

The Influence of Cuddling on Relational
Health for Cohabiting Couples

by

Lisa J. van Raalte

A Dissertation Presented in Partial Fulfillment
of the Requirements for the Degree
Doctor of Philosophy

Approved March 2017 by the
Graduate Supervisory Committee:

Kory Floyd, Co-Chair
Paul Mongeau, Co-Chair
Mary Burleson

ARIZONA STATE UNIVERSITY

May 2017

ABSTRACT

Affection represents a positive and often intimate psychological state (Floyd & Morman, 1998) that is communicated through verbal, nonverbal, and social supportive behaviors. A formidable research literature indicates that receiving and expressing affection significantly benefits health. One form of affection that may produce these benefits is cuddling. Cuddling includes intimate, physical, and loving whole-body contact that does not necessarily include sexual activity and tends to be reserved for very intimate relationships. Working from affectionate exchange theory (Floyd, 2001), this study's purpose is to examine the effects of cuddling on relational health for individuals living with their spouse. To test a causal relationship between cuddling and relational health, a four-week experiment was conducted. Eighty adults were randomly assigned to one of three conditions: (1) a treatment condition in which individuals were instructed to increase cuddling behaviors with their spouse, (2) a comparison condition in which individuals were instructed to increase shared mealtime with their spouse, or (3) a control condition in which individuals were instructed to not change their behavior. Individuals in the treatment condition were predicted to experience significant improvements in relational health as outlined in the investment model (i.e., relational satisfaction, investment, quality of alternatives, and commitment) to a greater extent than individuals in the comparison or control conditions. A research question explored whether individuals in the comparison condition differed from those in the control condition. Planned contrasts were conducted to test the hypotheses. Results revealed that individuals in the treatment condition reported more relationship satisfaction and commitment and less quality of alternatives than individuals in the comparison and control conditions.

Experimental conditions did not differ on reports of investment. Finally, individuals in the comparison and control conditions did not differ on any of the relational health markers. These findings support affection exchange theory and contribute to a growing literature identifying the benefits of affectionate communication. Moreover, the methodology and results of this study provide compelling evidence for a causal relationship between cuddling and satisfaction and commitment for relatively satisfied couples.

DEDICATION

To Christine and Peter van Raalte (mum and papa)

ACKNOWLEDGMENTS

There are several groups of people I would like to acknowledge. First, I would like to thank my dissertation committee. Thank you, Kory Floyd, for being a calm and forever supportive co-advisor and co-chair for my dissertation. Even with a transition to another university, I always felt supported and appreciated your mentorship. Thank you, Paul Mongeau, who was also my co-advisor and co-chair for my dissertation. I appreciate all the time and effort you invested in my education, and I particularly enjoyed our many impromptu meetings. Thank you, Mary Burleson, my outside committee member, for your friendship and all of your advice and guidance for my dissertation. I will fondly remember our meetings at the Lux Coffee shop in Phoenix.

Second, I'd like to thank my friends who were very much my family in the program. Thank you, Bailey Oliver, James Stein, Carlos Flores, Sarah Jones, and Austin Markwell, for providing me with never-ending support and love. Our game nights, writing sessions, and coffee induced brainstorming sessions will forever be some of my fondest memories in graduate school.

Last, I want to thank my family who always supported my decision to receive my education outside of my home country of New Zealand. To my parents, Peter and Christine, I find it hard to find the words that express how grateful I am for your unconditional love and support. I wouldn't be where I am today without your selfless giving and encouragement. It is for this reason that I dedicate this dissertation to you both. To my siblings, Vicky, John, and Julianne, I've missed you all so much and your endless support got me through some of the tougher times in the last four years.

It is with all the warmth in my heart that I say thank you to everyone who helped, guided, and supported me through this adventure of a PhD. Thank you, also, to the Hugh Downs of Human Communication at Arizona State University for partially funding my dissertation research project through the Summer Research Grant Project program and thank you to Paul Mongeau who also partially funded my dissertation research project through his personal research funds.

TABLE OF CONTENTS

	Page
LIST OF TABLES	ix
CHAPTER	
1 INTRODUCTION & LITERATURE REVIEW	1
Background and Significance	2
Defining Cuddling	4
Review of Hugging and Cuddling Literature.....	8
Affection Exchange Theory	13
Assumptions.....	13
Proposition	14
Affectionate Behavior.....	16
Relational Health	19
Relational Satisfaction	21
Investment and Quality of Alternatives	22
Commitment	23
2 METHOD	25
Participants.....	25
Procedures.....	26
Prescreening Procedures	26
Experimental Procedures	27
Instrumentation	31
Relational Health	31

CHAPTER	Page
Manipulation Checks	31
Demographics and Relationship Information	33
3 RESULTS	34
Manipulation Checks	34
Descriptive Analyses	35
Hypotheses.....	36
Relational Satisfaction	38
Investment.....	39
Quality of Alternatives.....	39
Commitment	40
4 DISCUSSION	41
Summary of Findings.....	41
Relational Satisfaction	42
Investment.....	44
Quality of Alternatives.....	45
Commitment	46
Methodological Implications	47
Clinical Implications.....	50
Pedagogical Implications	53
Strengths and Limitations	54
Directions for Future Research	57
Conclusion	58

CHAPTER	Page
REFERENCES	59
APPENDIX	
A APPROVAL FORM	68
B PRESCREENING INFORMATION AND CONSENT FORM.....	71
C EMAIL RECRUITMENT FOR FULL STUDY.....	74
D EMAIL TO BEGIN FULL STUDY	77
E REMINDER OF STUDY INSTRUCTIONS.....	81
F INTERIM SURVEY EMAIL	84
G POST-STUDY EMAIL.....	88
H SURVEY MEASURES	90
I TABLE 1	96

LIST OF TABLES

Table	Page
2. Means and Standard Deviations for Self-Report Outcomes	36
1. Means and Standard Deviations for Items Used in Manipulation Check	97

CHAPTER 1

INTRODUCTION & LITERATURE REVIEW

An extensive amount of research indicates that social interaction and touch are crucial to human social, psychological, and physiological development (Baumeister & Leary, 1995; Field, 2010, 2014). A specific form of communication that can have significant effects on one's well-being is affection (Floyd et al., 2009). Affection represents "an internal psychological state of positive, often intimate regard for another" (Floyd & Morman, 1998, p. 145) that is communicated through an "overt enactment or expression of feelings of closeness, care, and fondness for another" (Floyd & Morman, p. 145). Affection exchange theory (AET; Floyd, 2001) is a helpful theoretical framework to help us understand why affection influences health, and will be used as the frame for this investigation.

Receiving physical affection in the form of hugs (Light, Grewen, & Amico, 2005) and kissing (Floyd et al., 2009) can significantly reduce physiological ailments. Additionally, non-physical affection such as reflecting on past positive events with a romantic partner in combination with hugs (Grewen, Girdler, Amico, & Light, 2005) can also significantly help physiological responses such as reducing cortisol, norepinephrine, and blood pressure. Research has also linked affection to psychological well-being, such as reducing susceptibility to depression and increasing self-esteem (Floyd et al., 2005), and to relational health, such as increasing relational satisfaction and commitment (Horan & Booth-Butterfield, 2010). Whereas these effects consistently hold true in laboratory settings, it is equally important to explore these effects in naturalistic settings (Field, 2014). Research examining couples in their day-to-day life provides a significant look at

their interaction (Roberts, Tsai, & Coan, 2007). The goal of this study is to examine how romantic partners use cuddling to communicate affection with each other at home in their daily routine, and how these interactions might influence their relational health. The following sections will be divided into three core areas. First, research identifying the beneficial effects of affection and touch will be described. Second, cuddling as a specific form of affectionate behavior will be defined and research related to cuddling will be reviewed. Third, affection exchange theory will be described and adopted as the theoretical lens for this study.

Background and Significance

A significant amount of research has examined the beneficial effects of touch and massage therapy (Field, 2014). Dr. Tiffany Field's program of research has examined moderate-pressure massage (Field, Diego, & Hernandez-Reif, 2010) across multiple contexts and ages to make the claim that welcomed touch with positive intent is beneficial. For example, employees who received a 15-minute massage at work two times a week for five weeks reported reduced anxiety and increased work ability at work (Field et al., 1996a). Children who experienced a traumatic hurricane event had lower stress levels after receiving a 30-minute back massage two times a week for a month (Field et al., 1996b). Burn patients who received 20-minute massages once a day for one week reported significantly less pain (Field et al., 1998).

In most of her work, Field adopts an experimental design to highlight the therapeutic effects of massage. Although her research is undoubtedly adding to the body of literature showing that positive touch has health benefits (e.g., reducing stress and anxiety, increasing alertness and self-esteem), an important critique of her work is the

lack of comparison groups in her experimental designs. Comparison groups allow researchers to test alternative explanations for observed effects (Shadish, Cook, & Campbell, 2002). In her work, Field makes the claim that it is the massage that has produced health benefits for participants; however, alternative explanations might include receiving touch in general, spending time with another person and feeling cared for, or it might be the relationship bonding associated with the massage that leads to health benefits. Without including comparison groups in her design, these alternative explanations cannot be accounted for. Additionally, most of Field's work has examined the effects of touch from a trained masseuse or researcher. For most, receiving a massage is not a daily occurrence and the benefits of daily touch received in one's relationships have received far less scholarly attention. By examining a specific form of affection communication, this study will address these two limitations.

A wealth of literature connects affectionate communication with a variety of psychological, physiological, and relational health variables. For example, receiving frequent passionate kisses from a romantic partner has been connected to increases in relational satisfaction, decreases in stress, and decreases in cholesterol (Floyd et al. 2009). Most often, scholarship has examined the beneficial effects of *receiving* affection or touch (Field, 2014), but research has also connected *expressed* affection to health (Floyd, 2002; Floyd et al., 2005). For instance, expressing affection through writing a letter to a loved one has been linked with decreases in cholesterol (Floyd, Mikkelson, Hesse, & Pauley, 2007). Similarly, elderly individuals who provided massage to infants experienced decreased cortisol levels (Field, Hernandez, Quintino, Schanberg, & Kuhn, 1998) which has been associated with improved health benefits such as immune system

functioning (Ironson et al., 1996). Even touch that is not intended to be affectionate has been linked to physiological advantages. For example, a touch on the wrist has been shown to decrease heart rate (Drescher, Whitehead, Morrill-Corbin, & Cataldo, 1985; Nilsen & Vrana, 1998; Vrana & Rollock, 1998).

A potential shortcoming of this line of inquiry, however, is that most research examining the health effects of touch has been conducted in a controlled or laboratory setting. Examining the health effects of touch in a laboratory setting has important methodological value, but reduces the researcher's ability to make ecologically validity claims. As a wealth of research has now how connected touch behavior to health in controlled environments, it is worthwhile to examine whether these effects hold true in naturalistic settings. The current study will address this limitation by examining a specific form of affectionate behavior within the homes of cohabitating romantic couples. Cuddling has been chosen as the specific affectionate nonverbal behavior under investigation in this study. A working conceptual definition of cuddling and research that has examined cuddling (or hugging) are examined next.

Defining Cuddling

As cuddling is the selected behavioral focus of this study, it is important to develop a comprehensive definition for cuddling as well as to differentiate it from similar types of behavior. The most similar type of behavior to cuddling is a hug, and it may be tempting to equate cuddling with hugging, but the two behaviors are different (L'Abate, 2001). There has been no definitive conceptual definition of a hug in the scholarly literature, but a hug is typically described as a brief embrace between two people (Floyd, 1999; Rabinowitz, 1991), that can occur in a variety of relationship types (Floyd), and in

a variety of contexts (L'Abate). Even in short durations, a hug can convey "much information" between partners (Rabinowitz, p. 575) such as closeness or caring (van Anders et al., 2013), or it can be simply used in the context of a greeting (L'Abate). Hugging, then, is a distinct behavior that likely covaries with cuddling.

Cuddling is defined as "...intimate, physical, and loving contact that does not involve sexual behavior and that involves some degree of whole body touching (i.e., not just hand-hand or lips-lips)" (van Anders et al., 2013, p. 554). Compared to hugging, cuddling seems to be reserved for more personal and close relationships such as romantic partners (van Anders et al.) or family members (L'Abate). Shorter and more egalitarian hugs (i.e., criss-cross hugs), for example, are attributed to platonic friendships, while longer neck/waist hugs are attributed to familial or romantic relationships (Floyd). As cuddling engages in prolonged body contact, it is likely partners feel a greater sense of trust and intimacy with their partner compared to a brief embrace. Achieving a sense of relaxation and bondedness with partner through cuddling (van Anders et al.) indicates that cuddling is only engaged in with close relationships in which one feels vulnerable enough to relax in close proximity with another person. Additionally, simply spending more time together during a cuddle reinforces a partner's willingness to invest time and energy into the relationship.

As mentioned, a key element that differentiates cuddling from hugging is the duration of the behavior. Some studies examining hugs typically report shorter durations of the embrace anywhere from 1 to 5 seconds (Floyd, 2009; Rabinowitz, 1991) whereas other studies consider a 20- to 60-second embrace a hug (Grewen, Girdler, Amico, & Light, 2005; L'Abate, 2001; Light, Grewen, & Amico, 2005). However, cuddling

between romantic partners normally lasts for a much longer time, typically about 45 minutes (van Anders et al., 2013; van Raalte & Floyd, 2016), but can even last for hours (L'Abate).

Cuddling and hugging are similar behaviors within romantic relationships that likely overlap and are not totally separate. In their descriptive study of cuddling, Van Anders and colleagues (2013) reported that most cuddling behaviors included hugs. Although it is not clear in the literature what a “hug” entails, it is possible that a hug is a behavior that includes arms around each other (e.g., see Floyd's 1999 study for three different types of hugs), whereas cuddling might include other whole body touching with or without arms around each other such as spooning (one person's back pressed against a partner's front). Not all reports of cuddling behaviors include hugging (van Raalte & Floyd, 2016), but many do. Therefore, it is possible that hugging and cuddling can co-occur.

Another way hugging and cuddling could be differentiated is through the relational elements communicated by that behavior. Not all behaviors communicate the same meaning, but it has been suggested that communication helps partners define the nature of their relationship (Duck, 1994). Although some studies have linked hugging to perceptions of closeness (Floyd, 1999; Rabinowitz, 1991), L'Abate (2001) described hugging as a type of behavior that is often used for routine greeting, thus relegating it to a less relationally meaningful behavior. In contrast, cuddling is a behavior that lasts for a longer time, more intimate body parts can touch, that in turn can have deeper relational meaning associated with it, such as intimacy, closeness, caring, nurturing (van Anders et al., 2013) and even sometimes sexual connotations (van Raalte & Floyd, 2016).

Reviewing literature to develop 12 fundamental relational topoi, Burgoon and Hale (1984) describe several ways that relational meaning might be attributed to behavior. For example, cuddling would be a behavior that is associated with intimacy, involvement, trust, emotional arousal, inclusion, and liking. If rating the relational meanings of cuddling along Burgoon and Hale's 12 relational topoi's, it becomes clear that cuddling is indicative of a close and personal relationship.

In romantic relationships, cuddling can lead to, or occur after, sexual activity (Hughes & Kruger, 2011; van Anders et al., 2013; van Raalte & Floyd, 2016). Sexual behaviors *during* cuddling are also possible (e.g., kissing, massaging, fondling; van Raalte & Floyd) and can be used as foreplay, yet, sexual activity tends to happen as a result of cuddling or occurs before cuddling (van Anders et al.). Importantly, sexual behavior during cuddling is not present in other relationship types such as parent-child cuddling. Although this study does not include parent-child cuddling, the same relational implications (e.g., closeness, intimacy) other than sex are likely involved during cuddling. It is for this reason that cuddling is conceptualized without including sexual behaviors.

