

Discrepancy and Evaluation in Romantic Relationships: Testing the Emotion in  
Relationships Model

A DISSERTATION  
SUBMITTED TO THE FACULTY OF THE GRADUATE SCHOOL  
OF THE UNIVERSITY OF MINNESOTA  
BY

Lane Alexander Beckes

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS  
FOR THE DEGREE OF  
DOCTOR OF PHILOSOPHY

Ellen Berscheid, Jeffry Simpson, Advisers

June, 2009

© Lane Alexander Beckes, 2009

## Acknowledgements

I'd like to acknowledge the invaluable help of a number of undergraduate research assistants that assisted with collecting data from early piloting through completion including Tamara Blue, Lindsay Deling, Kristen Denzer, Alyssa Erickson, Lucas Johnson, Joseph Kaufman, Oren Lambert, and Amanda Woitas. I'd like to give special thanks to Sweta Venkataramanan whose excellent assistance in general, and essential work with the facial coding was critical in the final product.

This project could not have been completed as is without Laura Wallace's invaluable work, suggestions on design, and contributions to data collection. Thank you Laura, I am truly indebted to you for all that you did to make this project happen.

I am grateful for the assistance and support given to me by my committee members and advisors, Ellen Berscheid, Jeff Simpson, Chad Marsolek, and Andy Collins. You have all been tremendously supportive through this process, and I am eternally grateful for your patience and kindness. You have all influenced me in numerous ways and I am humbled to have been given the privilege to work with such a group of excellent scholars.

I am also particularly indebted to Ellen Berscheid and Jeff Simpson for their suggestions, guidance, and insight, and whose aid allowed me undertake and complete this dissertation.

## Dedication

I dedicate this dissertation to my wonderful wife who supported me in so many different ways through this process. Thank you for all that you have given to me.

## Abstract

This paper is a test of Ellen Berscheid's Emotion in Relationships Model (ERM; Berscheid, 1983; Berscheid & Ammazzalorso, 2001). This model is based primarily on the Discrepancy/Evaluation Theory of emotion proposed by George Mandler (1975; 1990a). The ERM predicts that emotion in interpersonal relationships occurs when our relationship partner violates our expectancies and interrupts our behavioral sequences. This expectancy violation leads to arousal. Cognitive evaluation of the situation then either simultaneously or subsequently determines whether the violation is positive or negative based on whether it provides an opportunity to promote the individual's welfare or poses a threat to the individual's welfare. The ERM also expands upon Mandler's ideas by formulating hypotheses related to the infrastructure of the relationship, specifically how interdependent relationship partners are. This paper provides strong evidence for the expectancy – arousal relationship in an experimental paradigm that tests people in intact relationships, using a real time interaction between the participant's and their partners. The ERM is well supported by the data and evidence for a variety of expectancy sources such as the partner's past behavior, social norms, individual differences in attachment history, and relationship interdependence or behavioral closeness is gleaned and discussed.

## Table of Contents

Acknowledgements.....	i
Dedication.....	ii
Abstract.....	iii
Table of Contents.....	iv
List of Tables and Figures.....	v
Chapter 1: Introduction.....	1
Chapter 2: The Present Research.....	18
Chapter 3: Conclusion.....	59
References.....	70
Footnotes.....	78
Appendices.....	79

## List of Tables and Figures

Table 1: Descriptive Statistics for Measured Variables.....	34
Table 2: Correlations Between Measured IV's.....	36
Figure 1: Interaction Between Decision and Gender on Face Valence.....	40
Figure 2: Interaction Between Decision and Behavior on SR-Surprise .....	42
Figure 3: Interaction Between Decision and Behavior on SR-Strength .....	43
Figure 4: Interaction Between Decision and Behavior on Face Strength .....	44
Figure 5: Interaction Between Decision and Gender on SR-Valence.....	46
Figure 6: Interaction Between Agreement and Gender on SR-Strength.....	47
Figure 7: Interaction Between Agreement and Closeness on SR-Valence.....	49
Figure 8: Means of SE-Surprise by Quartiles of Relationship Longevity.....	52
Figure 9: Inter. Between Decision, Behavior, & Close on Face Strength.....	53
Figure 10: Inter. Btwn Dec., Behav., & Actor Anxiety on Face Strength.....	57

## Chapter 1: Introduction

*The sweetest joy, the wildest woe is love. -Pearl Bailey*

Pearl Bailey's observation about the intensity of emotion in relationships perfectly reflects a truth relationship and emotion scholars have long recognized. Relationships breed intense emotional experience. Emotion is more frequently experienced in our relationships than in any other context in which people commonly find themselves (see, Berscheid, 1983/2002; Berscheid & Ammazalorso, 2001; Clark, Fitness, & Brisette, 2001; Fehr & Harasymchuk, 2005). Not only are relationships fecund sources of emotion, but the emotional tone in relationships has important consequences for relationship outcomes. Gottman and Levenson (1992), for example, famously found that stable couples have five positive interactions for every one negative interaction and distressed marriages that are likely to end in divorce have a ratio of .8 positive to 1 negative interactions. As this finding suggests, the experience and ratio of positive and negative emotion in marriages may be key to marital stability.

This paper explores and tests one of the more prominent models of interpersonal emotional experience, the Emotion in Relationships Model (e.g., Berscheid, 1983/2002; Berscheid & Ammazalorso, 2001). This model, based on the ideas and work of George Mandler (e.g., 1975; 1990a), is at its core a constructivist conceptualization of emotion (e.g., Mandler, 1990a; 1990b). The constructivist tradition in emotion research is very

old, but is far from the only conceptualization of emotion that has been offered. In fact, there has never been a true consensus about what emotion is.

## What is Emotion?

### *Hot vs. Cold Emotion*

*Arousal.* One issue which has plagued the study of emotion is how inclusive to be in defining it (see, Berscheid & Ammazzalorso, 2001). Many theorists have argued that autonomic nervous system (ANS) arousal is a critical component of emotion, and without it one simply has a form of evaluation or attitude. With a definition excluding a key role for arousal, virtually all human experience can be described as emotional. Thus, it is useful to limit definitions of emotion to reactions that include physiological arousal as a component. Importantly, such a definition conforms to the kind of affect that most people find interesting. As Berscheid and Ammazzalorso (2001, pp. 51-52) note, “when (people) talk about the emotions they experience in their close relationships, they usually are talking about experiences in which their knees tremble, their faces flush, their hearts pound, and ... they feel ‘butterflies in their stomachs’”.

Physiological arousal is also an important component to any definition of emotion because it distinguishes the critical affects from the more mundane. Most scholars would agree that arousal readies the body for action and significantly organizes attention toward high priority concerns (see Mandler, 1975). Such high arousal emotional events have long been known to narrow attention toward the most motivationally salient features of the situation (e.g., Loftus, Loftus, & Messo, 1987). As this line of thinking indicates,

arousing events are likely to have more significant consequences for the individual, and it is this feature of arousal that leads theorists to assert that it is essential to differentiate “hot” affect from “colder” forms of affect such as attitudes, moods, or low arousal feelings.

*The Two Factor Theory.* Stanley Schachter was one of the most influential proponents of a two factor solution to the question of what constitutes a true emotion, and he was critical in sparking renewed interest in emotion research by arguing that cognitive processes are critical determinants of emotional experience. He published a classic paper with Jerome Singer (Schachter & Singer, 1962) which tested the hypothesis that both arousal and cognitive appraisal of the situation are necessary conditions for emotional experience. They reasoned that if people have non-emotional explanations for arousal, such as the ingestion of an arousal inducing drug, they will not report any emotional experience. Schachter and Singer also reasoned that the same form of arousal can be interpreted as a variety of distinct emotions depending on the context of the situation, and the individual’s cognitive interpretation of it. They also argued that, even if given the same situation or “cognitive circumstances” (p. 382), people will experience emotion only to the extent that they are also physiologically aroused.

In their experiment participants were given either an epinephrine shot or a placebo. The epinephrine caused arousal in the participants in that condition, whereas the placebo was simply a saline solution and caused no reaction. Some participants were told that the shot they received would lead to symptoms that are associated with arousal, while others were told that the shot would not have any side effects. A third group was

misinformed of the types of side effects and told they would experience side effects not associated with arousal, such as itching and headaches. In addition, participants interacted with a confederate who either acted euphoric or angry, thus giving them a social indication of what emotional reaction was appropriate in the situation.

Generally their data conformed to their predictions indicating that when the participants knew they were injected with an arousal inducing drug they reported less emotion than those who did not know the injection would produce arousal. Further, those who received the placebo reported less emotion than those who received epinephrine but were ignorant of the arousing effect of the drug. In addition, the emotional state of the participants conformed to that of the confederate suggesting that participants easily misattributed the reason for their arousal and constructed the meaning of the arousal based on situational cues. These results indicated that both arousal and cognition are necessary for emotion, and that emotional experience is largely determined by the situation and the person's cognitive appraisal of the situation. Significantly, the misattribution of arousal effect found in this study has been replicated numerous times, perhaps most famously in an experiment by Dutton and Aron (1974) in which male participants misattributed their fear-based arousal after walking on a shaky bridge to heightened physical attraction to a female confederate.

This approach is commonly referred to as the two factor theory of emotion, and it is the basis of the definition of emotion that will be used for the remainder of the paper. In order for an experience to qualify as emotional, the individual must experience ANS arousal. In addition, the individual must appraise the source of the arousal as having

some positive or negative value for themselves. Thus, in order to qualify as an emotion, a reaction to a given stimulus or situation must include arousal and evaluation. This is an essentially constructivist definition, and is at its core the same as the definition George Mandler (e.g., 1990a) adopted for his discrepancy/evaluation theory.

### Discrepancy/Evaluation Theory

*Arousal motivates, focuses, and prepares.* One of the core tenets of discrepancy/evaluation theory (e.g., Mandler, 1975; 1990a) is that the human nervous system has evolved sensitivity to discrepancies between an individual's expectations or expectancies and his/her perceptions of the world. When such a discrepancy between expectancies and reality is detected, the ANS automatically activates producing physiological arousal. Discrepancy also disrupts previous behavioral routines until a meaning analysis has determined the meaning and value of the discrepant stimulus sufficiently to either alter situational behavioral strategies or to resume previous routines. The meaning analysis is often instigated at the same time, or even possibly before arousal is evident, but if the meaning analysis has not initiated, the arousal acts as a "secondary support system" to alert the person that an important change has occurred in the environment.

One can thus glean three important roles for ANS arousal. First, it alerts the individual to the discrepant event acting to orient and narrow attention (e.g., Loftus, et al., 1987; Steinsmeier-Pelster, Martini, & Reisenzein, 1995; Meyer, Reisenzein, & Schutzwahl, 1997). Second, it motivates cognitive processes to determine the meaning

(i.e. the value, positive or negative and its implications for reaching goals and completing behavioral routines) of the discrepancy (e.g., Meyer et al., 1997). Third, it prepares the body to take rapid action (see Mandler, 1990).

Importantly, discrepancies are usually detected when an individual is in the middle of an “organized action sequence” or a behavioral sequence designed to achieve a goal. Mandler notes that the degree of arousal is related to: a) the degree of organization of the behavior sequences and plans that are interrupted, b) the degree of discrepancy between the person’s cognitive expectancies and the actual event, c) whether alternative behavioral sequences that substitute for the behavioral sequence are available, and d) whether the disrupted behavior is linked to higher level goals and plans. Additionally, Mandler argues that highly organized behavior sequences and plans should be resumed before others.

*Cognition and arousal combine for emotion.* Mandler (e.g., 1975; 1990a) does not argue that differential activation of the viscera creates emotion, but rather non-differentiated arousal is interpreted through the meaning analysis. It is the meaning analysis that then determines the valence of the arousing event, processes the specifics of the situation, and produces the psychological experience of emotion. In this way cognition and arousal combine to determine the emotional experience. Neither one is sufficient, but both are necessary for emotion. MacDowell and Mandler (1989) tested the theory in a videogame environment in which participants played a computer game called Rogue. They found reasonable support for the model, noting that violations of expectancies led to evidence of arousal.

## Emotion in Relationships

### *Relationships, Interaction, and Interdependence*

An important feature of applying Mandler's model to close relationships is the interdependence between partners in close relationships. As Mandler (e.g., 1975) theorized, arousal should be related to how organized an interrupted behavioral sequence or plan is. In interpersonal contexts, the other person's behavior is often critical for plans and behaviors to run off without a hitch (i.e. to complete the routine and attain any goals related to it). Thus, the degree to which two people are dependent upon each other to complete sequences and plans should be related to how much arousal is experienced when a discrepancy is detected.

*Interaction.* In the seminal book *Close Relationships* Harold Kelley and his colleagues (1983/2002) set out to define the properties that characterize interpersonal interaction and relationship closeness. In this conceptualization, they note that the analysis of causal sequences is critical. They argue that each person in an interaction has an intrapersonal causal chain that could be diagrammed if the person's thoughts, feelings, and behaviors could be fully documented. For example, imagine Charles is reading a magazine and sees a picture of a young child. The picture arouses thoughts and feelings about his children when they were younger. These thoughts and feelings lead him to feel a desire to contact them, so he picks up the phone and calls his daughter Sarah. Thus, there is an intrapersonal causal chain of events that leads Charles to ultimately call his daughter.

According to Kelley and colleagues, interaction between two people occurs when their intrapersonal causal chains are affected by each other. Thus, when the behavior of one person influences the behavior of the other, an interaction occurs. In this case, we can imagine that Charles' daughter Sarah was doing something such as preparing a sandwich and salad for lunch. During the process, her phone rings interrupting her lunch preparations. At this point Charles' behavior has influenced his daughter's behavior and intrapersonal causal sequence. One can imagine that father and daughter might then speak over the phone further influencing each others' thoughts, feelings, and behaviors. As Berscheid and Reis (1998) indicate, interactions are the "living tissue" of interpersonal relationships.

*Interdependence and relationship closeness.* The extent to which one person's behavior is likely to produce changes in the other person's thoughts, feelings, and behaviors marks the degree to which the affected person is dependent on the other (Kelley et al., 1983/2002). The extent to which changes in either person's behavior is likely to produce changes in the other marks the degree of interdependence between the two individuals. Importantly, relationship scholars frequently consider relationship closeness to be equivalent to the degree of interdependence in a relationship.

One of the difficulties in investigating relationship closeness is that people in relationships may not be able to accurately report how close their relationships really are (Berscheid & Ammazalorso, 2001; Berscheid, Snyder, & Omoto, 1989a). For example, a couple may seem to enjoy each other's presence, have been married for many years, think of themselves as close, but ultimately have little influence on each other.

Relationship scholars have termed such relationships “empty shell” marriages, in which each partner seems to live in parallel, but rarely influence one another in significant ways. Alternatively, some people may swear that they have little or no relationship, but closer analysis reveals strong reciprocal connections between the two individuals. Such a situation is most likely to occur when relationship partners dislike each other (Berscheid & Ammazzalorso, 2001).

Given the need for a clear definition of closeness that does not require the interpretation of people, relationship scholars have argued for a definition of closeness that captures interpersonal interdependence (Kelley et al., 1983/2002, also see, Berscheid, Snyder & Omoto, 1989b). These theorists argue for a definition that includes four different characterizations of a relationship including the strength, frequency, diversity, and duration of influence within the relationship.

The first dimension of closeness is the strength of influence within the relationship. The more powerfully one partner influences, either directly or indirectly, the other partner’s thoughts, feelings, and behaviors, the closer the relationship. For example, imagine a relationship in which two work partners frequently interact, but most interactions are routine and have little influence on the welfare of the other. Despite the fact that they are interacting frequently, the strength of each interaction is weak, and they almost never influence each other’s important decisions. Now imagine a relationship between two lovers separated by 1000 miles. Even though they may infrequently interact, they may have significant influence on each other’s thoughts, feelings, and behaviors. A daily call or twitter may send each into an emotional spin. They might save

their money for plane tickets to see each other. They may even form long-term plans that involve finding a way to live near or with each other, thus indicating that each member of the dyad strongly influences the other on important outcomes.

The second dimension of closeness is the frequency of influence. Even though the lovers in the last example influence each other's thoughts, feelings, and behaviors, it would be hard to imagine such a long distance romance being characterized by more interdependence than a relationship in which two partners live, play, and work together on a daily basis. In the latter case, the partners not only influence each other's decisions for the future and where they go on vacation; they influence each other often. Partners should have more influence on each other the more frequently they interact.

The third dimension of closeness is the diversity of influence. This dimension is concerned with the fact that truly close relationship partners influence each other in a variety of ways. Partners who possess diverse influence on us might have a powerful influence on where the other works, how much money or resources are available to the other, how easy it is to get to work in the morning, what they have for dinner, what movie they see on Friday night, and numerous other aspects of daily life. Thus, the more domains in which our partner influences our decisions and behavior, the more interdependent we are with them.

