre-ejection period indicating cardio autonomic activity. Similarly, Nater et al. established the relationship between alpha amylase levels and sympathetic tone. In addition to

cardiovascular measures, a study measuring stress responses in children found a significant relationship between alpha amylase levels and skin conductance (El-Sheikh et al., 2008). These measures of sympathetic activity further corroborate studies outlining relationships between salivary alpha amylase and catecholamine levels as well as pharmacological stimulation and blockade effects. Taken together, these studies establish the rationale and provide the results necessary to substantiate the hypothesis that salivary alpha amylase is indeed a marker for adrenergic activity.

Multiple studies have been conducted utilizing alpha amylase as a marker for sympathetic activity (e.g., El-Sheikh et al., 2008; Granger et al. 2006; Gordis et al., 2008; Gordis et al., 2008). This new method for ascertaining information about adrenergic activity has allowed researchers the ability to investigate potential effects of sympathetic stimulation on behavior and affect. For instance, investigating levels of sympathetic activity indicated which children were more likely to have internalizing and externalizing disorders (El-Sheikh et al., 2008). Furthermore, symmetrical interactions between markers for the HPA axis and the SNS predicted more aggressive behavior in adolescent (Gordis et al. 2006). Finally, Granger found that heightened levels of alpha amylase were related to increased feelings of tension and fearfulness (Granger et al., 2006). For the purposes of the present study alpha amylase represents a potential mediator for the relationship between attachment style and affect negativity and flexibility. Given that alpha amylase represents adrenergic activity which is responsible for multiple effects most simply referred to as the “fight or flight” response, it is assumed that individuals who are physiologically aroused would have more difficulty moving out of a defensive stance leading them to be more negative and less flexible in affect expression.

Conclusions

As the literature indicates, negative affect has numerous deleterious effects including low marital satisfaction, relational dissolution, and health problems (Gottman & Levenson, 1992; Gottman & Levenson, 2002). Specifically, longer durations of negativity and inflexibility in negative affect have been shown to be highly effective predictors of distress and divorce (Griffin, 1993; 2003; Gottman & Levenson, 1999; 2002). Moreover, adult attachment literature has outlined specific emotion regulation processes based on working models. Individuals that are insecurely attached, or have a working model that is characterized by either anxiety or avoidance, display increased levels of distress and negative emotionality. The same results have been found for partners of insecurely attached individuals. Taken together, insecurely attached couples, or couples in which at least one member is insecurely attached, may be predictive of lower levels of flexibility and increased negativity in affective expression. A small exploratory study found that indeed insecure couples were predictive of increased negativity (Gardner & Williams, 2008). Due to the interaction effects found in numerous attachment studies and suggestions that negative affective states should be viewed as a dyadic variable (Griffin, 2003), attachment as well as negative affectivity and flexibility will be examined at the dyadic level during a conflict and supportive discussion.

Finally, hyperactivation of the stress response system as evidenced by increased levels of alpha amylase presumably would be linked to insecure attachment as preliminary evidence suggests and further, may account for negativity and inflexibility of affective states. To this end, the current study will be divided into two parts. The first part will establish the relationship between insecure versus secure couples and the affect

measures. The second portion of the study will test a mediational model which outlines alpha amylase as a potential mediator between insecurely attached couples and the affect measures.

Hypotheses

Informed by previous research and theory, the following hypotheses for the first portion of the study are proposed. The specific measures utilized to test these hypotheses will be derived from State Space Grids (SSGs), which allows for the derivation of specific time-series measures (for example see Figure 1). The definitions of specific variables have been included in Table 1.

Flexibility Hypotheses:

1. Secure couples will have lower mean durations-per-event pre perturbation, and higher mean durations-per-event post perturbation than insecure couples.
2. Secure couples will have higher dispersion pre perturbation and lower dispersion post perturbation than insecure couples.
3. Secure couples will have higher transitions-per-minute pre perturbation, and lower transitions-per-minute post perturbation than insecure couples.

Negativity Hypotheses:

1. Secure couples will have lower negative durations than insecure couples during both the pre and post perturbation discussions.
2. Secure couples will have fewer visits to negative affect than insecure couples during both the pre and post perturbation discussions.

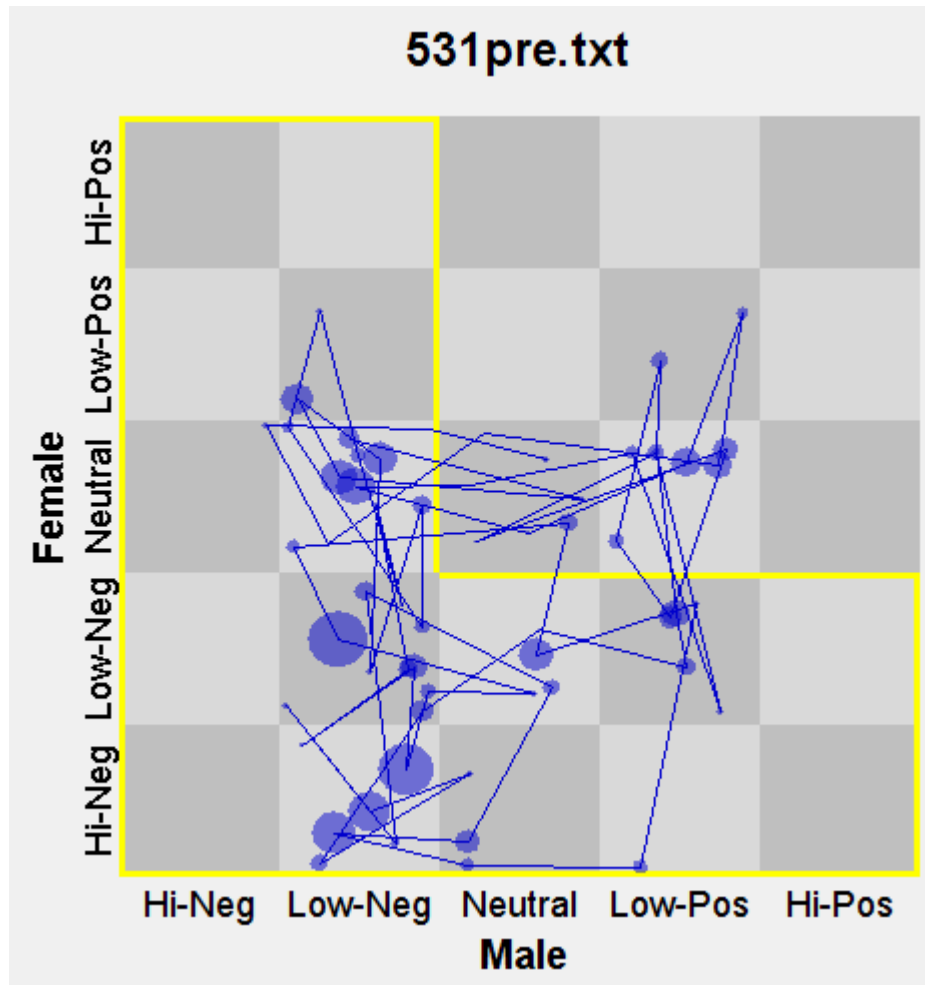
Mediational Hypothesis. The hypothesis which will guide the second portion of the study is as follows:

1. The relationship between insecurely attached individuals and the individual measures for both flexibility and negativity will be partially mediated by the activation of the SNS as evidenced by increased levels of alpha-amylase.