Similar to hugging, most forms of cuddling are perceived as a relationally bonding act (Derlega et al., 1989; Floyd, 1997; Floyd & Morman, 1997; Rabinowitz, 1991; van Anders et al., 2013; van Raalte & Floyd, 2016). For example, Hughes and Kruger (2011) found that for both short- and long-term romantic partners, cuddling was an important behavior to engage in after sexual activity and was indicative of an intimate and relational bonding type of behavior. Other studies have indicated that most people

view cuddling as a nurturing type of behavior (van Anders et al.), that likely reflects relational closeness and intimacy.

Cuddling was selected as a focus of this study for several reasons. First, cuddling is a behavior that most people view as a positive and nurturing behavior (L'Abate, 2001; van Anders et al., 2013; van Raalte & Floyd, 2016). Second, for cohabitating romantic couples, cuddling occurs on average 3 to 4 times per week for about 30-45 minutes per session (van Anders et al.; van Raalte & Floyd), which allows for an increase of cuddling behaviors to examine the effects on relational health. Third, testing the predictions made by affection exchange theory (AET; Floyd, 2001) is possible if cuddling is conceptualized as an affectionate form of behavior.

The methodology for this study will follow Floyd et al.'s (2009) kissing study and will examine how changes in cuddling influence couples' relational health. Similar to kissing, cuddling can be "delivered in several forms and sustained for several different durations..." (Floyd et al., 2009, p. 285). Cuddling is reported to occur most often in bed or on a couch (van Anders et al., 2013; van Raalte & Floyd, 2016) and is enacted in different ways such as spooning, one partner curling up into a partner's lap, or side by side sitting with arms around each other.

Review of Hugging and Cuddling Literature

To obtain a broader understanding of how whole body touching is associated with health outcomes, it is useful to review the literature involving hugging and cuddling. Floyd's (1999) hugging study examined how the intimacy of different embraces are perceived and the relational attributions associated with three different embraces. In his study, Floyd had participants view video clips of either male-male or female-female

dyads standing and hugging at one, three, or five seconds. The first type of hug is a crisscross hug in which "one person puts one arm over and one arm under the shoulder of the other" (p. 285). The second type of hug is the neck-waist hug which includes one person hugging with both arms around a person's neck, and the other person hugging with both arms around a partner's waist (Floyd, 1999). Third, engulfing hugs include hugs in which one person has his or her arms crossed over his/her chest and the second person engulfs him or her in a hug (Floyd, 1999). These hug types differ in the notion of power and control. High egalitarian hugs are those in which neither person has power over the other (i.e., crisscross hug) but is equally distributed across similar body touching. In contrast, low egalitarian hugs are those in which there is a clear distinction of control over one person (i.e., engulfing hug) as one person envelops another in a protective or powerful stance. In low egalitarian hugs, for example, the person being engulfed in a hug trusts a partner to control his/her body movements and becomes vulnerable, thus, relinquishing power in the dynamic. Results in his study revealed a complex pattern, but generally, brief and egalitarian hugs (i.e., criss-cross hugs) were perceived as the most intimate (Floyd).

Hugging has also been linked with several physiological responses. For example, a short hug has been associated with decreases in blood pressure and cortisol (Grewen et al., 2005). Additionally, Light et al. (2005) found that more frequent partner hugs and high oxytocin levels were linked to lower heart rate, blood pressure, and norepinephrine levels for women. Although important, these two studies examined the health effects of hugging in a laboratory setting, reducing the researcher's ability to make ecological validity claims.

More recent work has examined how hugs at home moderate the relationship between daily tension and an infection (Cohen, Janicki-Deverts, Turner, & Doyle, 2015). In Cohen et al.'s study, healthy adults were interviewed on 14 consecutive evenings about their interpersonal behaviors with a partner and whether or not they received a hug or hugs that day. After the two weeks of interviews, participants were quarantined and exposed to a rhinovirus that causes the common cold. Logistic regression results revealed that those participants who reported frequent hugs were least at risk for viral infection.

Studies examining hug behavior have provided an initial look into how hugs can be connected to relational bonds (Floyd, 1999) and have positive health effects (Cohen et al., 2015; Grewen et al., 2005; Light et al., 2005). It is possible, then, that for a behavior that most likely covaries with hugs (i.e., cuddling), we would see similar effects. Few researchers have made cuddling the focus of their study, but those studies that examine cuddling are reviewed next.

Van Anders et al. (2013) conducted a descriptive study wherein participants reported on their cuddling behaviors with their romantic partners (committed and casual relationships). Recruiting participants through Amazon Mechanical Turk and Craigslist, van Anders and colleagues examined cuddling behaviors across a diverse sample including a range of religious backgrounds, income, employment status, ethnicity, and sexual orientation. Their study generated several important descriptive findings. For example, cuddling was mostly viewed as a nurturing behavior, although sexual elements were sometimes included. Nearly all participants reported cuddling at night on a couch or bed. Common behaviors included during cuddling were hugging, spooning, touch/rubbing, kissing, holding each other, and talking. When talking occurred during

cuddling episodes, participants indicated that they talked most often about anything, relationships, and the future. When participants were asked why they cuddled, most responses included to communicate intimacy/closeness and love/affection. When asked whether they generally engaged in sexual activity after cuddling, participants most commonly responded “sometimes.”

Van Raalte and Floyd (2016) conducted a similar descriptive study to van Anders et al. (2013) and sought to understand the cuddling behaviors of romantic couples. Paralleling van Anders et al.’s findings, participants reported cuddling to be a loving and nurturing type of behavior, rather than sexual, and was associated with feelings of calmness, happiness, and bondedness, among others. Participants reported cuddling to occur most often in bed and late at night (typically before sleeping), and to last, on average, for 30-45 minutes about four times a week. The results of van Raalte and Floyd’s study also indicated that equally initiated cuddling sessions was associated with more relational satisfaction, cuddling satisfaction, and closeness, compared to one person in the relationship always initiating cuddling. Additionally, results suggested that participants who received the right amount of cuddling and participants who received more cuddling than wanted had significantly higher relational satisfaction and cuddling satisfaction scores compared to participants who received less cuddling than wanted. Whereas van Anders et al. and van Raalte and Floyd’s study was an important descriptive look into cuddling behaviors at home, and van Raalte and Floyd’s study beginning to connect cuddling behaviors to relational health markers, other reports have connected cuddling with physiological and relational advantages.

Hughes and Kruger (2011) examined pre- and post-coital behaviors of long-term romantic partners and found cuddling to be a common foreplay and afterplay behavior. Cuddling behaviors were most common and preferred after engaging in sexual activity. Hughes and Kruger reasoned that cuddling after coitus serves the purposes of relational bonding and intimacy building. Similarly, Muise, Giang, and Impett (2014) examined post-coital affectionate behaviors, which included cuddling behaviors. In their study, post-coital affection (including cuddling) was associated with higher relationship satisfaction and sexual satisfaction.

L'Abate (2001) examined a family intervention designed to increase hugging, holding, huddling, and cuddling. L'Abate posits that hugging is "...too short-lived to derive clinical applications for couples and families" (p. 7) and suggests that extensive touching like cuddling would be a more effective intervention strategy to benefit one's well-being and health in families and romantic couples. In a case study using L'Abate's suggested 3HC cuddling intervention (cuddling as a family on the couch every day for 10 to 20 minutes), one family including a single mother and three children reported stronger relational bonds, more intimacy, and better prosocial behaviors after two weeks. L'Abate noted that the beneficial effects of cuddling may not produce any significant changes if the family or couple already engaged in extensive touching with each other, or if the family or couple had an extremely negative relationship to which the extensive touching might be burdensome. The latter is an important consideration moving forward with research examining the benefits of cuddling as cuddling for dissatisfied couples might look very different compared to neutral or satisfied couples. Moreover, L'Abate's case

study examined the effects of cuddling for only one family; therefore, researchers should to be careful when drawing inferences from L'Abate's findings to other families.

Nonetheless, when these studies are considered together, there seems to be little doubt that affectionate communication through touch is associated with one's health and well-being as long as the touch is positive welcomed. However, one of the biggest gaps in this literature is the lack of theoretical understanding of the findings. The theoretical framework used in this study will be AET (Floyd, 2001).

Affection Exchange Theory

AET (Floyd, 2001) is well suited to the task of understanding how cuddling as a specific form of affection might influence relational health. Affection exchange theory is grounded in a Neo-Darwinian perspective and was developed as a comprehensive theory of affectionate behavior (Floyd, 2006). The theory includes three core assumptions and five propositions.

Assumptions. The first assumption of AET is that procreation and survival are superordinate human goals (Floyd, 2006). For example, affectionate communication can help develop pair bonds which can provide access to necessary resources such as social support, thereby increasing chances of survival (Floyd & Morman, 2001). Physical affection, for example, has been linked to several relational advantages that encourages pair bonds such as relationship satisfaction, intimacy, and closeness (Hughes & Kruger, 2011; L'Abate, 2001; Muise et al., 2014; Rabinowitz, 1991).

The second core assumption of AET is that individual behaviors (such as affection) do not need to directly serve human superordinate goals of procreation and survival, but can do so indirectly (Floyd, 2006). Communication can help people fulfill

these goals, even in non-obvious ways. This means that people's behaviors are influenced by their superordinate goals, and that people act in ways to meet their innate needs. For example, communicating affection may directly serve procreation goals as physical affection might encourage sexual intercourse. Moreover, providing affection to children—at least, biological children—contributes to the children's survival and ability to reproduce their parents' genetic material (Floyd & Morman, 2001).

The third core assumption of AET is that "...individuals need not be consciously aware of the evolutionary goals being served by their behaviors" (Floyd, 2006, p. 161). Individuals need not need be aware that providing affection to others or receiving affection from others are distally serving procreation and survival goals. They may simply want to hug each other for support or comfort without thinking of procreation, for example. These goals (procreation and survival) are innate and not something people are required to think about consciously (Floyd).

Propositions. In addition to the three core assumptions of AET, there are five propositions of AET that help explain how and why affection and affectionate communication are manifested in social relationships (Floyd, 2006). The first proposition is that the "need and capacity for affection are inborn" (Floyd, p. 161). For example, "kangaroo care" (wherein infants are held skin-to-skin with a parent) is used to facilitate warmth and bonding between parents and a newborn baby. Kangaroo care helps infants sleep longer (Ferber & Makhoul, 2008), increases flexor movement and postures (Ferber & Makhoul), increases the uptake and duration of breastfeeding (Charpak et al., 2005), and reduces stress (Charpak et al.). Without physical touch and affection, a child's psychological, physiological, and social development is significantly harmed (Field,

2014). For example, orphans in Romania who were touched only for the purposes of feeding and being changed but received no affectionate touch were severely delayed in their physiological, psychological, and social development (Kaler & Freeman, 1994; Rutter, 1998). Taken together, it appears that affection is a crucial component of human development; thus, theorists of AET claim that the need to receive and communicate affection is innate (Floyd, 2001, 2006).

The second proposition of AET is that affectionate feelings and affectionate communication are distinct experiences that often, but not always, covary (Floyd, 2006). This means that it is possible to feel affection and not show it, or show affection and not really feel it. For example, on a first date one might want to hold her partner's hand to demonstrate affection but might be too shy to do it. At other times, people show affection but do not really feel it, such as when grandchildren visit their grandparents and do not want to hug them but do so anyway. So, although often related, affection and its expression are not always enacted together.

The third proposition of AET is that affectionate communication is adaptive with respect to human viability (survival) and fertility (reproduction) (Floyd, 2006). This proposition represents the core underpinnings of AET from a Neo-Darwinian perspective. For survival, affection can help buffer against harmful psychological and physiological stressors by strengthening pair bonds, for example (Floyd, Pauley, & Hesse, 2010; Floyd & Riforgiate, 2008). For fertility, affectionate behaviors between romantic partners might encourage sexual activity thereby facilitating procreation.

The fourth proposition of AET claims that individuals vary in their tolerances for communicating affection and receiving affection (Floyd, 2006). For example, kissing in

public (a contextual factor) might be favorably received by one person but be psychological and physiologically aversive to another person (Floyd). Or, receiving a hug from an acquaintance rather than a spouse (an individual factor) might be experienced differently. This proposition has important implications for the current study. It is possible that romantic couples are already engaging in their optimal level of physical affection with one another, so an increase in cuddling behavior could be burdensome.

The fifth proposition of AET asserts that when affectionate behaviors violate one's tolerances for affection, it is physiologically aversive (Floyd, 2006). For example, if an individual receives affection from someone who she or he does not desire to develop a relationship, that person may respond to the affectionate expression negatively. Additionally, the relationship may suffer if too much affection is provided. This proposition is one of the least examined propositions in AET and would suggest that if one's tolerance for affection is already reached within a relationship or context, an increase of cuddling behaviors might actually be harmful rather than beneficial to one's health.

Affectionate behavior. Affectionate communication includes a range of behaviors (Floyd, 2001) and is typically operationalized in research with direct verbal messages (e.g., saying "I love you"), nonverbal behaviors (e.g., hugging), and supportive messages (e.g., doing favors for each other) (Floyd & Morman, 1998). Affectionate verbal statements include direct messages through written or spoken words. Feelings for another, reinforcing the status of the relationship, describing hopes and dreams of the future, and statements about how one would feel without the relationship are all examples of affectionate verbal statements (Floyd, 2006). Although these statements are explicit,

they can have ambiguous meaning (Floyd, 2006). For example, saying “I love you” is an explicit statement but in the context of saying “I love you” after sharing a humorous joke between friends, it might be unclear what type of love (friendship or romantic) is being communicated.

Direct nonverbal gestures include behaviors that communicate affection through touch (e.g., kissing, hugging, hand holding; Floyd & Morman, 1998) or other nonverbal codes (e.g., prolonged eye contact or close proximity) (Floyd, 2006). Floyd states that these behaviors are direct in the sense that they “...are readily associated with the communication of affection within the social community in which they are observed” (Floyd, p. 33).

Last, social support affection include social or instrumental support (Floyd, 2006). For example, paying for another’s lunch or giving someone a ride in a car is considered social support. Whereas these behaviors do not reflect as direct affection compared to kissing, for example, Floyd argues that these behaviors are still affectionate as those behaviors are known to be evaluated as affectionate by a partner. For example, provisions of instrumental support could be perceived as a way to communicate importance and concern for a partner. Floyd (2001) theorized and tested that male-male relationships will use more supportive behaviors to show affection than verbal or nonverbal behaviors so as to avoid any ridicule from a socially constructed stigma around male affection.

Much scholarship testing AET has examined affection with Floyd and Morman’s (1998) tripartite measure of affection (i.e., verbal, nonverbal, and supportive affection). Although examining the benefits of expressed and received affection overall is important and relationally interesting, examining one of form affectionate behavior can enable more

specific practical applications. Similar to Floyd et al.'s (2009) examination of one form of affection (i.e., kissing), a core aim of this study is to examine how cuddling influences relational health.

Floyd and colleagues (2009) tested kissing as an affectionate behavior in cohabitating romantic couples. The experiment tested how an individual's cholesterol levels, stress, and relational satisfaction were influenced by an increase in romantic kissing behavior. Individuals were randomly assigned either to the experimental or control group. In the experimental group, participants were instructed to romantically kiss more often and for longer periods of time with their romantic partner over a 6-week period. Participants in the control group were not asked to change their behavior in any way. On every Monday during the 6-week period, participants received reminder emails about the study, and on two of those Mondays, short online surveys for manipulation checks and other health questions were provided. Only one person per couple completed measures of relational satisfaction and perceived stress and provided a blood sample during an initial laboratory visit so cholesterol levels could be monitored. After a six-week period, participants returned to the lab to complete the same measures. Results revealed that, compared to the control group, participants who romantically kissed their partner more decreased their cholesterol levels, reported a decrease in their stress, and reported an increase in relational satisfaction with moderate to large effect sizes. This study aims to replicate and extend Floyd et al.'s (2009) experiment on kissing in romantic couples using cuddling as the manipulated variable instead of kissing. Additionally, the outcome variables in this study will focus on relational health markers rather than physiological outcomes.