The fourth dimension is the duration of influence. This dimension is based on the premise that the longer two people are interdependent, the closer they will be. For example, two young lovers who spend nearly every minute together and do virtually

everything together, but have known each other a mere six months, are not necessarily closer than a married couple just celebrating their 30<sup>th</sup> anniversary, but due to the demands of normal life, do not spend every possible moment together. Importantly, the young couple could potentially end their relationship with little disruption of goals and plans other than the nascent goals and plans to form the relationship, whereas the married couple would lose years of dreams and goals, and each would likely need to readjust their own behavior to an extraordinary extent to compensate for the broken bond.

*Causal connections, meshed intrachain sequences, facilitation, and interference.*

As this conceptualization of closeness implies, the determinants of relationship closeness are the causal connections between two individuals' intrachain sequences. One important implication of this conceptualization was originally pointed out by Berscheid (1983/2002), who noted that a person's interruption of the other's intrachain sequence may either facilitate or interfere with the completion of the other's goals. This extension of Mandler's ideas was formalized in the Emotion in Relationships Model (ERM, Berscheid, 1983/2002) which argues that when a person's intrachain sequences are interrupted by another's behavior, the person should experience positive emotion if the interruption facilitates their goals, and negative if it interferes with their goals.

This extension of Mandler's model included an important suggestion for how an interruptive action can be interpreted as positive, a feature that Mandler's theory inadequately outlined. The "completion" hypothesis put forward by Berscheid (1983/2002) argues that an interrupting event or action by another can either remove an interrupting and negative stimulus, or allow the person to complete a goal more quickly

than anticipated. Both of these circumstances lead to the interruption of behavioral sequences, but they are also characterized by attaining or speeding up attainment of the goal.

Another important concept from the Kelley et al. (198/2002) conceptualization of closeness is the concept of meshed intrachain sequences. When partners become closer, they often develop highly organized behaviors that rely on the other in order to be completed. Often two people will simultaneously engage in highly organized intrachain sequences in which they facilitate each others' sequences. These sequences are considered meshed when there are a large number of causal connections linking each partner's intrachain sequence to the other's intrachain sequence. For example, if a couple typically cooks dinner together, they are likely to have developed highly coordinated behaviors that facilitate the ultimate goal of cooking dinner. If one of other partners fails to do his/her part, the other's sequence becomes interrupted. Frequently such sequences are engaged in with little attention, occur smoothly with little thought, possess little variation, and tend to run off automatically (Berscheid, 1983/2002).

Many close relationships are characterized by large numbers of meshed intrachain sequences. Because these sequences are not interruptive or surprising, such relationships rarely produce the necessary conditions for emotion (see Berscheid, 1983/2002). Thus, they seem emotionally quiet on the surface. It is important to note, however, that such relationships possess a tremendous amount of *potential* for emotion, particularly negative emotion. If a person's partner is suddenly unable or unwilling to do his/her part in such interactions, then the person should experience strong emotion related to being unable to

complete his/her behavioral sequences. This is part of the reason people don't realize how important a relationship was to them until it's gone, and why people who seemed to experience little emotion within a relationship when it existed express tremendous grief when their relationships end through separation, death, or divorce. To use an analogous idea from physics, close relationships have a tremendous amount of potential emotional energy, however they may release that potential energy in its kinetic form very rarely. Less close relationships, alternatively, are likely to produce the bulk of emotional energy in the form of kinetic emotional energy, but store very little of it in the form of potential emotional energy.

*ERM predictions.* As the previous discussion indicates, the ERM makes a clear set of predictions regarding the experience of emotion in interpersonal contexts. First, it argues that the interruption of behavioral sequences (i.e., expectancy violations) is a necessary condition for arousal. Second, it argues that the perception of the interruption as facilitating or interfering with important behavioral sequences is a necessary condition for the valence of the event. Thus, in order to predict emotion, it is necessary to know: (a) a person's expectancies in a given situation to predict arousal, and (b) what their goals are in the situation to predict valence.

*Origins of relationship expectancies.* There are a number of potential sources for relationship expectancies (Berscheid & Ammazzalorso, 2001). One rich source of relationship expectancies is the agreements and promises we make to each other. For example, if Robert and Will have an agreement that Robert will do the dishes, and Will

promises to clean the bathroom, then violation of this agreement can lead to frustration and anger.

A second source of relationship expectancies comes from learning how our partner typically behaves in different situations. For example, if Tina consistently wakes up at eight in the morning and is out of the shower by 8:30, then Martin will learn to take a shower before her in order to get to work on time. If Tina then switches her routine and wakes up at 7:30 to take a shower, this would likely be surprising for Martin and should result in an emotional reaction. Martin may quickly realize that he can alter his shower time to a little later, thus calming him down, but not before the surprising event has caused a visceral reaction.

Not all sources of expectations are the result of explicit or implicit learning in the present relationship. Some expectancies are the result of each partner's relationship history, societal norms, or other general schemas people have about relationships and interpersonal interaction. One example might be the existence of strong norms of reciprocity (e.g., Fehr & Fischbacher, 2004). Indeed, these norms have been shown to be strong enough that third parties will punish violators of equity and other reciprocity norms at cost to themselves.

*Attachment as a source of expectations.* One well documented example of a person's relationship history affecting his or her expectancies is attachment history. John Bowlby (e.g., 1969/1982) created Attachment Theory as an explanatory framework for the strong bonds between mothers and their infants. He noticed that children respond to

separation from their mothers with loud protests and high levels of distress. The theory posits that all humans possess an innate behavioral system that motivates infants to maintain close proximity to their caregivers. In addition, Bowlby theorized that this system is activated most strongly by distressing conditions, and the system plays a role in interpersonal relationships from the “cradle to the grave” (Bowlby, 1979).

One of the more influential developments from this tradition of research was the documentation of individual differences (Ainsworth, Blehar, Waters, & Wall, 1978) in the way children respond to separations and reunions with their mothers. Ainsworth and colleagues identified three separate classifications: a secure attachment classification, an anxious/ambivalent insecure attachment classification, and an avoidant insecure attachment classification. Secure children use their caregivers as a base of security from which to explore the world, returning if they need comfort when distressed. Avoidant children try to regulate their emotions in a self-reliant manner and do not use their caregivers to regulate their negative affect when they are distressed. Anxious children vacillate between clinginess and avoidance, making inconsistent bids for their caregiver’s support when distressed.

Since these developments, attachment theory has become a focus of attention in adult relationships as well, particularly romantic relationships (see Hazan & Shaver, 1987). This research has found similarities between adults and children in terms of attachment style individual differences. Currently, most adult attachment researchers conceptualize attachment insecurity on two dimensions, an avoidance dimension, and an anxiety dimension (Simpson, Rholes, & Phillips, 1996). According to this

conceptualization, a person can be high in either form of insecurity, high on one or the other, or low on both. Being low on both indicates a secure attachment disposition.

Mikulincer and Shaver's (2003) model of adult attachment suggests that highly anxious individuals use hyper-activating strategies when they believe that a caregiver is not sufficiently available. A hyper-activating strategy is characterized by persistent attempts to achieve proximity and support. Highly avoidant individuals use hypo-activating strategies that include denial of interpersonal needs and intimacy. Generally, anxious individuals seem to fear, and thus expect that relationship partners will not be available, whereas avoidant individuals have learned to do without others because they "distrust relationship partners' goodwill" (Mikulincer & Shaver, 2005). For the remainder of this paper, all references to "anxiety" will address attachment anxiety and not other forms of anxiety.

*Previous research on the ERM.* Despite its appeal and general stature in the field of interpersonal relationships research, the ERM has received relatively little empirical attention over the years, largely because it is difficult to test (Fehr & Harasymchuck, 2005). Fehr and Harasymchuck (2005) found support for the ERM by having participants imagine and remember situations in which certain types of relationship events occurred. Attridge (1995) found that, in line with predictions from the ERM, behavioral closeness or interdependence predicted the extent to which relationship partners experienced strong emotions during a physical separation (a study abroad program). Additionally, he found evidence that attachment insecurity predicted more emotional negativity before and after the separation, but not during the separation.

Recently Simpson, Collins, Tran, and Haydon (2007) found a developmental link between attachment orientations and emotional experience in relationships. In this study they documented longitudinal links between a person's infant attachment style (assessed by the strange situation) and their emotional experience in later adult romantic relationships. This is one of the clearest demonstrations of how early relationship experiences have lifelong effects on emotional experience. In particular, they found that infant attachment styles predicted childhood peer competence, which predicted attachment security at age sixteen, which predicted emotional tone in adult romantic relationships. Importantly the link between attachment security and romantic relationship emotional tone indicated that greater security was related to greater positive relative to negative emotion in romantic relationships.

Both the Attridge and Simpson studies point to a similar finding, namely that security predicts more positive emotion and less negative emotion over time. This is a highly intuitive finding from an attachment perspective, but one might predict the opposite pattern from the ERM. If secure individuals expect positive interactions, then they have more potential for interference in their interactions, and therefore negative emotion. Whereas insecure individuals would have more potential for facilitation in their interactions, and therefore positive emotion. This simple analysis ignores the fact that secure individuals are also better at coping with stress and at making sure relationship interactions are positive. Thus, there may be more potential for the relationships between attachment security and emotion predicted above, but behavioral differences between secure and insecure people lead to the opposite pattern in real data.

## Chapter 2: The Present Research

### *Goals and Objectives*

There are two primary objectives for the current research. The first was to design an experimental procedure that was capable of testing the nuts and bolts of the ERM by using planned manipulations that systematically altered relationship partners' expectations about each others' behavior. No previous study has fully experimentally tested the premise that emotional experience in interpersonal contexts occurs when partners violate each other's expectancies, and that facilitation leads to positive emotion, whereas interference leads to negative emotion. All previous studies have involved either memory of or imagined expectancy violations, the effects of separation, or the effects of attachment based expectancies on emotion in relationships. This study, alternatively, uses a real time situation in which participants' expectations are directly manipulated.

The second goal was to conduct a test with this procedure to see if expectancy violation led to arousal, and whether the facilitative or interfering nature of the partner's affected each participant's evaluation of the valence of events. Thus, I hope to test whether the ERM successfully predicts the arousal and valence of participant's reactions to manipulated, real-time events during a psychologically believable relationship interaction. In order to fully test the theory, the design must include manipulations of the situation such that participants expect their partners to act against the participant's self interest in some cases, and for the participant's self interest in others. Those conditions

must then be crossed with manipulations of the partner's actual behavior, such that sometimes the participant's expectations are in line with the partner's behavior, and sometimes they are not.

### *Overview of the Study*

The experiment utilized an interactive card game that participants played with their "partners" over an intranet connection. In reality, they were playing a computer simulation in which their partner's decisions and behaviors were fully predetermined and manipulated by the researchers. This game was set up to allow participants and their partners to act cooperatively or selfishly in the game context. In order to motivate participants to care about the game outcomes, they were informed that they were earning points during the game that could be exchanged for money afterward.

In addition to manipulating the partners' allocation decisions throughout the game, manipulations were conducted to vary participants' expectations of their partners' behaviors. One set of expectation manipulations involved a verbal agreement between the participant and his/her partner as to whether each would use a selfish or a cooperative strategy during the game. Another manipulation, also varied between couples, involved having the participant's partner consistently act cooperatively or selfishly during the first few rounds of the game. This manipulation was designed to mimic how expectations often develop in relationships from individuals watching their partners' behavior and then using that behavior to predict future behavior.

Dependent measures included self-reports of emotional reactions and observer ratings of facial reactions to partner's allocation decisions during the game. Valence and arousal or strength of reaction were assessed via both self-reports and observer ratings. Self-reports of surprise were also collected as a manipulation check.

### *Study Design*

To test whether expectation violation leads to arousal, several sources of expectation were measured or manipulated in the experiment, and all of the participants' partners' allocation decisions were manipulated throughout the study. The design included a manipulation of the partner's behavior ("allocation decision") within subjects so that each participant experienced multiple instances in which his/her partner "chose" to act selfishly, and multiple instances in which their partner "chose" to act cooperatively. Another core manipulation included a verbal agreement manipulation in which participants were cajoled to choose "in concert" with their partners either a selfish or a cooperative strategy to the game. This variable was between couples, and was designed to manipulate one source of expectations in the form of agreements ("agreement"). A third manipulated variable involved manipulating the partner's behavior at the beginning of the game to be consistently selfish or consistently cooperative. This was a between couples manipulation, and was designed to manipulate another source of expectations in the form of behavioral predictions ("initial allocation decision"). The gender of each participant was included as a between subjects (within couple) variable.

In addition to the manipulated variables and gender, a variety of personality and relationship variables were also measured using a battery of questionnaires. These measures were collected primarily for secondary analyses to supplement the core design, with closeness and attachment style being given special priority in these analyses.

In sum, the core design is a 2 within subjects (“allocation decision”) X 2 between couples (“agreement”) X 2 between couples (“initial allocation decision”) X 2 within couples (gender) design. This design allows for the control and assessment of several different sources of relationship expectancies including agreement sources, situational behavioral sources, relationship specific sources (e.g., closeness), actor personality/relationship history sources (e.g., actor attachment security), normative sources (e.g., norms of benevolence), and partner personality/past behavior sources (e.g., partner attachment security). The primary dependent measures were self-report and observer rated facial expression of valence measures and arousal measures, or the manipulation check surprise measure.

*Main effects of “allocation decision” on valence.* Hypothesis 1 is that there will be a main effect of partner “allocation decision” on self-reported valence of reaction and facial reaction valence such that cooperative behaviors by partners would be seen as positive, whereas selfish behaviors by partners would be seen as negative. Thus, valence of reaction should be determined by the value of the partner’s allocation decision to the participant, not an interaction between the participant’s expectations and the partner’s allocation decision.

*Interactions between “allocation decision” and expectations (“initial allocation decision” or “agreement”) on surprise and arousal.* Hypothesis 2 is that there will be an interaction between partner “allocation decision” and participant expectations from partner “initial allocation decision” on self-reported strength of reaction (self-reported arousal), self-reported surprise, and the strength of observer rated facial reactions. Specifically, when the partner’s allocation decision is discrepant from the participant’s expectation, participants will report and have stronger emotional reactions and experience more surprise.

Hypothesis 3 is that there will be an interaction between partner “allocation decision” and participant expectations from couple “agreement” on self-reported strength of reaction (self-reported arousal), self-reported surprise, and the strength of observer rated facial reactions. Specifically, when the partner’s allocation decision is discrepant from the participant’s expectation, participants will report and have stronger emotional reactions and more surprise.

Beyond these core predictions it is expected that there may be effects from norms regarding interpersonal benevolence and from actor and partner personality, particularly attachment security and relationship closeness.

## Method

### *Participants*

Sixty-two romantic couples (62 males and 62 females) participated in exchange for money or a combination of extra credit and money (one couple was removed from the

final analysis due to technical problems in data collection). Participants were recruited through an online research recruitment site or through flyers posted around the campus of a large Midwestern university.

The majority of participants identified themselves as White or European American (71%). The next largest groups identified as Asian or Asian American (17%), and Black or African American (4%). One participant identified as Native American and nine categorized themselves as “Other”.

Participants were approximately 21 years of age on average (males  $M = 21.3$ ,  $SD = 6.2$ ; females  $M = 20.9$ ,  $SD = 5.4$ ), and ranged in age from 17 – 56. Relationship length ranged from 1.3 months to 11 years. The mean relationship length was 1.7 years. Six percent of the sample reported being in a casual dating relationship, 82% reported that they were seriously dating, 2% reported being engaged, and 10% reported being married. Two couples reported being same sex couples. In order to run the type of analysis used (a distinguishable dyadic analysis), we needed to label one partner male and one female, so we randomly assigned one member of each same sex couple to be coded as the opposite sex. This procedure did not change the results.

### *Materials*

The manipulations and dependent measures of the study were taken in the context of a game participants ostensibly played with their partners over a computer connection. The game was created on E-prime, and was played on a Dell laptop computer. The game included digital presentations of standard playing cards from a typical 52 card deck (see

Appendix A). The game was videotaped using a dyadic camera system that allowed us to tape each participants' facial reactions and the computer screen simultaneously. All video data was recorded using the Noldus Observer Pro software package. In addition, each participant completed a packet of personality and relationship measures.

