Big spoon or little spoon: Relations of couples' attachment styles to cuddling, affection, sleep, and relationship satisfaction

by

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Abstract

The purpose of this study was to examine the association of attachment styles on relationship satisfaction and sleep quality in romantic couples. The study also sought to understand how cuddling and other types of affection (i.e. verbal and supportive) may mediate those relationships. The Actor Partner Interdependence Model (APIM) was used to examine 104 heterosexual couples from the United States to determine whether actor and/or partner effects were present for the relationship between insecure attachment (i.e. anxious and avoidant) and relationship satisfaction. APIM was also used to determine whether actor/partner effects were present between insecure attachment and sleep disturbance. Significant actor effects were present in these models, indicating those who reported higher anxious and avoidant attachment, reported lower relationship satisfaction, and higher sleep disturbance. Some of the partner effects for the outcome of relationship satisfaction were also significant. The APIM with mediation (APIMeM) and bias-corrected bootstrapped confidence limits were used to assess mediation and test the significance of the indirect effects of cuddling, affectionate communication, and sleep disturbance. Affectionate communication partially mediated the relationship between avoidant attachment and relationship satisfaction, such that those with lower avoidant attachment reported more affectionate communication, and in turn, reported higher relationship satisfaction. Affectionate communication also partially mediated the relationship between avoidant attachment and sleep quality, such that those with higher avoidant attachment reported lower affectionate communication, and in turn, reported higher sleep disturbance. Significant mediation

effects were present for actors only. Sleep disturbance partially mediated the relationship between anxious attachment and relationship satisfaction for actors, such that those with lower anxious attachment reported lower sleep disturbance, and in turn, reported higher relationship satisfaction. There were no significant indirect effects for cuddling as a mediator in the relationship between insecure attachment and relationship satisfaction, nor in between insecure attachment and sleep disturbance. There were no significant indirect effects for affectionate communication as a mediator between anxious attachment and relationship satisfaction, nor in between anxious attachment and sleep disturbance. There was also no significant mediation effect for sleep quality in the relationship between avoidant attachment and relationship satisfaction. Implications for these findings and suggestions for future research are discussed.

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List of Abbreviations

ACI	Affectionate Communication Index
AMOS	Analysis of a moment structures
APIM	Actor-Partner Interdependence Model
APIMeM	Actor-Partner Interdependence Model with mediation
DASS	Depression, Anxiety and Stress Scale
ECR-S	Experiences in Close Relationship Scale
ESS	Epworth Sleepiness Scale
RAS	Relationship Assessment Scale
SD	Sleep Disturbance-Short Form
SPSS	Statistical Package for Social Sciences
US	United States of America

Chapter I

Introduction

Sleep is a universal experience and one of life's most important biological processes. It provides numerous benefits, including increased lifespan (Grandner, Hale, Moore, & Patel, 2010) and improved physiological and cognitive functioning important for daily living (Banks & Dinges, 2007). Social relationships are also significant for humans as they too provide a number of benefits, such as improved mental health, emotional well-being, and physical health (S. Cohen, 2004). The connection between these two domains—interpersonal relationships and sleep, is a newer area of research as people have recognized the interpersonal nature of the biological function of sleep (Troxel, Robles, Hall, & Buysse, 2007).

Sleep research has historically been conducted on the individual level, but as people reach adulthood in the United States (US), approximately 70% of people sleep with a significant other (National Sleep Foundation, 2012). Over the course of humankind and across various cultures, sleeping arrangements and their meanings have taken on many forms (D'Emilio & Freedman, 2012; Glaskin & Chenhall, 2013; Handley, 2016). As Glaskin and Chenhall (2013) note, "Sleep reflects and literally embodies culture" (p. 2). Sleeping alone or in pairs, bed-sharing with children, family members or servants, and engaging in group sleep have all been common occurrences throughout history. Traditionally, nighttime was, and still is, viewed as a frightening period of the day because of threats to the body (Ekirch, 2005). Some of these threats are real, such as attacks or poisonous creatures, and some are imagined as in dreams and the

occult (Ekirch, 2005). What is consistent across cultures is the notion that the act of sleeping is a vulnerable one, so finding safety and security during that time is paramount (Glaskin & Chenhall, 2013; Handley, 2016). What has shifted over time and across cultures is the context in which sleeping arrangements occur, the meaning we ascribe to those arrangements, and our examination of the phenomena. Therefore, the rising interest in exploring sleep in the context of a romantic couple, or as an interpersonal behavior, is a logical step in understanding this biological and social process in today's US culture (Troxel, Robles, et al., 2007).

In the early settlement era of the US, a cultural clash existed between the native tribes of North America and the Protestant-influenced Puritan immigrants. These differences in values and beliefs existed across several domains of life, but one such domain included sexuality, intimacy, and sleeping practices (D'Emilio & Freedman, 2012). For the immigrants from Protestant cultures, strict rules of morality and religiosity governed these practices, whereas Native American tribes generally had more fluid and collectivistic conceptions of gender identity, sleeping and sexual practices, marital unions, reproduction, and child-rearing (D'Emilio & Freedman, 2012). For early immigrants, the motivation for marriage and cohabitation were largely economic, and sexual unions were procreative-driven, which remained generally true until the late 1800s (D'Emilio & Freedman, 2012). Sleeping in the same bed with others was not uncommon, as the cost of beds was high and the lack of space inhibited private bedrooms (Ekirch, 2005; Worsley, 2011). It was more practical than romantic in nature.

However, throughout the 1600s and into the 1900s what evolved through a complex interaction of cultures and events was the rise of intimacy and love as incentive for marriage and legal unions, not just economic and procreative factors (D'Emilio & Freedman, 2012). As the drive for intimacy through sexual relations in addition to reproductive goals balanced out, couples adopted

the practice of spending more nights together in the same bed. The practice became increasingly accepted by society and was sometimes called "bundling" (D'Emilio & Freedman, 2012; Worsley, 2011).

The cost of materials used to produce beds decreased as the Industrial Revolution was underway and bedrooms became increasingly private spaces as the size and layout of homes expanded (Worsley, 2011). Worsley (2011) stated that "only in the nineteenth century did the bedroom become secluded, set aside for sleep, sex, birth, and death" (p. 1). As the early 1900s continued, births and deaths more commonly took place in hospitals, further narrowing the function of bedrooms and beds at home (Worsley, 2011). This space for shared intimacy in married couples was no longer limited, interrupted by others, or for the sole purpose of reproducing, but rather to foster a stronger sense of love and connection with one another (D'Emilio & Freedman, 2012).

Our current US cultural narrative for pair-sleep or couples co-sleeping has evolved from this history. The "good" and "healthy" couple goes to sleep together in the same room and in the same bed. They engage in talking or sexual contact and wake up together in the morning rested and refreshed. If a couple sleeps in separate beds or separate rooms, it might be assumed that their relationship is at risk of dissolution or that they have problems with intimacy. A notable exception to this narrative is separate sleeping spaces for older couples, particularly if health issues are present, as this is assumed to be more natural and is more socially accepted (Rosenblatt, 2006). The myth of separate sleep being indicative of relationship problems has been propagated by popular culture with such phrases as "sleeping in the doghouse." In Methven's (2014) article in *The Atlantic* on why people sleep together, couples therapist Lee

Crespi called people's separate sleeping arrangements the "dirty little secret" (n.p.) in society as few openly discuss it.

In reality, pair sleeping is far more complicated than the idyllic representation described above and numerous factors, including health and illness, work, and parenting all affect sleep arrangements and sleep quality (L. M. Diamond, Hicks, & Otter-Henderson, 2008; Medina, Lederhos, & Lillis, 2009; Troxel, 2010). What is unclear is the extent to which these factors, people's preferences for sleep, and their actual sleeping arrangements affect their relationship satisfaction overall. As couples respond to the demands of work, family, school, health, and are pulled in different directions, their ability to maintain connection and intimacy becomes relegated to smaller segments of the day (Riggs, 1990). The bed and bedtime rituals are often integral for couples to maintain connection and commitment to their relationship (Rosenblatt, 2006), yet this time may be dwindling or impaired for various reasons. If bedtime rituals were approached more intentionally, perhaps the maintenance that occurred during that time could have lasting benefits for couples despite the decreased time or separate space. So what is it that couples need during this time of night? How can they meet their needs while maintaining adequate sleep? How can they ensure they are satisfied with their relationship and that their partner is satisfied?