Table 1

Affect Hypotheses and Definition of Variables

Hypothesis	Variable	Definition
Flexibility Hypotheses		
Hypothesis 1	Mean Durations-Per-Event	Persistence of individual affective experiences on SSG
Hypothesis 2	Dispersion	Range of different affective experiences on the SSG
Hypothesis 3	Transitions-Per-Minute	Number of transitions between affective states on SSG
Negativity Hypotheses		
Hypothesis 1	Negative Durations	Amount of time spent in specific negative affect state
Hypothesis 2	Negative Visits	Number of visits to negative affect state



Note: The negative region is highlighted in yellow.

Figure 1. State space grid negative region

CHAPTER III

METHODOLOGY

Sample

The convenience sample consisted of 45 non-clinical couples for a total of 90 participants recruited from cities around the state. The couples were recruited through posted flyers and listserv emails. The participants were required to be in a married or committed relationship, and be between the ages of 18-35. No other selection criteria were used. The participants reported their ethnicity as Caucasian (67%), African American or Black (13.6%), American Indian or Alaska Native (12.5%), Hispanic or Latino (5.7%), or Asian or Pacific Islander (1.1%). Participants were between the ages of 18-35. Over half of the couples, 29, were dating, and the remaining 16 were married. Close to half of the participants reported having children (48.3%). The sample reported their highest level of educational training as follows: less than high school (5.6%), high school graduate (11.2%), some college (37.1%), trade/technical/vocational (10.1%), college graduate (25.8%), and post graduate work/degree (10.1%). Finally, with regard to income, 33% reported family incomes of less than \$15,000, 35.2% between \$15,000 - \$35,000, 14.8% between \$35,000 - \$55,000, 5.7% between \$55,000 - \$75,000, 3.4% above \$75,000, and 8.0% reported not knowing their income level. Each couple received \$100.00 for their participation.

Procedure

This study was part of a larger study investigating low income couples. Couples were informed about the purpose of the study, which was to assess couple's emotional experiences as they discuss difficult relationship issues and that their participation was entirely voluntary. The specific components of the study and a timeline were provided to couples who were then presented with \$100 and a consent form. Upon completion of the consent form, the first saliva sample was collected. Although six samples were collected for the larger study, two were utilized for the current project. Next, couples were handed an assessment packet including among other assessments a demographic questionnaire and the Experiences in Close Relationships Questionnaire (Brennan et al., 1998). Each partner completed their assessment packets in separate rooms. Next, partners were taken into separate rooms and a project staff member conducted a brief interview with each partner about a time when they felt hurt or offended by their partner, a protocol developed by Waldinger, Moore, and Schulz (2003). Participants were asked to briefly describe the incident and then asked to discuss this incident with their partner during the partner conversation.

Couples were then escorted into a room set up with video recording equipment and physiological measures. Each participant was connected to the heart rate and skin conductance monitors, and seated on opposite sides of a table with a cardboard partition separating the couple. The members were informed that they were to sit quietly for 6 minutes before removing the barrier and beginning the conversation as signalled by a knock on the door. Participants were also told that after a second knock on the door they were to open the envelope on the table and follow the directions listed: "*Please share*

with your partner a time when you felt cared-for and supported by her/him and discuss how you think such experiences affect your relationship” which served as the perturbation. The first part of the conversation lasted seven minutes, and the second five minutes. Immediately following this twelve-minute conversation, a third saliva sample was collected.

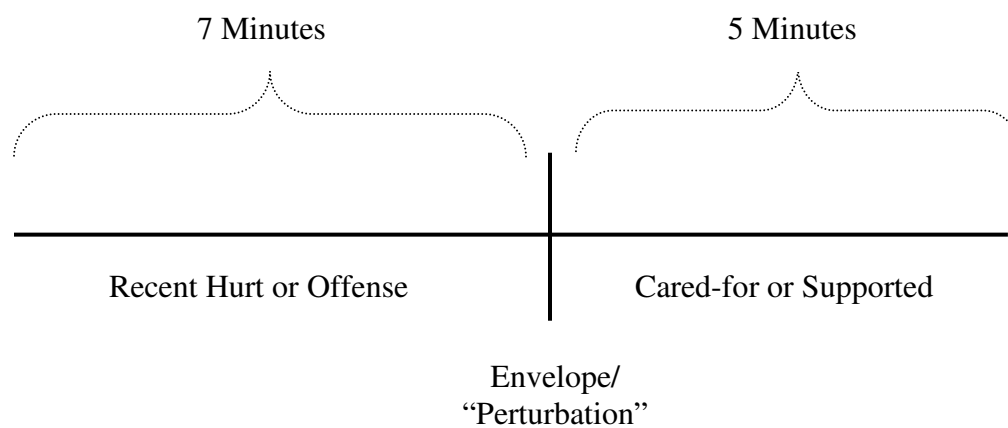


Figure 2. Conversation time-line.

Next, the couples engaged in a second conversation, not relevant for the purposes of this paper. After the second conversation, a fourth saliva sample was collected at which time the couple participated in a relaxation period before the fifth saliva sample was collected. Couples were then escorted into a room with multiple computer screens and told that they were going to watch their previous conversation and rate how they were feeling during the conversations. After completing the video-recall procedure, the final saliva sample was collected. The couple was debriefed before leaving. The total estimated time for participation was 2.5 hours.

Measures

Self-reported Continuous Affect. A continuous-response measure (Biocca, David, & West, 1994) was utilized in conjunction with a video recall procedure to obtain continuous self-report data on individuals' affective experience. Partners rated how positively or negatively they felt at each moment during the interaction as they watched the videotape of their conversation. This rating was made on a computer which displayed a colored, 9-point vertical scale. Each point on the scale was identified by a small box that changed color when highlighted. The upper four boxes, which became progressively wider in width as they moved higher, were colored blue when highlighted, and labeled "positive." The lower four boxes, which became progressively wider as they moved lower, were colored red when highlighted, and labeled "negative." The middle box on the scale was the most narrow in width, was colored grey when highlighted, and represented "neutral."