Relational Health

AET (Floyd, 2001) claims that affectionate communication is critical in fostering pair bonds and connectedness between relational partners (proposition 3; Floyd, 2006). An increasing number of studies indicates that affection is contributing to pair bonds as understood through various relational quality measures such as relational satisfaction (Floyd, 2002; Floyd et al., 2005), relational maintenance (Dainton, Stafford, & Canary, 1994), and investments (Horan & Booth-Butterfield, 2010). A popular and thoroughly tested model (Le & Agnew, 2003) that incorporates several relational outcomes is the investment model (Rusbult, 1980). The investment model provides a basis for identifying specific outcomes that are consequential for relational health, and are chosen as the outcomes in the hypotheses derived from AET.

The investment model seeks to predict commitment in relationships. Commitment is understood as "...an intention to remain in a relationship, a psychological attachment to a partner, and a long-term orientation toward the partnership" (Le & Agnew, 2003, p. 38). The investment model has been useful in predicting commitment across an array of relationships and contexts (Le & Agnew) and as Horan and Booth-Butterfield (2010) have explored, the investment model in conjunction with AET might be one way to test AET's proposition 3.

The investment model (Rusbult, 1980) claims that the interdependence between relational partners will influence one's commitment to the relationship such that when the outcomes of a relationship are beneficial, one will choose to persist in the relationship. The three relational mechanisms the investment model uses to predict commitment include relational satisfaction, investments, and quality of alternatives. Relational

satisfaction is defined as the global satisfaction of one's relationship (Hendrick & Hendrick, 1997; Stackert & Bursik, 2003). Investments are “resources that become attached to a relationship and would decline in value or be lost if the relationship were to end” (Rusbult, Martz, & Agnew, 1998, p. 359). Quality of alternatives represents one’s perceptions of attractive alternatives outside of the relationship that provide superior outcomes than the current relationship (Le & Agnew, 2003). The investment model predicts that relational satisfaction and investments will positively predict commitment and quality of alternatives will negatively predict commitment; in turn, level of commitment will predict whether an individual will continue in the relationship or terminate it (Le & Agnew, 2003).

Horan and Booth-Butterfield (2010) was the first study to examine received and expressed affection in combination with the investment model variables. In their study, received affection significantly predicted relational satisfaction and expressed affection significantly predicted commitment. The authors interpreted these findings by suggesting that relational partners became more satisfied in the relationship after receiving affection, and that expressing affection is an indicator of their commitment. Moreover, in their study neither received nor expressed affection predicted investment or quality of alternatives. Horan and Booth-Butterfield suggested that there were no significant relationships between these variables because the reliability of the investment measure was poor ($\alpha = .65$) and quality of alternatives may not have been as salient for a relatively committed sample (participants in their study were either seriously dating or married). This notwithstanding, Horan and Booth-Butterfield advocate future studies to use the investment model variables as a way to provide a unique understanding for how

affection predicts commitment. Each of the relational outcomes in the investment model will be briefly described and predictions based on AET will be provided.

Relational satisfaction. Previous research indicates a clear link between affectionate communication and relational satisfaction (Floyd et al., 2009; Horan & Booth-Butterfield, 2010), such that the more one communicates affection to a partner, the higher the relational satisfaction. These findings support proposition 3 of AET that claims affection will facilitate survival through building pair bonds. AET asserts that humans build pair bonds, unlike many other mammals (Immerman & Mackey, 2003), to increase access to, and the sharing of, resources for long-term survival. In this case, when one is satisfied in a relationship, he or she will more likely persist and stay in a relationship (Rusbult, 1980), thus providing that individual with better access to the resources associated with a romantic relationship and consequently facilitating one's long-term viability.

Thus, on the basis of AET, we would expect that if couples increase time spent cuddling (experimental group), we would see an increase in relational satisfaction compared to couples who do not change their cuddling behavior (control group). An experimental design allows researchers to test stronger causality claims, and will be used as the methodology of this study. Additionally, a prevailing critique in Field's (2010, 2014) research is that her work does not include comparison groups to test alternative explanations. To account for such critiques, this study employs a comparison condition that will account for a plausible alternative explanation that simply spending more time together could have an influence on relational satisfaction. Thus, a comparison group by

which couples increase time spent together will be utilized. As such, the following prediction and research question is offered:

H1: Individuals in the experimental (cuddling) group report more relational satisfaction than participants in the comparison (meal time) and control (no change) groups.

RQ1: Do participants in the comparison group and the control group differ on their reports of relational satisfaction?

Investments and quality of alternatives. Investments are perceptions of resources put in a relationship and quality of alternatives are perceptions of attractive alternatives outside of a relationship (Le & Agnew, 2003; Rusbult, Martz, & Agnew, 1998). Horan and Booth-Butterfield (2010) found no relationship between affection and quality of alternatives or investments and suggested that their reliability measures and already committed sample contributed to these non-significant findings. Indeed, in a meta-analysis of the investment variables, Le and Agnew (2003) found that the investment-commitment relationship was stronger for shorter relationships (e.g., casual dating) versus longer relationships (e.g., married couples). In most studies testing the investment model, including Horan and Booth-Butterfield's study, the data are cross-sectional. It is possible that by changing one's behavior in a relationship over time, feelings of investments and quality of alternatives will change. By increasing cuddling behavior, for example, it is possible that romantic partners will feel as though they are exerting more support, love, and care into the relationship, thereby increasing their perceptions of investment in the relationship. Additionally, by increasing cuddling

behavior, the comparison between one's current relationship and perceptions of an attractive alternative is likely changed.

By examining these relationships through the lens of AET, an increase in cuddling would cause change in the perceptions of one's relational investments and quality of alternatives. Proposition 3 of AET predicts that affection facilitates survival through developing and maintaining pair bonds. Individuals who invest a lot in a relationship and perceive few quality alternatives outside of the relationship are more likely to commit and stay with their partner; thus providing a greater opportunity to access the resources associated with that relationship to facilitate survival. Therefore, on the basis of AET, and testing an alternate explanation that just spending time together may influence perceptions of relational health, we would expect the following hypotheses:

H2: Individuals in the experimental (cuddling) group report more investment than participants in the comparison (meal time) and control (no change) groups.

RQ2: Do participants in the comparison group and the control group differ on their reports of investment?

H3: Individuals in the experimental (cuddling) group report less quality of alternatives than participants in the comparison (meal time) and control (no change) groups.

RQ3: Do participants in the comparison group and the control group differ on their reports of quality of alternatives?

Commitment. Last, although little research has examined how affection influences commitment, AET would predict that affectionate communication would

strengthen feelings of commitment as it would be beneficial to feel committed to and have access to resources that would facilitate survival and procreation. Particularly for humans who are driven to develop and maintain pair bonds, commitment in one's romantic relationship would facilitate one's decision to procreate with a partner because of the likelihood of future support in child bearing. On the basis on AET, and replicating the previous predictions, a direct relationship between affectionate communication and commitment is offered:

H4: Individuals in the experimental (cuddling) group report more commitment than participants in the comparison (meal time) and control (no change) groups.

RQ4: Do participants in the comparison group and the control group differ on their reports of commitment?

CHAPTER 2

METHOD

Participants

The study began with $N = 91$ adults living in the United States who were recruited through Amazon.com's Mechanical Turk survey platform. Eleven participants did not complete all the surveys during the study which resulted in a usable sample size of $n = 80$ (indicating a 12% attrition rate). The sample included men ($n = 27$) and women ($n = 53$) with ages ranging from 24 to 74 years and an average age of 42.85 years ($SD = 12.37$). The majority of participants identified as White/Caucasian ($n = 68$), followed by Asian ($n = 5$), Hispanic/Latino ($n = 3$), African American ($n = 3$), and other ($n = 1$). At the time of the study, the highest education received by participants included a bachelor's degree ($n = 29$), master's degree ($n = 12$), associate's degree ($n = 9$), high school degree ($n = 7$), PhD degree ($n = 1$), some college but no degree ($n = 20$), and other ($n = 2$). Combined household income by the most frequent report included \$75,000 or less ($n = 28$), \$50,000 or less ($n = 18$), \$100,000 or less ($n = 16$), \$150,000 or less ($n = 10$), \$25,000 ($n = 5$), or more than \$150,000 ($n = 3$). All participants were married and indicated living with their spouse for 3-12 months ($n = 5$), 1+ years ($n = 15$), 5+ years ($n = 25$), 10+ years ($n = 16$), 20+ years ($n = 12$), 30+ years ($n = 5$), and 40+ years ($n = 2$). All participants indicated that the participants or their spouse were not pregnant or trying to become pregnant. Participants indicated that they did not have any roommates but 30 individuals indicated having one child living at home. For those who had a child living at home, the average age of the child was $M_{age} = 5.34$ ($SD = 3.70$).

Procedures

This study was funded by in part by a research award grant, an individual research fund, and approved by the university's institutional review board (see Appendix A). A 1-week pilot study was conducted to test the manipulations and procedures of the full study. Having successfully tested the manipulations and procedures in the pilot study, the full study was conducted and is described below.

Prescreening procedures. Participants were recruited through Amazon.com's Mechanical Turk survey platform and were paid \$0.75 for participating in the recruitment survey (see Appendix B). Mechanical Turk requires users to be at least 18 years old to participate in online surveys. A free location qualification was used so that the survey would only be available to individuals living in the United States. Another qualification was purchased so the survey would only be available to married individuals. In addition to these qualifications, participants were considered eligible if: a) they had been living with their romantic partner for at least three months; b) were not pregnant or trying to get pregnant; c) and are able to speak and read English well.

The criteria for the study have been selected to isolate the effects of cuddling on relational health. Cohabiting couples were chosen as the target group because couples who live together are afforded an extensive opportunity for frequent close physical contact and are likely to engage in routine affectionate behaviors. Scholars have suggested that couples who have lived together for at least three months are more likely to exhibit routine affectionate behavior compared to couples who have lived together for a shorter time period (Horan, 2012; Horan & Booth-Butterfield, 2011). Additionally, pregnancy or trying to become pregnant may bring another element of complexity to

couples' regular affectionate behavior, which, although important, is beyond the scope of this study.

The prescreening survey included all study measures and served as the Time 1 (T_1) measures for this study. A total of 407 prospective participants completed the prescreening measure; of that number, 117 (29.25%) met all study qualifications, were randomized into one of three experimental conditions (each condition had exactly $n = 39$ participants), and were invited to participate in the full study (see Appendix C). This invitation email included experimental condition specific instructions and a short online survey where participants could indicate their interest in participating in the full study. Of the 117 participants who qualified and were invited to participate in the full study, $n = 91$ (77.78%) agreed to participate and were sent a \$10 Amazon.com gift card as a pre-study incentive (two participants indicated they did not want to participate in the full study and 24 participants did not respond to the email invitation).

Experimental procedures. After participants were screened for the study qualifications, participants were randomized into one of three conditions using a random application from the random.org website. The three conditions included: (1) a treatment group that would increase their cuddling behaviors, (2) a comparison group that would increase time spent together, and (3) a control group that were instructed to not change their behavior. To facilitate increased time spent together in the comparison group, a specific couple activity was selected. Research suggests that novel activities that are exciting and physiologically arousing positively influences relationship qualities such as relational satisfaction compared to more mundane, but pleasant, activities (Aron et al., 2000; Reissman, Aron, & Bergen, 1993). Thus, the selected couple activity is sharing

meals together as this activity is most likely typical for cohabitating couples, is not normally physiologically arousing, and would be a type of activity that does not easily provide opportunities for cuddling behaviors, or, more broadly, affectionate behavior.

Before the study was conducted, a sample size estimation was conducted using the software G*Power 3.1 (Faul, Erdfelder, Lang, & Buchner, 2007). The following parameters included an F-test, repeated-measures between-factors ANOVA, effect size f of .25 (an indication of a strong effect size), α error probability of .05, power of .80 (which is typical for social science research), three groups/conditions, four measures (to reflect each of the study outcomes), and a correlation among repeated measures of .5. The analysis yielded an estimation sample size of 102 (34 participants per condition). Hair et al. (2006) and Tabachnick and Fidell (1996) indicate that at least 20 participants per cell are necessary to achieve minimal levels of statistical power, and central limit theorem (Keppel & Wickens, 2004) suggest that when a sample gets to approximately 20 participants, the sampling distribution of mean scores become normally distributed. With these estimations in mind, an initial target sample size of about 30 participants per condition was determined.

The initial randomization of participants who qualified for the study ($N = 117$) included exactly 39 individuals in each of the three conditions. Subsequently, 91 participants agreed to participate in the study which changed the frequencies to $n = 29$ for the treatment condition, $n = 33$ for the comparison condition, and $n = 29$ for the control condition. Next, the participants who completed all study measures and were included in the analyses included $n = 25$ in the treatment condition, $n = 30$ in the comparison condition, and $n = 25$ in the control condition (providing a final sample size of $n = 80$ for

the current study)¹. A test of independence revealed that the three conditions did not differ on whether participants stayed in ($F_{\text{treatment}} = 25$, $F_{\text{comparison}} = 30$, $F_{\text{control}} = 25$) or dropped out ($F_{\text{treatment}} = 4$, $F_{\text{comparison}} = 3$, $F_{\text{control}} = 4$) of the study, $\chi^2(2) = 1.29$, $p = .53$, Cramer's $V = .12$.

Participants in all conditions were emailed on a Sunday with instructions specific to their condition, and were told to begin the four-week long study on Monday (i.e., the next day; see Appendix D). Participants were also told that reminders concerning the study instructions would be sent on a Wednesday (see Appendix E), and every Friday they would receive an interim survey (see Appendix F). The interim survey contained all the same measures in the prescreening survey (except for the demographic questions) as well as manipulation check items and potential control variable questions. Two weeks after the last interim survey and after the study had finished, participants were asked to complete a post-study survey (see Appendix G). The fourth interim survey served as the Time 2 (T_2) measures for the study.

Experiment design. Participants in the experimental group were instructed to increase the frequency and duration of cuddling with their romantic partner. The specific text of the message was as follows: Over a four-week period, we would like you and your romantic partner to cuddle more. You should continue cuddling the way you normally do but more often and/or for longer periods of time. For example, if you typically cuddle for 30 minutes, you could cuddle for 45 minutes. Or if you cuddle four times a week, you

¹ A test of independence revealed that men and women did not differ across the treatment ($F_{\text{men}} = 7$, $F_{\text{women}} = 18$), comparison ($F_{\text{men}} = 10$, $F_{\text{women}} = 20$), or control ($F_{\text{men}} = 10$, $F_{\text{women}} = 15$) conditions, $\chi^2(2) = .81$, $p = .67$, Cramer's $V = .10$.

could cuddle nearly every day. You could increase the length of each cuddle, increase the number of times you cuddle, OR a combination of both. It's up to you. The point is that for the four-week period, the two of you should cuddle more than you typically do right now. We hope you will enjoy this part of the study. Please share these instructions with your partner; we hope you will both make increased cuddling a priority over the four-week period. Cuddling is defined as intimate, physical, and loving contact that does not involve sexual behavior and that involves some degree of whole body touching.

Participants in the comparison group were given instructions to increase the frequency and duration of meal times with their romantic partner. The specific text of the message was as follows: Over a four-week period, we would like you and your romantic partner to spend more time together at meal times. You should continue eating together as you normally do but more often and/or for longer periods of time. For example, you could spend more time prepping and cooking the meal together, eating together, cleaning up together, or even shopping for food together. You could choose to increase the length of each meal time together, increase the number of times you share meals together, OR a combination of both. It's up to you. The point is that for a four-week period, the two of you should spend more time together at meal times more than you typically do right now. We hope you will enjoy this part of the study. Please share these instructions with your partner; we hope you will both make increased meal time together a priority over the four-week period.

Participants in the control group were given instructions to maintain their normal routine with their romantic partner. The specific text of the message was as follows: Over a four-week period, we would like you and your romantic partner to maintain your

normal routine. We are simply interested in how couples interact over time. You will be contacted throughout the study to respond to some questions online. We hope that these responses will help us assess the daily life of romantic couples who live together.