A major framework used for understanding interpersonal relationships and adult romantic relationships is attachment theory (Ainsworth, 1989; Hazan & Shaver, 1987, 1994; Mikulincer & Goodman, 2006; Mikulincer & Shaver, 2007; Rholes & Simpson, 2004). Several theories inform our understanding of the development of adult romantic relationships from adolescence, such as psychosocial development theory (Erikson, 1963, 1968), behavioral systems theory (Furman & Wehner, 1994), and social exchange theory (Laursen & Jensen-Campbell, 1999). These theories

help us understand how priorities and perspectives change in romantic relationships over the life span (Lantagne & Furman, 2017). The current study focused on attachment systems in adults, examining how secure and insecure attachments were related to people's bedtime wishes, their perceived needs for physical touch (i.e., cuddling), and sleep quality, and then determined how these variables affected their relationship satisfaction. Developmental factors, including age of couples and length of relationship were also examined.

The following section summarizes a study demonstrating the importance of bedtime rituals and negotiations for couples that inspired the present research. The summary is followed by a brief review of attachment theory and its application to romantic relationships. Finally, the specific research questions of interest are described.

Two in a Bed: A couples system

In an interview-based qualitative study, Rosenblatt (2006) interviewed 42 couples, three of whom were same-sex couples and four individuals who were in bed-sharing relationships, to learn about couples' sleep patterns and behaviors. From the interviews, Rosenblatt determined that for two people to sleep together, a "routine" is developed over time that satisfies both partners in the couple to acceptable degrees. Rosenblatt called it "creating the couple system," where each person in the couple communicates and negotiates their needs and wants related to sleep and intimacy.

The study found that a majority of couples identified the bed as where they had the largest amount of time to spend together and where they did most of their talking to each other (Rosenblatt, 2006). Their beds and activities involving the bed, such as talking, touching, and sleeping, were shown to be integral in exchanges between partners that served to maintain their relationship. The couples in the study viewed time in bed as essential to feelings of "connection,

intimacy, pleasure, and feeling comfortable together" (Rosenblatt, 2006, p. 10). It was the space where most holding and cuddling occurred and was viewed as critical in meeting individual relationship needs.

According to the study, the conversations couples had in bed varied in specifics based on relationship dynamics, but often included each person sharing their day's activities and discussing their plans for the following day respectively or as a couple. Several of the interviewed couples stated that there were certain heavy issues that needed to be discussed in bed before they could even fall asleep, otherwise their sleep would be disrupted or of poor quality, suggesting a link between interpersonal needs and sleep quality. Rosenblatt hypothesized that the intimacy of bedtime made it easier for couples to express feelings for one another and connect emotionally. However, are there differences in the types of connections people need?

The descriptions gathered in Rosenblatt's study revealed that touching in bed met physical, emotional, psychological, and sexual needs. It also symbolized the unique relationship two individuals within a couple have with one another. Rosenblatt found that when couples did not go bed at the same time, they still negotiated ways of touching. In the study, some partners reported enjoying touching in bed to a point, but then needed to create space in order to fall asleep. When couples did not match on how much time they wanted to cuddle versus have space, they described a process of clarifying needs so partners understood boundaries. The exchange seemed to resolve misunderstandings about different preferences as partners sometimes internalized the boundary as a lack of desire for closeness.

Rosenblatt's study described several issues that arose when couples slept together, including work schedules, health issues, preferences for room temperature, bedding, and even the number and types of pillows present. Some participants in the study explicitly reported that they

slept more soundly when separate from their partners and yet almost all 42 couples slept together regularly. The question is, why? Despite all of the annoyances and challenges participants referenced to co-sleeping, the majority were still quick to say that they slept "better," or possibly they meant that it felt better to sleep, when their partner was present (Rosenblatt, 2006). The word "security" was repeatedly mentioned by participants when reflecting on co-sleeping (Rosenblatt, 2006, p. 166). Some saw sleeping together as matter-of-fact and natural, or that not sleeping together was beyond reasonable consideration. Others saw it as meeting an "ideal" expectation for their relationship (Rosenblatt, 2006, p. 170). Desire for physical touch in some cases changed over the life span of the individuals and over the course of their relationships, highlighting important developmental considerations. Couples who had been together for a very long time appeared more comfortable with space, whereas early couples sometimes experienced panic when a partner asked for space or did not want to cuddle.

Although sleep is a biological process, it is infused with sociocultural meaning. The way we manage the interpersonal process of sleep and interpret the meaning of our own and others' behaviors are important to our well-being and relationship satisfaction. Next, we briefly look at the role of attachment systems in how we function in interpersonal relationships.

Attachment Theory

Attachment theory has long been an important theory in psychology and the social sciences. The objective here is to present a brief history and overview of some of the tenets of the theory and then more literature and research on attachment will be presented in the following chapter. Attachment theory is most notably associated with John Bowlby, his seminal works on attachment, separation, and loss (Bowlby, 1973, 1980, 1982), and Mary Ainsworth's "Strange Situation" experiment (Ainsworth & Wittig, 1969). Essentially, the theory posits that the quality

and characteristics of the early relationship among an infant and their caregivers shapes the infant's view of the world, of themselves, of others, and creates patterns for interpersonal interactions that then develop over the lifespan (Cassidy, 2008). Since Bowlby and Ainsworth's foundational works, decades of research have elaborated on and provided more in depth understandings of the attachment behavioral system (Cassidy, 2008; Mikulincer & Goodman, 2006; Mikulincer & Shaver, 2007; Rholes & Simpson, 2004; Simpson & Rholes, 1998). From its inception, attachment theory called upon aspects of developmental psychology, evolutionary biology, cognitive science, and control systems theory (i.e., monitor stimulus and adjust behavior; [Powers, 1973]) to establish a comprehensive foundation for the necessity of attachment bonds for survival (Cassidy, 2008). Those who were able to remain close to others who were protected and supported had greater chances of survival and eventual procreation (Bowlby, 1958).

Bowlby's background was informed by psychoanalysis and object relations theory (Bretherton, 1992). This drew him to examine children's behavior in relation to family dynamics, but he was dissatisfied with the existing theories' lack of emphasis on observable activities occurring day-to-day (Cassidy, 2008). His work was developed concurrently with evolutionary studies on primates that revealed the role of caregivers in survival of the young beyond providing a source of food, which was novel at the time (Harlow & Zimmermann, 1958). Bowlby was also informed by studies about animal imprinting of the young onto their caregivers for behavioral learning and survival (Lorenz, 1935). His decades of clinical work with personality development in infants, adolescents, and parents, as well as the exploration of experiences with separation and loss of maternal caregivers, laid the groundwork for attachment theory (Cassidy, 2008). He observed that, whether primate or human, we are born with an innate desire to connect with

others as a means of ensuring survival (Bowlby, 1958). When caregivers meet an infant's needs consistently, the baby is soothed and intimate bonds are formed establishing a relationship of trust, protection, safety, and support (Bowlby, 1958). However, not all caregivers meet the needs of their infants equally (Bowlby, 1956). The repeated interactions between infants and caregivers creates the infant's internal working model for relationships. The model becomes their framework for understanding themselves, their needs, their expectations of others, and their coping strategies for distress (Bowlby, 1982).

Mary Ainsworth, who collaborated with Bowlby, famously conducted an experiment with toddlers known as the "Strange Situation" (Ainsworth & Wittig, 1969). The study was based on theories of attachment and also advanced our understanding of predictable patterns observed in attachment systems between infants and caregivers (Bretherton, 1992). From this experiment, Ainsworth identified three dominant types of responses from children when they were separated and reunited with their maternal caregiver. Some infants sought closeness and proximity with their returned mother, some infants appeared angry and protested their mother, and others appeared indifferent or detached. The patterns of reactions were categorized into three styles of attachment: *secure*, *insecure anxious-avoidant* (later called avoidant or dismissive), and *ambivalent* (later called anxious-ambivalent, anxious, or preoccupied; [Ainsworth, Blehar, Waters, & Wall, 1978]). Each style reflected distinct attachment behaviors related to seeking closeness, protesting separation, emotional regulation, and feelings of detachment that characterized the relationship between the caregiver and infant (Ainsworth et al., 1978).

The term "attachment style" has come to refer to:

> Stable, global individual differences in (1) tendencies to seek and experience comfort and emotional support from persons with whom one has an attachment bond and (2)

> presumptions about the responsiveness of attachment figures to bids for comfort and support (Rholes & Simpson, 2004, p. 4).