*Adult Attachment Questionnaire.* The ERM clearly predicts that one source of expectancies should be each individual's personality. Excess emotional baggage and internal dispositions create a wide variety of expectations for the people with whom we interact. Attachment orientation is a particularly meaningful source of expectations regarding our relationship partners given its close ties to people's self, other, and relationship schemas (Baldwin, Keelan, Fehr, Enns, & Rangarjoo, 1996). To measure attachment orientation we used the Adult Attachment Questionnaire (AAQ; Simpson, Rholes, & Phillips, 1996; see Appendix B). The AAQ is a 17 item scale that contains two attachment insecurity subscales, an avoidance subscale (example item: "*I don't like people getting to close to me*") and an ambivalence or anxiety subscale (example item: "*I often worry my partner(s) don't really love me*"). The items are answered in regards to how the individual feels in relationships in general, and thus is not a relationship specific measure. Each item is answered on a seven point Likert-type scale, with the anchors being 1 – strongly disagree and 7 – strongly agree. Simpson et al. report high internal consistency for each subscale, with Cronbach alphas of .70 for men and .74 for women on the avoidance subscale, and .72 for men and .76 on the ambivalence scale for women.

*Perceived Relationship Quality Components.* Another potential source of variance in the data stems from relationship quality. In order to control for and test for

effects due to relationship quality, we gave participants the Perceived Relationship Quality Components index (PRQC; Fletcher, Simpson, & Thomas, 2000; see Appendix C). The PRQC measures six aspects of relationship quality in a short format. Each aspect is measured using three items with seven point Likert-type scales ranging from 1 – not at all to 7 - extremely. The subscales include: relationship satisfaction (example item: “*how happy are you with your relationship*”; Cronbach alpha = .91), commitment (example item: “*how devoted are you to your relationship*”; Cronbach alpha = .96), intimacy (example item: “*how connected are you to your partner*”; Cronbach alpha = .86), trust (example item: “*how dependable is your partner*”; Cronbach alpha = .78), passion (example item: “*how sexually intense is your relationship*”; Cronbach alpha = .86), and love (example item: “*how much do you adore your partner*”; Cronbach alpha = .89).

*The Relationship Closeness Inventory.* One of the core ideas in the ERM is that relationship closeness, particularly behavioral closeness, should have important effects on expectations. As relationships become more behaviorally close and interdependence increases, partners should have more potential expectations to violate even though they may be less likely to violate each other’s expectations. To measure relationship closeness/interdependence, we gave the Relationship Closeness Inventory (RCI; Berscheid, Snyder, & Omoto, 1989b; Berscheid, Snyder, & Omoto, 2004; see Appendix D) to each participant. The RCI measures the frequency of influence, diversity of influence, and strength of influence within a relationship. The three subscales are then combined to estimate the “behavioral closeness” of the relationship partners. The

frequency subscale simply asks participants to provide estimates of how much time they have spent alone with their partner. The diversity subscale asks participants to check off from a list which activities they have engaged in with their partners in the last week. The strength subscale consists of questions about the partner's influence on the participant in a number of domains, each measured on a seven item Likert-type scale. Berscheid and colleagues (2004) reported a test-retest reliability of .82 over a 3 – 5 week interval.

*The Inclusion of the Other in the Self scale.* In addition to behavioral closeness, we gave participants a more global measure of relationship closeness, the Inclusion of the Other in the Self scale (IOS; Aron, Aron, & Smollan, 1992; see Appendix E). This measure is a Venn-diagram constructed of seven pairs of circles that overlap each other to varying degrees. One circle in each pair represents the self, and the other circle represents the partner. Participants are asked to choose which of the seven pairs represents the relationship between themselves and their partner. No overlap represents a relationship with little closeness, whereas nearly complete overlap represents a high degree of closeness. The scale has good test-test reliability with Aron, et al. (1992) reporting correlations between one test and a second test two weeks later being .85 among romantic partners.

*The Emotional Tone Index (28 item - alternate version).* The emotional tone of a relationship could also represent an important source of information about relationship expectations. For example, if a relationship is characterized by a higher frequency of positive emotions than to negative emotions, then interfering behaviors from the partner might be even more surprising than otherwise. As such, an alternate version of the

Emotional Tone Index (ETI; Berscheid, et al., 1989b; see Appendix F) was used to measure emotional tone. The ETI is a 27 item index of positive and negative emotions on which respondents indicate how frequently they have experienced each of 12 positive and 15 negative emotions in their relationship. Answers are given on a Likert-type scale with higher values indicating higher frequency. The ETI measure used in this study had a balanced number of positive (e.g., elated) and negative (e.g., hostile) items, 14 items in each subscale.

*The Berkeley Personality Profile.* Another possible source of expectations is basic personality. Contemporary personality theorists agree that most personality traits fall into one of five general categories of personality that are largely orthogonal (see, John & Srivastava, 1999; Paunonen & Jackson, 1996). Participants filled out the Berkeley Personality Profile (Big 5, Harary & Donahue, 1994; see Appendix G) which measures the Big Five using a 35-item scale. Each item is measured on a Likert-type scale ranging from strongly disagree to strongly agree. The Big Five include extroversion, openness to experience, agreeableness, conscientiousness, and neuroticism (or its opposite, emotional stability).

*Competitiveness.* Given the nature of the game being played by participants, the results of the study may be sensitive to each person's individual competitiveness. Two measures of competitiveness were collected. The Competitiveness Index (CI; Smither & Houston, 1992; see Appendix H) is a 20 item scale measuring interpersonal competitiveness in everyday contexts. The CI demonstrates high internal reliability with a Cronbach alpha of .90. The Competitiveness Questionnaire (CQ; Griffin-Pierson, 1990;

see Appendix I) was designed to measure both goal competitiveness and interpersonal competitiveness. The goal competitiveness subscale proved to be less reliable ( $\alpha = .45$ ) than the interpersonal competitiveness subscale ( $\alpha = .76$ ). The latter scale consists of 14 items, 8 of which comprise the interpersonal competitiveness subscale.

### *Procedure*

When partners entered the lab, they were greeted by two researchers and separated into different rooms where they could not see or hear what the other was doing. After giving informed consent and filling out demographic questionnaires, they began the main study tasks. In one room, each participant was seated at a computer where s/he filled out the various personality and relationship questionnaires. In the other room, the other member of the couple was seated at the Dell laptop in the dyadic camera room, and began playing the interactive card game. Both partners were led to believe that their partner was doing the same task that they were, just in a different room. The gender of the partner that started with the game vs. the questionnaires was counterbalanced across couples, so that the male of the first couple would play the game first and answer questionnaires second, the female of the second couple would play the game first and answer questionnaires second, and so on and so forth.

*The game.* Before beginning the game, participants were given extensive instructions (see Appendix J) on how to play the game. They were told that the object of the game was to get as many points as possible, and that the points could later be exchanged for a reward in the form of cash. They were also told that the game had

proven to predict certain aspects of relationship quality in the past. In order to gain points, they were to match cards with their partner. On each turn, either they or their partner would alternately choose to place points in either a joint couple shared account (in which the points would ostensibly be shared equally between the partners), or in a personal account (in which the points would only go to the chooser's account). Each couple was then randomly assigned to receive instructions that noted that the "personal account strategy" would lead to double the profits of the "joint couple strategy" or that the "joint couple strategy" would lead to double the profits of the "personal strategy".

After finishing the instructions participants were told that their *partner* had suggested using whichever strategy the instructions indicated would generate the highest profits and suggesting they agree to the arrangement. All participants complied with this request before starting the game, thus entering into an effective agreement (IV: "agreement") about how each member of the couple would make allocation decisions during the game. This manipulation was used to test the hypothesis that expectations formed out of agreements are a potential source of emotion. This variable was manipulated between couples. It is important to note, however, that it was clear to each participant that the optimal outcome for her/him was to have their partner put their points into the "joint couple account", while s/he kept his/her own points by placing them in the "personal account". Thus, even though s/he might expect their partner to act "selfishly", s/he would not necessarily benefit from it, and should prefer that their partner give to the "joint couple account" under all conditions.

The game proceeded in rounds during which the participant and her/his “partner” (actually a series of programmed responses by the computer) took turns picking a card for their partner to match. The participant always went first and selected one of four cards displayed on the screen (the cards were always the same color and were always two pairs). After choosing, the screen (presented for varying lengths) indicated that they were waiting for their partner to guess which card they chose. The computer then indicated that their partner had picked a card that matched only on color (earning the players one point), on color and rank or color and suit (earning the players 2 points), or on color, rank, and suit (earning the players 3 points). Subsequently, the participant was cued to choose which account to place the points in, the personal account, or the joint account. After indicating their choice, the computer asked them to respond to the following questions on a seven point Likert-type scale: do you think your partner will be surprised by your decision? (1 – not at all surprised; 7 – very surprised); how do you think your partner will feel about your decision? (1 - very negative; 7 – very positive); and how strongly do you think your partner will feel about your decision? (1 – not at all strong; 7 – very strong).

The participant then switched roles with his/her “partner” and became the guesser. Once the computer indicated how many points the players had earned, it indicated the participant’s “partner’s” allocation decision (IV: “allocation decision”) about which account to award the points, the “joint couple” or the “personal” account. This manipulation occurred within subjects. Each participant experienced six instances of their partner allocating points to each of the two accounts after all manipulations (12 total

instances). After displaying this information briefly, the participant was cued to answer the following questions on a seven point Likert-type scale with the same anchors as the previous questions: how surprised were you by your partner's decision?; how did you feel about your partner's decision?; and how strongly did you feel about your partner's decision? These measures were the key dependent variables and provided a measure of valence, strength of reaction, and a manipulation check on surprise (which should look like strength of reaction in analyses if the ERM is correct). This type of self-report measure of valence and arousal is commonly used in emotion research and typically generates results very similar to those obtained using physiological measures (e.g., Bradley, Codispotti, Cuthbert & Lang, 2001)

Before playing the game, each participant was given two practice rounds in which the researcher walked her/him through the game to make sure s/he understood all aspects of the game. Once they began the actual game, the first three rounds were controlled such that some participants were randomly assigned to a condition in which their "partners" (i.e., the computer) always contributed to their "personal account", whereas other participants were randomly assigned to a condition in which their "partners" always contributed to the "joint couple account" (IV: "initial allocation decision"). This variable was manipulated between couples. Following these initial three rounds twelve more rounds ensued during which the "partner's" contributions were half to the "joint couple account" (6 rounds) and half to the "personal account" (pseudo-randomly ordered). The entire game was videotaped through wall-mounted cameras controlled by another researcher located in a control room.

After finishing the game, the first participant was taken from the camera room to a room to complete the questionnaires, and his/her partner was brought into the dyadic camera room. The lab was set up such that this exchange could be done easily without the partners seeing each other and arousing suspicion. Once both partners had finished all tasks, they were carefully debriefed, told the true purpose of the study, thanked, and compensated.

*Facial expressions coding.* The facial reactions of each participant were coded by three independent raters after each time the “partner” made a point allocation decision. The raters used a slightly modified version of the FACES system of facial emotion coding (Kring & Sloan, 2007). The FACES system is designed under the assumption that valence is the most fundamental unit of emotion. The system codes for frequency, intensity and duration of expression. Frequency is typically used to measure the number of positive or negative expressions seen in a given time frame. Because of the event related nature of the study, valence was scored on a 5 point Likert-type scale (1 – very negative; 5 – very positive). Intensity was coded on a 4-point scale (1 – low; 4 – high), and duration was coded as the number of seconds from the onset of a valenced expression to the offset of that expression. For purposes of this study, the combined valence ratings, intensity ratings, and duration ratings were used in the final analyses, but frequency was omitted and replaced with a Likert-type measure. We then created a composite scale from the intensity and duration scores to create a facial reaction measure that captured the strength of the reaction as an indication of arousal.

The FACES system has strong convergent validity and previous research has documented correlations between facial codes and physiological measures (Kring & Sloan, 2007). Both the intensity and duration ratings have moderate to strong correlations with skin conductance and heart rate. The two ratings used in the final analyses, expression valence and facial reaction strength, both showed high inter-rater reliability, with the intra-class correlation for valence being .86 and the intra-class correlation for facial reaction strength being .85.

## Results

### *Descriptive Statistics and Correlations*

Descriptive statistics for all measured independent variables can be found in Table 1. Zero-order correlations between all measured independent variables can be found in Table 2. Correlations of potential interest include negative relations between attachment insecurity and various measures of participant and partner relationship quality, and attachment insecurity and the ratio of positive-to-negative affect experienced in the relationship for both the participant and her/his partner. Participant's agreeableness was positively related to relationship satisfaction, love, and the partner's agreeableness. It was also negatively correlated with both dimensions of attachment insecurity. Consistent with previous research (e.g., Karney & Bradbury, 1997), neuroticism was negatively correlated with relationship satisfaction, and positively correlated with both dimensions of attachment insecurity, as well as partner's attachment avoidance. Additionally openness was positively related to partner's openness. There was also a significant correlation between passion and length of relationship,  $r = -.20$ .

Table 1

*Descriptive Statistics for Measured Variables*

Variable	<i>M</i>	<i>SD</i>	<i>Range</i>
Attachment Avoidance	24.8	8.2	8-56
Attachment Anxiety	24.4	8.2	9-63
Satisfaction	6.0	1.1	3-21
Commitment	6.3	1.0	3-21
Intimacy	6.1	0.8	3-21
Trust	6.0	1.2	3-21
Passion	5.3	1.2	3-21
Love	6.3	0.9	3-21
IOS	4.9	1.3	1-7
Extraversion	4.5	1.1	7-49
Agreeableness	5.1	0.9	7-49
Conscientiousness	4.7	0.9	7-49
Neuroticism	3.5	1.0	7-49
Openness	4.9	1.0	7-49
RCI Closeness	18.5	3.8	3-30
ETI	3.1	1.6	-84-84

*APIM Analyses*

Relationship partners had correlated scores on several measures. Thus, to deal with interdependence between relationship partners, the Actor-Partner Interdependence Model (APIM; Kenny, 1996; Kashy & Kenny, 2000) was used to analyze the data. The APIM is a form of linear mixed modeling that allows for data interdependence. The APIM has been specifically designed and tested for research on relationship dyads. The model allows for the estimation of both actor (the participant) and partner (the participant's partner) effects, and allows both members of the dyad to be treated simultaneously as actors and partners. This method treats the dyad as the primary unit of analysis, adjusts for the appropriate degrees of freedom, which vary more than traditional

tests due to the procedure the model uses to determine *df*, and allows proper tests of actor and partner effects. All analyses were conducted with SPSS version 16. All effects will be reported as regression coefficients. All independent variables were centered on the grand mean (see, Aiken & West, 1991). Because no significant interaction involved more than one continuous IV, all interactions were broken down by repeating relevant analyses at each level of one of the dichotomous IVs.

Table 2  
*Correlations Between Measured IV's*

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Avoidance	1.0																
2. Anxiety	.47**	1.0															
3. Satisfaction	-.23*	-.46**	1.0														
4. Commitment	-.25**	-.27**	.75**	1.0													
5. Intimacy	-.23*	-.46**	.67**	.60**	1.0												
6. Trust	-.07	-.38**	.46**	.41**	.53**	1.0											
7. Passion	-.18	-.22*	.52**	.47**	.51**	.24*	1.0										
8. Love	-.20*	-.32**	.74**	.80**	.70**	.43**	.44**	1.0									
9. IOS	-.11	-.08	.29**	.27**	.28**	.05	.14	.24*	1.0								
10. Extraversion	-.27**	-.05	.12	.16	.10	.003	.04	.18	-.03	1.0							
11. Agreeableness	-.31**	-.27**	.23*	.17	.15	.15	.04	.20*	-.08	.15	1.0						
12. Conscientiousness	.03	-.02	.06	.09	-.01	-.10	.002	.05	-.01	.13	.01	1.0					
13. Neuroticism	.27**	.42**	-.20*	.06	-.14	-.15	-.12	-.02	.08	-.16	-.32**	-.19*	1.0				
14. Openness	-.11	-.05	.002	.06	.13	-.06	.07	-.04	-.06	.03	.02	.07	-.08	1.0			
15. RCI Closeness	.14	.05	.24*	.19*	.25**	.16	.06	.16	.36**	-.12	-.08	-.01	.09	-.01	1.0		
16. ETI	-.39**	-.62**	.71**	.46**	.47**	.46**	.41**	.44**	.16	.08	.29**	.08	-.46**	.001	.11	1.0	
17. Longevity	.08	-.08	-.12	-.02	.01	.004	-.20*	.03	-.03	-.09	-.04	.03	.003	-.07	.06	-.08	1.0
P-Avoidance	.38**	.31**	-.26**	-.13	-.11	.07	-.18	-.11	-.04	-.10	-.05	-.08	.25**	.05	.12	-.34**	.12
P-Anxiety	.29**	.16	-.32**	-.22*	-.17	-.02	-.12	-.26**	-.26**	-.18	-.14	-.06	.021	.01	.02	-.33**	-.07
P-Satisfaction	-.25**	-.32**	.4**	.22*	.21*	.22*	.15	.16	.32**	-.05	.18	-.13	-.12	-.03	.17	.64**	-.11
P-Commitment	-.12	-.22*	.22*	.17	.21*	.17	.06	.13	.24*	-.03	.07	-.10	-.12	-.05	.17	.42**	-.02
P-Intimacy	-.11	-.17	.21*	.21*	.28**	.13	.09	.15	.19	-.06	.01	.13	-.04	.11	.18	.34**	.01
P-Trust	-.07	-.02	.22*	.17	.13	.06	-.01	.14	.18	.02	.03	.13	-.09	.05	.04	.23*	.02
P-Passion	-.18	-.12	.15	.06	.10	-.01	.37**	-.06	.01	.07	.02	.01	-.08	.18	-.002	.29**	-.18
P-Love	-.11	-.26**	.16	.13	.15	.14	-.06	.15	.16	-.07	.11	-.09	-.08	-.13	.06	.37**	.06
P-IOS	-.04	-.26**	.29**	.22*	.16	.17	.01	.14	.33**	-.09	-.05	.03	.07	-.11	.25**	.19	.01
P-Extraversion	-.10	-.17	-.05	-.03	-.06	.02	.07	-.07	-.09	-.04	.04	.05	-.12	-.09	-.03	.002	-.15
P-Agreeableness	-.06	-.15	.19*	.07	.01	.03	.02	.11	-.06	.04	.29**	.07	-.13	.033	-.10	.17	-.01
P-Conscientiousness	-.08	-.06	-.12	-.09	.11	.13	.01	-.08	.028	.05	.06	-.11	-.03	.13	.03	-.03	.08
P-Openness	.05	.01	-.03	-.05	.10	.04	.18	-.11	-.11	-.09	.03	.13	-.06	.38**	-.03	.04	-.09
P-RCI Closeness	.15	-.01	.21*	.19*	.21*	.04	.04	.10	.33**	-.06	-.08	.04	.184	.02	.59**	.09	.06
P-ETI	-.32**	-.32**	.59**	.38**	.30**	.22*	.28**	.33**	.19	-.01	.15	-.024	-.092	.04	.06	.59**	-.03