Instrumentation (see Appendix H)

Relational health. The Investment Model Scale (IMS; Rusbult et al., 1998) was used to assess four relational health markers. The IMS includes four sub-scales: relational satisfaction, investment, quality of alternatives, and commitment. Rated on a scale from 0 (*do not agree at all*) to 8 (*agree completely*), the scale includes five items for relationship satisfaction (e.g., “I feel satisfied with our relationship”), five items for quality of alternative (e.g., “The people other than my partner with whom I might become involved are very appealing”), five items for investment (e.g., “I have put a great deal into our relationship that I would lose if the relationship were to end”), and seven items for commitment (e.g., “I want our relationship to last for a very long time”). Items were prefaced with the statement: “Considering your romantic partner, please indicate how much you agree or disagree with the following statements.” Cronbach’s alpha for each sub-scale was acceptable: relationship satisfaction $\alpha = .97$, quality of alternatives $\alpha = .86$, investment $\alpha = .83$, commitment $\alpha = .91$.

Manipulation checks. A 25-item Likert-type scale was developed check study manipulations and to assess other potential control variables. Items were prefaced with the following statement: “The following items will ask you about aspects of your romantic relationship. Considering the last week with your romantic partner, please indicated how much you agree or disagree with the following statements.” Each item was

a declarative statement and rated on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*).

To directly test the manipulation of cuddling, three statements were developed: “My romantic partner and I have been cuddling more than we normally do,” and “I have been cuddling my romantic partner more often than usual,” and “My romantic partner and I have been touching more often than normal.” To directly test the manipulation of more time together through shared meal times, three statements were developed: “My romantic partner and I have been spending more time eating together than usual,” “My romantic partner and I have had more meals together lately,” and “My romantic partner and I have been spending more time cooking together.” Embedded within the scale were 19 additional items designed to disguise the real manipulation checks as well as to act as potential control variables. The 19 additional items are described below.

Three items assessed verbal communicative change: “I have been giving my partner more compliments than I normally do,” “My romantic partner and I have verbally expressed our love more often than we normally do, and “My romantic partner and I have been more open with each other.” Three items assessed participant’s sleeping activity: “I have been falling asleep a lot quicker than I normally do,” and “My sleep has been less interrupted than normal,” and “I have felt more rested than normal.” Two items assessed participant’s sexual activity: “My romantic partner and I have been engaging in sexual activity more often than we normally do” and “The quality of our sexual activity is better than normal.” Two items assessed participant’s conflict activity: “My romantic partner and I have had more conflict than normal” and “My romantic partner and I have fought more than we typically do.” Two items assessed participant’s time spent together: “I have

spent more time with my romantic partner than usual” and “I have been in my partner’s presence more often than usual.” Two items assessed communicative changes: “The communication with my romantic partner has been better” and “My romantic partner and I have been more positive with each other.” One item assessed how relaxed the participant felt: “I have been more relaxed than usual.” One item assessed the participant’s nutrition awareness: “I have been more aware of my nutrition lately.” One item assessed favors done for a partner: “My romantic partner and I have been doing a lot more favors for each other.” One item assessed exercise behavior: “My romantic partner and I have been exercising more often than usual.” One item assessed participant’s kissing behavior: “My romantic partner and I have been passionately kissing more often than we normally do.”

Demographic and relationship information. At T₁ only, participants were asked demographic questions including age, sex, ethnicity, cohabitation length, education level, and combined household income.

CHAPTER 3

RESULTS

Manipulation Checks

The 25-items developed for the study included several items to directly test the manipulations, as well as items that could be potentially used as controls in the study and items designed to disguise the manipulations of the study (see Appendix I, Table 1 for means and standard deviations for these items across conditions for T₂).

Three items were combined to create a composite variable to test the direct manipulation of increased cuddling (Cronbach's $\alpha = .96$), and three items were combined to create a composite variable to test the direct manipulation of increased shared meal time (Cronbach's $\alpha = .90$). To test the manipulation of increased cuddling, a one-way ANOVA with planned contrasts test was conducted; contrast coefficients were 2 for the treatment condition, -1 for the comparison condition, and -1 for the control condition. There was a significant effect of experimental condition on increased cuddling, $F(2, 77) = 4.99, p < .01$, partial $\eta^2 = .11$. Planned contrasts revealed that the treatment condition ($M = 5.47, SD = 1.67$) reported significantly more cuddling than both the comparison ($M = 4.62, SD = 2.20$) and control condition ($M = 3.75, SD = 1.81$), $t(77) = 2.76, p < .01$, indicating success for the increased cuddling manipulation.

To test the manipulation of shared meal time, a one-way ANOVA with planned contrasts test was also conducted; contrast coefficients were -1 for the treatment condition, 2 for the comparison condition, and -1 for the control condition. There was a significant effect of experimental condition on increased shared meal time, $F(2, 77) = 9.82, p < .001$, partial $\eta^2 = .20$. Planned contrasts revealed that the comparison condition

($M = 5.44$, $SD = 1.76$) reported significantly more shared meal time than the treatment ($M = 3.81$, $SD = 2.07$) and control condition ($M = 3.40$, $SD = 2.02$), $t(77) = 4.34$, $p < .001$, indicating success for the increased shared meal time manipulation.

To test if there were differences across conditions for the remaining 19 items of the scale, a one-way ANOVA with all the items as dependent variables, and condition as the independent variable, was conducted. None of the items, except the item measuring a change in kissing, was significantly different across groups. The item asking participants if they had kissed their romantic partner more than usual was significant across groups, $F(2, 77) = 3.17$, $p < .05$, partial $\eta^2 = .08$; a Tukey HSD post hoc analysis revealed that the treatment condition ($M = 4.84$, $SD = 1.80$) reported significantly more kissing than the control condition ($M = 3.48$, $SD = 1.98$), but did not differ from the comparison condition ($M = 4.60$, $SD = 2.30$). The comparison and control conditions did not differ on this item. Since the kissing item showed a significant group difference, this item was tested as a potential covariate in the hypothesis tests.

Descriptive Analyses

To test for T_1 equivalency, all outcome variables (relational satisfaction, investment, quality of alternatives, and commitment) were assessed in sex-by-experimental condition ANOVAs. The ANOVAs revealed no main effects of the experimental condition, sex, and no sex-by-condition interactions effects for any of the outcomes (all p 's $> .05$), indicating equivalency between the experimental, comparison, and control conditions. Means and standard deviations for all outcomes at T_1 appear in Table 2.

Table 2

Means and Standard Deviations for Self-Report Outcomes

Variable	Condition	T ₁ <i>M</i>	T ₁ <i>SD</i>	T ₂ <i>M</i>	T ₂ <i>SD</i>
Relational Satisfaction	Experimental	7.69	1.60	8.14	1.03
	Comparison	7.43	1.85	7.15	2.42
	Control	6.89	2.49	6.66	2.88
Investment	Experimental	7.33	1.48	8.07	.99
	Comparison	7.45	1.45	8.11	1.35
	Control	6.85	2.18	7.14	2.33
Quality of Alternatives	Experimental	3.42	1.73	1.75	1.02
	Comparison	3.47	1.85	2.31	2.18
	Control	3.04	2.12	2.91	2.15
Commitment	Experimental	8.55	.92	8.85	.35
	Comparison	8.40	1.07	8.20	1.63
	Control	7.69	2.36	7.70	2.39

Note. All self-report outcomes were measured on 9-point scales wherein higher scores correspond to greater values.

Hypotheses

Before testing the hypotheses, a number of potential control variables were explored. These potential control variables included: 1) sex; 2) age; 3) ethnicity; 4) cohabitation length; 5) education level; 6) combined household income; 7) having a child live at home; and 8) change in kissing behavior, as measured in the manipulation check scale.

Several tests were used to examine whether these potential control variables should be included in the hypotheses tests. To test whether sex would be used as a covariate, a t-test was conducted. Men and women did not differ on any of the T₂ study outcomes.

To test whether ethnicity, cohabitation length, educational level, combined household income, and whether having a child living at home or not should be used as covariates, a series of one-way ANOVAs with the study outcomes as the set of dependent variables and each potential covariate as an independent variable was conducted. Only income was significantly different across groups for the study outcome investment, $F(5, 74) = 3.02$, $p < .05$, $\eta^2 = .17$. This test revealed a violation of homogeneity of variance among groups (Levene's $< .001$); therefore, Tamhane's T₂ will be used for the post hoc tests (as suggested by Meyers, Gamst, & Guarino, 2013, p. 170). The post hoc tests did not reveal any significant differences of income across groups, therefore, income will not be included as a control variable in the hypothesis tests.

The continuous variables, age and change in kissing behavior, were correlated with the T₂ outcome measures of the study. Age was not significantly correlated with any study outcome; however, kissing was significantly correlated with all study outcomes. Using a two-tailed probability, change in kissing was significantly and positively related to relational satisfaction ($r = .66$, $p < .001$), investment ($r = .40$, $p < .001$), and commitment ($r = .45$, $p < .001$), and negatively correlated with quality of alternatives ($r = -.40$, $p < .001$).

The hypotheses predicted an increase over time in relational satisfaction, investment, commitment, and a decrease over time in quality of alternatives in the

experimental condition that are not also observed in the comparison or control condition. Tests on the outcome variables between the treatment group and comparison/control groups were conducted using a series of ANCOVAs with condition (experimental, comparison, and control) as the fixed factor, the T₂ outcome as the dependent variable, the T₁ outcome and the T₂ kissing score as covariates for all study outcomes. Following each ANCOVA are planned contrasts, with contrast coefficients of 2 for the experimental group and -1 for both the comparison and control groups.

The research questions asked if the comparison and control groups differed on the study outcomes. Tests on the outcome variables between the comparison and control groups were conducted with two-tailed independent samples t-tests. Means and standard deviations for all outcomes at T₂ appear in Table 2.

Relational satisfaction. The first hypothesis predicted that the treatment group would report higher relational satisfaction scores than the comparison group and control group. There was no main effect of condition on T₂ satisfaction, $F(2, 75) = 2.37, p = .10$, partial $\eta^2 = .06$. Due to the directional nature of the hypothesis, however, a planned contrast was conducted despite the nonsignificant F-test. The contrast was significant, $t(68.41) = 2.94, p < .01, \eta^2 = .11$, with the treatment condition ($M = 8.14, SD = 1.03$) reporting the highest relational satisfaction scores followed by the comparison condition ($M = 7.15, SD = 2.42$), and the control condition ($M = 6.66, SD = 2.88$). Data are consistent with H1.

The first research question asked if the comparison and control groups differed on their reports of relational satisfaction. A two-tailed independent samples t-test revealed a

non-significant effect, $t(53) = .68, p = .50, \eta^2 = .01$. Participants in the comparison and control groups did not differ on reports of relational satisfaction.

Investment. The second hypothesis predicted that the treatment group would report higher investment scores than the comparison group and control group. There was no main effect of condition on T₂ investment, $F(2, 75) = 1.07, p = .35$, partial $\eta^2 = .03$. The planned contrast test did not reveal significant differences across conditions. Data were not consistent with H2.

The second research question asked if the comparison and control groups differed on their reports of investment. A two-tailed independent samples t-test revealed a non-significant effect, $t(36.92) = 1.83, p = .08, \eta^2 = .08$. Participants in the comparison and control groups did not differ on reports of investment.

Quality of alternatives. The third hypothesis predicted that the treatment group would report lower quality of alternatives scores than the comparison group and the control group. There was a significant main effect of condition on T₂ quality of alternatives, $F(2, 75) = 3.44, p < .05$, partial $\eta^2 = .08$. The planned contrast was significant, $t(75.49) = -2.43, p < .05, \eta^2 = .07$, with the treatment condition ($M = 1.75, SD = 1.01$) reporting the lowest quality of alternative scores followed by the comparison condition ($M = 2.31, SD = 2.18$), and the control condition ($M = 2.91, SD = 2.15$). Data are consistent with H3.

The third research question asked if the comparison and control groups differed on their reports of quality of alternatives. A two-tailed independent samples t-test revealed a non-significant effect, $t(53) = -1.02, p = .31, \eta^2 = .02$. Participants in the comparison and control groups did not differ on reports of quality of alternatives.

Commitment. The fourth hypothesis predicted that the treatment group would report higher commitment scores than the comparison group and control group. There was no main effect of condition on T₂ commitment, $F(2, 75) = 1.53, p = .22$, partial $\eta^2 = .04$. However, the planned contrast was significant, $t(46.02) = 3.09, p < .01, \eta^2 = .06$, with the treatment condition ($M = 8.85, SD = .35$) reporting the highest commitment scores followed by the comparison condition ($M = 8.20, SD = 1.63$), and the control condition ($M = 7.70, SD = 2.39$). Data are consistent with H4.

The fourth research question asked if the comparison and control groups differed on their reports of commitment. A two-tailed independent samples t-test revealed a non-significant effect, $t(53) = .91, p = .50, \eta^2 = .02$. Participants in the comparison and control groups did not differ on reports of commitment.

CHAPTER 4

DISCUSSION

Social relationships and a need to belong are crucial human needs (Baumeister & Leary, 1995). An important behavior that builds human bonds is affection (Floyd, 2006). AET (Floyd, 2001) is a comprehensive theory of affection that describes the innate need for providing and receiving affection to foster human bonds. A wealth of literature has identified affectionate behavior as having a significant impact on psychological (Burleson, Trevathan, & Todd, 2007; Debrot, Schoebi, Perrez, & Horn, 2013), physiological (Cohen et al., 2015), and relational (Debrot et al., 2017; Horan & Booth-Butterfield, 2010) health. The current investigation sought to examine how cuddling in cohabitating romantic relationships influences relational health. Relational health was examined with four distinct markers identified by the investment model: relational satisfaction, investment, quality of alternatives, and commitment (see Le & Agnew, 2003). Data are consistent with hypotheses on all study outcomes except for investment. Overall, results provide support for proposition 3 of AET, which posits that affectionate communication is adaptive with respect to human viability and fertility (Floyd, 2006). The following discussion will provide a summary and interpretation of findings; a discussion of methodological, clinical, and pedagogical implications; a description of the strengths and limitations of the current study; and directions for future research.

Summary of Findings

Overall, participants in the treatment group reported more relational satisfaction and commitment and less quality of alternatives compared to participants in the comparison and control groups. Experimental groups did not differ on reports of

investments. Additionally, participants in the comparison and control groups did not differ on any study outcomes. Results for each study outcome will be described next.

Relational satisfaction. The first hypothesis predicted that individuals in the treatment group (i.e., increased cuddling) would report higher relational satisfaction than individuals in the comparison group (i.e., increased shared meal time) and the control group (i.e., no change). Data were consistent with this prediction. Additionally, the first research question asked if individuals in the comparison and control group differed on their reports of relational satisfaction, and results indicate no differences between these groups.

Taken together, results suggest that increasing cuddling in cohabitating romantic relationships significantly increases feelings of relational satisfaction above and beyond spending more time together during meals or not changing behavior at all. Insofar as scholars have recommended caution when interpreting statistical significance (Hunter & Schmidt, 1990), examining effect sizes provides a better understanding of the strength of relationship between variables. Not only did increased cuddling positively affect relational satisfaction for the treatment group in ways that were not evident in the comparison or control groups, but the analysis revealed a medium effect ($\eta^2 = .11$; Cohen, 1988, pp. 285-288). This effect size supports the claim that cuddling can have a substantial influence on relational satisfaction even in only four weeks.

Several research studies have linked affectionate behavior with relational satisfaction (e.g., Floyd, 2002; Floyd et al., 2005; Horan & Booth-Butterfield, 2010), and advancing these findings, results of this study indicate that increasing affectionate behaviors through cuddling leads to significant increases of relational satisfaction.

Importantly, the design of the study provides compelling evidence that increasing a specific affectionate behavior *caused* an increase in relational satisfaction above and beyond just spending time together. Testing causal claims in this study extends previous research adopting correlational designs (e.g., Horan & Booth-Butterfield).

Moreover, as AET (Floyd, 2001) suggests, affection is critical for cultivating pair bonds that provide relational partners with more opportunity for procreation and access to resources not otherwise available (proposition 3). By increasing cuddling, and thereby increasing relational satisfaction, individuals reinforce their perception of pair bondedness with a partner and, in turn, increase their chances for survival and procreation.