Secure attachments are marked by low anxiety and low avoidance regarding others. These infants seek out their attachment figure or caregiver when they are in distress and they are more quickly comforted by this figure (Rholes & Simpson, 2004). The pattern of expressing distress and receiving comfort develops over time and leads to a sense of safety and security for the infant. Avoidant attachments are marked by low anxiety and high avoidance regarding emotional ties with others (Rholes & Simpson, 2004). These infants demonstrate independence and discomfort with intimacy over time due to minimal responses of comfort to their expressions of distress (Rholes & Simpson, 2004). Anxious, or anxious-ambivalent, attachments are marked by high anxiety and low avoidance. These infants have a strong need for attention and comfort from their caregiver coupled with a strong uncertainty about their caregiver's ability or willingness to meet those needs due to inconsistencies in the response to comfort (Rholes & Simpson, 2004). Researchers later identified a fourth category for attachment called "fearful" or "disorganized" marked by high anxiety and high avoidance (Bartholomew & Horowitz, 1991). However, most studies focus on the three dominant categories of secure, avoidant, and anxious for ease (Feeney, 2008).

A critical aspect of the attachment behavioral system is that it is a dynamic system (Fraley & Brumbaugh, 2004). It evolves over time as an individual develops and is an interplay between two people that can look differently depending on the context and individual differences (Cassidy, 2008). The system includes both trait-like and contextually-driven patterns of cognitions and interpersonal behaviors (Fraley & Brumbaugh, 2004). In the 1980s, researchers

became interested in extending attachment theory to relationships beyond infant and caregiver. Its applicability to the current study will be discussed further in the following chapter.

Sleep and Attachment

Historically, sleep has been studied on the individual level but most adults in the US sleep with a partner (Troxel, 2010). The negotiation of sleeping as a couple is an interpersonal process that has the capacity to both affect the quality of one's sleep and affect people's satisfaction with their relationships (Troxel, 2010). Bedtime signifies an ever increasing important time and space for couples as it has become the focal point for relationship maintenance (Rosenblatt, 2006). Couples use physical touch, cuddling, and affection as forms of maintaining bonds and intimacy (Gallace & Spence, 2010). However, individual preferences for touching during bed time and during sleep varies as demonstrated in Rosenblatt's (2006) study and others (Chopik et al., 2014). Whether personal needs and boundaries are met can affect the quality of sleep for both partners and their satisfaction with one another (Gulledge, Gulledge, & Stahmann, 2003; Rosenblatt, 2006). Attachment styles are a well-studied dimension of romantic relationships, and are valuable in understanding interpersonal processes and patterns (Bowlby, 1973, 1980, 1982; Feeney & Noller, 1990; Fraley & Shaver, 2000; Hazan & Shaver, 1987, 1994; Mikulincer & Goodman, 2006; Mikulincer & Shaver, 2007; Rholes & Simpson, 2004). Therefore, it becomes clear that an examination of couples sleep negotiation and satisfaction through the lens of attachment is a beneficial endeavor.

Rationale and Research Questions

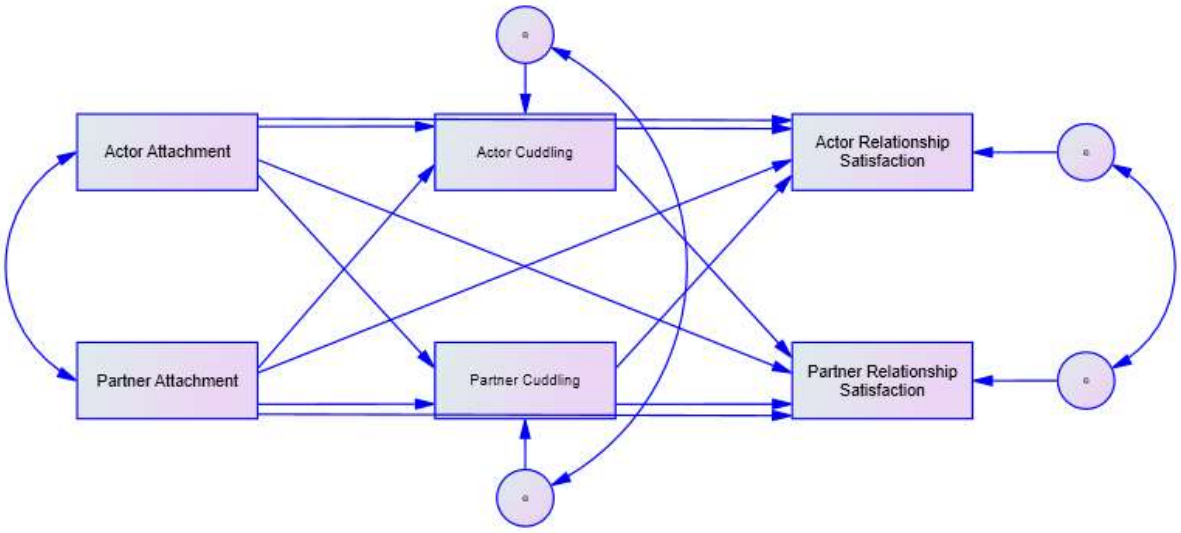
If we can better understand the connection between partners, their attachment styles, bedtime preferences for cuddling, sleep quality, and overall satisfaction, this knowledge might allow couples and couple's therapists to explore relationship concerns in different ways and adjust interventions to address this relational system. It may allow partners to increase self-

awareness about personality aspects and each other's preferences, and then allow them to be intentional with behaviors to improve the relationship and their bond. The following research questions are addressed by this study in a dyadic analysis of couples. The questions focus on the extent to which attachment in partners relate to the variables discussed above, namely, cuddling, affection, sleep quality, and relationship satisfaction.

Research Question 1a (RQ1a): To what extent will Partner A's attachment relate to their own relationship satisfaction and to the satisfaction of Partner B? To what extent will Partner B's attachment relate to their own relationship satisfaction and to the satisfaction of Partner A?

Research Question 1b (RQ1b): To what extent will cuddling mediate the relationship between attachment and relationship satisfaction for Partners A and B?

Figure 1. Example of APIM mediation model (APIMeM) used to address research question on relationship satisfaction mediated by cuddling.



The first question focuses on the relationship between attachment, each partner's relationship satisfaction, and that of their partner's (RQ1a). The second question is exploratory and focuses on whether cuddling mediates the relationship between attachment and relationship satisfaction for each partner (RQ1b). *Figure 1* demonstrates the mediation model examining

relationship satisfaction; a similar model will also be used to address all mediation research questions.

Research Question 2b (RQ2b): To what extent will cuddling mediate the relationship between attachment and sleep quality for Partners A and B?

The first question in this set focuses on the relationship between attachment, each partner's sleep quality, and that of their partner's (RQ2a). The second question is exploratory and focuses on whether cuddling mediates the relationship between attachment and sleep quality for each partner (RQ2b).

Research Question 3a (RQ3a): To what extent will affectionate communication mediate the relationship between attachment and *relationship satisfaction* for Partners A and B?

Research Question 3b (RQ3b): To what extent will affectionate communication mediate the relationship between attachment and *sleep quality* for Partners A and B?

These two questions seek to examine whether affectionate communication mediates the relationships between attachment and relationship satisfaction and also between attachment and sleep quality.

Research Question 4 (RQ4): To what extent will sleep quality mediate the relationship between attachment and relationship satisfaction for Partners A and B?

The last question seeks to examine whether sleep quality is a mediator in the relationship between attachment and relationship satisfaction. Hypotheses for these research questions will be presented in the methods chapter, after literature and measures have been reviewed.

Chapter II

Literature Review

This chapter presents relevant research related to the current study. Literature pertaining to attachment theory in romantic relationships, cuddling, affection, sleep, and relationship satisfaction are reviewed.

Attachment Theory: Development into romantic relationships

In the 1980s, researchers became interested in extending attachment theory to relationships beyond the infant and caregiver. Tenets of the theory laid the groundwork for these logical extensions. Bowlby (1982) asserted that the attachment system functioned in various ways throughout one's lifespan and Ainsworth (1989) wrote that sexual and other affectional bonds were examples of the attachment system at work in adulthood. Weiss (1982, 1991) went on to demonstrate that the basic factors of an attachment bond—proximity maintenance, separation protest, secure base, and safe haven—occurred in most marital or committed romantic relationships. Therefore, there was grounding to extend the research of attachment in to the context of adult romantic relationships.

Hazan and Shaver (1987, 1994) spearheaded the examination of romantic attachments, as they desired to understand romantic relationships, love, intimacy, loss, and grief. They posited that the theories of attachment provided superior theoretical basis for their research compared to other theories on love, such as those by Dion and Dion (1985) and Sternberg (1986). Hazan and Shaver (1987) argued that attachment theory was a more comprehensive framework for several

reasons: it utilized common underlying dynamics to account for multidimensional relationships; it took into account social experiences; it was less pathologizing than other theories in understanding "unhealthy" behaviors as adaptive in some contexts; it accounted for loss, which is intimately related to relationships and love; and lastly, it placed interpersonal processes in an evolutionary context.