### *Primary Analyses*

All of the primary manipulated variables were included in all beginning models, including the within subjects manipulated variable “allocation decision”, and the between couples manipulated variables, “agreement” and “initial allocation decision”. The within couple variable, gender was also included in all beginning models. Separate analyses were done for the measured variables due to concerns about model size and multiple collinearity. In addition, the number of measured variables included in these analyses were limited to attachment orientations (AAQ) and relationship closeness as measured by the RCI given previous findings and theoretical importance, as well as high levels of correlation between other measured variables. Ultimately, no significant effects of attachment avoidance were found, so it was excluded from all final models. Models including the two measured variables of primary interest, attachment anxiety (both actor and partner anxiety) and relationship closeness, are fully reported.

All final models were determined using a backwards stepwise procedure in which variables that did not contribute to significant terms were dropped based on their individual p-values in the model (high p-values being thrown out first), until the final model included only terms that significantly contributed to the model (up to 3-way interactions). The models were tested for overall significance using a chi-square difference test between a null model including only the participant and couple intercepts and the chosen model. All models reported were significantly better predictors than the null model, and all effects reported are nested within significant models. These models,

one for each dependent measure, are reported in the following section. Each description indicates the terms included in the given model, and the overall model significance.

*Model 1.* Model 1 tested for the effects on self-reported valence of reaction to the partner's allocation decision to allocate points to the "joint-couple" or the "personal" account. Relationship closeness was included as the measured variable in the first model. The final model produced included the variables "allocation decision", "agreement", relationship closeness, and gender. The model -2 log likelihood was equal to 711.7,  $\chi^2(15, N = 122) = 49.99, p < .001$ .

*Model 2.* Model 2 included the valence of facial reaction data, and was an attempt to verify the valence effect from the self-report data with a measure of emotional valence that didn't require the participant's self-report. The final model produced included the variables "allocation decision", and gender. The model -2 log likelihood was equal to 814.8,  $\chi^2(4, N = 122) = 160.09, p < .001$ .

*Model 3.* Model 3 tested the self-reported strength of reaction to the partner's allocation decisions. This model tested whether expectancy violation led to emotional arousal. Again relationship closeness was included as a measured variable in the model. The final model produced included the variables "allocation decision", "initial allocation decision", "agreement", and gender. The model -2 log likelihood was equal to 725.5,  $\chi^2(15, N = 122) = 107.02, p < .001$ .

*Model 4.* In order to be certain that the manipulations were creating expectations and that expectations were being violated, model 4 tested the self-reported surprise variable as the dependent measure. Again, relationship closeness was included as a measured variable in the model. The final model produced included the variables “allocation decision”, “initial allocation decision”, and “closeness”. The model -2 log likelihood was equal to 824.9,  $\chi^2(8, N = 122) = 51.33, p < .001$ .

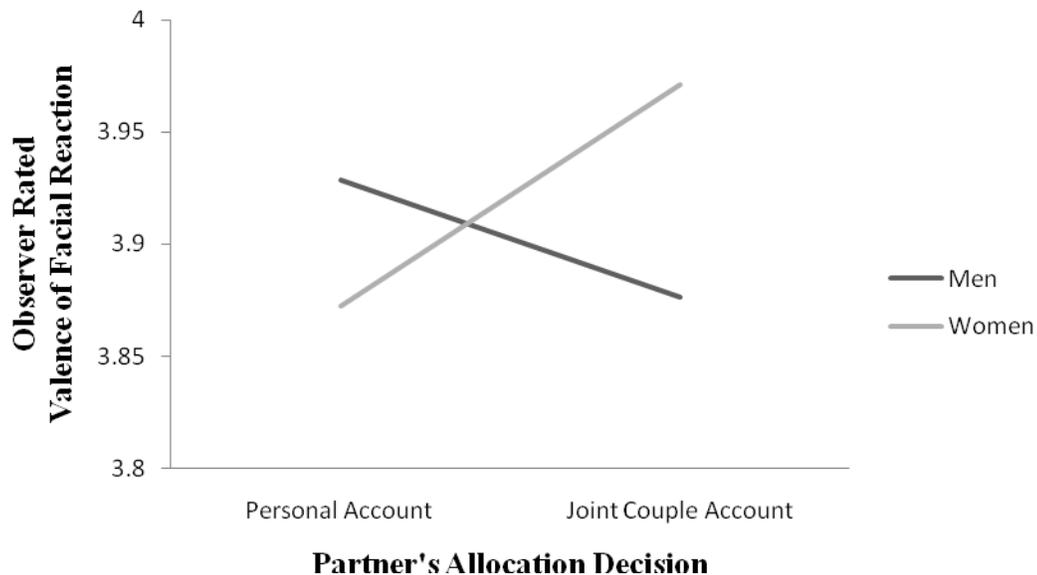
*Model 5.* Model 5 tested the observer rated strength of facial reaction as the dependent measure. This model tested an alternative, non-self-report measure of emotional arousal. Again, relationship closeness was included as a measured variable in the model. The final model produced included the variables “allocation decision”, “initial allocation decision”, and “closeness”. The model -2 log likelihood was equal to 863.0,  $\chi^2(8, N = 122) = 39.16, p < .001$ .

#### *Tests of Primary Hypotheses*

*Hypothesis 1.* Hypothesis 1 was confirmed by analysis the of self-reported valence of reaction, given that a predicted significant main effect of allocation decision was found,  $b = .63, t(114) = 10.6, p < .001$ . Importantly, as expected, when the partner chose the “personal account”, the participant reported a more negative reaction ( $M = 3.72$ ) below the neutral midpoint of the scale. When the partner chose the “joint couple account”, the participant reported a more positive reaction ( $M = 4.98$ ) above the neutral midpoint of the scale. Thus, participants interpreted their partner’s behavior as

facilitating when their partner chose the “joint couple account”, and as interfering when their partner chose the “personal account”.

Hypothesis 1 was not directly supported by the observer rated facial reaction, as a main effect for “allocation decision” was not found,  $p > .05$ . However, an interaction between “allocation decision” and gender was found,  $b = -.11$ ,  $t(120) = -2.71$ ,  $p = .008$ , suggesting that the prediction was confirmed for women, but not men. As Figure 1 indicates women’s facial expressions were more positive when their partner’s allocated points to the joint couple account,  $b = .15$ ,  $t(60) = 2.47$ ,  $p = .02$ . Men, however, showed little difference in the valence of their facial expression as a function of their partner’s allocation decision,  $p > .05$ . This effect may be due to norms of expressivity, such that men are generally expected to be less expressive than women in American culture (e.g., Richman, 1988).



*Figure 1.* Interaction between the partner's allocation decision and gender on the participant's observer rated valence of facial reaction to the partner's allocation decision.

*Hypothesis 2.* Hypothesis 2 was confirmed by self-reported surprise, given that the predicted significant interaction of "allocation decision" by "initial allocation decision" on surprise was found,  $b = -.28$ ,  $t(118) = -4.88$ ,  $p < .001$ . As Figure 2 indicates, participants reported greater surprise to their partner's allocation decision when that allocation decision violated their expectations based on the initial allocation decision manipulation. The difference between the expected and unexpected conditions when the partner allocated to the "joint couple account" was marginally significant in the expected direction,  $b = -.24$ ,  $t(59) = -1.79$ ,  $p = .079$ , and the difference between the expected and unexpected conditions when the partner allocated to the "personal account" was significant in the expected direction,  $b = .33$ ,  $t(59) = 2.45$ ,  $p = .017$ .

This result serves as a manipulation check by verifying that participants' experienced surprise in a manner consistent with the interpretation that the initial allocation decision manipulation set up participants' expectations about their partners' future behavior during the game. Participants whose partners allocated points to the "joint couple account" reported more surprise when they expected their partner to allocate to the "personal account" because of the initial allocation decision manipulation (i.e., their partner allocated to the "personal account" during the first three rounds) than when they expected their partner to allocate to the "joint couple account". Alternatively, participants whose partners allocated points to the "personal account" reported greater surprise when they expected their partner to allocate to the "joint couple account".

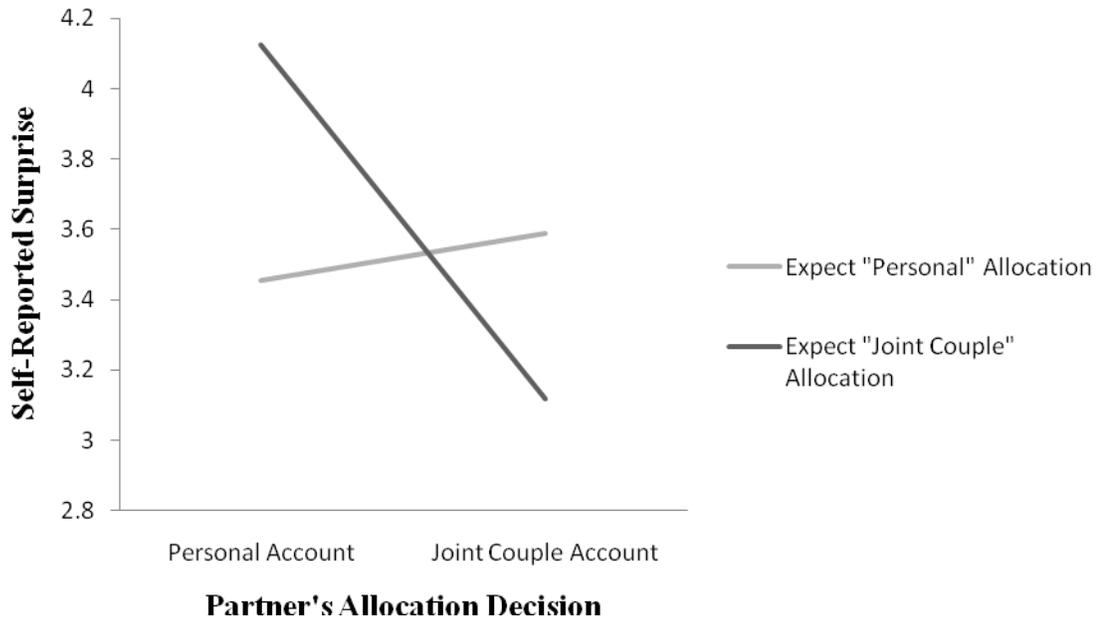
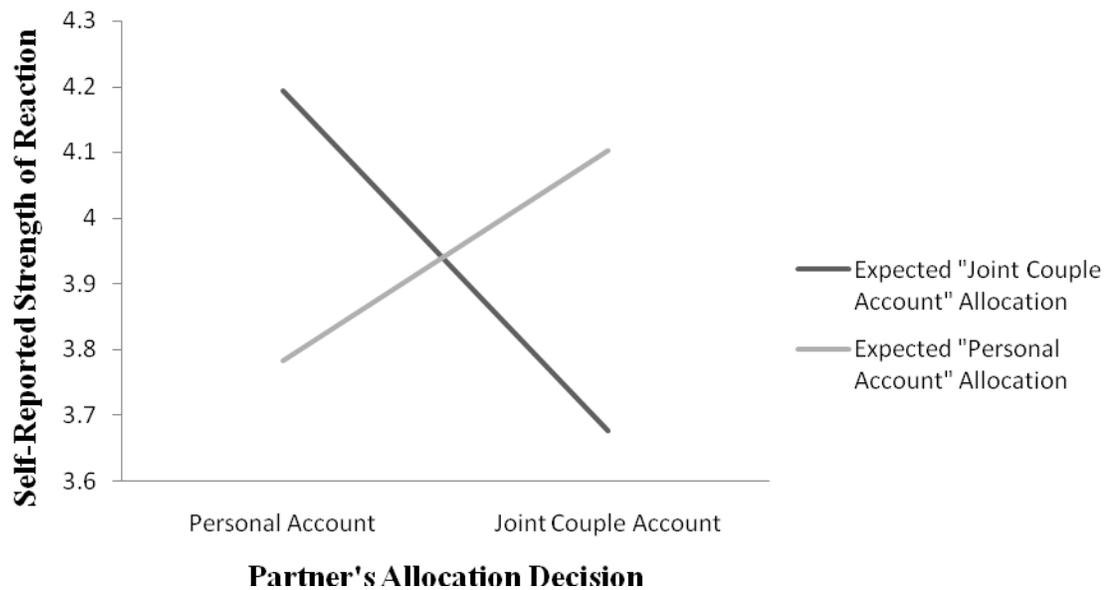


Figure 2. Interaction between “allocation decision” and “initial allocation decision” on the participant’s self-reported surprise to the partner’s allocation decision.

Hypothesis 2 was again confirmed as a predicted significant interaction of “allocation decision” by “initial allocation decision” on self-reported strength of reaction was found,  $b = -.21$ ,  $t(115) = -5.79$ ,  $p < .001$ . As Figure 3 indicates, participants reported stronger emotional reactions to their partner’s allocation decision when that allocation decision violated their expectations based on the initial allocation decision manipulation. Both the expected “joint couple account” allocation slope,  $b = -.26$ ,  $t(69) = -4.99$ ,  $p < .001$  and the expected “personal account” allocation slope,  $b = .16$ ,  $t(51) = 3.46$ ,  $p = .001$ , were significantly different from zero. Participants whose partners allocated points to the “joint couple account” reported stronger reactions when they expected their partner to allocate to the “personal account” given the initial allocation decision manipulation (i.e.,

their partner allocated to the “personal account” during the first three rounds) than when they expected their partner to allocate to the “joint couple account”. Alternatively, participants whose partners allocated points to the “personal account” reported stronger reactions when they expected their partner to allocate to the “joint couple account”.



*Figure 3.* Interaction between the partner’s allocation decision and the participant’s expectation based on the partner’s early initial allocation decisions (i.e., during the first three rounds) on the participant’s self-reported strength of emotional reaction to the partner’s allocation decision.

Hypothesis 2 was confirmed a third time as a predicted significant interaction of “allocation decision” by “initial allocation decision” on observer rated strength of facial

reaction,  $b = -.20$ ,  $t(118) = -3.04$ ,  $p = .003$ . As Figure 4 indicates, participant's facial reactions to their partner's allocation decision were stronger when that allocation decision violated their expectations based on the initial allocation decision manipulation.

Participants who expected their partner to allocate to the "joint couple account" had stronger facial reactions when their partner allocated to the "personal account" than when their partner allocated to the "joint couple account",  $b = -.53$ ,  $t(69) = -5.85$ ,  $p < .001$ .

Participants who expected their partner to allocate to the "personal account" did not have significantly stronger facial reactions when their partner allocated to the "joint couple account" relative to when their partner allocated to the "personal account", but their reactions trended in the predicted direction,  $p = .14$ .