The mouse was used to provide the appropriate rating along the scale, which was recorded at each hundredth of a second. Such ratings have been shown to be extremely reliable and valid measures of how one feels during an interaction episode (Gottman & Levenson, 1985). Indeed, Gottman and Levenson (1985) found that rather than just "recalling" the interaction, partners tended to physiologically "re-experience" the interaction, with physiological readings of skin conductance and heart rate taken during the recall procedure closely paralleling those readings obtained during the actual interaction itself, even after one week had elapsed. Furthermore, recent research employing this "mouse paradigm" has suggested that individuals are capable of tracking their own affect and making meaningful changes or corrections to their reported affect

state at increments less than one-tenth of a second, and that these reports are highly correlated with more traditional paper-and-pencil measures of affect (Brenner & Smeets, 2003; Schulberg & Gottlieb, 2002).

Flexibility. Thompson (1990) introduced multiple concepts for measuring dynamic emotional experience including *range of emotional responses*, *lability* or changes in emotional reaction, and persistence of specific emotional response. In order to calculate these concepts, couples' continuous affect data was entered into a State Space Grid (SSG) using the GridWare software (Lewis, Lamey, & Douglas, 1999). Two measures of each of these emotional experiences were determined from the SSGs, both before the perturbation (pre), after the conflict conversation, and afterward the positive conversation(post). First, dispersion, or how widely dispersed throughout the grid couples' affective responses are, was calculated utilizing the following formula $[(\sum (di/D)^1) - 1] / n - 1$. Lability was calculated to reflect the number of affect transitions per minute during the couple conversation. Finally, persistence indicated the mean duration per affect event. These measures were compared between secure and insecure couples as well as those with high salivary alpha amylase levels and those with low salivary alpha amylase levels.

Negativity. Negativity was assessed utilizing the SSGs outlining the process of affective dyadic interaction. Thus, two measures of negativity were derived from the "negative region" determined as a report of affect within the negative range for either partner. The first measure indicated the number of times each couple visited the negative region (negative visits). The second measure was the amount of time each couple spends in the negative region (negative duration). These measures were calculated both pre-

perturbation and post-perturbation, or during the conflict and positive discussion, for each couple. Secure couples were compared to insecure couples, and individuals with higher levels of alpha amylase were also be compared to those with lower levels of alpha amylase with regard to the affect measures.

Experiences in Close Relationships Questionnaire (ECRQ). In answer to concerns about the number of attachment measures, Brennan et al. (1998) developed a measure that combined typically assessed components of adult attachment on two dimensions, anxiety and avoidance. The 36-item measure calculates a cut-off score, 72, for the two scales, anxiety and avoidance, to determine attachment security. Questions are answered using a 7 point Likert-type scale (1 = disagree strongly, 4 = neutral/mixed, 7 = agree strongly). The reported reliability was .91 for the avoidance subscale and .94 for the anxiety subscale (Cronbachs alpha). The reliability for the current study was .866 for male avoidance, .908 for male anxiety, .942 for female avoidance, and .914 for female anxiety. Moreover, convergent validity has been established through the correlation of the ECRQ with other similar measures (Brennan et al., 1998).

Alpha Amylase Assay. Saliva samples were collected by the subjects using passive drool collected through straws into test tubes. Samples were collected at intake and directly following the conversations. Saliva was collected in 2 ml. containers and immediately placed in frozen storage as outlined by Granger et al. (2006). Samples were then shipped to Salimetrics, a lab, for analysis.

Data Analysis

The first part of the current study attempted to replicate portions of a previous study (Gardner & Williams, 2008) using a larger sample size. Of specific interest,

Gardner and Williams found that insecurely attached couples were less flexible and spent more time in negative affect. Subsequently, two couple level variables (secure couples vs. insecure couples and the couple level affect variables) were utilized to identify potential differences between the groups. The results were derived from SSGs utilizing GridWare (Hollenstein, 2004), a software program designed to facilitate dynamic systems investigation of time-series data. Two SSGs were developed for each couple (one pre, one post) and measures of flexibility and negativity obtained for each. These measures were then examined via analysis of variance (ANOVA) in order to substantiate the first leg of the proposed mediational model (see Figure 2).

Exploratory analyses were also conducted to determine potential relationships between attachment, alpha amylase, and the affect measures. The differences between attachment groups and alpha amylase were also calculated by means of ANOVA. Pearson Product Moment Correlations were conducted to examine the relationships between alpha amylase and the affect measures.

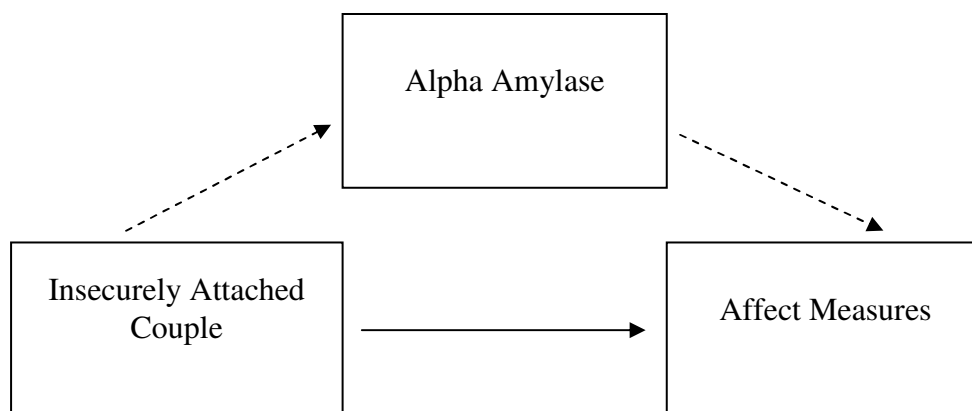


Figure 3. Mediational Model

CHAPTER IV

FINDINGS

The purpose of this study was to identify how attachment styles may influence emotional patterning in adult romantic relationships, specifically affective flexibility and negativity as well as to explore the potential mediational role of adrenergic reactivity. To this end, couples in which both members were determined to be secure by the ECRQ (see Table 2 for description) were compared to couples in which at least one member was found to be insecure on a variety of affect measures. Insecure and secure couples were compared during a marital interaction task which required a transition from a negative to a positive discussion topic. First, individuals were instructed to discuss a time when they felt hurt or offended by their partner (referred to as pre) and then after seven minutes were instructed to discuss a time when they felt loved or appreciated (referred to as post). Saliva samples were collected both at the beginning of the conversation and at the end of the conversation in order to explore the potential role of adrenergic activity as evidenced by increased levels of alpha amylase.