Hazan and Shaver (1987) mapped the theory of attachment for infant-caregiver relationships onto hypotheses for adult romantic relationships and through a series of studies, found fundamental similarities. They found that the styles of secure, avoidant, and anxious/ambivalent attachment were prevalent among adults in the same proportions as they were in infants and young children. They found that adults had different internal working models about love and relationships, as well as different attachment experiences with their caregivers that generally aligned with their attachment style. They deduced that, "…romantic love is a biological process designed by evolution to facilitate attachment between adult sexual partners, who at the time love evolved, were likely to become parents of an infant who would need their reliable care" (Hazan & Shaver, 1987, p. 523). Despite the similarities in attachment processes, they recognized inevitable differences that arose in the context of romantic relationships, including changes due to social development, dynamics within specific pairings of people, and other differences that ongoing research would reveal.

Although longitudinal studies of attachment and examinations across the lifespan have increased (Adams, Stoops, & Skomro, 2014; Antonucci, Akiyama, & Takahashi, 2004; Konrath, Chopik, Hsing, & O'Brien, 2014), the stability of attachment from infancy through late adulthood is still being debated (Feeney, 2008; Fraley & Shaver, 2000). There is evidence that the attachment styles and internal working models we co-construct with caregivers as infants and

children create the foundation for our interpersonal style, view of self, and view of others (Collins, Guichard, Ford, & Feeney, 2004; Mikulincer & Shaver, 2007). However, there is also evidence that as we get older, gain more experience and information, and create meaningful relationships with others, our attachment bonds can look different, especially depending on the dynamic created with the other people involved (Collins et al., 2004; Mikulincer & Shaver, 2007). Certain pairings of attachment styles can heighten or diminish hallmark features of the three main styles (Feeney, 2004). For example, a person who is generally securely attached may begin to exhibit signs of insecure anxious attachment if they are with a partner who demonstrates an avoidant style. Therefore, sometimes the term attachment style can refer to a "category" of people or it can also be used to describe a relationship dynamic between two people (Hazan & Shaver, 1987). This usage accounts for some of the stability seen in internal working models, while also accounting for relational development and change (Feeney, 2008).

The three styles of attachment manifest themselves in expected ways in romantic attachments largely due to the similar internal working models that develop in infancy (Mikulincer, Shaver, & Slav, 2006). Those who experienced repeated patterns in relationships without experiences that challenged those models, developed even stronger schemas (Hazan & Shaver, 1987). These internal working models guide thoughts, feelings, and behaviors related to romantic attachments (Collins, 1996). Researchers have found that individuals with secure attachment generally characterize love and relationships with themes of trust, friendship, and positive emotions (Mikulincer & Shaver, 2004). Those who are more securely attached tend to have positive working models of themselves and others. They can rely on others to meet their needs, but are also capable of self-soothing in times of distress (Mikulincer & Shaver, 2004). They are found to be comfortable with both intimacy and autonomy, and have a high sense of

self-worth (Feeney, 2008). These individuals are most likely to report positive experiences with their mother and saw their caregivers as dependable, caring, and warm (Feeney, 2008; Hazan & Shaver, 1987).

Individuals who identify as having avoidant attachments in romance are most likely to characterize relationships and love with a lack of trust and fear of closeness (Collins et al., 2004). Their working models of themselves and others are based on skepticism so they lack confidence in themselves and are suspicious of others (Mikulincer et al., 2006). They tend to report that the existence and durability of romantic love is doubtful and that they do not need a partner to be happy, which is demonstrated by maintaining distance from others and focusing on achievement-related goals (Hazan & Shaver, 1987). They are more likely to report that their mother was cold and rejecting (Priel & Besser, 2001). Moreover, they are likely to feel lonely, but try to hide expressing their true emotions as a form of self-protection (Mikulincer & Shaver, 2003).

Individuals who tend to have more anxious attachment are most likely to experience love as preoccupying and painful, but exciting (Feeney & Noller, 1990). They desire to merge with others and can be overwhelming for their partners (Mikulincer et al., 2006). Their view of self includes doubting their worthiness for love, being open about their insecurities, and expecting vulnerability from others, but can easily feel rejected when that expectation is not met (Hazan & Shaver, 1987). They tend to fall in love easily and frequently as they are looking for someone to rely on, and tend to be compliant to gain acceptance (Feeney, 2008). They are most likely to report a mixture of positive and negative experiences with their mother, but experienced their fathers as unfair (Priel & Besser, 2001). These individuals tend to have needs that are difficult to meet (Hazan & Shaver, 1987) and are more prone to feeling lonely, depressed (Simpson & Rholes, 2004), and having low self-esteem (Mikulincer & Shaver, 2003).

Although romantic attachment styles have distinct characteristics, no single style perfectly captures a person's entire behavior due to the developmental and dynamic nature of attachment theory (Feeney, 2008). Researchers concluded that measuring attachment as a dimensional variable rather than a categorical one better captured the construct in studies seeking to further understand its effects (Fraley & Waller, 1998). This lead to a more nuanced understanding of attachment and enhanced research into its role in romantic relationships. For example, those who have exhibited anxious attachment behaviors in the past can over time adopt a more secure style when with a secure partner (Levine & Heller, 2010), but this may be dependent on intersections with gender and attachment style (Banse, 2004). Despite some of this nuance, there are still clear patterns associated with attachments. Monteoliva, García–Martínez, and Calvo–Salguero (2016) explored how college students conceptualized the costs and benefits of being in a romantic relationship. They found significant agreement by attachment styles, where secure individuals identified more benefits than costs and insecure individuals identified more costs than benefits. Among the insecurely attached group, those who identified as anxious identified more benefits than those who were avoidant/dismissive.

Attachment has also been included in studies that examined how well individuals cope with breakups (Madey & Jilek, 2012); levels of jealousy and surveillance in relationships (Marshall, Bejanyan, Di Castro, & Lee, 2013); whether partners are able to communicate about sexual satisfaction (Goldsmith, Dunkley, Dang, & Gorzalka, 2016; McNeil, Rehman, & Fallis, 2018); methods used for relationship maintenance (Goodboy, Dainton, Borzea, & Goldman, 2017); and partner's symptom distress level and therapy treatment outcomes (Parker, Johnson, & Ketring, 2012). In one study, Wilson, Gardner, Brosi, Topham, and Busby (2013) found that partners who were both securely attached experienced the lowest level of aggression in their

relationship, whereas couples who were mixed with one secure and one insecure had higher levels of aggression, and then those relationships where both partners were insecurely attached had the highest levels of aggression. Attachment has also been a variable in more complex studies examining paths between sleep, emotional regulation, and overall health (Arsiwalla, 2017). Where attachment security was significantly related to better sleep, health, and emotion regulation. There is no shortage of studies on attachment as researchers continue to broaden its application and deepen our understanding of romantic relationships.

However, there are still some limitations. A majority of romantic attachment research has been conducted with heterosexual couples. Some researchers have begun to examine whether the styles manifest differently for individuals who identify as gay, lesbian, bisexual, transgender, queer or another sexual orientation (LGBTQ+). One of the first studies to examine romantic attachment in non-heterosexual relationships was Ridge and Feeney (1998). They found that patterns of attachment style between hetero- and non-heterosexual groups were generally similar. Results related to working models were similar and consistent to those reported in heterosexual samples. Wang, Schale, and Broz (2010) studied the relationship between attachment, sexual identity, and sexual attitudes and results demonstrated a complex intersection of attachment for those who identify as non-heterosexual. LGB individuals high on avoidance were associated with permissiveness sexual attitudes, whereas those who were higher on anxiety exhibited "communion" sexual attitudes (Wang et al., 2010, p. 37). Sexual communion in this context meant a higher expression of commitment and emotional involvement rather than seeing sexual intercourse as a casual encounter. Both studies highlighted how the individual's security with their own identity (versus internalized stigma) played a role in findings as well as relationships with early caregivers that showed varying degrees of acceptance of the individual's sexual

orientation. More research needs to be done with these populations in order to better understand how adult attachments effect same-sex romantic relationships.

Feeney (2008) wrote that the research most useful to further understanding romantic attachment are those that are dyadic in nature and those that seek to understand mediating associations between security and relationship functioning, both of which are aims of the current study. Acknowledging the dyadic effects of attachment is a more recent breakthrough in research and also accounts for the co-constructive nature of romantic relationships (Fraley & Brumbaugh, 2004). The interaction of attachment styles in romantic relationships can predict important outcomes, such as relationship quality since two securely attached adults in a couple tend to rate the highest on measures of relationship quality (Feeney, 2008; Kane et al., 2007). There is also some interaction with gender, as Kane et al. (2007) found men were more dissatisfied with partners high on anxiety and women were more dissatisfied with partners high on avoidance. The current study sought to advance our understanding of the dyadic nature of attachment systems and used dyadic data collection and statistical methods to account for this dynamic.