By increasing cuddling, and in turn relational satisfaction, individuals are more likely to persist in a relationship (Le & Agnew, 2003). Through a committed relationship, individuals afforded access to resources that are not otherwise available to them. Potential outcomes of persisting in a relationship could include access to emotional and tangible support, feeling loved and cared for, sharing household costs, and divisions of labor. In one study, participants in romantic relationships reported feeling love and loving another, companionship, and happiness as major benefits to being in a relationship (Sedikides, Oliver, & Campbell, 1994). Moreover, being in a high-quality romantic relationship has been associated with higher life satisfaction, lower blood pressure, less stress, and less depression compared to being single (Holt-Lunstad, Birmingham, & Jones, 2008). Research also shows that affectionate individuals are physiologically and psychologically healthier compared to their non-affectionate counterparts (Floyd, 2002), that state and trait affection can buffer the harmful effects of stress (Floyd et al., 2010),

and that the act of expressing affection provides numerous health advantages (Floyd et al., 2005). Thus, increasing cuddling with a romantic partner affords individuals with greater physiological, psychological, and relational advantages that contributes to their long-term survival.

Investment. The second hypothesis predicted that individuals in the treatment group (i.e., increased cuddling) would report higher investment than individuals in the comparison group (i.e., increase shared meal time) and control group (i.e., no change). Data were not consistent with this hypothesis. The second research question asked if individuals in the comparison and control group differed on their reports of investment, and results indicate no differences between these groups.

Investment includes intrinsic and extrinsic resources that one would mourn the loss of if the relationship should dissolve (Le & Agnew, 2003). Intrinsic resources include such things as spending time and effort with a partner, social support, and self-disclosures, and extrinsic resources include such things as material possessions (a house) and building a mutual social network (Rusbult, 1980). These results suggest that increasing cuddling does not change perceptions of investment compared to individuals who increase time spent together at meal times, nor those who did not change their behavior.

It is possible that increasing time spent together at shared meal times and increasing time cuddling are both forms of intrinsic investment. Across these two conditions, individuals perceive an increase in time spent on the relationship, thus, these two conditions do not differ. Moreover, by examining the T_1 scores of investment (see Table 2), it is likely that ceiling effects are taking place. Before the experiment began,

individuals across all conditions had high reports of investments with very little room for variation. Additionally, perceptions of investment are likely global perspectives that are unlikely to change in one month, compared to satisfaction that is more malleable. The current sample are married individuals who live together and have likely spent years investing in the relationship (e.g., having children, buying property, building a social network). In only a short span of four weeks, changes in perceptions of investments is unlikely because investments focus on a long-term evaluation that is unlikely to change substantially in a short period. Considering these explanations together, it is possible that any length of experiment in which an affectionate behavior is manipulated for married individuals would not result in changes of reported investment. As Le and Agnew (2003) have illustrated, the link between investment and commitment is strongest for dating or new relationships compared to long-term and married relationships. Although changes in investment were not present in the current study of married individuals, results may look different for similar experiments with newly formed romantic relationships.

Quality of alternatives. The third hypothesis predicted that individuals in the treatment group (i.e., increased cuddling) would report lower quality of alternatives than individuals in the comparison group (i.e., increase shared meal time) and the control group (i.e., no change). Data were consistent with this prediction. The third research question asked if individuals in the comparison and control group differed on their reports of quality of alternatives, and results indicate no differences between these groups.

Quality of alternatives represents perceptions of available alternatives outside of the relationship (i.e., being in a different relationship or being alone; Le & Agnew, 2003;

Rusbult, 1980). As the treatment group reported significantly lower quality of alternative scores compared to the comparison and control group ($\eta^2 = .07$), changes in cuddling behaviors likely influences perceptions of quality of alternatives. That is, increases cuddling influenced perceptions of quality of alternatives above and beyond just spending more time together at meal times.

It is likely that cuddling is perceived as a more intimate act versus shared meal time. Cuddling is reserved for more intimate relationships (van Anders et al., 2013), so it is not a behavior engaged with a wide range of people. Sharing meals together, on the other hand, is a routine task that is unlikely to be associated with intimate relational acts. Indeed, shared meal times was specifically selected in this study as an activity to induce more time spent together as it would unlikely produce arousing or intimate effects (Aron et al., 2000). There are several people one could share a meal with (e.g., family, friends, co-workers), but cuddling is often reserved for close relationships (e.g., romantic partner or family), so increasing time spent together at meal times likely did not influence perceptions of quality of alternatives.

Commitment. The fourth hypothesis predicted that individuals in the treatment group (i.e., increased cuddling) would report higher commitment than individuals in the comparison group (i.e., increase shared meal time) and control group (i.e., no change). Data were consistent with this prediction. The fourth research question asked if individuals in the comparison and control group differed on their reports of commitment, and results indicate no differences between these groups.

Even with already high commitment means at T_1 across conditions (see Table 2), participants in the cuddling condition reported significantly more commitment four

weeks later compared to participants who increased shared meal times and those who did not change their behavior ($\eta^2 = .06$). As proposition 3 of AET predicts (Floyd, 2001), affection is crucial in developing pair bonds, and current results suggest that cuddling is a specific affectionate behavior that influences a commitment to staying in a relationship. By increasing commitment, relational partners are provided access to resources that would not otherwise be available (thereby increasing survival chances). Moreover, increasing feelings of commitment could also increase procreation success. For many participants in this sample, individuals reported having children with their romantic partner. When individuals are more committed to a partner, they are more likely to contribute to childbearing which improves the probability of their genetic line being passed on. It is also possible that increasing affectionate behavior through cuddling influences frequency and satisfaction of sexual encounters (Burleson et al., 2007), thereby increasing chances for reproduction.

Methodological Implications

The current findings provide several important methodological implications for researchers testing AET (Floyd, 2001) and for researchers utilizing experimental design. Much of the last decade in AET research has focused on examining the correlational relationship between affectionate communication and physiological health markers (Floyd & Riforgiate, 2008; Floyd et al., 2007; Floyd et al., 2014). In these studies, affectionate communication is often measured cross-sectionally with an index of affectionate communication behaviors (Floyd & Morman, 1998) or a scale of trait levels of affection (Floyd et al., 2010). These measures of affection are then compared to physiological markers that might differ over a day-long period or through a stress-

induced event in a laboratory (Hesse, Boren, & Veksler, 2014). This emerging focus on physiological markers of health and affectionate communication is important and valuable. However, the majority of this research does not manipulate participant's affectionate behavior to test the effects on health, with the exception of Floyd et al. (2009) and Pauley, Floyd, and Hesse (2015). Experimental design allows research to test causality claims and provides a more complete picture of how affectionate behaviors influence health. Using an experimental design in the current study, for example, we know more about how increasing affection through cuddling might influence four relational health markers.

Now that a wealth of literature has linked affectionate communication to psychological, physiological, and relational health outcomes, it would be valuable to include more experimental designs to manipulate affectionate behavior in the future. Presently, experimental designs have manipulated cuddling (the current study), kissing (Floyd et al., 2009), and positive relational talk and brief hugs (Pauley et al., 2015). Future studies may investigate other specific affectionate behaviors that are used as an index of affectionate communication, such as backrubs, saying "I love you," or sharing private information (Floyd & Morman, 1998).

As past research has suggested (Church, 1993), providing a pre-study incentive (both monetary and nonmonetary) is an effective strategy to retain participants in a study. The current study followed this recommendation and provided a monetary pre-study and post-study incentive to all participants. Additionally, a nonmonetary incentive was utilized; participants were told that their participation would provide important insight into how different types of interactions between partners influence romantic

relationships. Out of the original 91 participants, only 11 dropped out of the study, resulting in an 88% retention rate. Using this strategy provides important implications for future researchers of affectionate communication who wish to have a high retention rate in a four-week long experiment. However, caution must be taken when providing monetary incentives as some participants may be participating just for the monetary gains. Studies longer than four weeks may benefit from paying participants more than \$20 in Amazon.com gift cards, though past longitudinal studies have had success retaining participants without monetary incentives (e.g., Burleson et al., 2007).

Another methodological implication gained from the current study relates to the recruitment of participants and the diversity of the sample. Amazon's Mechanical Turk was used as the recruitment tool to find participants for this study (for a review of the benefits and limitations of Mechanical Turk, see Goodman, Cryder, & Cheema, 2013; Kees, Berry, Burton, & Sheehan, 2017; Paolacci, Chandler, & Ipeirotis, 2010). A convenient tool of the survey platform was distributing the survey only to married individuals (at an extra cost). Compared to a typical undergraduate student sample, Mechanical Turk provided a geographically diverse range of married individuals with a wide range of ages and household income. The survey was distributed to individuals living only in the United States (individuals from 29 states participated in the study), but Mechanical Turk allows researchers to select specific countries to send the survey to. This is a useful tool for future research designs as studies can transcend across different nations and cultures.

Limitations of Mechanical Turk should be considered before adopting the survey platform in future studies. It is possible that the quality of the data is compromised if

users are completing questionnaires for payment without sincere consideration of the survey questions or use software designed to complete questionnaires automatically (Paolacci & Chandler, 2014). Researchers can take steps to mitigate these limitations by selecting only master workers (i.e., Mechanical Turk users who have demonstrated accuracy and consistency across a variety of surveys), removing questionnaires that were completed too quickly, or embedding attention checks in the surveys (Oppenheimer, Meyvis, & Davidenko, 2009).

Clinical Implications

The findings in this study provide important implications for clinical practitioners such as marriage counselors and behavioral therapists, and for individuals in romantic relationships. Depending on the state of the relationship, clinical practitioners who work with long-term married couples may suggest an increase in time spent cuddling to promote feelings of relational quality. Current findings suggest that increased cuddling is beneficial for relational health, but claims may be limited to couples who are relatively satisfied. For couples who are in relational distress, the influence of cuddling on relational quality might look very different. Increasing affectionate behaviors during times of relational turmoil might do more harm than good to the relationship (L'Abate, 2001), although this is a speculative claim and requires empirical testing. Similarly, it is also possible that increasing affectionate behaviors for distressed couples could be beneficial. For example, data from Gullledge, Gullledge, and Stahmann's (2003) study of undergraduate college students suggest a significant and positive correlation between receiving and expressing physical affection and the ease of resolving conflict in romantic relationships. Taken together, how increased affection might influence unhappy couples

is likely a complex question. The type of conflict or relational turmoil present in the relationship, the threshold one has for affectionate communication, and idiosyncrasies of affectionate communication may all need to be taken into account before recommending increase in cuddling. This notwithstanding, current findings suggest that for relatively satisfied married couples looking to increase their relational quality (i.e., perceptions of relational satisfaction, quality of alternatives, and commitment), practitioners could suggest increasing the frequency and/or duration of cuddling at home.

Clinicians may provide married couples with a space and time for increased cuddling. Previous research has provided evidence for a positive relationship between affectionate touch and relational and psychological health in a laboratory setting (Grewen et al., 2005; Light, Grewen, & Amico, 2005). Married couples who have busy lives could use part of the session time as a space to increase their affectionate behavior through cuddling. However, one of the advancements of this study was exploring affectionate behavior in a naturalistic setting. Past research suggests a bidirectional causal relationship between physical affection and improved mood states and reduced stress (Burleson et al., 2007). Clinicians can also instruct married couples to increase their time and/or duration of cuddling in their own home. This way, couples are afforded the freedom to increase their cuddling behavior that suits their schedules.

Outside of a clinical setting, or for those couples not participating in frequent clinician sessions, relatively satisfied couples may also benefit from results of this study. Individuals could increase their cuddling behaviors with a romantic partner to gain the benefits of increased affectionate touch. Simply increasing the time spent or frequency of

cuddling with a romantic partner, couples could feel an increased sense of relational quality.

Given the considerable attention scholarship has given to affectionate touch in close relationships, it might be surmised that the benefits of receiving and expressing affection is only gained through close relationships. Indeed, researchers using AET would argue that the experience of affection is influenced by the relationship and context. Receiving a hug from a stranger versus a family member, for example, could be experienced very differently. Or, receiving a kiss from a romantic partner at home versus the work place, for example, could be responded to differently. Yet, Field's (2014) work on receiving massages from strangers might suggest that welcomed positive touch from a stranger can also be beneficial to one's health (although alternative explanations for her findings have not yet been tested). In fact, it is becoming more common that individuals with affection hunger are satisfying their affectionate needs by going to cuddling professionals (see websites such as thesnugglebunnies.com or cuddlist.com).

Cuddling professionals offer hourly or night-long cuddle sessions where clients are provided with safe, healthy, and nurturing touch (for a price). Explicit rules are provided to ensure only positive and non-sexual touch occurs. For example, clothes must be worn at all times and touch in swimsuit areas is strictly avoided. Cuddling is a behavior that is associated with a host of positive feelings such as feeling cared for and nurtured (van Anders et al., 2013). What is unclear in research so far, however, is whether cuddling from strangers provides the same positive experiences. Understandably, receiving unwanted cuddling from a stranger would be stress inducing, but voluntarily receiving cuddling from a stranger might be advantageous to one's health.

Pedagogical Implications

Findings also provide pedagogical implications for educators of interpersonal, relational, and family communication courses. Results of the current study can provide instructors with material to emphasize the importance of affectionate touch. Through discussion of affection exchange theory (Floyd, 2001), classroom discussion can include specific affectionate behavior that can have substantial influence on relational and physical health such as kissing (Floyd et al., 2009), or cuddling. As Sanders (2010) suggests, fostering conversations about theory and how theory translates to real-life implications, students are able to change their communication and improve their relationships. For example, while discussing affectionate exchange theory, instructors may encourage students to increase their cuddling behaviors with family or spouses that can result in considerable advantages to their relationships.

The classroom is also an effective context to begin a conversation about affection hunger (Floyd, 2015, p. 9). Affection hunger is experienced when one craves more affection than is received which can result in feelings of loneliness (Perlman & Peplau, 1981). Research suggests individuals who are lonely experience significant deleterious health and social effects compared to their non-lonely counterparts (Hawkley, Burleson, Berntson, & Cacioppo, 2003). Current findings provide a stepping stone to conversations about increasing affectionate touch through cuddling or other healthy affectionate touches.

Educators of research method courses might also consider teaching students how to use the Mechanical Turk survey platform. In these classes, students would benefit by

learning the advantages and disadvantages of Mechanical Turk (Paolacci et al., 2010) as well as how to include questions in their survey design to bolster data quality.

Strengths and Limitations

A core strength of the current study is the experimental design. Cross-sectional studies have been critiqued (Lindell & Whitney, 2001) as data provides only a one-moment-in-time glimpse at relational communication. With cross-sectional data, researchers are limited to identifying associations—rather than causal relationships—between variables. Using a four-week longitudinal experimental design allows for a clearer insight into the causal and dynamic interplay (Laurenceau & Bolger, 2005) between cuddling and relational health. Indeed, a change in a specific affectionate behavior (i.e., cuddling) caused improvements in relational health compared to individuals who did not change their affectionate behavior. It was only through an experimental design that this claim of causality was most compelling.

Additionally, including a comparison group that tests alternative explanations to hypotheses creates stronger methodological designs and strengthens findings. The alternate explanation in the current study is that it might not be cuddling that influences relational health, but increasing time spent together. Results revealed that individuals who increased their cuddling behavior did not differ on reports of investment compared to individuals who increased time spent together during meal times. This is another core strength of the current study: an alternative explanation was tested with a comparison group. A major critique of Field's (2014) program of massage research, for example, has been that she does not test for alternative explanations for the benefits of massage, such as spending time with another person, or increases in relational bonding. In Field's work

(e.g., 2013, 2001), experimental designs only included treatment and control conditions. Though Field's work has added important and meaningful contributions to the benefits of healthy touch, future methodological designs should include comparison groups to test alternate explanations for the effect. By including a comparison group in the current study, it can be concluded that increasing cuddling influences reports of relational satisfaction, quality of alternatives, and commitment above and beyond just spending time together at meal times.