As a prerequisite for testing mediation, the relationship between couple attachment and the affect measures was examined. The affect measures were obtained from an approach outlined by Hollenstein and Lewis (2006), SSG analysis, which allows for the derivation of specific time-series measures as well as permits the researcher to

Table 2

Breakdown of Couple Attachment

M. Insecure-F. Secure	M. Secure-F. Insecure	M. Insecure-F. Insecure	M. Secure-F. Secure
3	11	8	23

derive measures for dyadic level data. Considering flexibility and negativity were the areas of interest, three measures were utilized for the exploration of flexibility and two additional measures will provide information on couple negativity. Each of the measurements was derived using the SSG analysis of the self-report continuous affect data. A series of ANOVAs were then conducted to compare secure and insecure couples on the following measures. The first flexibility measure, *mean duration per affective event* measures in seconds the duration of reported affect for the couple. As couples reported a change of affect, this transition represented a new affective event. Calculating the mean duration per affective event provided the information necessary for comparison of differences in means between insecure and secure couples.

The second measure, *dispersion* identified the couple's range of affective experiences. For instance, couples that remained within a small range of affect (e.g., negative range or positive range) had a lower dispersion score. However, couples who were more mobile in their transitions to different affect states, has a higher dispersion score. Thus, this measure helped to identify flexibility in affective interactions.

The third measure of flexibility, *transitions per minute*, was derived from the number of changes in affective experience reported by the couples during a one minute time period. Couples who transitioned numerous times in a minute demonstrated more flexibility in affective interaction. All of the flexibility measures were calculated for both the pre and post-perturbation phases of the marital interaction episode. These measures were utilized to determine couple's flexibility in affective interaction. It is important to note that these measures alone do not differentiate between flexibility levels in the positive or negative affect regions. Therefore, it is possible that a couple might be

inflexible in their positive affect experience. In other words, the couple may remain in the positive regions for longer periods of time without much variability. As a result, the second set of measures helped to further distinguish couples through exploring negativity.

Two measures were employed to better understand negativity in couple affective interaction. These measures were taken solely from the negative region on the SSGs (see figure 3). The first of these measures was *negative duration* which was calculated as the amount of time, in minutes, a couple reported experiencing a state of negative affect during the marital interaction episodes. This measure allowed for the comparison between groups based on total time spent in the negative region per the SSGs. Next, *negative visits* were determined from the actual number of visits a couple made to the negative region. In other words, each time a couple entered the negative region (determined by either member reporting negative affect), it represented a negative visit. The total number of these visits provided a base of comparison between secure and insecure couples.

Analysis

To begin, a series of ANOVAs were conducted to test the potential differences between secure and insecure couples and the affect measures.

Flexibility Hypotheses

A one-way ANOVA was conducted to test the prediction that secure couples would have lower mean durations-per-event in the pre discussion and higher mean durations-per-event in the post discussions than insecure couples. Secure and insecure couples were compared in both pre and post discussion based on data derived from the SSGs. The data indicate no significant difference between the secure and insecure

couples pre discussion, $F(1, 38) = .026, p = .872$, or post discussion, $F(1, 38) = 1.043, p = .314$. Therefore, the hypothesis was rejected.

To test the hypothesis that secure couples would have higher dispersion during the pre perturbation discussion and lower dispersion in the post perturbations discussion than insecure couples, a second between subjects ANOVA was conducted. The analysis revealed no significant difference between couples on dispersion pre discussion, $F(1, 38) = .436, p = .513$, or post discussion, $F(1, 38) = .983, p = .328$. As a result, the hypothesis was not corroborated.

Next, an ANOVA was calculated to evaluate whether secure couples would have higher transitions-per-minute in the pre perturbation discussion, and lower transitions-per-minute in the post perturbation discussion than insecure couples. Contrary to expectation, the analysis revealed no significant difference for either the pre discussion, $F(1, 38) = .918, p = .345$, or post discussion, $F(1, 38) = 1.781, p = .190$.

Negativity Hypotheses

A one-way ANOVA was conducted to test the hypothesis that secure couples would have higher means per event in the pre perturbation discussion, and lower means per event in the post perturbation discussion than insecure couples. The analysis revealed no significant differences between groups pre discussion, $F(1, 38) = .492, p = .488$, or post discussion, $F(1, 38) = .910, p = .347$. Accordingly, the hypothesis was rejected.

Finally, the prediction that secure couples would have fewer visits to negative affect than insecure couples during both the pre and post perturbation discussion was tested using an ANOVA. The expected results were not found. The analysis revealed no significant different between groups during the pre discussion phase, $F(1, 38) = .026, p =$

.872, and post discussion phase, $F(1, 38) = 765, p = .387$. Thus, the prediction was not statistically substantiated. The findings from the above analyses failed to provide support for the expected results. Therefore, the meditational model was not analyzed.

Exploratory Analyses

Exploratory analyses were computed to examine possible relationships between the variables of interest in order to inform future research. Alpha amylase variables utilized were as follows: levels at intake, levels at post discussion, change between levels at intake and post discussion, and differences in partners' alpha amylase levels at intake and post discussion. Although the analyses did render several significant findings, most of the results were not significant. First, a series of ANOVAs were computed in order to determine potential differences in attachment groups and alpha-amylase levels including levels at intake and post conversation as well as the change in levels from intake to post conflict discussion (see Table 2). The results showed a significant difference between attachment groups and changes in females' levels of alpha amylase, $F(1, 38) = 4.308, p = .045$. The means plot (see figure 3) shows that group 1 (secure group) demonstrated larger changes in alpha amylase levels from intake to post conversation than did group 2 (insecure group). Additionally, levels of alpha amylase of female partners in secure couples post discussion significantly varied from female partners in insecure couples $F(1, 38) = 4.213, p = .047$. The means plot reveals that female partners in secure relationships had higher levels of alpha amylase than did their counterparts (see figure 4).

Next, correlational analyses were used to test potential associations between alpha amylase levels and the affect measures. Female partner's level of alpha amylase at intake was positively correlated with transitions per minute during the pre-period ($r = .390; p =$

.015). In addition, differences between partner's alpha amylase levels post conflict was positively associated with dispersion during post conversation, ($r = .333, p = .047$).