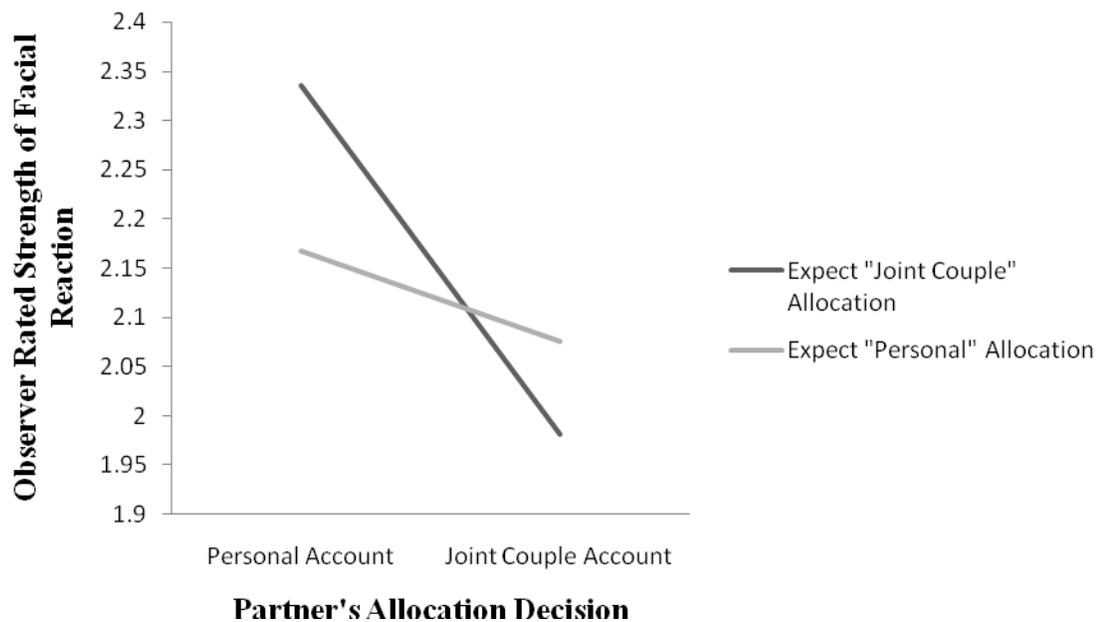


Figure 4. Interaction between "allocation decision" and "initial allocation decision" on the observer rated strength of facial reaction to the partner's allocation decision.

*Hypothesis 3.* Hypothesis 3 was not confirmed as no interaction between “agreement” and “allocation decision” was found for any of the DVs (self-reported strength of reaction, surprise, and observer rated strength of facial reaction, all  $p$ 's > .05). This indicates that the agreement manipulation failed to create expectations strong enough to override the initial allocation decision manipulation.

*Gender Effects.* A small number of gender effects were found. The first was an allocation decision by gender interaction on self-reported valence of reaction,  $b = -.18$ ,  $t(114) = -3.02$ ,  $p = .003$ . As Figure 5 indicates, men reported less positivity and less negativity than women. This is likely due to norms of expressivity, given that men tend to be less expressive than women in American culture (e.g., Richman, 1988). This effect is similar to the previously discussed gender effect found in the facial expression data. Importantly, both the male regression lines,  $b = .45$ ,  $t(60) = 5.88$ ,  $p < .001$ , and the female regression lines,  $b = .80$ ,  $t(60) = 9.01$ ,  $p = .003$ , were significantly different from zero.

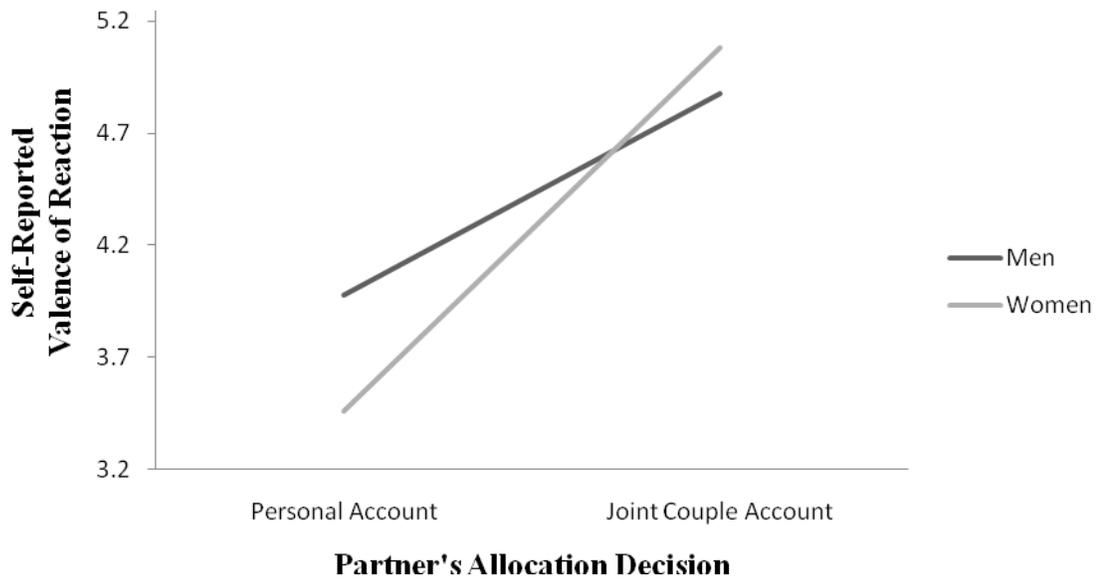


Figure 5. Interaction between the partner’s allocation decision and participant gender on the participant’s self-reported valence of reaction to the partner’s allocation decision.

Similarly, there was an interaction between “agreement” and gender on self-reported strength of reaction,  $b = -.28$ ,  $t(114) = -2.46$ ,  $p = .01$ . As Figure 6 indicates, women reported stronger emotional reactions to their partner’s allocation decisions when they (women) had agreed on the “joint couple strategy” than when they had agreed to the “personal strategy”,  $b = .42$ ,  $t(59) = 2.69$ ,  $p = .009$ , whereas men had little to no difference in reaction as a function of the “agreement”,  $p > .05$ .



Figure 6. Interaction between the participant’s gender and “agreement” on the participant’s self-reported strength of emotional reaction to the partner’s allocation decision.

*Mood effects.* An additional main effect emerged for “agreement” on self-reported valence of reaction,  $b = .14$ ,  $t(113) = 2.31$ ,  $p = .023$ . The “agreement” main effect indicates that participants who agreed with their partner to use the “joint couple strategy” reacted more positively to their partner’s allocation decisions throughout the game. This is likely because the “joint couple strategy” probably coincided with most participants’ preferences.

*Relationship Closeness.* A main effect of relationship closeness on self-reported valence of reaction was revealed,  $b = .56$ ,  $t(113) = 2.82$ ,  $p = .006$ . The relationship closeness main effect indicates that closer relationship partners were generally more

positive about their partner's allocation decisions. This outcome may exist for numerous reasons. One possibility is that because closeness correlates positively with relationship quality, participants in higher quality relationships had a stronger tendency to see their partners in a more positive light. It could also be because close relationship partners are less threatened by, and thus more positive toward their partner's allocation decisions. A third possibility is that closer partners perceived their partner's behavior as more positive, but only when they had already "agreed" to one strategy versus the other.

Closer analysis suggests that the first two explanations are unlikely. If the relationship closeness effect is due to close partners having higher quality relationships, then relationship quality should mediate the relation between relationship closeness and valence of reaction. This is not the case, and suggests that relationship quality is not a key mediator between relationship closeness and reaction valence. If the relationship closeness effect was due to participant's reactions primarily to their partner's allocation decisions to allocate to the "personal account", which it would be if the effect was due to the partner's allocation decisions being less threatening, then one would expect a significant interaction between "allocation decision" and closeness. No such effect was found,  $p = .84$ .

The third possibility is supported by a significant interaction between relationship closeness and "agreement",  $b = .04$ ,  $t(113) = 2.17$ ,  $p = .032$ . As Figure 7 indicates, participants in highly close relationships were more positive about their partner's allocation decisions when they agreed to the "joint couple strategy" before the game than were participants in less close relationships,  $b = .10$ ,  $t(54) = 2.97$ ,  $p = .004$ . This may be

because closer participants were more likely to view their partner's cooperative behavior as positive because it is essential in interdependent situations. As a result, perhaps they value their partner's cooperation more highly in general than do people in less close relationships. There was no significant difference between the high and low closeness participants who agreed to the "personal accounts strategy,  $p > .05$ .

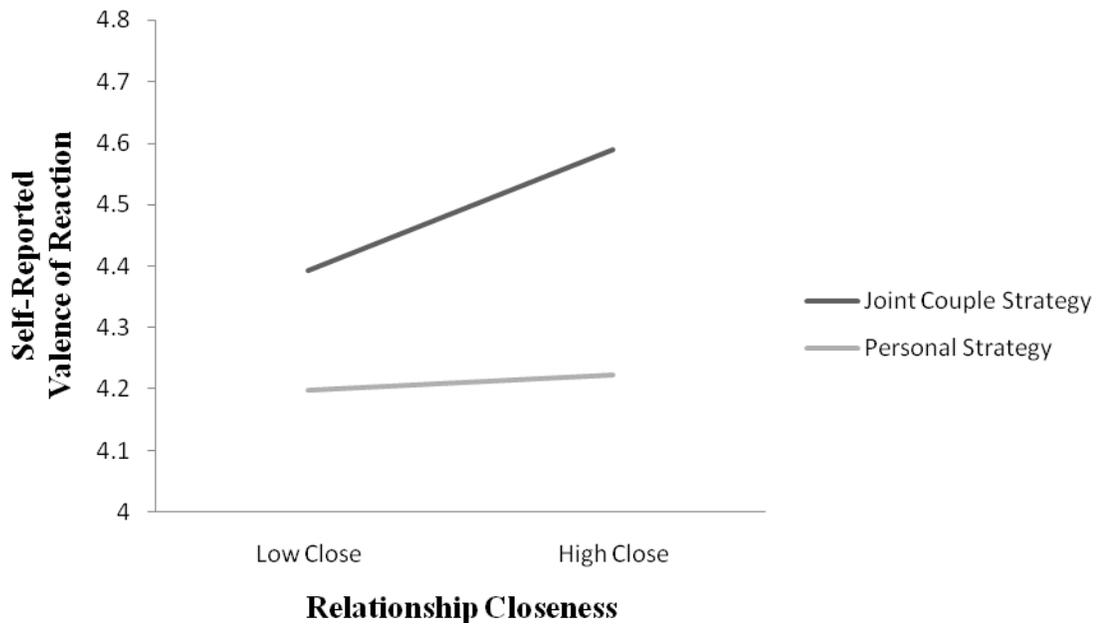


Figure 7. Interaction between the agreed upon account strategy and relationship closeness on the participant's self-reported valence of reaction to the partner's allocation decision.

A main effect of relationship closeness on self-reported surprise also emerged,  $b = -.10$ ,  $t(118) = -2.77$ ,  $p = .006$ . It indicated that participants in closer relationships were less surprised than were those in less close relationships. This effect might be due to closer relationship partners having more exemplar memories of possible behaviors

involving their relationship partners. If so, participants in closer relationships might be less surprised in relatively novel situations in which strong expectations are non-existent. This finding is somewhat at odds with a surface reading of the ERM, which suggests that greater interdependence might lead to increased potential emotional energy. If this is the case, one might expect an actual violation to release some stored energy. Such an interpretation of the model is likely to be superficial, however. The degree to which a violation occurs during a meshed intrapersonal sequence is what should release potential emotional energy into its kinetic form, but the findings from this study do highlight an aspect of the model which is perhaps under specified.

Additionally this effect may be due to the significance of the partner's behavior to the relationship partners in predicting the viability of the relationship. If so, then participants in young, but significant relationships may see their partner's behavior as more diagnostic than other participants, and a stage model of relationships might be useful in examining the data. Related research on outcome dependency in impression formation may be useful for understanding this effect. For example, Berscheid, Graziano, Monson and Dermer (1976) found that participants formed more positive impressions of others they expected to date later. This suggests that when people are initially forming impressions of each other, they are motivated to view them positively. A subsequent set of studies by Neuberg and Fiske (1987) indicated that outcome dependency led to more accurate impressions of others. These authors stress that it is important to consider participant's goals as they relate to operational definitions of important variables.

In the context of this study it seems likely that individuals early in romantic relationships are likely to be motivated to like their partner and interpret their behavior in a positive way. Alternatively, they may not be certain they want to continue the relationship, and may not care about the diagnostic validity of the situation because they have low outcome dependency on their partner. Alternatively, when the relationship is starting to get serious accuracy becomes very important. Thus, participants that still have much to learn about their partners, but are committed to their relationship, are going to be motivated for accuracy in interpreting their partner's behavior. This should lead to them reacting more to unexpected events, and having more concern about their ability to predict their partners' behavior. Participants in well established relationships, alternatively, are likely able to see that the game is less diagnostic of their relationships future than other situations. Presumably, they are already well aware of how their partner behaves in a wide variety of interdependent situations, and thus this situation is unlikely to be given much weight in any kind of impression formation.

To test this I looked at the means on surprise in each quartile. One would expect that very young relationships might not be distinguishable from relationships in the upper quartiles because many such relationships are yet to reach a serious stage (i.e., many are probably unconcerned with the long term prospects of the relationship). However, participants in the second quartile (approximately 1 to 2 years) might indicate more surprise than participants in the other three quartiles. These participants should be in a stage in which they are trying to determine the long term viability of the relationship, yet not have enough knowledge of their partners' behavior as to not be threatened or

surprised by their partners' behaviors. This hypothesis was not significantly supported by Scheffe test, but the means in each quartile do indicate a potential trend that with more power might become significant. As Figure 8 indicates, participants in the second quartile indicated more surprise than participants in the other three quartiles.

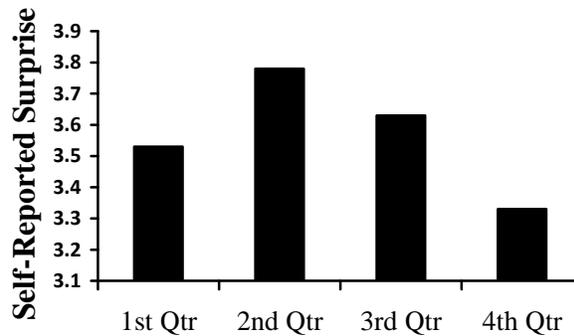


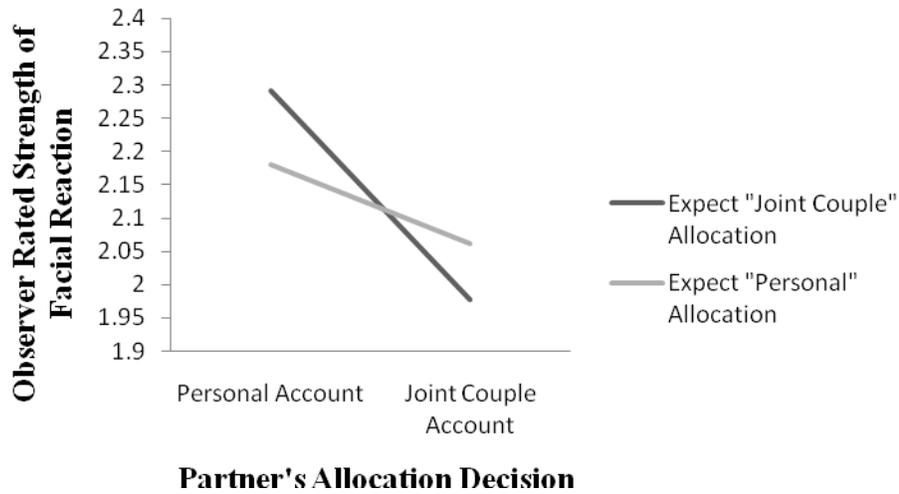
Figure 8. Means of self-reported surprise by quartiles of relationship length.

An informal analysis supports this assumption indicating that stage of relationship (excluding the first quartile participants) predicts self-reported surprise when controlling for relationship commitment, gender, and allocation decision,  $b = -.31$ ,  $t(87) = -2.12$ ,  $p = .04$ . The negative relationship between relationship length (in stage form) indicates that participants in the second quartile may be interpreting the situation as more diagnostic than other participants. It is important to note that the overall effects are not significantly driven by this group, but simply enhanced within the group. Also supporting this view is a significant negative relationship between commitment and surprise in the top three quartiles,  $b = -.14$ ,  $t(118) = -3.08$ ,  $p = .003$ . This indicates that more committed

participants were less surprised, suggesting that they were less likely to see the partner's behavior as surprising and diagnostic of the relationship.