Conducting the current experiment in a naturalistic setting is another strength. Although previous research examining the health effects of touch has used experimental designs in the past, it has often done so in laboratory settings (Grewen et al., 2005; Light, Grewen, & Amico, 2005). These studies provide important insight into the advantages of touch on health but lose the ability to examine these effects in a naturalistic setting. In this study, participants were instructed to increase their cuddling behavior or shared meal time at home. This bolsters ecological validity and thereby increases the researcher's ability to apply findings to real-life situations.

Another strength of the study is the diverse geographical and demographic sample. The sample included individuals from 29 states in the United States, a wide range of ages (24-74 years old), a range of educational level (from individuals who had received high school degrees to graduate degrees), and a range of household income (from \$75,000 or less to \$150,000 or more). Although findings cannot be generalized to married individuals outside of the United States, the demographically diverse sample strengthens the application of results to a range of married individuals. Caution, however, must be considered with findings as the current sample included married individuals with

higher-than-average relational satisfaction scores. Therefore, findings may not be generalizable to dissatisfied couples.

As with all research, certain limitations must be considered. A potential limitation to the currently study is the length of the experiment. It is possible, for example, that increasing perceptions of investment takes longer than four weeks. The sample in this study comprised long-term married individuals living with their spouses, who have likely developed their perceptions of investment over a long period of time (e.g., buying property together or having children). Changing affectionate behavior for one month might not be long enough to see an influence on perceptions of investment. Yet, it is equally possible that any extended length of time (above four weeks) in an experiment where participants change their cuddling behaviors also does not change perceptions of investment. And, what is more, there might come a point of diminishing returns. As cuddling frequency and duration increase for a longer period of time (say for 2, 4, 6 months), increased cuddling might become the same routine and may not have the sustained influence over time. Future researchers may want to select other relational health markers, then, to examine how cuddling or other affectionate behaviors influence perceptions of relational quality.

The sample in the current study could also be a limitation as the individuals who opted to participate in the experiment might be systematically different from individuals who chose not to participate. Individuals who participated in this study began with higher-than-average satisfaction and commitment scores, so findings may be generalized only to satisfied and long-term couples, but not distressed or new couples (a similar limitation to van Anders et al., 2013).

Directions for Future Research

Current findings provide new and important understanding for how increasing affection through cuddling influences relational health and provides new avenues for future research to explore. For example, the current study did not record other behaviors that occurred during cuddling. Past research indicates that cuddling occurs with several other behaviors such as daily routine or relational talk, kissing, massaging, watching TV, or sexual behaviors (van Anders et al., 2013; van Raalte & Floyd, 2016). It is possible that these other behaviors are influencing how affection is received, which in turn influences relational health outcomes. Future research may want to measure changes in these other behaviors as a way to control for them during statistical analyses and/or have participants record a daily diary about their cuddling episodes.

A second direction for future research that would help illuminate knowledge of how increasing affection through cuddling leads to relational health is examining increases of affection for unhappy relationships. It is not clear from the current study how increases in cuddling would influence relational health for couples who are extremely unhappy or who are in relational turmoil (e.g., cases of infidelity). As L'Abate (2001) speculated, increasing affectionate behaviors during times of relational distress could result in further harm to the relationship. This warrants empirical verification, however. It is also possible that increasing cuddling can help in times of conflict (Gulledge, Gulledge, & Stahmann, 2003), though how increased cuddling influences extremely dissatisfied couples is unclear. Comparably, the relational health effects of increased cuddling for those who are exceeding their threshold of affection is unclear. Proposition 5 of AET (Floyd, 2006) states that affectionate behaviors that violate one's threshold are

physiologically damaging; however, how these violations influence perceptions of relational quality are unclear.

Developing interventions that promote affectionate behaviors during times of stress would be a logical direction for future research. Several research studies have now connected the ameliorating effects of affection and affectionate communication on stress (Floyd & Riforgiate, 2008; Floyd et al., 2007; Floyd et al., 2010). For example, future research could use an experimental design to test whether increased cuddling during times of stress (e.g., being promoted or demoted at work, losing family members, major health diagnoses, or relocating), buffers the harmful physiological effects of stress.

Conclusion

A core aim of this study was to explore the relational health effects of cuddling. Through a longitudinal experimental design, findings indicate that increased cuddling for cohabitating married individuals caused increases in relational satisfaction and commitment above and beyond just spending time together with a romantic partner at meals, or not changing behavior at all. Findings provide important clinical and practical implications for individuals seeking to improve their relational health with a romantic partner. It is suggested that future research explore how increased cuddling benefits relational health for relationships that are unsatisfied or in relational turmoil, if at all. In sum, the methodology and results of this study provide compelling evidence for a causal relationship between cuddling and satisfaction and commitment for relatively satisfied couples.

REFERENCES

- Aron, A., Norman, C. C., Aron, E. N., McKenna, C., & Heyman, R. E. (2000). Couples' shared participation in novel and arousing activities and experienced relationship quality. *Journal of Personality and Social Psychology*, 78, 273-284. doi:10.1037//0022-3514.78.2.273
- Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, 117, 497-529. doi:10.1037/0033-2909.117.3.497
- Burgoon, J. K., & Hale, J. L. (1984). The fundamental topoi of relational communication. *Communication Monographs*, 51, 193-214. doi:10.1080/03637758409390195
- Burleson, M. H., Trevathan, W. R., & Todd, M. (2007). In the mood for love or vice versa? Exploring the relations among sexual activity, physical affection, affect, and stress in the daily lives of mid-aged women. *Archives of Sexual Behavior*, 36, 357-368. doi:10.1007/s10508-006-9071-7
- Charpak, N., Ruiz, J. G., Zupan, J., Cattaneo, A., Figueroa, Z., Tessier, R., ... Worku, B. (2005). Kangaroo mother care: 25 years after. *Acta Paediatrica*, 94, 514-522. doi:10.1111/j.1651-2227.2005.tb01930.x
- Church, A. H. (1993). Estimating the effect of incentives on mail survey response rates: a meta-analysis. *The Public Opinion Quarterly*, 57, 62-79. doi:10.1086/269355
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Cohen, S., Janicki-Deverts, D., Turner, R. B., & Doyle, W. J. (2015). Does hugging provide stress-buffering social support? A study of susceptibility to upper respiratory infection and illness. *Psychological Science*, 26, 135-147. doi:10.1177/0956797614559284
- Dainton, M., Stafford, L., & Canary, D. J. (1994). Maintenance strategies and physical affection as predictors of love, liking, and satisfaction in marriage. *Communication Reports*, 7, 88-98. doi:10.1080/08934219409367591

- Debrot, A., Meuwly, N., Muise, A., Impett, E. A., & Schoebi, D. (2017). More than just sex: Affection mediates the association between sexual activity and well-being. *Personality and Social Psychology Bulletin*, 1-13. doi:10.1177/0146167216684124
- Debrot, A., Schoebi, D., Perrez, M., & Horn, A. B. (2013). Touch as an interpersonal emotion regulation process in couples' daily lives: The mediating role of psychological intimacy. *Personality and Social Psychology Bulletin*, 39, 1373-1385. doi:10.1177/0146167213497592
- Derlega, V. J., Lewis, R. J., Harrison, S., Winstead, B. A., & Costanza, R. (1989). Gender differences in the initiation and attribution of tactile intimacy. *Journal of Nonverbal Behavior*, 13, 83-96. doi:10.1007/BF00990792
- Drescher, V. M., Whitehead, W. E., Morrill-Corbin, E. D., & Cataldo, M. F. (1985). Physiological and subjective reactions to being touched. *Psychophysiology* 22, 96-100. doi:10.1111/j.1469-8986.1985.tb01565.x
- Duck, S. W. (1994). *Meaningful relationships: Talking, sense, and relating*. Thousand Oaks, CA: Sage.
- Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39, 175-191. doi:10.3758/BF03193146
- Ferber, S. G., & Makhoul, I. R. (2008). Neurobehavioural assessment of skin-to-skin effects on reaction to pain in preterm infants: a randomized, controlled within-subject trial. *Acta Paediatrica*, 97, 171-176. doi:10.1111/j.1651-2227.2007.00607.x
- Field, T. (2010). Touch for socioemotional and physical wellbeing: A review. *Developmental Review*, 30, 367-383. doi:10.1016/j.dr.2011.01.001
- Field, T. (2014). *Touch* (2nd ed.). Cambridge, MA: MIT Press.
- Field, T., Diego, M., & Hernandez-Reif, M. (2010). Moderate pressure is essential for massage therapy effects. *International Journal of Neuroscience*, 120, 381-385. doi:10.3109/00207450903579475

- Field, T., Hernandez, R. M., Quintino, O., Schanberg, S., & Kuhn, C. (1998). Elder retired volunteers benefit from giving massage therapy to infants. *Journal of Applied Gerontology*, 17, 229-239. doi:10.1177/073346489801700210
- Field, T. M., Ironson, G., Scafidi, F., Nawrocki, T., Goncalves, A., Burman, I., ... Kuhn, C. (1996a). Massage therapy reduces anxiety and enhances EEG pattern of alertness and math computations. *International Journal of Neuroscience*, 86, 197-205. doi:10.3109/00207459608986710
- Field, T. M., Peck, M., Krugman, S., Tuchel, T., Schanberg, S., Kuhn, C., & Burman, I. (1998). Burn injuries benefit from massage therapy. *Journal of Burn Care and Rehabilitation*, 19, 241-244. doi:10.1097/00004630-199805000-00010
- Field, T. M., Seligman, S., Scafidi, F., & Schanberg, S. (1996b). Alleviating posttraumatic stress in children following Hurricane Andrew. *Journal of Applied Developmental Psychology*, 17, 37-50. doi:10.1016/S0193-3973(96)90004-0
- Floyd, K. (1997). Knowing when to say "I love you": An expectancy approach to affectionate communication. *Communication Research Reports*, 14, 321-330. doi:10.1080/08824099709388675
- Floyd, K. (1999). All touches are not created equal: Effects of form and duration on observers' interpretations of an embrace. *Journal of Nonverbal Behavior*, 23, 283-299. doi:10.1023/A:1021602926270
- Floyd, K. (2001). Human affection exchange: I. Reproductive probability as a predictor of men's affection with their sons. *The Journal of Men's Studies*, 10, 39-50. doi:10.3149/jms.1001.39
- Floyd, K. (2002). Human affection exchange: V. Attributes of the highly affectionate. *Communication Quarterly*, 50, 135-152. doi:10.1080/01463370209385653
- Floyd, K. (2006). *Communicating affection: Interpersonal behavior and social context*. Cambridge, England: Cambridge University Press.
- Floyd, K. (2015). *The loneliness cure: Six strategies for finding real connections in your life*. Avon, MA: Adams Media/Simon & Schuster.

- Floyd, K., Boren, J. P., Hannawa, A. F., Hesse, C., McEwan, B., & Veksler, A. E. (2009). Kissing in marital and cohabiting relationships: effects on blood lipids, stress, and relationship satisfaction. *Western Journal of Communication*, 73, 113-133. doi:10.1080/10570310902856071
- Floyd, K., Hess, J. A., Miczo, L. A., Halone, K. K., Mikkelsen, A. C., & Tusing, K. J. (2005). Human affection exchange: VIII. Further evidence of the benefits of expressed affection. *Communication Quarterly*, 53, 285-303. doi:10.1080/01463370500101071
- Floyd, F., Hesse, C., Boren, J. P., & Veksler, A. E. (2014). Affectionate communication can suppress immunity: Trait affection predicts antibodies to latent Epstein-Barr virus. *Southern Communication Journal*, 79, 2-13. doi:10.1080/1041794X.2013.858178
- Floyd, K., Mikkelsen, A. C., Hesse, C., & Pauley, P. M. (2007). Affectionate writing reduces total cholesterol: Two randomized, controlled trials. *Human Communication Research*, 33, 119-142. doi:10.1111/j.1468-2958.2007.00293.x
- Floyd, K., & Morman, M. T. (1997). Affectionate communication in nonromantic relationships: Influences of communicator, relational, and contextual factors. *Western Journal of Communication*, 61, 279-298. doi:10.1080/10570319709374578
- Floyd, K., & Morman, M. T. (1998). The measurement of affectionate communication. *Communication Quarterly*, 46, 144-162. doi:10.1080/01463379809370092
- Floyd, K., & Morman, M. T. (2001). Human affection exchange: III. Discriminative parental solicitude in men's affection with their biological and non-biological sons. *Communication Quarterly*, 49, 310-327. doi:10.1080/01463370109385631
- Floyd, K., Pauley, P. M., & Hesse, C. (2010). State and trait affectionate communication buffer adults' stress reactions. *Communication Monographs*, 77, 618-636. doi:10.1080/03637751.2010.498792
- Floyd, K., & Riforgiate, S. (2008). Affectionate communication received from spouses predicts stress hormone levels in healthy adults. *Communication Monographs*, 75, 351-368. doi:10.1080/03637750802512371

- Goodman, J. K., Cryder, C. E., & Cheema, A. (2013). Data collection in a flat world: The strengths and weaknesses of Mechanical Turk samples. *Journal of Behavioral Decision Making*, 26, 213-224. doi:10.1002/bdm.1753
- Grewen, K. M., Girdler, S. S., Amico, J., & Light, K. C. (2005). Effects of partner support on resting oxytocin, cortisol, norepinephrine, and blood pressure before and after warm partner contact. *Psychosomatic Medicine*, 67, 531-538. doi:10.1097/01.psy.0000170341.88395.47
- Gulledge, A. K., Gulledge, M. H., & Stahmann, R. F. (2003). Romantic physical affection types and relationship satisfaction. *The American Journal of Family Therapy*, 31, 233-242. doi:10.1080/01926180390201936
- Hair, J. F., Black, B., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivariate data analysis* (6th ed.). New York, NY: Prentice Hall.
- Hawkey, L. C., Burleson, M. H., Berntson, G. G., & Cacioppo, J. T. (2003). Loneliness in everyday life: Cardiovascular activity, psychosocial context, and health behaviors. *Journal of Personality and Social Psychology*, 85, 105-120. doi:10.1037/0022-3514.85.1.105
- Hendrick S. S., & Hendrick, C. (1997). Love and satisfaction. In R. J. Sternberg & M. Hojjat (Eds.), *Satisfaction in close relationships* (pp. 56-78) New York: Guilford.
- Holt-Lunstad, J., Birmingham, W., & Jones, B. Q. (2008). Is there something unique about marriage? The relative impact of marital status, relationship quality, and network social support on ambulatory blood pressure and mental health. *Annals of Behavioral Medicine*, 35, 239-244. doi:10.1007/s12160-008-9018-y
- Horan, S. M. (2012). Affection exchange theory and perceptions of relational transgressions. *Western Journal of Communication*, 76, 109-126. doi:10.1080/10570314.2011.651548
- Horan, S. M., & Booth-Butterfield, M. (2010). Investing in affection: An investigation of affection exchange theory and relational qualities. *Communication Quarterly*, 58, 394-413. doi:10.1080/01463373.2010.524876