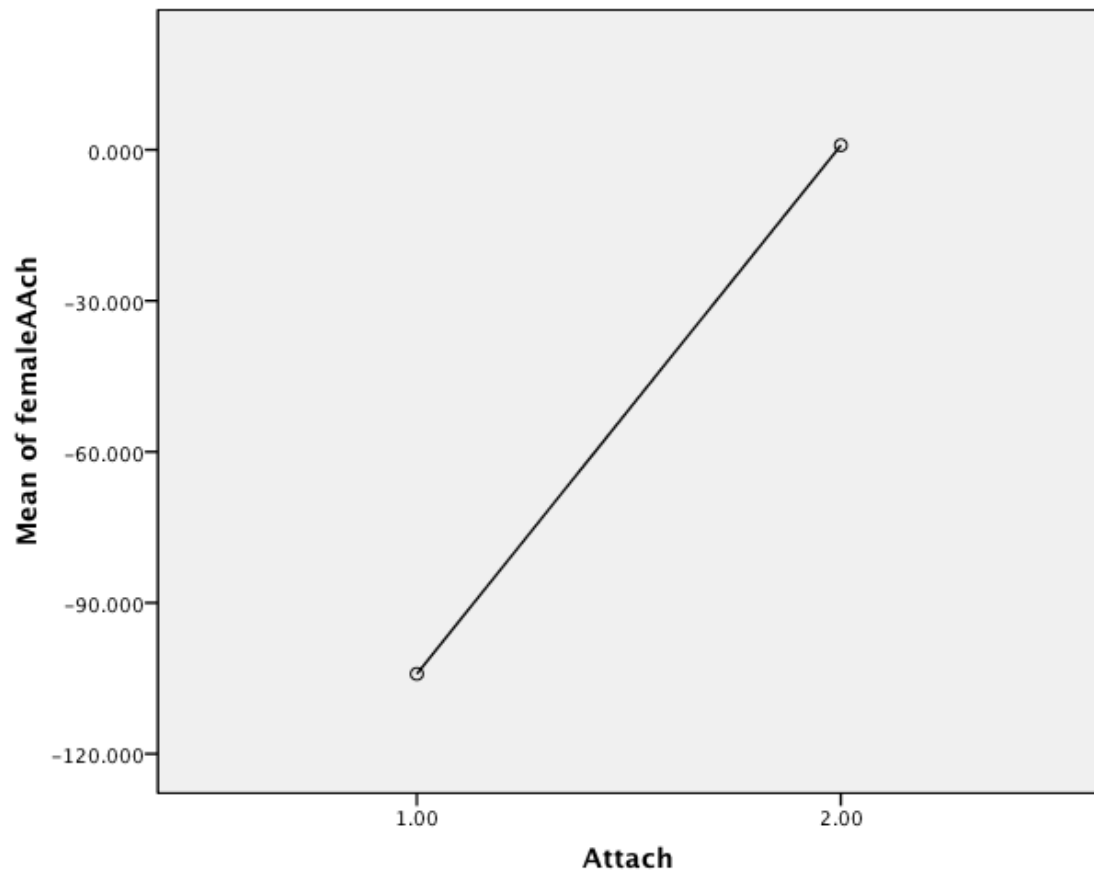


Figure 4. Means plot for females' change in AA levels and attachment groups.

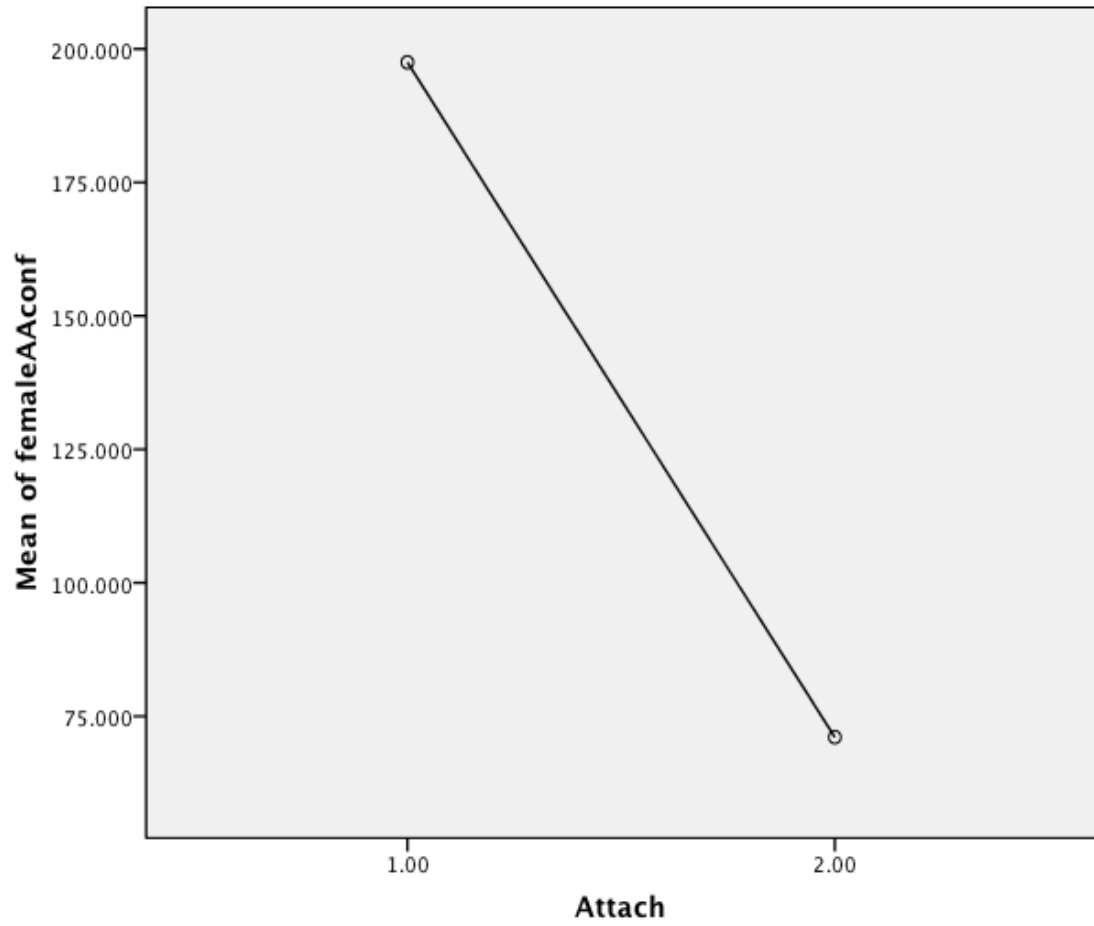


Figure 5. Means plot for females' AA levels post discussion and attachment groups.

Table 3

ANOVA Summary

<i>Source</i>		<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>
Male AA Change	Between groups	1228.26	1	1228.26	.31
	Within groups	154253.96	39	3955.23	
	Total	155482.21	40		
Female AA Change	Between groups	107502.99	1	107502.99	4.31*
	Within groups	923300.67	37	24954.07	
	Total	1.031E6	38		
Male Intake AA	Between groups	11839.62	1	11839.62	1.88
	Within groups	246278.46	39	6314.83	
	Total	258118.08	40		
Female Intake AA	Between groups	4716.59	1	4716.59	.86
	Within groups	213571.14	39	5476.18	
	Total	218287.724	40		
Difference AA Intake	Between groups	2424.27	1	2424.27	.41
	Within groups	233093.52	39	5976.76	
	Total	235517.79	40		
Difference AA Post	Between groups	65142.34	1	65142.34	2.16
	Within groups	1.119E6	37	30234.93	
	Total	1.184E6	38		
Male AA Post	Between groups	20668.41	1	20668.41	2.50
	Within groups	322152.15	39	8260.31	
	Total	342820.56	40		
Female AA Post	Between groups	155759.61	1	155759.61	4.21*
	Within groups	1.368E6	37	36970.90	
	Total	1.524E6	38		

*p < .05.