A 3-way interaction between “allocation decision”, “initial allocation decision”, and relationship closeness on observer rated strength of facial reaction was also found,  $b = -.33$ ,  $t(118) = -5.17$ ,  $p < .001$ . As Figure 9 indicates, the general interaction between “allocation decision” and “initial allocation decision” holds for more and less close relationships. Participants in closer relationships, however, reacted slightly less strongly in the condition in which they expected their partner to make a “joint couple” allocation, but their partner violated their expectations by making a “personal account” allocation. Although this difference was close to significant of all of the broken down effects tests, it was only a trend,  $b = -.12$ ,  $t(66) = -1.24$ ,  $p = .22$ , all other tests led to  $p's > .30$ . This finding is similar in nature to the main effect for closeness found on the surprise dependent measure. Thus, this unexpected but interesting result appears to be confirmed on yet another variable. This convergence suggests that this result should be taken seriously, and further explored in future research.

### **High Relationship Closeness**



**Low Relationship Closeness**

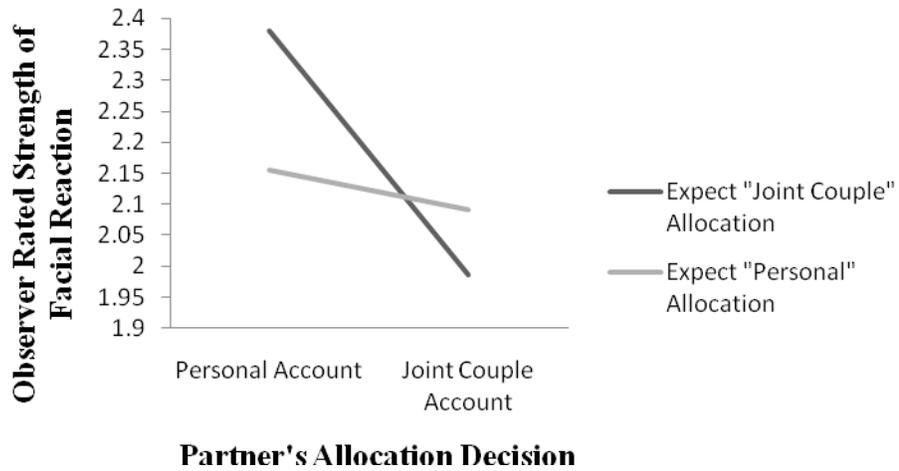


Figure 9. Interaction between “allocation decision”, “initial allocation decision”, and “relationship closeness” on the observer rated strength of facial reaction to the partner’s allocation decision.

*Normative benevolence.* A main effect of “allocation decision” on self-reported surprise was also found,  $b = -.22, t(118) = -3.74, p < .001$ . This result indicates that

participants were more surprised by their partner allocating to the “personal account” than they were by their partner allocating to the “joint couple account”. This result is consistent with the existence of norms that dictate that romantic relationship partners should act cooperatively and often in their partner’s best interest in most situations.

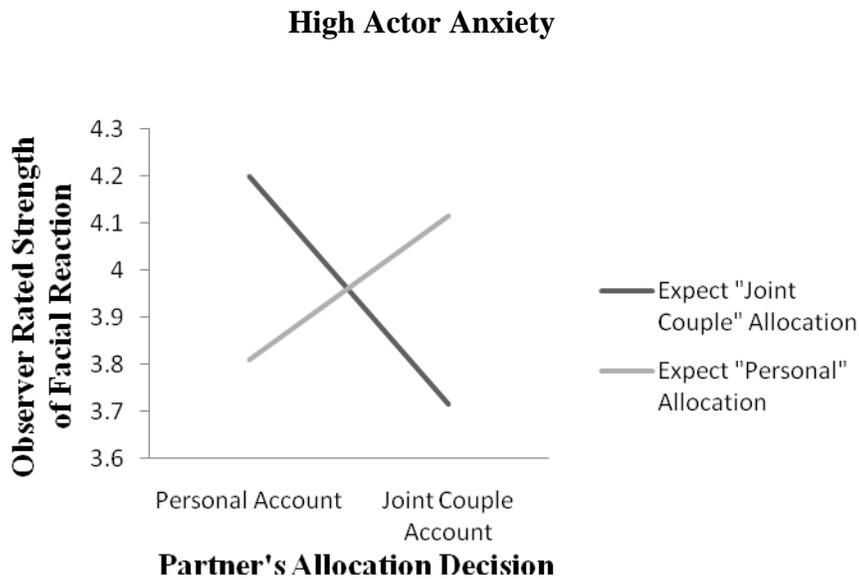
A main effect for allocation decision on observer rated strength of facial reaction was also revealed,  $b = -.33$ ,  $t(118) = -5.17$ ,  $p < .001$ . This effect indicates that participants had stronger facial reactions when their partners allocated to the “personal account” than when their partners allocated to the “joint couple” account. Similar to the same main effect on surprise, the outcome may be due to the existence of norms stipulating that romantic relationship partners should act cooperatively and often in their partner’s best interest.

*Attachment security effects.* Also of interest was the possible effect of attachment security during the game. Previous studies have found that attachment anxiety is a particularly important source for relationship expectations (e.g., Attridge, 1995; Simpson, Collins, Tran, & Haydon, 2007). To test for attachment anxiety effects, models including each of the DVs were tested using the core variables previously reported with both actor and partner anxiety included in the models (relationship closeness was excluded). The effects were largely the same as those reported above except for a partner anxiety effect on self-reported valence of reaction and an “allocation decision” by “initial allocation decision” by actor anxiety effect on self-reported strength of reaction.

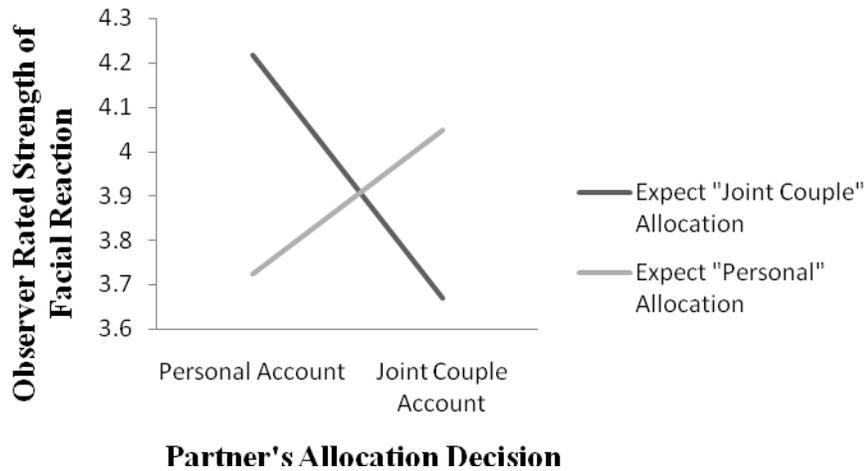
The partner anxiety effect on self-reported valence of reaction was significant in a model including “allocation decision”, “agreement”, gender, and partner anxiety. The model -2 log likelihood was equal to 726.0,  $\chi^2(15, N = 122) = 35.65, p = .002$ . Most of the model was the same as the previously tested model of self-reported strength of reaction. There was, however, a partner anxiety main effect,  $b = -.02, t(118) = -2.30, p = .024$ , such that participants viewed their partner’s allocation decisions as more negative if their partner was higher in attachment anxiety. This suggests that the partners of anxious individuals have a tendency to view their anxious partner’s behavior as more negatively motivated. A mediation test of this effect indicates that relationship satisfaction mediates the relationship between partner anxiety and valence of reaction to partner’s allocation decisions. Using the Baron and Kenny (1986) four step method, the analyses indicate the partner anxiety predicts valence of reaction and satisfaction. Additionally, satisfaction significantly predicts valence of reaction controlling for partner anxiety  $b = .05, t(113) = 2.31, p = .023$ , and partner anxiety falls to non-significance with satisfaction included in the model. A Sobel (1982) test also indicates satisfaction significantly mediates the relationship between partner anxiety and valence of reaction,  $z = 1.96, p = .05$ .

The 3-way interaction between “allocation decision”, “initial allocation decision”, and actor anxiety was significant in a model including “allocation decision”, “initial allocation decision”, “agreement”, gender, and actor anxiety. The model -2 log likelihood was equal to 788.0,  $\chi^2(26, N = 122) = 44.51, p = .01$ . Most of the model was the same as the previously tested model of self-reported strength of reaction. The 3-way interaction between “allocation decision”, “initial allocation decision”, and actor anxiety

is shown in Figure 10,  $b = -.01$ ,  $t(111) = -2.27$ ,  $p = .025$ . The results indicate a small tendency, in the expecting “joint couple account” allocation condition, for highly anxious participants to react less strongly to their partner violating their expectations,  $b = .05$ ,  $t(67) = 1.60$ ,  $p = .114$ . Similar to the 3-way interaction involving relationship closeness, this effect was only trending and no other conditions were close to significant,  $p$ 's  $> .50$ . This might be an indication of generally more negative expectations, with high anxiety participants expecting their partner to act selfishly.



**Low Actor Anxiety**



*Figure 10.* Interaction between “allocation decision”, “initial allocation decision”, and Actor Attachment Anxiety on the observer rated strength of facial reaction to the partner’s allocation decision. Slopes are computed 1 SD above and below the mean on Attachment Anxiety.

Overall, all the primary analyses provide strong support for the ERM’s predictions and for the usefulness of the Discrepancy/Evaluation Theory (e.g., Mandler, 1990a) approach in interpersonal contexts. Importantly, divergent dependent measures were used to test the core hypotheses. In all cases, predictions were either directly or indirectly confirmed across the various dependent measures. In addition, some interesting effects were found for relationship closeness, indicating a need for further exploration.

## Chapter 3: Conclusion

### Discussion

The ERM was successful at predicting participants' evaluations of events in the game. The results clearly indicate that participants viewed their partner's behavior as positive if they (partners) acted cooperatively and allocated points to the "joint couple account", and negative if they (partners) acted selfishly by allocating points to their "personal account". Predictions were confirmed in both men and women's self-reports of reaction valence, and women's observer-rated facial expressions of valence. Evidence from both self-reports and facial reactions revealed that men were less emotionally expressive than women in general. This may explain why there was no valence effect for men in the facial reaction data.

The primary objective of this study was to test the hypothesis that the same behavior from a relationship partner could, if expected, generate little or no arousal, or if not expected, generate discernable arousal. There was strong support for the model based on the manipulations of expectations derived from the partner initial allocation decision manipulation. Interactions between partner allocation decisions and participant expectations based on the initial allocation decision manipulation were found for both self-reported arousal and observer-rated arousal. In each case, expectation violation led to greater arousal reactions to the partner violation, regardless of the perceived positivity or negativity of the partner's behavior. In addition, the same interaction emerged for self-

reports of surprise, indicating that the events were indeed unexpected when they were intended to be unexpected.

No direct evidence was found that violation of agreements led to emotional reaction or surprise. One exception to this was that women reported stronger reactions when they agreed to the “joint couple strategy”. This may be an additive effect associated with general relationship norms, such that when normative expectations that partners will behave in a cooperative manner combine with an explicit agreement reinforcing the norm, violations of the agreement are sufficiently surprising to produce an arousal reaction. This is largely conjecture, however, and the current evidence for such an effect is weak at best.

There was also evidence for mood effects associated with the strategy agreement manipulation and relationship closeness. Generally, participants were more positive about their partner’s behavior in the “joint couple strategy” condition, and this effect was even more pronounced for partners in closer relationships. This suggests that the agreement condition created a “mood background” for participants more than it created expectations about their partner’s likely behavior. This also suggests that closer relationship partners’ moods are more sensitive to the communal versus competitive nature of agreements with their partners.

There was interesting evidence that higher levels of relationship closeness actually resulted in *lower* levels of surprise and arousal, as the main effect of closeness on surprise and the 3-way interaction between closeness, “initial allocation decision”, and

“allocation decision” indicated. Although the ERM does not predict that expectancies are necessarily more likely to be violated in most close relationships, it does anticipate that partners in closer relationships have more *potential* to interfere with one another’s plans and goals because they have more highly interdependent interactions. In this context, higher levels of relationship closeness were associated with lower levels of surprise and arousal during the game. The lower levels of surprise and arousal found for individuals who were closer to their partners may be due to the novelty of the situation. Given that the game situation was novel, closer relationship partners may not have had strong or clear expectations about how their partner was going to behave and make allocation allocation decisions. In fact their expectations may have been watered down due to having more representations of their partner’s past behavior, both positive and negative. In addition, they may be less threatened by the manipulation given that the weight of any novel and unimportant interaction in predicting relationship integrity is likely less than it is in developing relationships. Thus, this closeness effect may be attributed to the novelty and importance of the situation, and to the fact that relationship closeness is largely predicted by the ERM to contribute to potential emotion through meshed behavioral sequences of which this situation is not an example.

There was also evidence from observer-rated facial reactions and self-reports of surprise that participants generally were more surprised and aroused by their partner allocating points to their own “personal account”. This provides strong evidence for a normative expectation held by most participants that their partners should behave cooperatively and benevolently. Indeed, most people in romantic relationships harbor

what Taylor and Brown (1988) termed positive illusions, or beliefs that their relationship partners are generally superior in a variety of ways to other people.

Finally, the effects of partner and actor attachment anxiety indicate that attachment histories are a source of expectations and a lens through which people interpret their partner's behavior. The partner anxiety main effect on valence indicates that people in relationships with more anxious partners perceive their partner's behavior more negatively. This tendency might be due to their partner being clingy and needy in a variety of circumstances and may indicate a general annoyance when the partner behaves in a negative manner.

The interaction between actor attachment anxiety, partner's "allocation decision", and "initial allocation decision" based expectations of the partner's behavior indicates a slight tendency for highly anxious participants to be less surprised when their partner's engage in surprising negative behavior. This suggests that individuals who score higher attachment anxiety may be more prepared for the likelihood that their partners will interfere with rather than facilitate their goals. This is not surprising given the relationship schemas harbored by people high in attachment anxiety (e.g., Mikulincer & Shaver, 2005). This is, however, possibly inconsistent with previous findings in the literature that indicate that secure individual experience a higher relative ratio of positive to negative emotions in relationships (e.g., Attridge, 1995; Simpson, Collins, Tran, & Hayden, 2007).

The major difference between this study and previous studies is that individuals did not have control over how the interaction occurred in this study. Previous studies measured whether participants experienced positive and negative emotions in their regular lives, and thus the experience of both positive and negative emotions was not only sensitive to expectations, but actual behaviors and coping strategies as well. There is evidence that insecure individuals high in anxiety may create conditions that verify their negative expectations in a self-fulfilling prophecy. For example, individuals who have higher levels of rejection sensitivity and anxiety about interpersonal rejection have been shown to create conditions that produce greater instability in their romantic relationships (Downey, Freitas, Michaelis, & Khouri, 1998).

In addition to highly anxious people creating negative circumstances in their relationships, more secure individuals may create more positive experiences and be better at coping with stress generally (see Shaver, & Mikulincer, 2008). Thus, coping strategies, interpersonal behaviors, and self-fulfilling prophecies might affect real world behavior making it appear as if negative expectancies cause greater negative emotionality. However, as the current findings reveal, third variables may intervene to create the anomalies. This demonstrates the utility of using a mixture of longitudinal, correlational, and experimental methods to test the ERM.

## Conclusion

This study is the first critical experimental test of certain important features of the ERM (Berscheid, 1983; Berscheid & Ammazzalorso, 2001) and its translation of

Discrepancy/Evaluation Theory (Mandler, 1975; 1990a) to an interdependent dyadic context. Specifically this study demonstrates that expectations are critical for eliciting arousal to a relationship event, and that the valence of the event is determined by cognitive evaluation of the context and its value to the individual. The evidence clearly indicates that the same stimulus can create a “hot” emotional experience or not depending on whether it is expected.

*Implications for and extensions of the ERM.* The study demonstrates the predictive power of the ERM (Berscheid, 1983; Berscheid & Ammazzalorso, 2001) and strongly supports its most basic assumptions. However, there were a couple of results that were unanticipated enough to suggest extensions or refinements of the model. Specifically, the finding that relationship closeness in this context led to less surprise and less arousal is somewhat novel. What these results highlight is that although relationship closeness should create more expectations in more numerous situations regarding relationship partners, it might also create more counter exemplars leading partners to have weaker expectations in novel situations. Thus, for highly familiar and repeated situations (e.g., meshed sequences), relationship closeness may provide more refined expectations and greater potential for emotional experience. Alternatively, in novel situations in which a variety of exemplars of the partner’s previous behavior may apply, expectations may get watered down by individuals’ extensive knowledge of their partner and create less opportunity for the experience of emotion.

This indicates that the ERM could be refined by positing a situational moderator of the link between relationship closeness and emotion. Simply put, one might suggest

that, for highly learned situations and situations similar to the ones a given couple finds themselves in, closeness creates more opportunities for expectation violation. However, for unfamiliar, novel situations, closeness creates fewer opportunities for expectation violation.