Affection and Couples

Affection is a feeling of love, caring, fondness, or positive regard for someone or something ("Affection," 2018; Floyd, 2015). It is cornerstone of romantic relationships and takes the form of many overt and symbolic expressions (Schutz, 1958). Affection has ameliorating effects both when giving it to others and when receiving it, and accounts for shared and unique variance in outcomes when examining mental and physical well-being (Floyd et al., 2005). Floyd (2006, 2015) posits in Affectionate Exchange Theory (AET) that there are three main ways of communicating affection toward one's partner: verbal, supportive, and nonverbal. Verbal affection includes expressions of gratitude and love, either verbal or written, that share one's

feelings toward their partner and that show their valuing of the relationship (Floyd & Morman, 1998). Supportive affection includes acts that benefit and support one's partner, such as doing chores to give them a break, praising their accomplishments, or buying them something they enjoy (Algoe, Gable, & Maisel, 2010; Floyd, 2015). Nonverbal affection includes physical acts of touch, such as kissing, hugging, and handholding (Floyd, 2015). Bowlby (1973) described this type of physical contact as a defining feature of intimate relationships, both familial and romantic. For some individuals, engaging in physical affection with their romantic partner specifically, is the only person they have this level of intimacy and connection with (Rosenblatt, 2006).

Affection of all types are fundamental to romantic relationships and vary between couples, cultures, age, and life span of a relationship (Pendell, 2002). Affection helps form relationships, is a maintenance tool, and improves their quality (Floyd, 2006). Inevitably, partners may use multiple types of affection at the same time, for example a combination of physical and verbal affection, which can make examination of this construct difficult. However, affectionate communication has been found to be a buffer between insecure attachment and relationship satisfaction (Saavedra, 2012). It has also been a partial mediator between alexithymia and insecure attachment, enabling those with difficulty communicating emotions to still build and maintain relationships (Hesse & Floyd, 2011). It is so fundamental in relationships, that despite having an avoidant attachment, feelings of love toward a partner still encourage an avoidant individual's expressions of verbal, nonverbal, and supportive affection to some degree (Dillow, Goodboy, & Bolkan, 2014). Every type of affection is important, but the proceeding review will briefly examine verbal and supportive affection, then focus

predominantly on cuddling as a form of nonverbal physical affection, which is a main construct of interest in the current study.

Floyd et al. (2007) found that expressions of verbal and supportive affection from romantic partners had soothing physiological effects in response to acute stress. Participants who rated higher levels of verbal and supportive affection demonstrated lower resting heart rates and lower levels of salivary cortisol in reaction to a stress inducing task. Similarly, affection deprivation or withholding has negative associations with general health, happiness, social support, relationship satisfaction, and attachment security (Carton & Horan, 2014; Floyd, 2014). In a study examining the effects of affectionate communication on stress hormones, Floyd and Riforgiate (2008) found an inverse relationship between age and verbal affection, suggesting that older partners engage in less verbal affection. However, this relationship did not hold true for supportive or nonverbal affection. There was no significant interaction between gender and the types of affection, so both men and women are equally likely to engage in affectionate communication. When comparing relationship status though, Punyanunt-Carter (2004) found differences in affectionate expressions between dating and married couples. Couples who were dating reported higher rates of verbal and nonverbal affection than married couples, but married couples reported higher rates of supportive affection. In sum, this suggests that the types of affection expressed by couples depends on demographic and developmental factors but regardless, its expression has several positive effects on well-being and satisfaction.

Nonverbal physical affection is significantly and positively associated with relationship and partner satisfaction, satisfaction over the long-term, conflict resolution, and feeling understood (Gulledge et al., 2003; Sheldon, Gilchrist-Petty, & Lessley, 2014). Warm contact with one's partner, in the form of touching one another while sitting together and hugging for an

extended time, has been found to reduce cardiovascular reactivity to stressful situations (Grewen, Anderson, Girdler, & Light, 2003). Brief contact with a romantic partner lowers both blood pressure and heart rate in subsequent stressful situations (Grewen et al., 2003). The effects appear to be consistent across gender, but have been shown to have stronger interactions for African American couples, suggesting a greater benefit from positive intimate contact (Grewen et al., 2003). Increased kissing between romantic partners has been shown to decrease total serum cholesterol, which is linked to several health benefits, improved perceived stress, and increased relationship satisfaction (Floyd et al., 2009). The findings that non-verbal affectionate behaviors have stress-ameliorating properties makes it a logical activity at the end of a long, stressful day as a way to recharge with your partner. This enables individuals to face the stressors of the coming day with reduced negative health effects (Floyd et al., 2009).

Looking more closely at what constitutes nonverbal physical affection, Gulledge, Gulledge, and Stahmann (2003) define physical affection (PA) as “any touch intended to arouse feelings of love in the giver and/or the recipient” (p. 234). They identify seven main physical behaviors, and while not comprehensive includes—backrub/massage, caress/stroke, cuddle/hold, hand holding, kiss on the lips, and kiss on the face. People tend to have preferred times and places for these expressions, which includes, “…those [times] that are personal, private, emotionally charged, unhurried, and face-to-face” (Pendell, 2002, p. 84), which makes the bed a logical space for engaging in these behaviors. Cuddling, specifically, is defined by the literature 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). Notably, van Anders et al. (2013) exclude sexual touch from acts of cuddling because it is a distinguished and goal-driven act, which goes beyond the focus of love

and bonding. That is not to say that cuddling is not a form of sexual intimacy or that love and bonding are not parts of sexual activity, but as a construct, cuddling can be separately identified as nurturant intimacy rather than sexual (van Anders et al., 2013).

Research on cuddling is sparse, but van Anders et al. (2013) offered a general idea of what cuddling looks like for adult couples currently in the US. According to their sample of 514 participants, adults cuddle about 4.5 nights out of the week and 3.37 mornings, with almost all participants reporting they cuddle in bed or on the couch. Seventy-four percent of participants enjoyed talking to their partner while cuddling and most reported experiencing a range of pleasurable feelings while cuddling, such as calm, relaxed, happy, comfortable, protected, satisfied, bonded, appreciated, love, and feeling good. Cuddling and holding one another are the first and second *favorite* forms of PA for women and men, respectively (Gulledge et al., 2003). Women rated cuddling and holding as the second most *frequent* form of PA, the most intimate and the most expressive of love (Gulledge et al., 2003). Men rated cuddling and holding is the first most frequent form of PA and the second most intimate and expressive of love (Gulledge et al., 2003). This suggests that both men and women seek out and benefit from cuddling. In a study on a newer norm called "stayovers," Jamison and Ganong (2011) found that emerging adults and college-educated individuals are sleeping-over three to seven nights per week, while still maintaining separate homes. These partners choose to sleep together so frequently despite having separate living spaces because of the accompanying feelings of safety, security, comfort and joy (Jamison & Ganong, 2011). Physical closeness and its contributions to relationship development and relationship maintenance cannot be underestimated (Jamison & Proulx, 2013).

However, what happens if a partner does not like being touched or enjoy cuddling despite the benefits it has? Those with insecure attachments, specifically avoidant attachments tend to

have difficulty with cuddling and experience fewer positive feelings in response to it (Chopik et al., 2014). Individuals who have anxious attachments tend to have ambivalent feelings related to cuddling due to internal conflict over the desire to cuddle while feeling fear and suspicion (Chopik et al., 2014). More broadly, individuals with low self-esteem tend to express less affection of any kind toward their partners, tend to experience less positive reactions when doing so, and believe their partners derive less pleasure from their affection (Luerssen, Jhita, & Ayduk, 2017). One purpose of the current study was to determine how attachment insecurity and cuddling were related in a romantic couple and how they affected relationship satisfaction. Since we were specifically interested in cuddling at night, we were also eager to determine how the associations between attachment insecurity and cuddling effected sleep quality.

Sleep Characteristics

A study conducted by the National Sleep Foundation defines good sleep quality as sleeping for at least 85% of the time you are in bed, falling asleep in thirty minutes or less, waking up no more than one time throughout the night, and being awake for twenty minutes or less after initially falling asleep (Ohayon et al., 2017). The effects of adequate and poor sleep quality have been amply demonstrated in empirical literature. A review of the literature is presented here, including a broad examination of contributing factors to sleep quality, and then a focus on the associations between sleep quality and the variables pertinent to the current study.