CHAPTER V

CONCLUSION

Summary of Results

The aim of the present study was to examine the potential mediating effect of alpha amylase on attachment style and specific affect measures. As a condition of computing the analyses for the mediational model, a series of hypotheses were tested in order to first establish the potential relationships between attachment style and the affect measures. The ANOVAs failed to provide support for differences between securely and insecurely attached couples on any of the affect measures. Because no differences between groups existed, the mediational model was not tested.

In order to further explore the relationships between the variables of interest, exploratory analyses were conducted. Alpha amylase measurements were derived from levels at intake and levels after the 12 minute conversation, the difference between levels obtained at intake and directly following the couple conversation, and differences between partners pre and post conversation. Exploratory analyses revealed that secure couples demonstrated significantly larger changes in female partner's alpha amylase levels from intake to the end of the conversation. Additionally, female partners in secure couples had higher levels of alpha amylase post discussion than did female partners in insecure couples.

When testing possible associations between alpha amylase levels and the affect variables, two relationships emerged as significant. First, female partner's alpha amylase levels at intake were positively correlated with transitions per minute during the pre period. Second, differences between partners' alpha amylase levels post discussion were positively associated with dispersion in the post period.

Interpretation of the Results

Attachment and affect measures. There are multiple explanations as to why attachment was not found to be related to the affect variables. First, few studies have identified differences in attachment styles based on various sociodemographic variables (Mickelson, Kessler, & Shaver, 1997). Because of the homogenous samples generally utilized in attachment literature, it is possible that attachment may be affected by correlates related to differences in sample characteristics. Moreover, the results of previous research which provided the necessary support for the hypotheses tested in the current study may also have been partially related to the sample characteristics. Therefore, it is plausible that the differences in the present sample influenced the results in different ways than would more traditional samples utilized in previous studies. In support of this possibility Mickelson and associates found several sociodemographic variables which were strongly correlated with a secure attachment style including income, race, education, age, and marital status. Specifically, they found positive associations between attachment security and being middle class, white, middle-aged, educated, and married. As the sample characteristics in the current study included a considerable number of participants who were younger and reported lower income levels,

it is possible that their attachment representations might manifest differently in their affect regulation and behavioral responses.

In addition, the nonsignificant results could have also been associated with distinct differences in categories of insecurely attached individuals (i.e., anxious and/or avoidant). Not surprisingly, researchers have suggested that emotion regulation may differ as a product of attachment strategies (Shaver & Mikulincer, 2007; Wei et al., 2002). For instance, some have suggested that avoidantly attached individuals tend to underscore their emotional reaction (Shaver & Mikulincer, 2007). Research has demonstrated that avoidant individuals wish to avert negative emotions associated with potential attachment threats. Therefore, the results of the present study may have a product of the avoidant participants' suppression of emotions. Conversely, anxiously attached individuals tend to be more expressive when experiencing negative emotionality (Wei et al., 2002). For anxious individuals, the attachment system is hyperactivated in response to perceived threats (Shaver & Mikulincer, 2007). Therefore, not differentiating between anxious and avoidant attachment styles may have accounted for the results.

The current study was unique in that couple level variables were examined during marital interactions utilizing SSG analysis. Dynamic systems theory suggests that systems can be better understood as patterned interaction over time (Granic & Hollenstein, 2003). To this end, affective patterns were evaluated as they emerged in dyadic interaction. Thus, viewing attachment as a couple level variable offered a unique perspective into the emotional landscape of the couples. Although the literature clearly delineates interactional effects related to attachment style (e.g., Whiffen, 2005; Feeney,

2004; Powers et al., 2006), testing attachment as an individual variable may have yielded different results.

Attachment and alpha amylase. Counter to expectation, the results revealed that attachment security was related first to increased levels of alpha amylase for female partners post discussion and second, to a greater overall change in alpha amylase levels for female partners. Fitting with other studies, (e.g., Powers et al., 2006) the results appear to vary by gender. This gendered effect is not surprising considering that women are often socialized to be more relationally oriented (Knox & Schacht, 2004). Beyond gender effects, the results may indicate that individuals in secure relationships are adaptively motivated toward relationship maintenance when reacting to a perceived threat. Individuals that are able perceive and react to relevant threats are considered more effective at relationship management (Simpson, Ickes, & Oriña, 2001). Therefore, individuals that are attuned to the physiological cues of distress may be more motivated to react in a way which productively reestablishes security. Similarly, securely attached individuals have been shown to exhibit more confidence in their abilities to resolve conflict and regulate negative emotion (Creasey et al., 1999). Taken together, it is possible that the combination of slightly increased levels of alpha amylase as well as a secure working model may serve a protective function for females.

Despite the expectation that increased adrenergic activity would be related to insecurity, numerous studies have highlighted the importance of accessing both components of the stress response system in order to fully understand the influence of stress on various outcomes (e.g., El-Sheikh et al., 2008; Gordis et al., 2006; Gordis et al., 2008). In fact, there is substantial evidence to suggest that dysregulation is a result of

asymmetry between the components of the stress response system (Gordis et al., 2006; Gordis et al., 2008). These studies revealed that high levels of alpha amylase alone are not necessarily linked to negative outcomes. Instead, the stress response system must be understood as two interacting systems. Cortisol levels were not measured in the current study and thus, it was not possible to view the relationship between the components of the stress response system to determine effects on affective behavior.

Despite calls for increased research on adult attachment and physiology (Diamond, 2002), Powers and associates (2006) were the only study found that measured HPA response according to attachment style. They found that indeed insecurely attached individuals were associated with higher cortisol levels and additionally that the increases in reactivity varied by gender and type of attachment insecurity. Similar to other findings, the significant results varied by gender in the present study. Therefore, an alternative explanation of the results is that different findings may have emerged if the different types of attachment insecurity had been identified.

Finally, similar to the last variables of interest, the specific demographic characteristics in the present study may also have accounted for the results. Research indicates that unique stressors associated with lower socioeconomic status can lead to differences in stress response patterns in children (see Evans, 2003; Keenan, Gunthorpe, & Grace, 2007). However, less research exists outlining the effects of poverty on adult physiology. As a result, the current findings may also vary as a product of the sample utilized.

Alpha amylase and affect measures. Alpha amylase was found to be related to two of the affect measures. First, female partner's alpha amylase levels at intake were

positively correlated with transitions per minute during the pre period. Second, differences between partner's alpha amylase levels after the discussion were positively associated with dispersion in the post period. The first correlation appears again to corroborate the importance of accounting for gendered effects when investigating the emotional and physiological landscape of relationships. In addition, they indicate that higher levels of alpha amylase may be related to increased flexibility during the conflict conversations. This ability to be emotionally flexible during conversations which elicit negative reactions is extremely important to couple outcomes (Gottman & Levenson, 1999b; Griffin, 2003). Specifically, the ability to transition to positive affect during a conflict discussion appears to safeguard couples from possible divorce (Gottman & Levenson, 1999b). In sum, slightly elevated levels of alpha amylase at intake may increase attention paid to threats which may in turn activate the more flexible coping strategies. The findings indicate that for the present sample the activation of the SNS may account for unique and important aspects in the internal affective structure of the couple.