*Implications for applying attachment to the ERM.* This study also indicates that interpreting more global indicators of emotion in relationships involving longer time spans, and in naturalistic contexts is not necessarily a straightforward way of matching expectations to emotional experience. As is indicated by the results of this study, attachment anxiety creates negative expectancies, which in and of themselves create the opportunity for positive emotional experience. The opposite seems to be true for attachment security. Whereas this relation is predictable from the ERM, and confirmed in this data, in less controlled, more naturalistic studies (e.g., Attridge, 1995; Simpson et al, 2007), the opposite pattern.

As noted above, this difference may be due to differences in relationship behavior and coping strategies in which highly anxious individuals create self-fulfilling prophecies. Fortunately, previous authors did an excellent job of interpreting their results in a way consistent with the interpretation posited here, but this study provides some intriguing evidence that the time scale of measurement and behavioral flexibility given to participants in any given research context needs to be considered when making predictions about how expectations derived from individual differences relate to emotional experience in relationships.

*Implications for gender differences in relationship based emotion.* The results indicate that few gender differences emerged. The predictions derived from the ERM, therefore, seem to apply well to both men and women. The gender differences found in this study primarily related to the intensity and valence of emotional expression and reporting by men and women. These results are highly consistent with previous findings that there are norms governing the expression of emotion that allow more expressivity in women than men (Richman, 1988). There was also some evidence that women's expectations were more strongly influenced by the pre-game verbal agreement than men's were, but this evidence needs to be verified with additional data.

*Implications for the origins of expectations.* This study presented evidence for a variety of expectations working to generate participants' expectancies. Strong evidence was found for the influence of behaviorally based expectations, such that people seem to build much of their situational expectancies from their partner's previous behaviors. Little support was found for more general schemas about the partner's past behavior (i.e., partner's attachment style) as a critical determinant of situational expectancies. There was, however, evidence that more general partner schemas do relate to the actor's interpretation of the partner's behavior, separate from expectancies.

Additionally, strong support was provided for norms as a major source of situational expectancies. In this case, norms relating to positive illusions (e.g., Taylor & Brown, 1988) seemed to be playing a role in expectancies. Further, norms of expressivity (Richman, 1998) also seemed to have some influence in determining participants' reactivity to events.

Finally, weak but consistent evidence was found for both relationship specific and individual difference sources of expectancies. Both relationship closeness and attachment anxiety seemed to play a role in what individuals expected from their partners, and contributed significantly to whether or not the participants experienced surprise and emotion. The only type of expectancies that were tested for, but not found, were expectations based on verbal agreements. This may be due to either a methodological flaw (i.e., the agreement manipulation wasn't strong enough), or alternatively, the effects from this source may simply have been overwhelmed by the effect of other sources of expectancies.

*Implications for relationship intervention.* Perhaps the most important implication of this study is the possibility that emotional experience can be predicted using the ERM. The ability to understand the antecedents of emotion in relationships could be critical to helping couples work out emotional problems in relationships. The ability to help people maintain happy marriages is an increasingly important and difficult problem as around 40% of marriages in the United States end in divorce (Hurley, 2005). Therapists could better understand where expectations come from, how they form, how to measure them, and how they interact with other factors so that appropriate interventions can be planned.

*Implications for experimental approaches to the ERM.* This study demonstrates that the ERM is testable in a controlled experimental environment. The paradigm used here provides a framework that can be modified and built upon to test aspects of the ERM that need to be tested experimentally, such as causal aspects of the model, and controlled

observations of how personality, relationship factors, and other variables impact situational expectations. Given the difficulty researchers have had in developing suitable paradigms for testing this model, the development of an experimental design that works is a significant development.

*Limitations and future research.* Perhaps the greatest limitation of the current research is also its greatest strength. The experimental nature of the study provides a high level of internal validity, but is relatively low in mundane realism. This is a typical feature of experimental research and highlights why the use of a variety of different methods to study one phenomenon is important given that each method of testing ideas results in different, but critical types of information.

Another limitation of the current research is the homogeneity of the sample. Most couples were college-aged couples in relatively short term relationships. Further, they were mostly couples with at least one college student. This limits the generalizability of the results.

More research needs to test additional predictions that flow from the ERM. One particularly important approach would be to identify boundary conditions or situations in which the ERM is unable to make accurate predictions. Such research could lead to greater refinement of the model, supplementation of the model, competing frameworks, or even superior frameworks. In addition, more research, both in the lab and in the form of literature review, needs to be done to understand how and why expectancies develop, sustain, and/or diminish over time. For example, Cunningham, Shamblen, Barbee, and

Ault (2005) found evidence that repeated behaviors, such as uncouth habits and norm violations, can lead to emotional sensitization in relationship partners. One might hypothesize from this study that repeated behaviors should become expected behaviors over time. These behaviors, however, violate normative expectations, and they may interfere with partners' goals and behavioral routines. More research on the origin and change of expectations is necessary, particularly in cases where multiple and possibly conflicting expectations are involved.

Emotion is a critical feature of relationship experience, and more work needs to be done to explore its causes and consequences. Because relationships are such fertile ground for emotions (Berscheid & Ammazzalorso, 2001), understanding the processes involved in emotional experience in relationships is likely to have broad and important impact on the ability of psychologists to help people find and maintain a high quality of life.

## References

- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage.
- Ainsworth, M., Blehar, M. C., Waters, E., & Wall, S. (1978). *Patterns of attachment*. Hillsdale, NJ: Lawrence Erlbaum Associates Publishers.
- Attridge, M. D. (1995). Reactions of romantic partners to geographic separation: A natural experiment. *Unpublished Doctoral Dissertation, University of Minnesota* .
- Baldwin, M. W., Keelan, J. P., Fehr, B., Enns, V., & Koh-Rangarajoo, E. (1996). Social-cognitive conceptualization of attachment working models: Availability and accessibility effects. *Journal of Personality and Social Psychology* , 71, 94-109.
- Baron, R. M., & Kenny, D. A. (1986). The mediator-moderator distinction in social psychological research: Conceptual, strategic, and statistical considerations. *51*, 1173-1182.
- Berscheid, E. S. (1983). Emotion. In H. H. Kelley, E. Berscheid, A. Christensen, J. H. Harvey, T. L. Huston, G. Levinger (Eds.), et al., *Close relationships* (pp. 110-168). San Francisco, CA: W. H. Freeman and Company.
- Berscheid, E. S., & Ammazzalorso, H. (2001). Emotional experience in close relationships. In G. J. Fletcher, & M. S. Clark (Eds.), *Blackwell handbook of*

*social psychology : Vol. 2. Interpersonal processes* (pp. 308-330). Malden, MA: Blackwell.

Berscheid, E., Graziano, W., Monson, T., & Dermer, M. (1976). Outcome dependency, attention, attribution, and attraction. *Journal of Personality and Social Psychology*, *34*, 978–989.

Berscheid, E., & Reis, H. T. (1998). Attraction and close relationships. In D. T. Gilbert, S. T. Fiske, & L. Gardner (Eds.), *The handbook of social psychology (4th ed.)* (pp. 193-281). Boston: McGraw-Hill.

Berscheid, E., Snyder, M., & Omoto, A. M. (1989a). Issues in studying close relationships: Conceptualizing and measuring closeness. In C. Hendrick (Ed.), *Review of personality and social psychology* (pp. 63-91). Newbury Park, CA: Sage.

Berscheid, E., Snyder, M., & Omoto, A. M. (1989b). The relationship closeness inventory: Assessing the closeness of interpersonal relationships. *Journal of Personality and Social Psychology*, *57*, 792-807.

Berscheid, E., Snyder, M., & Omoto, A. M. (2004). The relationship closeness inventory revisited. In D.J. Mashek, & A. Aron (Eds.). *Handbook of closeness and intimacy* (pp. 81-102). Hillsdale, NJ: Lawrence Earlbaum Associates.

Bowlby, J. (1969/1982). *Attachment*. New York: Basic Books.

- Bradley, M. M., Codispotti, M., Cuthbert, B. N., & Lang, P. J. (2001). Emotion and motivation I: Defensive and appetitive reactions in picture processing. *Emotion*, *1*, 276-298.
- Castro-Martin, T., & Bumpass, L., (1989). Recent trends in marital disruption. *Demography*, *26*, 37-51.
- Clark, M. S., Fitness, J., & Brissette, I. (2001). Understanding people's perceptions of relationships is crucial to understanding their emotional lives. In G. J. Fletcher, & M. S. Clark (Eds.), *Blackwell handbook of social psychology: Interpersonal processes* (pp. 253-278). Oxford, England: Blackwell.
- Cunningham, M. R., Shamblen, S. R., Barbee, A. P., & Ault, L. K. (2005). Social allergies in romantic relationships: Behavioral repetition, emotional sensitization, and dissatisfaction in dating couples. *Personal Relationships*, *12*, 273-295.
- Downey, G., Freitas, A. L., Michaelis, B., & Khouri, H. (1998). Self-fulfilling prophecy in close relationships: Rejection sensitivity and rejection by romantic partners. *Journal of Personality and Social Psychology*, *75*, 545-560.
- Dutton, D. G., & Aron, A. P. (1974). Some evidence for heightened sexual attraction under conditions of high anxiety. *Journal of Personality and Social Psychology*, *30*, 510-517.

- Fehr, B., & Harasymchuck, C. (2005). The experience of emotion in close relationships: Toward an integration of the emotion-in-relationships and interpersonal script models. *Personal Relationships* , 12, 181-196.
- Fehr, E., & Ficschbacher, U. (2004). Third party punishment and social norms. *Evolution and Human Behavior* , 25, 63-87.
- Fletcher, G. J., Simpson, J. A., & Thomas, G. (2000). The measurement of perceived relationship quality components: A confirmatory factor analytic approach. *Personality and Social Psychology Bulletin* , 26, 340-354.
- Gottman, J. M., & Levenson, R. W. (1992). Marital processes predictive of later dissolution: Behavior, physiology, and health. *Journal of Personality and Social Psychology* , 63, 221-233.
- Griffin-Pierson, S. (1990). The competitiveness questionnaire: A measure of two components of competitiveness. *Measurement & Evaluation in Counseling & Development* , 23, 108-115.
- Harary, K., & Donahue, E. (1994). *Who do you think you are?: Explore your many sided self with the Berkeley Personality Profile*. New York: Harper Collins.
- Hazan, C., & Shaver, P. (1987). Romantic love conceptualized as an attachment process. *Journal of Personality and Social Psychology* , 52, 511-524.
- Hurley, D. (April 19<sup>th</sup>, 2005). Divorce rate: It's not as high as you think. *The New York Times*.

John, O. P., & Srivastava, S. (1999). The big-five trait taxonomy: History, measurement, and theoretical perspectives. In L. Pervin, & O. P. John (Eds.), *Handbook of personality: Theory and research (2nd Ed.)*. New York: Guilford.

Karney, B. R., & Bradbury, T. N. (1997). Neuroticism, marital interaction, and the trajectory of marital satisfaction. *Journal of Personality and Social Psychology* , 72, 1075-1092.

Kashy, D. A., & Kenny, D. A. (2000). The analysis of data from dyads and groups. In H. T. Reis, & C. M. Judd (Eds.), *Handbook of research methods in social psychology* (pp. 451-477). New York: Cambridge University Press.

Kelley, H. H., Berscheid, E., Christensen, A., Harvey, J. H., Huston, T. L., Levinger, G., et al. (1983/2002). Analyzing close relationships. In H. H. Kelley, E. Berscheid, A. Christensen, J. H. Harvey, T. L. Huston, G. Levinger, et al. (Eds.), *Close relationships* (pp. 20-67). New York, NY: W. H. Freeman and Company.

Kenny, D. A. (1996). Models of interdependence in dyadic research. *Journal of Social and Personal Relationships* , 13, 279-294.

Kring, A. M., & Sloan, D. S. (2007). The facial expression coding system (FACES): Development, validation, and utility. *Psychological Assessment* , 19, 210-224.

Loftus, E. F., Loftus, G. R., & Messo, J. (1987). Some facts about "weapon focus". *Law and Human Behavior* , 11, 57-62.

- MacDowell, K. A., & Mandler, G. (1989). Construction of emotion: Discrepancy, arousal, and mood. *Motivation and Emotion* , 13, 105-124.
- Mandler, G. (1990a). A constructivist theory of emotion. In N. S. Stein, B. L. Leventhal, & T. Trabasso (Eds.), *Physiological and biological approaches to emotion* (pp. 21-43). Hillsdale, NJ: Lawrence Earlbaum Associates.
- Mandler, G. (1975). *Mind and emotion*. New York, NY: Oxford University Press.
- Mandler, G. (1990b). William James and the construction of emotion. *Psychological Science* , 1, 179-180.
- Meyer, W.-U., Reisenzein, R., & Schutzwohl, A. (1997). Toward a process analysis of emotions: The case of surprise. *Motivation and Emotion* , 21, 251-274.
- Mikulincer, M., & Shaver, P. R. (2005). Attachment theory and emotions in close relationships: Exploring the attachment related dynamics of emotion reaction to relationship events. *Personal Relationships* , 12, 149-168.
- Neuberg, S. L., & Fiske, S. T. (1987). Motivational influences on impression formation: Outcome dependency, accuracy-driven attention, and individuating processes. *Journal of Personality and Social Psychology*, 53, 441-444.
- Ohman, A., & Soares, J. J. (1994). "Unconscious anxiety": Phobic responses to masked stimuli. *Journal of Abnormal Psychology* , 103, 231-240.
- Paunonen, S. V., & Jackson, D. N. (1996). The Jackson Personality Inventory and five-factor model of personality. *Journal of Research in Personality* , 30, 42-59.

- Plutchik, R. (2002). *Emotions and life: Perspectives from psychology, biology, and evolution*. Washington, DC: American Psychological Association.
- Richman, J. A. (1988). Deviance from sex linked expressivity norms and psychological distress. *Social Forces* , 71, 208-215.
- Schachter, S., & Singer, J. E. (1962). Cognitive, social, and physiological determinants of emotional state. *Psychological Review* , 69, 379-399.
- Shaver, P. R., & Mikulincer, M. (2008). Adult attachment and cognitive and affective reactions to positive and negative events. *Social and Personality Psychology Compass*, 2, 1844-1865.0
- Simpson, J. A., Rholes, W. S., & Nelligan, J. S. (1992). Support seeking and support giving within couples in an anxiety-provoking situation. *Journal of Personality and Social Psychology* , 62, 434-446.
- Simpson, J. A., Rholes, W. S., & Phillips, D. (1996). Conflict in close relationships: An attachment perspective. *Journal of Personality and Social Psychology* , 71, 899-914.
- Simpson, J., Collins, W. A., Tran, S., & Hayden, K. C. (2007). Attachment and the experience and expression of emotions in romantic relationships: A developmental perspective. *Journal of Personality and Social Psychology* , 92, 355-367.

- Smither, R. D., & Houston, J. M. (1992). The nature of competitiveness: The development and validation of the competitiveness index. *Educational Psychological Measurement* , 52, 407-418.
- Sobel, M. E. (1982). Asymptotic confidence intervals for indirect effects in structural equation models. In S. Leinhardt (Ed.), *Sociological Methodology 1982* (pp. 290-312). Washington DC: American Sociological Association.
- Steinsmeier-Pelster, J., Martini, A., & Reisenzein, R. (1995). The role of surprise in the attribution process. *Cognition and Emotion* , 9, 5-31.
- Taylor, S. E., & Brown, J. D. (1988). Illusion and well-being: A social-psychological perspective on mental health. *Psychological Bulletin*, 2, 193–210.

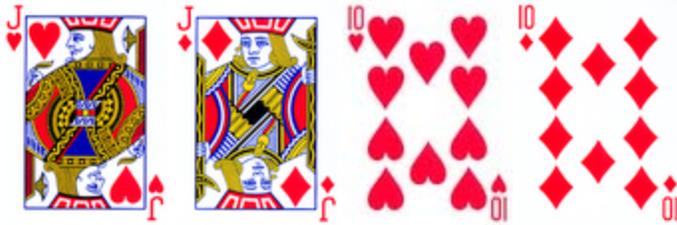
## Footnotes

<sup>1</sup> Seven participants reported being suspicious that they were not playing with their partner. Removal of these participants did not change significant results. No participants accurately guessed the hypotheses of the study.

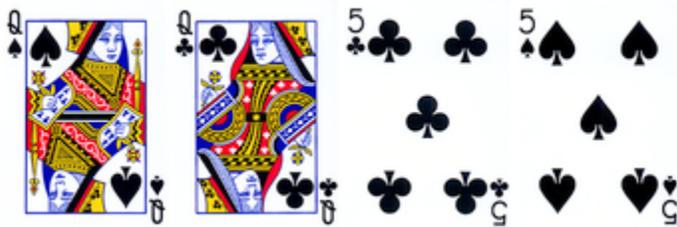
Appendix A

Card set examples.