Adequate sleep duration contributes to increased alertness and memory, improved emotional regulation, and stable hormone production (Banks & Dinges, 2007); all of which are beneficial for daily functioning. Conversely, restricted sleep duration leads to lapses in attention, diminished working memory, diminished cognitive load, low mood, and rumination (Acheson, Richards, & de Wit, 2007; Amaral et al., 2018; Turner, Drummond, Salamat, & Brown, 2007;

Van Dongen, Maislin, Mullington, & Dinges, 2003). In addition to impacting cognitive abilities and endocrine systems, restricted sleep has been shown to affect the immune system, specifically inflammatory responses, and cause increased risk for cardiovascular disease (Schwartz et al., 1998; Vgontzas et al., 2004). Diminished sleep lowers people's abilities to perform the most basic and necessary physiological and regulatory functions (Troxel, Cyranowski, Hall, Frank, & Buysse, 2007). Therefore, to support general well-being, adequate daily functioning, and personal success and achievement, it is important to understand how one gains and maintains adequate sleep. Numerous factors contribute to sleep deprivation/restriction and poor sleep but generally, diminished sleep quality can be caused by "medical conditions, sleep disorders, work demands, social and domestic responsibilities, and life style" (Banks & Dinges, 2007, p. 519). We examine these briefly below.

It is difficult to isolate the effect of medical conditions (e.g., cardiac, cancer, or stroke) or sleep disorders (e.g., insomnia, narcolepsy, obstructive sleep apnea , or restless legs syndrome) on sleep quality, as many conditions have the potential to negatively affect one's sleep (Troxel, Robles, et al., 2007). At times, the treatment of these conditions lowers sleep quality even if the condition itself does not (e.g. medication, sleep apnea machines; [Prigerson, Maciejewski, & Rosenheck, 1999]). Physical illnesses and injuries, mental disorders (e.g., depression, anxiety, substance use), and dysregulation of physiological systems all contribute to poor sleep quality, daytime fatigue, and drowsiness, which negatively affects one's ability to function safely and productively throughout the day (Smolensky, Di Milia, Ohayon, & Philip, 2011). The conditions above and their treatments cause difficulty falling asleep, waking up multiple times throughout the night, discomfort or pain, and medication that effects sleep cycles and phases, which are hindrances to our own sleep quality. Furthermore, individuals with pre-existing or developed

sleep disturbances may increase stress for their sleep-partners. Thereby reducing their partner's sleep quality and reducing relationship satisfaction, as limited sleep is associated with impaired emotional, cognitive, and physiological functioning (Troxel, Robles, et al., 2007). Gender is an important intersecting variable with medical conditions as men are more likely to have health conditions that create disruptive environments, such as snoring and sleep apnea, while women are more likely to have sleep disorders that are sensitive to their environments and limit their sleep, such as insomnia (Prigerson et al., 1999). Some couples develop separate sleeping arrangements for health reasons, but length of relationship and feelings of security make alternative arrangements possible for them (Rosenblatt, 2006). Separate sleeping arrangements have not always shown to be effective for couples (Seidel et al., 2013).

Work demands represent another set of factors that can affect sleep quality. For employed individuals, the type of shift they work (i.e. day, night or overnight) and the variability between shifts can make them at risk for sleep disturbances and overall poor sleep quality (Ma et al., 2018). Those who worked fixed shifts, whether they were during the day or at night, were better off than those who had inconsistent schedules (Ma et al., 2018). Individuals who worked three different shifts were more prone to sleep disorders (Ma et al., 2018). Additionally, jobs with high demands and low job control were predictors of poor sleep quality (Van Laethem, Beckers, Kompier, Dijksterhuis, & Geurts, 2013). Those who travel for work are also likely to have their sleep affected, and particularly the partner who stays at home when examining couples (L. M. Diamond et al., 2008). For adolescents, undergraduate, and graduate students, academic stress is a work demand that has been shown to negatively affect sleep quality (Yan, Lin, Su, & Liu, 2018). Academic stress is also related to depression and school burnout, which exacerbates the effects on one's sleep quality (Yan et al., 2018).

Social and domestic responsibilities that affect sleep quality can include social, romantic, and familial duties, including the presence of children in the home (Medina et al., 2009). In their review of literature on sleep and relationship quality, Troxel, Robles, Hall, and Buysse (2007) discovered a bidirectional association between the two, whereby functional interpersonal relationships promote positive health behaviors including good sleep hygiene, and dysfunctional relationships inhibit healthy choices and sleeping patterns. For example, couples who engaged in destructive conflicts led to worsening of various sleep measurements for both partners, so the types of conflicts in relationships affect the sleep of those in the relationship (El-Sheikh, Kelly, Koss, & Rauer, 2015). El-Sheikh et al. (2015) identified constructive and destructive types of conflict, which affect sleep differently. In heterosexual relationships, female partners who engaged in constructive conflict increased their own sleep duration and male partners increased sleep efficiency. Several studies have examined sleep deprivation in the context of early parenting, which is a natural occurrence that many adults experience and can sometimes be for an extended period of time (Medina et al., 2009; Meijer & van den Wittenboer, 2007). As a result, first-time parents experience a decrease in relationship satisfaction stemming from the resource depletion caused by sleep disruption (Medina et al., 2009). Troxel, Robles, et al. (2007) also found several other factors that may moderate the associations between sleep and relationship quality, namely "…personality, psychopathology, socioeconomic and occupational factors, stressful life events, and gender." (p. 401).

Personality factors that are related to sleep quality have been conceptualized by the big five factors—openness, conscientiousness, extroversion, agreeableness, and neuroticism (OCEAN; [Costa & McCrae, 1992]). Stephan, Sutin, Bayard, Križan, and Terracciano (2018) examined middle and older adults three times during a ten-year span and found that people

higher on extraversion and lower on neuroticism (i.e. emotional instability, anxious, depressed, distressed) were more likely to have higher sleep quality over all three trials. Openness and agreeableness did not have statistically significant associations with sleep quality at baseline or over time. However, low conscientiousness (e.g. disorganized, poor planning, less mindful) was associated with progressively lower sleep quality over the three trials and neuroticism had the strongest associations with poor sleep across the trials. This demonstrates the complexity of studying sleep quality as personality styles are also related to mental health, which was discussed above.

In a large study on sleep complaints, Grandner, Patel, et al. (2010) examined the association of sleep complaints with income, education, marital status, employment, and race/ethnicity. Socioeconomic status is an important factor in sleep because it can dictate the sleeping environment, such as heating, cooling, noise level, space, bed size, number of occupants, etc., which have been proven as important to high quality sleep (Hunter et al., 2018; National Sleep Foundation, 2012). Grandner, Patel, et al.'s (2010) study supported previous findings that income and education are negatively associated with sleep complaints and disturbances. The study found that multiracial women were more likely to report sleep complaints, but that “Hispanic/Latina” women and “Asian/other” men were the least likely within their respective gender groups. There was an interaction effect for race and marital status that differed depending on the racial group, but generally speaking, the highest likelihood of sleep complaints came from non-married individuals who were more specifically divorced or never married. This is somewhat surprising given how many factors pertaining to coupledom can negatively impact sleep quality. There is a large body of research that demonstrates relationships

between SES and health, which is not reviewed here but continues to speak to the complexity of factors related to sleep since both SES and health effect sleep quality.

Life-style factors that affect sleep quality can include physical activity, external environment, and the internal style of one's home. For example, where you live makes a difference in sleep quality on a very basic level because we must feel safe and have a sense of security to let go and drift off into the vulnerable state of sleep (Troxel, Robles, et al., 2007). A life-style factor can be as minimal as caffeine consumption. People typically drink caffeine to combat sleepiness, but the amount that is consumed and the timing of consumption can lead to worse sleep quality (Kerpershoek, Antypa, & Van den Berg, 2018). Smoking habits also negatively affect sleep quality (Yilmaz, Tanrikulu, & Dikmen, 2017). Lastly, the amount of TV watched is a negative contributor, as people who report watching over two hours of television per day are more likely to report poor sleep quality (de Souza et al., 2017). The effect of screen use on sleep goes beyond televisions, as Brunborg et al. (2011) demonstrated that the use of computers and mobile phones in the bedroom were associated with poorer sleep habits.