The second correlational finding in light of the rest of the results, would point toward the positive effects of lower dispersion during the post conversation. Gottman (1994) describes the concept of absorbing states as those emotional states which after entered become difficult to leave. Although the data do not indicate whether the affect was positive or negative, one would expect to find that positive emotion might become an absorbing state for nondistressed couples thereby limiting dispersion during the second half of the conversation. The results from the current study suggest that partners who are experiencing different physiological reactions during a shared experience, might also share vastly divergent emotional responses. It is therefore possible that the lack of shared

understanding or perspective would lead to increased dispersion during the positive portion of the conversation.

Clinical Implications

Keeping in mind that the findings are exploratory and subsequently must be viewed with caution, several clinical implications can be derived from the results. First, according to the results, attachment security was linked to increased levels of alpha amylase. If being attuned to physiological cues allows individuals to react adaptively to perceived threats, this draws attention to the importance of the emotion regulation system. As researchers have stressed, the awareness of the physiological response related to an emotional experience is paramount to emotion regulation (Stegge & Terwogt, 2007). For instance, facilitating better anger management skills often begins with promoting an awareness of those physiological responses such as a flushed face and clenched fists that indicate the emotional state (Kassinove & Tafrate, 2002; McKay & Rogers, 2000). Therefore, based on the present results, clinicians can work with couples to heighten awareness of their physiological reactions in order to become better acquainted with their personal emotional response patterns. This cognitive awareness benefits individuals in many ways. First, the understanding of the physiological response to emotion, enables individuals to begin applying beneficial coping strategies earlier before simply becoming reactive. In addition, increasing awareness also repositions individuals within their environment to a more empowered stance as they gain insight into their emotional process thereby alleviating the sense that they are controlled by their reactions. This new sense of agency allows individuals to bypass the undercurrent of their experience and invites them to explore and directly face what they find. Finally, this

awareness coupled with a knowledge of positive coping strategies may also prevent individuals from ignoring the stress response because of a sense of hopelessness.

Once increased awareness of physiological reactions has been established, clinicians can encourage more positive coping strategies. Of particular importance to couples, is sharing their emotional experience in a way that promotes support instead of defensiveness. Many experts in the field differentiate between primary and secondary emotions (Johnson, 2004). Primary emotions are those deeper more vulnerable emotions such as hurt, fear, or shame; whereas secondary emotions are the more reactive responses such as anger, jealousy, and resentment. Communicating secondary emotions assumes a more protective stance in communication and often results in further isolation. In other words, anger and other secondary emotions often operate as a personal barrier which signals to others to stay away. Although it is meant to be protective, the long term result is often isolating and less adaptive. In contrast, by coaching couple members to communicate the primary emotion, or that emotion underlying the secondary emotion, therapists can encourage the couple to adopt a different stance in the relationship, one of vulnerability. Consider a couple recovering from infidelity. If the couple is never able to move past rage and bitterness to communicating betrayal and deep hurt, they will remain on opposing sides instead of working together toward healing as vulnerability invites support.

Overall, by promoting open communication which encourages emotional intimacy, the therapist is able to help the couple establish increased attachment security. One particular model that may be useful in implementing this change is Emotionally Focused Couple Therapy (Johnson, 2004) which is informed by both attachment and

systems theory. Johnson emphasizes the importance of experiencing one's partner as open, receptive, and available. She outlines different steps which pushes the therapeutic process toward eliciting vulnerability in session and creating alternative interactions during which partners experience each other in new and supportive ways. This experiential style works directly to reshape one's working model through altering beliefs about the availability of one's partner and encouraging increased autonomy through the communication of one's personal experience in the relationship.

Next, the relationship between alpha amylase and the affect measures seemed to indicate the importance of plasticity in interaction and a shared an understanding of both partners' perspectives. Systems theory based models of couples' therapy are especially attuned to the importance of flexibility in interaction. In fact, rigid interactional cycles are often treated as one of the primary influencing factors for distress (Greenburg & Goldman, 2008; Scheinkman & Fishbane, 2004). For instance, the pursue-withdrawal cycle is believed to be detrimental because one individual adopts the position of pursuer and continues behaving within the boundaries of this limited role while their partner continues statically to withdraw (Berns, Jacobson, & Gottman, 1999; Eldridge et al., 2007). Being locked into any single position and maintaining homeostasis is maladaptive to the couple relationship because the severely limited options for interactions do not allow the couple to draw upon different strategies in order to face new challenges (Eldridge et al., 2007). Subsequently, clinicians can work with couples to unlock rigid patterns of interaction and incorporate new beliefs or perspectives which allow them to access dormant strategies or adopt newly learned approaches.

Clinicians can also affect change in couple relationships through guiding couple members to a better understanding of each other's perspectives. It is important to note that couples do not have to react similarly to a given situation but rather would benefit from understanding the experience from their partner's point of view as this increased understanding fosters empathy and support. Although numerous techniques can be utilized to accomplish this goal depending of the clinician's therapeutic perspective, examples from the experiential model are offered as examples for treatment. The "other interview" is a technique where individuals answer questions from their partner's perspectives (Fisher, 2002). Couples are instructed to place themselves in their partner's position and to try as best as possible to answer as the other member. Therapists can then ask questions that elicit primary emotions from the partner's perspective allowing the individual the opportunity to emotionally explore their partner's experience. An alternative technique is to conduct an enactment in which the therapist speaks for one of the partners and tries to articulate their perspective in a softer less defensive manner (Butler & Gardner, 2003). The listening partner often is more receptive of the alternative method of sharing and the partner for which the therapist is speaking experiences their thoughts and feelings in a different way as they listen to the therapist's languaging of their perspective. Both of these exercises attempt to circumvent personal defensives allowing different messages to be incorporated into their individual perceptions of their partner's intentions and experience.

Overall, the results point first to the importance of developing physiological awareness of emotional experiences in order to increase personal agency. Second, the findings indicated that secure couples were more capable of reacting to the threat with

adaptive coping mechanisms therefore, highlighting the potential benefits of emotional expression as a form of coping in the context of increased relational security. Third, in light of the perceived benefits of plasticity in the current study, increasing flexibility in interaction would allow couples to more easily adapt to their changing environment. Finally, the apparent advantage of increasing insight into a partner's perspective was also discussed.