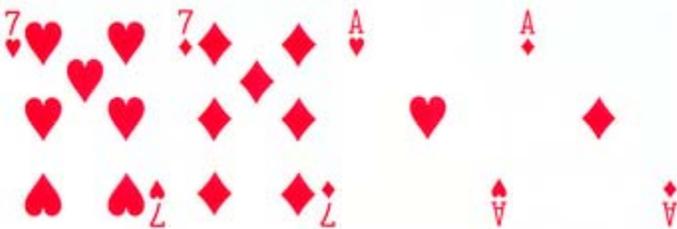
Set 1



Set 2



Set 3



## Appendix B

### The Adult Attachment Questionnaire

Please indicate how you typically feel toward romantic (dating) partners *in general*. Keep in mind that there are no right or wrong answers. Use the 7-point scale provided below.

1	2	3	4	5	6	7
I strongly disagree			I strongly agree			

1. I find it relatively easy to get close to others.
2. I'm not very comfortable having to depend on other people.
3. I'm comfortable having others depend on me.
4. I rarely worry about being abandoned by others.
5. I don't like people getting too close to me.
6. I'm somewhat uncomfortable being too close to others.
7. I find it difficult to trust others completely.
8. I'm nervous whenever anyone gets too close to me.
9. Others often want me to be more intimate than I feel comfortable being.
10. Others often are reluctant to get as close as I would like.
11. I often worry that my partner(s) don't really love me.
12. I rarely worry about my partner(s) leaving me.
13. I often want to merge completely with others, and this desire sometimes scares them away.
14. I'm confident others would never hurt me by suddenly ending our relationship.
15. I usually want more closeness and intimacy than others do.
16. The thought of being left by others rarely enters my mind.
17. I'm confident that my partner(s) love me just as much as I love them.

## Appendix C

### Perceived Relationship Quality Components Inventory

*Instructions:* Please indicate what your current partner/relationship is like, answering each question that follows. Use this scale when answering each question:

1	2	3	4	5	6	7
Not at all			Extremely			

1. How satisfied are you with your relationship?
2. How content are you with your relationship?
3. How happy are you with your relationship?
4. How committed are you to your relationship?
5. How dedicated are you to your relationship?
6. How devoted are you to your relationship?
7. How intimate is your relationship?
8. How close is your relationship?
9. How connected are you to your partner?
10. How much do you trust your partner?
11. How much can you count on your partner?
12. How dependable is your partner?
13. How passionate is your relationship?
14. How lustful is your relationship?
15. How sexually intense is your relationship?
16. How much do you love your partner?

17. How much do you adore your partner?

18. How much do you cherish your partner?

## Appendix D

### The Relationship Closeness Inventory

1. Who is this person? (initial of first name only)
  - a. What is this person's age? What is your age?
  - b. What is this person's sex? What is your sex?
2. Which one of the following best describes your relationship with this person? (Check *only one*)

*ROMANTIC:*

- married
- living together
- dating: date only this person
- dating: date this person and others

3. How long have you *known* this person? Please indicate the *number* of years and/or months (for example, 3 years, 8 months)

\_\_\_ years \_\_\_ months

We would like you to estimate the amount of time you typically spend alone with this person (referred to below as "X") during the day. We would like you to make these time estimates by breaking the day into morning, afternoon, and evening, although you should interpret each of these time periods in terms of your own typical daily schedule. (For example, if you work a night shift, "morning" may actually reflect time in the afternoon, but is nevertheless time immediately after waking.)

Think back over the past week and write in the average amount of time, per day, that you spent *alone with X, with no one else around*, during each time period. If you did not spend any time with X in some time periods, write 0 hour(s) Q minutes.

4. DURING THE PAST WEEK, what is the average amount of time, per day, that you spent *alone with X* in the MORNING (e.g., between the time you wake and 12 noon)?

\_\_\_ hour(s) \_\_\_ minutes

5. DURING THE PAST WEEK, what is the average amount of time, per day, that you spent *alone with X* in the AFTERNOON (e.g., between 12 noon and 6 pm)?

\_\_\_ hour(s) \_\_\_ minutes

6. DURING THE PAST WEEK, what is the average amount of time, per day, that you spent *alone with X* in the EVENING (e.g., between 6 pm and bedtime)?

hour(s) \_\_\_ minutes

Compared with the "normal" amount of time you usually spend alone with X, how typical was *the past week*?. (Check one)

\_\_\_ typical \_\_\_ not typical. . . if so, why? (please explain)

The following is a list of different activities that people may engage in over the course of one week. For each of the activities listed, please check all of those that you have engaged in *alone with X in the past week*,

Check only those activities that were done *alone with X* and *not* done with X in the presence of others.

*In the past week*, I did the following activities *alone with X*: (Check all that apply)

- did laundry
- prepared a meal
- watched TV
- went to an auction/antique show
- attended a non-class lecture or presentation
- went to a restaurant
- went to a grocery store
- went for a walk/drive
- discussed things of a personal nature
- went to a museum/art show
- planned a party/social event
- attended class
- went on a trip (e.g., vacation or weekend)
- cleaned house/apartment
- went to church/religious function
- worked on homework
- engaged in sexual relations
- discussed things of a non-personal nature

- \_\_\_ went to a clothing store
- \_\_\_ talked on the phone
- \_\_\_ went to a movie
- \_\_\_ ate a meal
- \_\_\_ participated in a sporting activity
- \_\_\_ outdoor recreation (e.g., sailing)
- \_\_\_ went to a play
- \_\_\_ went to a bar
- \_\_\_ visited family
- \_\_\_ visited friends
- \_\_\_ went to a department, book, hardware store, etc.
- \_\_\_ played cards/board game
- \_\_\_ attended a sporting event
- \_\_\_ exercised (e.g., jogging, aerobics)
- \_\_\_ went on an outing (e.g., picnic, beach, zoo, winter carnival)
- \_\_\_ wilderness activity (e.g., hunting, hiking, fishing)
- \_\_\_ went to a concert
- \_\_\_ went dancing
- \_\_\_ went to a party
- \_\_\_ played music/sang

The following questions concern the amount of influence X has on your thoughts, feelings, and behavior. Using the 7-point scale below, please



18. X influences the way I feel about the future.
19. X does *not* have the capacity to influence how I act in various situations.'
20. X influences and contributes to my overall happiness.
21. X does *not* influence my present financial security.<sup>1</sup>
22. X influences how I spend my free time.
23. X influences when I see X and the amount of time the two of us spend together.
24. X does *not* influence how I dress.'
25. X influences how I decorate my home (e.g., dorm room, apartment, house).
26. X does *not* influence where I live.'
- 27 X influences what I watch on TV.

Now we would like you to tell us how much X affects your future plans and goals. Using the 7-point scale below, please indicate the degree to which your future plans and goals are affected by X by writing the appropriate number in the space corresponding to each item. If an area does not apply to you (e.g., you have no plans or goals in that area), write a 1.

1	2	3	4	5	6	7
Not at all						A great extent

1. my vacation plans
2. my marriage plans
3. my plans to have children
4. my plans to make *major* investments (house, car, etc.)
5. my plans to join a club, social organization, church, etc.

6. my school-related plans

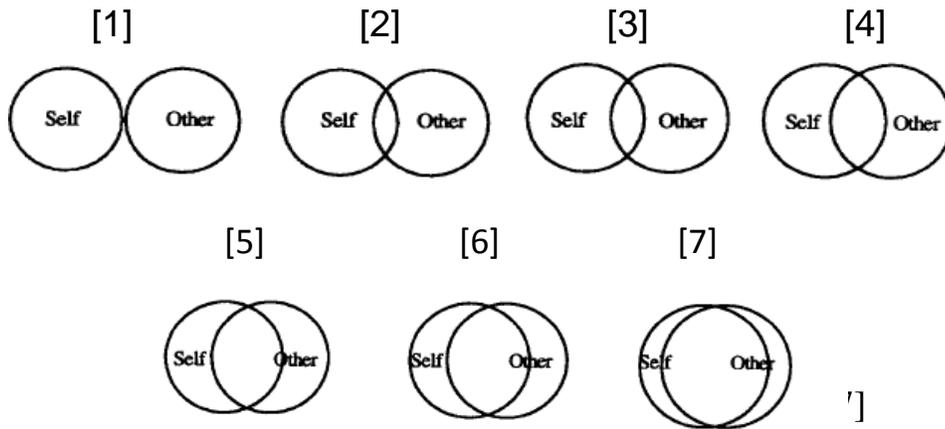
7. my plans for achieving a particular financial standard of living

<sup>1</sup> reverse-scored item.

Appendix E

**The Inclusion of the Self in the Other Scale**

Please choose which picture below best describes your relationship with your partner.



## Appendix F

### Alternate Emotional Tone Index

How often do you experience the following emotions in your relationship?

1      2      3      4      5      6      7

Never

Very Often

1. excited
2. elated
3. surprised
4. joyful
5. happy
6. delighted
7. passionate
8. calm
9. needed
10. serene
11. satisfied
12. wanted/cared for
13. content
14. optimistic
15. angry
16. fearful
17. jealous
18. irritated
19. hostile
20. distressed
21. disgusted
22. rejected
23. sad
24. guilty
25. worried
26. disappointed
27. depressed
28. lonely

## Appendix G

### Berkeley Personality Profile

For each of the following items honestly indicate whether you agree or disagree that each statement applies to your personality. Use the following scale.

1	2	3	4	5	6	7
Strongly						Strongly
Disagree						Agree

1. I am outgoing, sociable
2. I tend to find fault with others
3. I am a reliable worker
4. I remain calm in intense situations
5. I value artistic, aesthetic experiences
6. I am reserved
7. I am considerate and kind to almost everyone
8. I can be somewhat careless
9. I am relaxed, handle stress well
10. I prefer work that is routine and simple
11. I am full of energy
12. I can be cold and aloof
13. I do things efficiently
14. I get nervous easily
15. I have an active imagination
16. I am sometimes shy, inhibited
17. I like to cooperate with others
18. I tend to be disorganized
19. I am emotionally stable, not easily upset
20. I have few artistic interests
21. I am talkative
22. I am sometimes rude to others
23. I do a thorough job
24. I am depressed, blue
25. I am sophisticated in art, music, or literature
26. I tend to be quiet
27. I am generally trusting
28. I am lazy at times
29. I worry a lot
30. I am ingenious, a deep thinker
31. I generate a lot of enthusiasm
32. I have a forgiving nature

33. I am easily distracted
34. I can be tense
35. I am inventive





## Appendix J

### **GAME INSTRUCTIONS – Personal Account Strategy**

In this study, you will be playing an interaction game with your partner. The game will be divided into alternating rounds. In the first round, your partner will choose a specific card as the target card from a set of four cards. You will then be presented with the set of four cards and you must try to select the target card that your partner has chosen. The numbers 1 through 4 will be listed below each card and you can make your selection by entering the number on the keyboard that corresponds to the card you want to choose.

After you have made your selection, a screen will appear to tell you how many points you were awarded. Points will be awarded according to how accurate your selection was; one point will be awarded for selecting the same colored card as the target card, one point will be awarded for selecting the same suit, and one point will be awarded for selecting the same rank. Depending on the round, either you or your partner will be able to acquire between 1 and 3 points.

After your score is shown, you will have the opportunity to decide how the points will be distributed. The screen will give you the option to keep the points in your “personal account”, or you may distribute the points to the “joint couple account”. Keeping points in your “personal account” or distributing points to the “joint couple account” represent two opposing strategies in this game.

**“Personal Account” Strategy-** In this strategy, individuals would choose to keep the points they earned for themselves in each round instead of distributing points to the couple account. There are both strengths and weaknesses to this approach. By working individually, a participant may be able to maximize his or her earnings. However, the individual will not benefit from successful partner selections.

**“Joint Couple Account” Strategy-**In this strategy, couples would work together to acquire a large amount of points by distributing points to a joint account. Like

the former strategy, this strategy has both strengths and weaknesses. If this strategy is employed, couples will be able to benefit from their partner's successful selections. However, this strategy may hinder maximal earnings if both partners are not equally successful.

NOTE: Although both strategies theoretically have the potential to yield similar profits, in previous studies the "personal account" strategy has been shown to consistently double the amount of money earned when compared to the "joint couple account" strategy. There are, however, some exceptions to this trend, and for that reason we encourage you to choose the strategy that you think will optimize your success in the game.

The points that you keep for yourself will go toward a personal monetary compensation only for you, whereas the points that are given to the joint account will go toward a monetary compensation that will be shared between your partner and yourself. You can make your selection by entering the number on the keyboard that corresponds to the option of keeping points in your "personal account" or the option of distributing the points earned to the "joint couple account". Upon completing the game, if both strategies are used during the game, you will not be compensated for both accounts, but rather, you will be compensated for the "account" that was most successful.

After you select a distribution strategy, you will be presented with questions about the round which we ask that you answer as quickly and accurately as possible. The questions will ask you to rate different aspects of your experiences on a scale from 1 to 7. You will be able to enter your answers by pressing the number on the keyboard that corresponds to your response.

Once a round is completed, your role and your partner's role will be reversed, giving you the chance to select the target card. Once again, the numbers 1 through 4 will be assigned to each card. You can select a card as the target card by pressing the number on the keyboard that corresponds with the card you wish to choose. In this round, your partner will attempt to choose the target card you selected, and will also be responsible for deciding how to distribute the points earned.

Following your partner's decision on how to distribute points, you will be presented with questions about the round. These questions will be similar to the ones presented in the first round. You may enter your answers by pressing the number on the keyboard that corresponds to your response. There will be 30 alternating rounds in the entire game, 15 rounds you will be selecting the target card for your partner and 15 rounds your partner will be selecting the target card for you.

## **GAME INSTRUCTIONS – Joint Couple Account Strategy**

In this study, you will be playing an interaction game with your partner. The game will be divided into alternating rounds. In the first round, your partner will choose a specific card as the target card from a set of four cards. You will then be presented with the set of four cards and you must try to select the target card that your partner has chosen. The numbers 1 through 4 will be listed below each card and you can make your selection by entering the number on the keyboard that corresponds to the card you want to choose.

After you have made your selection, a screen will appear to tell you how many points you were awarded. Points will be awarded according to how accurate your selection was; one point will be awarded for selecting the same colored card as the target card, one point will be awarded for selecting the same suit, and one point will be awarded for selecting the same rank. Depending on the round, either you or your partner will be able to acquire between 1 and 3 points.

After your score is shown, you will have the opportunity to decide how the points will be distributed. The screen will give you the option to keep the points in your “personal account”, or you may distribute the points to the “joint couple account”. Keeping points in your “personal account” or distributing points to the “joint couple account” represent two opposing strategies in this game.

**“Personal Account” Strategy-** In this strategy, individuals would choose to keep the points they earned for themselves in each round instead of distributing points to the couple account. There are both strengths and weaknesses to this approach. By working individually, a participant may be able to maximize his or her earnings. However, the individual will not benefit from successful partner selections.

**“Joint Couple Account” Strategy-**In this strategy, couples would work together to acquire a large amount of points by distributing points to a joint account. Like the former strategy, this strategy has both strengths and weaknesses. If this

strategy is employed, couples will be able to benefit from their partner's successful selections. However, this strategy may hinder maximal earnings if both partners are not equally successful.

NOTE: Although both strategies theoretically have the potential to yield similar profits, in previous studies the "joint couple account" strategy has been shown to consistently double the amount of money earned when compared to the "personal account" strategy. There are, however, some exceptions to this trend, and for that reason we encourage you to choose the strategy that you think will optimize your success and your partner's success in the game.

The points that you keep for yourself will go toward a personal monetary compensation only for you, whereas the points that are given to the joint account will go toward a monetary compensation that will be shared between your partner and yourself. You can make your selection by entering the number on the keyboard that corresponds to the option of keeping points in your "personal account" or the option of distributing the points earned to the "joint couple account". Upon completing the game, if both strategies are used during the game, you will not be compensated for both accounts, but rather, you will be compensated for the "account" that was most successful.

After you select a distribution strategy, you will be presented with questions about the round which we ask that you answer as quickly and accurately as possible. The questions will ask you to rate different aspects of your experiences on a scale from 1 to 7. You will be able to enter your answers by pressing the number on the keyboard that corresponds to your response.

Once a round is completed, your role and your partner's role will be reversed, giving you the chance to select the target card. Once again, the numbers 1 through 4 will be assigned to each card. You can select a card as the target card by pressing the number on the keyboard that corresponds with the card you wish to choose. In this round, your partner will attempt to choose the target card you selected, and will also be responsible for deciding how to distribute the points earned.

Following your partner's decision on how to distribute points, you will be presented with questions about the round. These questions will be similar to the ones presented in the first round. You may enter your answers by pressing the number on the keyboard that corresponds to your response. There will be 30 alternating rounds in the entire game, 15 rounds you will be selecting the target card for your partner and 15 rounds your partner will be selecting the target card for you.