Sleeping in pairs, as many couples choose to do, is another important life-style consideration when examining sleep quality. Spiegelhalder et al. (2015) found that in young heterosexual couples engaging in stayovers, sleep quality was perceived to be better when sleeping with their partner regardless of which person's house they slept in. Randler, Barrenstein, Vollmer, Díaz-Morales, and Jankowski (2014) found that women preferred their partners to have matching sleep-wake cycles to them, with bedtime being a more valued match. Sex differences also exist in pair sleeping with regard to sleep efficiency, subjective sleep quality, and sexual contact prior to sleep (Dittami et al., 2007). Dittami et al.'s (2007) study found that in heterosexual couples, women's sleep was more disturbed in the presence of their male partner

versus sleeping alone, which did not hold true the other direction as men's sleep was not more disturbed in the presence of their female partners. The sample's subjective assessment of their sleep was mostly in line with the objective sleep efficiency measures. However, if the couple engaged in sexual contact prior to sleep, they tended to subjectively rate their sleep higher than the objective measures captured. Therefore, women rated sleep quality the same when sleeping alone and pair-sleeping with sexual contact, but rated pair-sleeping without sexual contact as poorer quality, whereas men rated their sleep quality higher for pair sleep with or without sex and sleeping alone as lower quality.

Research has shown that couples objectively sleep better alone than with their partner, but subjectively they often report that their sleep is better when with their partner (Pankhurst & Home, 1994). The fact that objective measures do not match with self-reports is an interesting phenomenon that leads to the question of why so many people prefer sleeping with a partner. Troxel, Cyranowski, et al., (2007) began to examine the associations between attachments, relationships, and sleep with the perspective that for some individuals, the need for closeness may outweigh the goal of good sleep. Diamond, Hicks, and Otter-Henderson, (2008) found that those with insecure attachments had exacerbated sleep disturbances when sleeping away from their partners. Hicks & Diamond (2011) found that attachment style played a role in sleep disturbances when couples experienced conflict. Individuals reported greater sleep disturbances the morning after a *couple-related* conflict than they did after a *non-couple-related* conflict. The positive association between couples-conflict and sleep disturbances held true for both highly avoidant and highly anxious individuals. However, the effect was much larger for people who identified as highly anxious. Although avoidant individuals did not report heightened negative affect the morning after an argument, they still reported sleep disruptions, which suggests that

their coping strategy of distancing themselves or not disclosing affect may not be truly effective. Hicks and Diamond (2011) found that greater sleep disruptions occurred with higher levels of relationship conflict, and those with high anxiety attachment were the most effected. Is it possible that the disruptions occurred in part because the couple changed their normal pre-bedtime rituals as a result of the conflict—less cuddling, going to bed at different times, or not processing the day's events together?

Adams et al. (2014) reviewed the literature on associations between attachment style and sleep across the life span, and found that a bidirectional relationship is formed early in life and persists over time. According to the findings of their review, individuals who identify as anxiously attached seem to experience worse sleep quality, those who are securely attached experience better sleep quality, and some studies have found that individuals with avoidant attachments experience fewer sleep disruptions. However, avoidantly attached individuals are not immune from sleep disturbances and still experience physiological arousal and avoidant-related dream content (Adams et al., 2014). Carmichael and Reis (2005) found that people who rate high in attachment anxiety also report lower sleep quality even when controlling for depressed affect. By controlling for depressed affect this study established a clearer link between attachment insecurity and poor sleep quality. When it comes to the relationship between sleep and attachment, "…for all indices, security was associated with better sleep and insecurity [preoccupied/anxious, fearful, and dismissing/avoidant] was associated with poorer sleep" (Scharfe & Eldredge, 2001, pp. 303–304). The effects Scharfe and Eldredge (2001) found were substantially stronger in those individuals who were in committed relationships, with the exception that dismissive/avoidant attachment predicted worse sleep quality for individuals not in a committed relationship.

The majority of past research has studied the individual as the focal point even though most adults sleep with a partner. The purpose of this section was not to present all of the research on sleep characteristics but rather to provide a brief summary establishing the associations between sleep quality and health, relationships, and attachment as a base for continuing to expand the study of sleep to a dyadic, interpersonal phenomenon.

Relationship Satisfaction

Relationship satisfaction as a construct has been measured in many ways, yet remains somewhat elusive as people's needs and satisfaction are subjective (Vaughn & Baier, 1999). Much of the research has focused on marital satisfaction between heterosexual couples, and less has examined romantic relationships more generally or varying sexual orientations (Bradbury, Fincham, & Beach, 2000). The construct's measurement has historically included evaluative judgments about the relationship, specific behaviors, and interactional patterns between partners (Bradbury et al., 2000). In a review, Bradbury et al. (2000) identified several possible contributing factors for marital satisfaction: interpersonal processes, cognitive attributions and interpretations, affect, synchronicity of physiological systems, behavioral patterns, social support, violence, children, individual partner characteristics, and life stressors. This is a broad scope when trying to better understand mechanisms within romantic relationships, which is further complicated by relationship satisfaction being a relatively "soft" construct and solely measured by subjective report. The following review does not seek to address every contributing factor listed above, but rather to briefly shed light on ones that are most pertinent to the current study.

Personality factors, individual partner characteristics, and affect all contribute to the way a person is in a relationship, which then effects the relationship satisfaction of their partner.

Individuals who are difficult interpersonally may struggle to find satisfying relationships and may contribute to damaging effects in any relationships they are in, regardless of the traits of their partner (Karney & Bradbury, 1995). Maladaptive personality traits can be categorized as emotional dysregulation, dissocial behavior, inhibition, compulsivity (Decuyper, Gistelinck, Vergauwe, Pancorbo, & De Fruyt, 2018); negative affectivity, detachment, antagonism, disinhibition, psychoticism (American Psychiatric Association, 2013); and neuroticism (Costa & McCrae, 1992). Some of these traits reflect issues related to mental health. Traits such as agreeableness, conscientiousness, and extroversion are associated strongly with relationship satisfaction (Karney & Bradbury, 1995). However, when these traits are exhibited in the extreme, they no longer contribute to relationship satisfaction (Leikas, Ilmarinen, Verkasalo, Vartiainen, & Lönnqvist, 2018). Ultimately, inhibition and related features, such as avoidant attachment, restricted sexuality and intimacy, and restricted expressions of emotion were among the most detrimental to relationship satisfaction (Decuyper et al., 2018). In a dyadic examination of these associations, presence of inhibition characteristics in either partner was linked to decreased satisfaction in both partners (Decuyper et al., 2018). This suggests that avoidant attachment may be the most negatively associated with relationship satisfaction.

Daily stressors have an effect on people's relationship satisfaction on a day-to-day basis. One such stressor is financial stress, which has been identified as the cause of much marital dissatisfaction. In a recent study, Totenhagen, Wilmarth, Serido, and Betancourt (2018) found interesting effects for how finances affect partners in married and unmarried relationships. For unmarried women, greater financial satisfaction was associated greater relationship quality for themselves and their partners. High financial stress was associated with lower relationship satisfaction for unmarried men and married women. For unmarried men, higher financial

satisfaction was associated with lower relationship satisfaction. Perhaps because the work that goes in to creating financial security can detract from aspects needed for higher relationship satisfaction. First-time parenting is a daily stressor that has been shown to cause a decrease in relationship satisfaction regardless of the level of satisfaction prior to having children (Twenge, Campbell, & Foster, 2003). Couples reporting the lowest levels of satisfaction are those with children two years old and younger (Twenge et al., 2003). Regardless of the source of daily stress, chronic stressors have been shown to decrease quality time in a relationship, decrease communication, reveal problematic personality traits, and create additional problems with physical or mental health (Bodenmann et al., 2007). These all contribute to decreased levels of satisfaction in a relationship.

Other qualities that contribute positively to relationship satisfaction include similar values between partners, shared beliefs, forgivingness (Sheldon et al., 2014); and physical affection as previously mentioned (Gulledge et al., 2003). Couples demonstrate significant similarity in political values with those identifying as conservative being more likely than liberals to have partners that also identify as conservative (Leikas et al., 2018). Women with partners who shared their political values demonstrated higher relationship satisfaction (Leikas et al., 2018). For married partners, the tendency to forgive one another is related to higher relationship satisfaction, since the ability to seek and give forgiveness is a predictor for satisfaction (Sheldon et al., 2014). The same did not hold true for dating partners, but for both groups, the forgiveness strategies most commonly used were nonverbal affection and minimizing strategies (Sheldon et al., 2014). The amount of physical affection in a relationship is significantly positively associated with partner and relationship satisfaction (Gulledge et al., 2003). Additionally, the more physical affection that is given and received in a relationship, the more easily conflict in the relationship

is resolved (Gulledge et al., 2003). General positive affect and positive problem-solving skills also contribute to increased happiness and satisfaction in marital relationships (Gottman, Coan, Carrere, & Swanson, 1998; Rauer & Volling, 2013). Couples who are highly supportive of one another, and who maintain this during difficult times especially, are those who tend to rate their satisfaction highly (Rauer & Volling, 2013).