Future Research and Limitations

Because of the support in the literature for the hypotheses, there is reason to believe that future researchers may find different results if the present study was replicated with a different sample. Therefore, with minimal alterations, the study should be reproduced in order to determine whether sample characteristics moderated the results. In addition, further exploration is needed to clarify effects of poverty on affective and physiological experience and couple interaction.

Several limitations should also be discussed. First, the sample size limited the ability to explore differences between specific individual attachment styles. Although it is not uncommon for a study assessing physiological parameters to be small, the size of the sample did not allow for further distinction among participants. Further research should attempt to replicate the current study distinguishing insecure attachment as either avoidant or anxious.

Second, alpha amylase was collected only twice in the current study. Because alpha amylase is extremely sensitive, multiple collection points might have provided different results. In addition, future researchers should calculate a trajectory which would

present the opportunity to view reactive patterns of alpha amylase (Nater et al., 2005) providing further insight into stress related responses.

Third, only part of the stress response system was analyzed in the present study. This provides only a partial view of the relationship between stress and the other variables of interest. Future research should also include cortisol as a measure of the HPA axis in order to identify potential interactions between the two components (HPA and SNS) as they relate to attachment security and the various affect measures.

Despite these limitations, the current study contributed to the body of research in a variety of ways. Due to difficulties in recruitment, little research has been conducted with a lower income sample. The current study may therefore shed light on this understudied population. Moreover, this is the first study to the researcher's knowledge to look at alpha amylase as it relates to attachment security. Although the results differed from what was expected, they provide a starting point for future inquiries utilizing this promising measure of adrenergic activity. Finally, the inclusion of interactional time series affect measures also affords a unique vantage point into the affective patterns of couples. This technique can be further utilized to better understand the patterned nature of couple interactions.

Conclusion

The purpose of the current study was to examine the potential mediating effect of alpha amylase on attachment style and specific affect measures. Informed by previous research, it was hypothesized that attachment insecurity was related to decreased flexibility and increased negativity. Further, insecure attachment was expected to be associated with increased adrenergic activity, and finally, hyperactivation of the stress

response system was thought to be related to decreased flexibility and higher levels of negativity. However, the results failed to support these assumptions.

As this study was the first to examine these relationships, exploratory analyses were conducted to guide future research. Although many of the analyses run were not significant, several interesting findings emerged. First, secure couples demonstrated significantly larger changes in female partner's alpha amylase levels from intake to the end of the conversation. Next, female partners in secure couples had higher levels of alpha amylase post discussion than did female partners in insecure couples. Third, female partner's alpha amylase levels at intake were positively correlated with transitions per minute during the pre period. Lastly, differences between partner's alpha amylase levels post discussion were positively associated with dispersion in the post period. Overall, these results point to the importance of recognizing physiological cues which may help individuals adaptively attend to relational threats, maintaining flexibility in interaction, and acknowledging their partner's perspective.

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APPENDIX A

Experiences in Close Relationships Inventory
Brennan, Clark, & Shaver (1998)

The following statements concern how you feel in romantic relationships. We are interested in how you generally experience relationships, not just in what is happening in a current relationship. Respond to each statement by indicating how much you agree or disagree with it. Write the number in the space provided, using the following rating scale:

1	2	3	4	5	6	7
Disagree Strongly			Neutral/ Mixed			Agree Strongly

- ___ 1. I prefer not to show a partner how I feel deep down.
- ___ 2. I worry about being abandoned.
- ___ 3. I am very comfortable being close to romantic partners.
- ___ 4. I worry a lot about my relationships.
- ___ 5. Just when my partner starts to get close to me I find myself pulling away.
- ___ 6. I worry that romantic partners won't care about me as much as I care about them.
- ___ 7. I get uncomfortable when a romantic partner wants to be very close.
- ___ 8. I worry a fair amount about losing my partner.
- ___ 9. I don't feel comfortable opening up to romantic partners.
- ___ 10. I often wish that my partner's feelings for me were as strong as my feelings for him/her.
- ___ 11. I want to get close to my partner, but I keep pulling back.
- ___ 12. I often want to merge completely with romantic partners, and this sometimes scares them away.
- ___ 13. I am nervous when partners get too close to me.
- ___ 14. I worry about being alone.
- ___ 15. I feel comfortable sharing my private thoughts and feelings with my partner.
- ___ 16. My desire to be very close sometimes scares people away.
- ___ 17. I try to avoid getting too close to my partner.
- ___ 18. I need a lot of reassurance that I am loved by my partner.
- ___ 19. I find it relatively easy to get close to my partner.
- ___ 20. Sometimes I feel that I force my partners to show more feeling, more commitment.
- ___ 21. I find it difficult to allow myself to depend on romantic partners.
- ___ 22. I do not often worry about being abandoned.
- ___ 23. I prefer not to be too close to romantic partners.
- ___ 24. If I can't get my partner to show interest in me, I get upset or angry.
- ___ 25. I tell my partner just about everything.
- ___ 26. I find that my partner(s) don't want to get as close as I would like.
- ___ 27. I usually discuss my problems and concerns with my partner.
- ___ 28. When I'm not involved in a relationship, I feel somewhat anxious and insecure.
- ___ 29. I feel comfortable depending on romantic partners.
- ___ 30. I get frustrated when my partner is not around as much as I would like.

- ___ 31. I don't mind asking romantic partners for comfort, advice, or help.
- ___ 32. I get frustrated if romantic partners are not available when I need them.
- ___ 33. It helps to turn to my romantic partner in times of need.
- ___ 34. When romantic partners disapprove of me, I feel really bad about myself.
- ___ 35. I turn to my partner for many things, including comfort and reassurance.
- ___ 36. I resent it when my partner spends time away from me.

VITA

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Scope and Method of Study: The aim of the present study was to examine the potential mediating role of alpha amylase, a marker of adrenergic activity, on attachment style and affective flexibility and negativity. Secure couples were expected to exhibit increased levels of flexibility and lower levels of negativity during the conflict discussion than were insecure couples. Moreover, secure couples were expected to demonstrate lower levels of flexibility during the positive portion of the conversation than were insecure couples. Analysis of variance and Pearson product moment correlation were utilized to assess the hypothesized relationships.

Findings and Conclusions: The results did not support the proposed hypotheses. Therefore, exploratory analyses were conducted which resulted in several significant findings. First, secure couples demonstrated significantly larger changes in female partner's alpha amylase levels from intake to the end of the conversation. Next, female partners in secure couples had higher levels of alpha amylase post discussion than did female partners in insecure couples. Third, female partner's alpha amylase levels at intake were positively correlated with transitions per minute during the pre period. Lastly, differences between partner's alpha amylase levels post discussion were positively associated with dispersion in the post period. Overall, these results point to the importance of recognizing physiological cues which may help individuals adaptively attend to relational threats, maintaining flexibility in interaction, and acknowledging their partner's perspective. Clinical implication and suggestions for future research are discussed.

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