- Horan, S. M., & Booth-Butterfield, M. (2011). Is it worth lying for? Physiological and emotional implications of recalled deceptive affection. *Human Communication Research*, 37, 78-106. doi:10.1111/j.1468-2958.2010.01394.x
- Hughes, S. M., & Kruger, D. J. (2011). Sex differences in post-coital behaviors in long- and short-term mating: An evolutionary perspective. *The Journal of Sex Research*, 48, 496-505. doi:10.1080/00224499.2010.501915
- Hunter, J. E., & Schmidt, F. L. (1990). *Methods of meta-analysis: Correcting error and bias in research findings*. Newbury Park, CA: Sage.
- Immerman, R. S., & Mackey, W. C. (2003). Perspectives on human attachment (pair bonding): Eve's unique legacy of a canine analogue. *Evolutionary Psychology*, 1, 138-154. doi:10.1177/147470490300100110
- Ironson, G., Field, T., Scafidi, F., Kumar, M., Patarca, R., Price, A., ... Fletcher, M. (1996). Massage therapy is associated with enhancement of the immune system's cytotoxic capacity. *International Journal of Neuroscience*, 84, 205-218. doi:10.3109/00207459608987266
- Kaler, S. R., & Freeman, B. J. (1994). An analysis of environmental deprivation: Cognitive and social development in Romanian orphans. *Journal of Child Psychology and Psychiatry*, 35, 769-781. doi:10.1111/j.1469-7610.1994.tb01220.x
- Kees, J., Berry, C., Burton S., & Sheehan, K. (2017). An analysis of data quality: Professional panels, student subject pools, and Amazon's Mechanical Turk. *Journal of Advertising*, 46, 141-155. doi:10.1080/00913367.2016.1269304
- Keppel, G., & Wickens, T. D. (2004). *Design and analysis: A researcher's handbook* (4th ed.). Upper Saddle River, NJ: Prentice Hall.
- L'Abate, L. (2001). Hugging, holding, huddling and cuddling (3HC). *Journal of Clinical Activities, Assignments & Handouts in Psychotherapy Practice*, 1, 5-18. doi:10.1300/J182v01n01_02
- Laurenceau, J., & Bolger, N. (2005). Using diary methods to study marital and family processes. *Journal of Family Psychology*, 19, 86-97. doi:10.1037/0893-3200.19.1.86

- Le, B., & Agnew, C. (2003). Commitment and its theorized determinants: A meta-analysis of the investment model. *Personal Relationships*, 10, 37-57. doi:10.1111/1475-6811.00035
- Light, K. C., Grewen, K. M., & Amico, J. (2005). More frequent partner hugs and higher oxytocin levels are linked to lower blood pressure and heart rate in premenopausal women. *Biological Psychology*, 69, 5-21. doi:10.1016/j.biopsycho.2004.11.002
- Lindell, M. K., & Whitney, D. J. (2001). Accounting for common method variance in cross-sectional research designs. *Journal of Applied Psychology*, 86, 114-121. doi:10.1037//0021-9010.86.1.114
- Muise, A., Giang, E., & Impett, E. A. (2014). Post sex affectionate exchanges promote sexual and relationship satisfaction. *Archives of Sexual Behavior*, 43, 1291-1402. doi:10.1007/s10508-014-0305-3
- Nilsen, W. J., & Vrana, S. R. (1998). Some touching situations: The relationship between gender and contextual variables in physiological responses to human touch. *Annals of Behavioral Medicine*, 20, 270-276. doi:10.1007/BF02886376
- Oppenheimer, D. M., Meyvis, T., & Davidenko, N. (2009). Instructional manipulation checks: Detecting satisficing to increase statistical power. *Journal of Experimental Social Psychology*, 45, 867-872. doi:10.1016/j.jesp.2009.03.009
- Paolacci, G., & Chandler, J. (2014). Inside the Turk: Understanding Mechanical Turk as a participant pool. *Current Directions in Psychological Science* 23, 184-188. doi:10.1177/0963721414531598
- Paolacci, G., Chandler, J., & Ipeirotis, P. G. (2010). Running experiments on Amazon Mechanical Turk. *Judgment and Decision Making*, 5(5), 411-419.
- Pauley, P. M., Floyd, K., & Hesse, C. (2015). The stress-buffering effects of a brief dyadic interaction before an acute stressor. *Health Communication*, 30, 646-659. doi:10.1080/10410236.2014.888385
- Perlman, D., & Peplau, L. A. (1981). Toward a social psychology of loneliness. In R. Gillmour & S. Duck (Eds.), *Personal relationships 3: Personal relationships in disorder* (pp. 31-56). London, England: Academic Press.

- Rabinowitz, F. E. (1991). The male-to-male embrace: Breaking the touch taboo in a men's therapy group. *Journal of Counseling and Development*, 69, 574-576. doi:10.1002/j.1556-6676.1991.tb02648.x
- Reissman, C., Aron, A., & Bergen, M. R. (1993). Shared activities and marital satisfaction: Causal direction and self-expansion versus boredom. *Journal of Social and Personal Relationships*, 10, 243-254. doi:10.1177/026540759301000205
- Roberts, N. A., Tsai, J. L., & Coan, J. A. (2007). Emotion elicitation using dyadic interaction tasks. In J. S. Coan & J. J. B. Allen (Eds.), *Handbook of emotion elicitation and assessment* (pp. 106-23). Oxford, England: Oxford University Press.
- Rusbult, C. E. (1980). Commitment and satisfaction in romantic associations: A test of the Investment Model. *Journal of Experimental Social Psychology*, 16, 172-186. doi:10.1016/0022-1031(80)90007-4
- Rusbult, C. E., Martz, J. M., & Agnew, C. R. (1998). The Investment Model Scale: Measuring commitment level, satisfaction level, quality of alternatives, and investment size. *Personal Relationships*, 5, 357-391. doi:10.1111/j.1475-6811.1998.tb00177.x
- Rutter, M. (1998). Developmental catch-up, and deficit, following adoption after severe global early privation. English and Romanian Adoptees (ERA) Study Team. *Journal of Child Psychology and Psychiatry*, 39, 465-476. doi:10.1111/1469-7610.00343
- Sanders, M. L. (2010). The interpersonal development project: Bridging theory and practice in interpersonal communication courses. *Communication Teacher*, 24, 165-169. doi:10.1080/17404622.2010.489191
- Sedikides, C., Oliver, M. B., & Campbell, W. K. (1994). Perceived benefits and costs of romantic relationships for women and men: Implications for exchange theory. *Personal Relationships*, 1, 5-21. doi:10.1111/j.1475-6811.1994.tb00052.x
- Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. Boston, MA: Houghton Mifflin Company.

- Stackert, R. A., & Bursik, K. (2003). Why am I unsatisfied? Adult attachment style, gendered irrational relationship beliefs, and young adult romantic relationship satisfaction. *Personality and Individual Differences*, 34, 1419-1429. doi:10.1016/s0191-8869(02)00124-1
- Tabachnick, B. G., & Fidell, L. S. (1996). *Using multivariate statistics* (3rd ed.). Boston, MA: Allyn & Bacon.
- van Anders, S. M., Edelstein, R. S., Wade, R. M., & Samples-Steele, C. R. (2013). Descriptive experiences and sexual vs. nurturant aspects of cuddling between adult romantic partners. *Archives of Sexual Behavior*, 42, 553-560. doi:10.1007/s10508-012-0014-8
- van Raalte, L. J., & Floyd, K. (2016, July). "*Honey, come back to bed*": A descriptive study of cuddling in romantic relationships. Paper presented at the annual meeting of the International Association for Relationship Research, Toronto, Canada.
- Vrana, S. R., & Rollock, D. (1998). Physiological response to a minimal social encounter: Effects of gender, ethnicity, and social context. *Psychophysiology*, 35, 462-469. doi:10.1111/1469-8986.3540462

APPENDIX A
IRB APPROVAL FORM

APPROVAL: EXPEDITED REVIEW

Paul Mongeau
Human Communication, Hugh Downs School of
480/965-3773
Paul.Mongeau@asu.edu

Dear Paul Mongeau:

On 10/29/2016 the ASU IRB reviewed the following protocol:

Type of Review:	Initial Study
Title:	The Influence of Cuddling on Relational Health for Cohabiting Couples – Full Study
Investigator	Paul Mongeau
IRB ID:	STUDY00005207
Category of review:	(7)(b) Social science methods, (7)(a) Behavioral research
Funding:	Name: Human Communication, Hugh Downs School of
Grant Title:	
Grant ID:	
Documents Reviewed:	<ul style="list-style-type: none"> • 2_Interim Survey.pdf, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • 1_Post-Study Survey.pdf, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • 1_Full Study_HRP-503a-TEMPLATE_PROTOCOL_SocialBehavioralV02-10- • 15.docx, Category: IRB Protocol; • 1_Invite to Full Study Survey.pdf, Category: Measures (Survey questions/Interview questions/interview guides/focus group questions); • Consent form - Post-Study Survey.pdf, Category: Consent Form; • 1_Consent Form - Invite to Full Study.pdf, Category: Consent Form; • 1_Consent Form - Screening MTurk.pdf, Category: Consent Form; • 2_Screening Survey.pdf, Category: Measures (Survey questions/Interview questions /interview

	guides/focus group questions); <ul style="list-style-type: none"> • Correspondence Emails_Texts.pdf, Category: Recruitment Materials; • 1_Consent Form - Interim Survey.pdf, Category: Consent Form; • Sources of Funds.pdf, Category: Other (to reflect anything not captured above);
--	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

The IRB approved the protocol from 10/29/2016 to 10/28/2017 inclusive. Three weeks before 10/28/2017 you are to submit a completed Continuing Review application and required attachments to request continuing approval or closure.

If continuing review approval is not granted before the expiration date of 10/28/2017 approval of this protocol expires on that date. When consent is appropriate, you must use final, watermarked versions available under the “Documents” tab in ERA-IRB.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

Sincerely,

IRB Administrator

cc: Lisa van Raalte
Mary Burleson
Lisa van Raalte

APPENDIX B

PRESCREENING INFORMATION AND CONSENT FORM

Hello,

I am doctoral student working under the direction of Professor Paul Mongeau in the Hugh Downs School of Human Communication at Arizona State University. I am conducting a research study designed to gain information about cohabiting romantic couples.

I am inviting your participation to an online survey which should take approximately 15-20 minutes to complete. To participate in this study, you must be (a) be at least 18 years of age, (b) be able to speak and read English, (c) be part of an opposite-sex romantic relationship, (d) and have been living with a romantic partner. Only if you meet these qualifications will you be paid for your participation through Mechanical Turk. Payment for this online survey through Mechanical Turk is \$.75.

The online survey you answer today includes questions about yourself (e.g., age, income, education level, etc.) and questions about the different kinds of interactions you've had with your romantic partner. You will be asked to complete scales that ask about your relational quality (such as social support, affection behavior, and commitment) and you will be asked to respond to questions about your sex life.

After participating in this online survey, we will be able to determine your eligibility for a four-week long study where you could receive up to \$20 in Amazon.com gift cards. If you qualify for the full study, I will contact you via email, describe the nature of the study, and invite your participation. In the four-week study, you will be asked to complete a similar, but shorter, survey to the survey you are doing today once a week for four weeks and you may be asked to modify some of your daily routines as part of the study.

If you agree to participate in the second part of the study, you will be sent a \$10 Amazon.com gift card before the study begins and a \$10 Amazon.com gift card once you have finished the last survey. All eligible participants are eligible to receive up to \$20 in Amazon.com gift cards. *You will NOT receive any compensation for the current online survey, this is just to determine if you qualify for the full study.*

Your participation in this study is voluntary. You can skip questions if you wish. You may choose not to participate or to withdraw from the study at any time without penalty.

Your responses in the online questionnaire are important and will be used to gain a better understanding of how different types of interactions between partners influence romantic relationships. One benefit of participating is the potential to receive Amazon.com gift cards. There are no foreseeable risks or discomforts to your participation.

Your responses will be confidential. You will be asked to report your initials and birthdate, but this is done so that we can match these responses that you might provide in future surveys. You will also be asked for your email address, but this information will only be seen by the researchers in the study, will remain confidential, and will be

destroyed at the end of the study. This information is needed to distribute the gift cards if you qualify and agree to participate in the four-week full study. The results of this study may be used in reports, presentations, or publications but your personal information will not be known.

If you have any questions concerning the research study, please contact Paul Mongeau at 480.965.3773. This study has been reviewed and approved by the Arizona State University Institutional Review Board. If you have any questions about your rights as a subject/participant in this research, or if you feel you have been placed at risk, you can contact the Institutional Review Board, through the ASU Office of Research Integrity and Assurance, at (480) 965-6788.”

Clicking the ‘next’ button will be considered your consent to participate in this study.

Sincerely,

Lisa van Raalte
Paul Mongeau

APPENDIX C

EMAIL RECRUITMENT FOR FULL STUDY

Hello,

I am contacting you because your responses in the Romantic Relationships Study survey on Mechanical Turk qualified you to participate in the four-week long full study. Below I describe more information about what the study entails and what you would be asked to do.

[INCLUDE HERE ONE OF THREE SCRIPTS BELOW]:

Script 1:

Over a **four-week period**, we would like you and your romantic partner to **cuddle more**. You should continue cuddling the way you normally do but more often and/or for longer periods of time.

For example, if you typically cuddle for 30 minutes, you could cuddle for 45 minutes. Or if you cuddle four times a week, you could cuddle nearly every day. You could increase the length of each cuddle, increase the number of times you cuddle, OR a combination of both. It's up to you. The point is that for the **four-week period**, the two of you should **cuddle more** than you typically do right now.

We hope you will enjoy this part of the study. Please share these instructions with your partner; we hope you will both make **increased cuddling** a priority over the **four-week period**.

Cuddling is defined as intimate, physical, and loving contact that does not involve sexual behavior and that involves some degree of whole body touching.

Script 2:

Over a **four-week period**, we would like you and your romantic partner to **spend more time together at meal times**. You should continue eating together as you normally do but more often and/or for longer periods of time.

For example, you could spend more time prepping and cooking the meal together, eating together, cleaning up together, or even shopping for food together. You could choose to increase the length of each meal time together, increase the number of times you share meals together, OR a combination of both. It's up to you. The point is that for a **four-week period**, the two of you should **spend more time together at meal times** more than you typically do right now.

We hope you will enjoy this part of the study. Please share these instructions with your partner; we hope you will both make **increased meal time** together a priority over the **four-week period**.

Script 3:

Over a **four-week period**, we would like you and your romantic partner to maintain your normal routine. We are simply interested in how couples interact over time. You will be contacted throughout the study to respond to some questions online. We hope that these responses will help us assess the daily life of romantic couples who live together.

Additionally, you will complete a brief online survey (about 10-15 minutes each time) once a week over the course of the study. *If you agree to participate in the four-week long study, these instructions will be sent to you again on a Sunday so you may begin the study on a Monday.* You will receive an email or text reminder over the week.

Your participation in this study is voluntary. Your responses in the surveys will be confidential. You will be asked to report your initials and birthdate each time you take the survey so we may match your responses to future surveys. You can skip questions or decide not to participate at any time. There will be no penalty if you decide not to participate.

If you agree to participate in the study and complete a very brief survey, I will send you a \$10 Amazon.com gift card. If you complete all future online surveys and a short post-study survey, you will receive another \$10 Amazon.com gift card. This is our way to thank you for your important contributions to the study.

While receiving Amazon.com gift cards might be viewed as a benefit, other benefits of your participation include contributing to a better understanding of these relationships. There are no foreseeable risks or discomforts to your participation.

If you have any questions concerning the research study, please contact Dr. Paul Mongeau at 480.965.3773.

Completing and submitting this brief survey represents your willingness and consent to participate in the study.

INSERT LINK HERE

If you have any questions, please do not hesitate to contact me or Dr. Mongeau via email. We can also set up a time to talk over the phone if you prefer.

Best,

Lisa van Raalte
lvanraal@asu.edu

Paul Mongeau
Paul.Mongeau@asu.edu

APPENDIX D

EMAIL TO BEGIN FULL STUDY

TREATMENT CONDITION – INCREASE CUDDLING:

Hello,

Thank you for agreeing to participate in the 4-week long romantic relationship study! Your pre-study \$10 Amazon.com gift card has just been sent to you. You will receive a second \$10 gift card at the end of the study.

Please read through the following instructions again and **begin the study tomorrow**. I will send you reminders over the course of the study with these instructions as well as a short online survey to complete on Friday this coming week. *The online surveys should only be completed by you (not with your romantic partner).*

Over a **four-week period (BEGINNING TOMORROW)**, we would like you and your romantic partner to **cuddle more**. You should continue cuddling the way you normally do but more often and/or for longer periods of time.

For example, if you typically cuddle for 30 minutes, you could cuddle for 45 minutes. Or if you cuddle four times a week, you could cuddle nearly every day. You could increase the length of each cuddle, increase the number of times you cuddle, OR a combination of both. It's up to you. The point is that for the **four-week period**, the two of you should **cuddle more** than you typically do right now.

We hope you will enjoy this part of the study. Please share these instructions with your partner; we hope you will both make **increased cuddling** a priority over the **four-week period**.

Cuddling is defined as intimate, physical, and loving contact that does not involve sexual behavior and that involves some degree of whole body touching.

Please let me know if you have any questions.

Thank you,

Lisa

COMPARISONS CONDITION – INCREASE MEAL TIME:

Hello,

Thank you for agreeing to participate in the 4-week long romantic relationship study! Your pre-study \$10 Amazon.com gift card has just been sent to you. You will receive a second \$10 gift card at the end of the study.

Please read through the following instructions again and **begin the study tomorrow (Monday)**. I will send you reminders over the course of the study with these instructions as well as a short online survey to complete on Friday this coming week. *The online surveys should only be completed by you (not with your romantic partner).*

Over a **four-week period (STARTING MONDAY TOMORROW)**, we would like you and your romantic partner to **spend more time together at meal times**. You should continue eating together as you normally do but more often and/or for longer periods of time.

For example, you could spend more time prepping and cooking the meal together, eating together, cleaning up together, or even shopping for food together. You could choose to increase the length of each meal time together, increase the number of times you share meals together, OR a combination of both. It's up to you. The point is that for a **four-week period**, the two of you should **spend more time together at meal times** more than you typically do right now.

We hope you will enjoy this part of the study. Please share these instructions with your partner; we hope you will both make **increased meal time** together a priority over the **four-week period**.

Please let me know if you have any questions.

Thank you,

Lisa

CONTROL CONDITION - NO CHANGE:

Hello,

Thank you for agreeing to participate in the 4-week long romantic relationship study! Your pre-study \$10 Amazon.com gift card has just been sent to you. You will receive a second \$10 gift card at the end of the study.

Please read through the following instructions again and **begin the study tomorrow**. I will send you reminders over the course of the study with these instructions as well as a short online survey to complete on Friday this coming week. *The online surveys should only be completed by you (not with your romantic partner).*

Over a **four-week period (STARTING TOMORROW)**, we would like you and your romantic partner to maintain your normal routine. We are simply interested in how couples interact over time. You will be contacted throughout the study to respond to some questions online. We hope that these responses will help us assess the daily life of romantic couples who live together.

Please let me know if you have any questions.

Thank you,

Lisa

APPENDIX E

REMINDER OF STUDY INSTRUCTIONS

TREATMENT CONDITION – INCREASE CUDDLING:

Good morning,

This email is simply a friendly reminder of the instructions sent to you at the beginning of the Romantic Relationship Study.

You have been asked to **cuddle more with your romantic partner**. You should continue cuddling the way you normally do but **more often and/or for longer periods of time**. You could increase the length of each cuddle, increase the number of times you cuddle, OR a combination of both. It's up to you. The point is that for the **four-week period**, the two of you should **cuddle more** than you typically do right now.

This Friday you will be sent a link to complete a mid-study online survey.

Thank you,

Lisa

COMPARISON CONDITION – INCREASE MEAL TIME:

Good morning,

This email is simply a friendly reminder of the instructions sent to you at the beginning of the Romantic Relationship Study.

You have been asked to **spend more time together at meal times with your romantic partner**. You should continue eating together as you normally do but **more often and/or for longer periods of time**. You could choose to increase the length of each meal time together, increase the number of times you share meals together, OR a combination of both.

This Friday you will be sent a link to complete a mid-study online survey.

Thank you,

Lisa

CONTROL CONDITION – NO CHANGE:

Good morning,

This email is simply a friendly reminder of the instructions sent to you at the beginning of the Romantic Relationship Study.

Over a **four-week period**, we would like you and your romantic partner to maintain your normal routine. We are simply interested in how couples interact over time. We hope that these responses will help us assess the daily life of romantic couples who live together.

This Friday you will be sent a link to complete a mid-study online survey.

Thank you,

Lisa

APPENDIX F
INTERIM SURVEY EMAIL

TREATMENT GROUP - CUDDLING VERISON:

Hello,

Thank you for your continued participation in the Romantic Relationship Study!

Please find below the first mid-study online survey that you should **complete today (Friday) or by Sunday at the latest. The survey link will close on Sunday at 11:59pm MST.**

Please answer all questions in the survey to the best of your ability. Remember, the second \$10 Amazon.com gift card will be distributed only after all online surveys are completed. You will be sent this survey again next week on Friday.

The questions in the survey are the same questions you have already completed before.

INSERT LINK HERE

As a reminder, continue this week with the following instructions:

For the rest of the study, we would like you and your romantic partner to **cuddle more**. You should continue cuddling the way you normally do but more often and/or for longer periods of time.

For example, if you typically cuddle for 30 minutes, you could cuddle for 45 minutes. Or if you cuddle four times a week, you could cuddle nearly every day. You could increase the length of each cuddle, increase the number of times you cuddle, OR a combination of both. It's up to you. The point is that **for the rest of the study**, the two of you should **cuddle more** than you typically do right now.

We hope you will enjoy this part of the study. Please share these instructions with your partner; we hope you will both make **increased cuddling** a priority for the **rest of the study**.

Cuddling is defined as intimate, physical, and loving contact that does not involve sexual behavior and that involves some degree of whole body touching.

Please contact Lisa if you have any questions.

Lisa

COMPARISON GROUP - MEAL TIME VERSION

Hello,

Thank you for your continued participation in the Romantic Relationship Study!

Please find below the first mid-study online survey that you should **complete today (Friday) or by Sunday at the latest. The survey link will close on Sunday at 11:59pm MST.**

Please answer all questions in the survey to the best of your ability. Remember, the second \$10 Amazon.com gift card will be distributed only after all online surveys are completed. You will be sent this survey again next week on Friday.

The questions in the survey are the same questions you have already completed before.

INSERT LINK HERE

As a reminder, continue this week with the following instructions:

For the rest of the study, we would like you and your romantic partner to **spend more time together at meal times**. You should continue eating together as you normally do but more often and/or for longer periods of time.

For example, you could spend more time prepping and cooking the meal together, eating together, cleaning up together, or even shopping for food together. You could choose to increase the length of each meal time together, increase the number of times you share meals together, OR a combination of both. It's up to you. The point is that **for the rest of the study**, the two of you should **spend more time together at meal times** more than you typically do right now.

We hope you will enjoy this part of the study. Please share these instructions with your partner; we hope you will both make **increased meal time** together a priority over **the rest of the study**.

Please contact Lisa if you have any questions.

Lisa

CONTROL CONDITION – NO CHANGE

Hello,

Thank you for your continued participation in the Romantic Relationship Study!

Please find below the first mid-study online survey that you should **complete today (Friday) or by Sunday at the latest. The survey link will close on Sunday at 11:59pm MST.**

Please answer all questions in the survey to the best of your ability. Remember, the second \$10 Amazon.com gift card will be distributed only after all online surveys are completed. You will be sent this survey again next week on Friday.

The questions in the survey are the same questions you have already completed before.

INSERT LINK HERE

As a reminder, continue this week with the following instructions:

For the rest of the study, we would like you and your romantic partner to **maintain your normal routine**. We are simply interested in how couples interact over time. You will be contacted throughout the study to respond to some questions online. We hope that these responses will help us assess the daily life of romantic couples who live together.

Please contact Lisa if you have any questions.

Lisa

APPENDIX G

POST-STUDY EMAIL

Hello,

Thank you for participating in the Romantic Relationship Study! We hope you enjoyed the study.

Please find below the last survey link for you to complete. Once this last survey is complete, you will be sent a \$10 Amazon.com gift card to the email of your choice. The gift card will be sent within 1 week of your response.

INSERT LINK HERE

Please email Lisa if you have any questions.

Lisa
lvanraal@asu.edu

APPENDIX H
SURVEY MEASURES

Matching Questions

Directions: The following two questions are for future survey matching purposes only. Your responses will remain confidential and will not be connected to you in any way.

What are your initials? Please include your first, middle, and last initials (e.g., LVR). Do NOT include periods or spaces.

What is your birthdate? Please use the mm/dd/yyyy format.

Relational Health Measures

9-Point Likert-Type Scale (0 = *do not agree at all*; 8 = *agree completely*).

Directions: The following items will ask you about aspects of your romantic relationship. Considering your romantic partner, please indicate how much you agree or disagree with the following statements.

Relational Satisfaction Items:

1. I feel satisfied with our relationship.
2. Our relationship does a good job of fulfilling my needs for intimacy, companionship, etc.
3. My relationship is much better than others' relationships.
4. My relationship is close to ideal.
5. Our relationship makes me very happy.

Investment Items:

1. I feel very involved in our relationship - like I have put a great deal into it.
2. Compared to other people I know, I have invested a great deal in my relationship with my partner.
3. I have put a great deal into our relationship that I would lose if the relationship were to end.
4. Many aspects of my life have become linked to my partner (recreational activities, etc.), and I would lose all of this if we were to break up.
5. My relationships with friends and family members would be complicated if my partner and I were to break up (e.g., partner is friends with people I care about).

Quality of Alternatives Items:

1. My alternatives to our relationship are close to ideal (dating another, spending time with friends or on my own, etc.).
2. My needs for intimacy, companionship, etc., could easily be fulfilled in an alternative relationship.

3. If I weren't with my partner, I would do fine - I would find another appealing person to date.
4. The people other than my partner with whom I might become involved are very appealing.
5. My alternatives are attractive to me (dating another, spending time with friends or on my own, etc.).

Commitment Items:

1. I am oriented toward the long term future of my relationship (for example, I imagine being with my partner several years from now).
2. I want our relationship to last for a very long time.
3. I am committed to maintaining my relationship with my partner.
4. I would not feel very upset if our relationship were to end in the near future.
5. I want our relationship to last forever.
6. It is likely that I will date someone other than my partner within the next year.
7. I feel very attached to our relationship - very strongly linked to my partner.

Manipulations and Potential Control Scale Items

5-Point Likert Scale (1 = *strongly disagree*; 5 = *strongly agree*).

Directions: Think about your relationship over the last 2-3 days. Please indicate your agreement to the following statements regarding your relationship.

Treatment check items

1. My romantic partner and I have been cuddling more (treatment check).
2. I have been cuddling with my romantic partner more often (treatment check).
3. My romantic partner and I have been in physical contact more often (treatment check).

Comparison check items

4. My romantic partner and I have been spending more time eating together than usual (comparison check).
5. My romantic partner and I have had more meals together lately (comparison check).
6. My romantic partner and I have been spending more time cooking together (comparison check).

Sexual activity items

7. The quality of our sexual activity has been better.
8. My romantic partner and I have been engaging in sexual activity more often.
9. My romantic partner and I have been kissing more often.

Conflict items

10. My romantic partner and I have been experiencing more conflict than we normally do.
11. My romantic partner and I have fought more than we typically do.

Verbal affection items

12. I have been giving my partner more compliments.
13. My romantic partner and I have verbally expressed our love more often than we normally do.
14. My romantic partner and I have been more open with each other.

Sleep items

15. I have been falling asleep a lot quicker than I normally do.
16. I have experienced fewer interruptions while sleeping.
17. I have felt more rested than normal.

Random items

18. I have spent more time with my romantic partner than usual.
19. I have been in my partner's presence more often than usual.
20. My romantic partner and I have been doing a lot more favors for each other.
21. My romantic partner and I have been exercising more often than usual.
22. The communication with my romantic partner has been better.
23. My romantic partner and I have been more positive with each other.
24. I have felt more relaxed than usual.
25. I have been more aware of my nutrition lately.

Demographic and Qualifying Questions

What is your biological sex?

Male

Female

How old are you?

What ethnicity do you most closely identify with?

White/Caucasian
Asian
African American
Hispanic/Latino
Hawaiian/Pacific Islander
Native American
Other

Are you in a romantic relationship?

Yes
No

Do you live with your romantic partner?

Yes
No

Are you and your romantic partner married?

Yes
No
No, but we're engaged.

Are you comfortable reading and speaking English?

Yes
No
Maybe

How long have you lived with your romantic partner?

Less than 1 month
1-2 months
3-6 months
7-12 months
1+ years
5+ years
10+ years
20+ years
30+ years
40+ years

Do you and/or your romantic partner have children?

Yes, and they live in our household.
Yes, but they do NOT live in our household.
No, we do not have children.

If applicable, how many children do you have living at home with you?

1
2

3
4
5
6+

If applicable, how old is each of your children?

Child 1
Child 2
Child 3
Child 4
Child 5
Child 6

What is your highest level of education?

High school degree
Associates degree
Some college but no degree.
Bachelors degree
Masters degree
PhD degree
Other

What is your combined household income?

\$10,000 or less
\$25,000 or less
\$50,000 or less
\$75,000 or less
\$100,000 or less
\$150,000 or less
\$200,000 or less
More than \$200,000
I'd rather not say.

Are you and your partner pregnant or trying to become pregnant?

No, we are not pregnant and we are not trying to get pregnant.
No, we are not pregnant but we are trying to get pregnant.
Yes, we are currently pregnant.

APPENDIX I

TABLE 1

Table 1

Means and Standard Deviations for Items Used in Manipulation Check

	Treatment	Comparison	Control
	Group	Group	Group
Item	<i>M/SD</i>	<i>M/SD</i>	<i>M/SD</i>
My romantic partner and I have been cuddling more.	5.52/1.69	4.67/2.47	3.68/1.91
I have been cuddling with my romantic partner more often.	5.52/1.64	4.53/2.43	3.60/1.94
My romantic partner and I have been in physical contact more often.	5.36/1.80	4.67/1.95	3.96/1.95
My romantic partner and I have been spending more time eating together than usual.	4.24/2.17	5.60/1.92	3.64/1.91
My romantic partner and I have had more meals together lately.	3.84/2.25	5.57/2.01	3.52/1.87
My romantic partner and I have been spending more time cooking together.	3.36/2.52	5.17/2.07	3.04/1.84
The quality of our sexual activity has been better.	4.64/1.91	4.43/2.30	3.44/2.02
My romantic partner and I have been engaging in sexual activity more often.	3.72/2.11	3.70/2.49	2.96/1.90

My romantic partner and I have been kissing more often.	4.84/1.80	4.60/2.30	3.48/1.98
I have been falling asleep a lot quicker than I normally do.	4.16/2.23	4.63/2.21	4.20/1.80
I have experienced fewer interruptions while sleeping.	4.40/2.12	4.37/2.34	4.48/1.64
I have felt more rested than normal.	4.32/1.97	3.93/2.38	3.76/1.83
My romantic partner and I have been experiencing more conflict than we normally do.	1.76/1.48	2.77/2.45	2.52/1.94
My romantic partner and I have fought more than we typically do.	1.84/1.70	2.37/2.11	2.00/1.63
I have been giving my partner more compliments.	5.20/1.80	4.83/2.10	3.92/1.75
My romantic partner and I have verbally expressed our love more often than we normally do.	4.96/1.57	4.50/2.22	3.92/1.85
My romantic partner and I have been more open with each other.	5.12/1.81	5.07/1.72	4.16/1.86
I have spent more time with my romantic partner than usual.	4.56/2.33	5.20/1.88	3.56/1.87

I have been in my partner's presence more often than usual.	4.12/2.40	4.9/2.21	4.12/1.94
My romantic partner and I have been doing a lot more favors for each other.	4.52/2.00	4.73/1.91	3.76/1.90
My romantic partner and I have been exercising more often than usual.	3.40/2.04	2.97/2.11	2.88/1.72
The communication with my romantic partner has been better.	5.20/1.61	4.87/2.05	4.16/1.89
My romantic partner and I have been more positive with each other.	5.20/1.80	5.10/2.04	4.20/2.08
I have felt more relaxed than usual.	4.16/2.15	4.00/2.24	3.44/1.96
I have been more aware of my nutrition lately.	4.32/1.91	4.20/2.11	4.12/1.83

Note. Participants were instructed to “think about your relationship over the last week” and to indicate their level of agreement with each statement. Scores were rated on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*).