What role does attachment play in relationship satisfaction? Individuals who identify with a more secure attachment tend to rate their relationship satisfaction higher than those who identify with an insecure attachment (R. M. Diamond, Brimhall, & Elliott, 2018). Individuals who identify as secure are good at providing comfort, support, and reassurance in their relationships and they seek these attributes in their partners as well (Collins, Guichard, Ford, & Feeney, 2006). They are good at providing secure bases for their partners to encourage growth and exploration of personal pursuits, which increases satisfaction for their partners (Collins et al., 2006). There are not significant differences in satisfaction between the two insecure attachment types (avoidant/dismissive or anxious/preoccupied). Both are rated lower in relationship satisfaction than secure relationships, but for different reasons as avoidant individuals tend to limit intimacy and seem unavailable to partners and anxious individuals are hyper-vigilant for signs of abandonment and experience great distress as a result (R. M. Diamond et al., 2018). The type of relationship, such as first marriage versus second marriage or even dating post-divorce, has less to do with relationship satisfaction than the security of the attachment within the relationship (R. M. Diamond et al., 2018). This suggests that the dynamic between two individuals is crucial in the ability to form a safe haven and secure base from which the two can feel safe and satisfied in their relationship. For those who identify as more anxiously attached, there can be greater difficulty in experiencing relationship satisfaction. Campbell, Simpson,

Boldry, and Kashy (2005) found that anxiously attached people tended to perceive greater conflict in their relationships, they gave experiences of conflict more weight in the relationship, and they appeared and reported becoming more distressed when recalling major conflicts. They appeared less soothed by their partner's positive behaviors toward them, yet after a conflict and with some time, they become flooded with positive memories, which increases their desire to maintain the attachment bond. As a result, their perception of their relationship is somewhat unstable as is their degree of relationship satisfaction. Secure individuals may be more likely to hold steady views, goals, and objectives of their relationship while managing arising conflicts in less extreme manners. The current study examined whether affection and cuddling mediate the relationship between attachment systems and relationship satisfaction, given the associations described above.

Hasler and Troxel's (2010) examination of sleep and relationship functioning is one of the first studies to model a dynamic and reciprocal relationship between sleep and relationship functioning in couples. They found differences in bidirectionality for men versus women. For example, men who self-reported higher sleep efficiency predicted less negative interactions with their partners the following day. However, women who experienced objectively greater sleep efficiency on a particular night, predicted less negative interactions with their partner throughout that same day. Potentially meaning that when men get adequate sleep they have more positive interactions with their partners the following day, but women's sleep is more dependent upon the quality of interactions with their partner during that current day. They also found a relationship between the ratings of positive interactions as reported by women and the self-reported sleep efficiency for men that same evening. Gordon and Chen (2014) examined whether the consequences of low quality sleep influenced the "degree, nature, and resolution of conflict" (p.

168) between romantic couples. They found that after one night of poor sleep, couples experienced a greater amount of conflict the following day. They also experienced a lower ratio of positive to negative affect and were less empathically accurate with their partner during conflicts that arose. This led to couples having more difficulty resolving conflicts after poor sleep. Gordon and Chen (2014) identified "sleepless nights" as a risk factor for relationship satisfaction in that inadequate sleep may undermine people's ability to resolve conflict and it decreases empathy. This phenomenon may contribute to the decrease in relationship satisfaction that first-time parents experience due to increases in sleep disruptions (Medina et al., 2009). Inter-partner violence is another area of couples sleep and relationship functioning that has been examined (DiBello, Preddy, Øverup, & Neighbors, 2017; El-Sheikh et al., 2015; Rauer & El-Sheikh, 2012). Several studies show that sleep problems predicted increased psychological intimate partner violence over time for both partners, and that sleep problems are predicted by earlier intimate partner violence. Rauer and El-Sheikh (2012) found that men were affected differently than their female partners in that their sleep disruption was more sensitive to previous behaviors of their partners. It is unclear how attachment styles play a role in the resolution of these perpetrations or how couples cope with their reactions prior to going to bed.

Sleep and relationship satisfaction are associated in others ways as well. Couples who do not have similar sleep-wake cycles reported lower satisfaction in their relationship, including lower satisfaction in their sexual relationship, than couples whose sleep-wake cycles matched (Lange, Waterman, & Kerkhof, 1998; Larson, Crane, & Smith, 1991). Larson et al. (1991) found that matched morning couples engaged in sex in the morning more often and evening couples engaged in sex more often at night. There were no significant differences in the amount of sex these couples had, however, they both engaged in sex more often than couples that were

mismatched in sleep-wake cycles. Mismatched couples reported lower interactional problem solving abilities (Lange et al., 1998), greater amount of conflict, less affectional expression, less time in shared activities, less time engaging in serious conversations, and were less satisfied in their relationships than matched couples (Larson et al., 1991). However, if couples who were mismatched happened to exhibit high marital adjustment and reported high happiness, their ability to adapt and problem-solve was similar to matched couples (Larson et al., 1991).

Summary

The preceding literature review has demonstrated a relationship between attachment and affectionate communication, where those with insecure attachments are potentially less likely to engage in its expression or benefit from it. Additionally we looked more closely at cuddling as a form of nonverbal affectionate communication and as part of the bed-time ritual for couples. We found that affection is a behavior that enhances relationship satisfaction, and its expression in the form of cuddling provides safety and security for couples, which is related to greater sleep quality. We looked at relationship satisfaction, and although there are several contributing variables, we established a connection between attachment and relationship satisfaction, as those who are more securely attached appear to experience greater relationship satisfaction. We also looked at sleep quality and highlighted the many factors that affect it as an outcome, including health, work, family, environment, and pair-sleeping. Additionally, there is an established relationship between attachment and sleep quality, with a similar theme as above where those with secure attachment tend to experience greater sleep quality. We discussed an important bidirectional relationship between sleep quality and relationships satisfaction in which better sleep means coping with relationship challenges better, and feeling more satisfied with one's relationship allows for more peaceful sleep.

Another aspect highlighted throughout the literature review is the examination of these dynamics in the context of a romantic relationship, where one partner inevitably influences the other in each of these areas. For example, a couple with one secure and one insecure partner are more likely to rate their satisfaction lower than two secure individuals. They may have to exert more energy in negotiating affectionate communication, such as cuddling, particularly if one partner has a more avoidant attachment. How well they are able to cope with meeting each other's needs at night may influence their satisfaction with the relationship, which may in in turn dictate how well they are able to sleep together. The process is a complex one, but observing these relationships within the context of a romantic dyad is a new direction in research, which will enable us to better understand how we operate interpersonally, as we are rarely independent actors in life or relationships. The statistical analysis used in the current study is one specifically used to examine dyadic effects (Cook & Kenny, 2005). Other studies that have used the same model include those examining attachment and experiences of support in couples (Davila & Kashy, 2009); attachment and symptom distress in couple's therapy (Parker et al., 2012); dark personality traits and marital stability (He, Wang, Xing, & Yu, 2018); and couple's sleep efficiency with their daytime relationship functioning (Hasler & Troxel, 2010).

Chapter III

Method

This is a dyadic study of self-reported data from couples to investigate how each partner's attachment are related to the individual and their partner's feelings about cuddling, affectionate communication, subjective sleep quality, and relationship satisfaction. The target population, sample selection, instruments used, study's design and procedures, and statistical analysis will be described below.

Participants

To determine an appropriate sample size, several factors were taken into consideration. For the dyadic data analysis used in this study, Actor-Partner Interdependence Model (APIM), a test of nonindependence must be completed. It is recommended to have a minimum of 35 dyads to test for nonindependence (Kenny, Kashy, & Bolger, 1998). A computer program created by Ackerman and Kenny (2016), *APIMPower,* allows one to conduct a priori and post hoc power analyses for the standard APIM model. In a post hoc analysis with a sample size of 100 dyads, the program predicts a power of .959 for a pre-set actor effect size, β=0.25, and a power of .602 for a pre-set partner effect size, β=0.15. This is with alpha pre-set to α=.05, correlation of the actor and partner variables pre-set to 0.3, and correlation of errors pre-set to 0.3. Partner effects generally require larger sample sizes for detection (Ackerman & Kenny, 2016). Studies that use APIM for mediation analyses (APIMeM) have dyad sample sizes ranging from 80 (Côté, Gagnon-Girouard, Sabourin, & Bégin, 2018; Samios & Baran, 2018), to 100-120s (Gewirtz-

Meydan & Finzi-Dottan, 2018; Leclerc et al., 2015; Weigel, 2008), and up to several hundred dyads (Kane et al., 2007). In their review of APIM studies, Kenny, Kashy, and Cook (2006) determined that the median number of dyads in these studies was 101 with a mean of 80 dyads.

In the current study, a total of 314 individuals responded to the questionnaire. Of the 314 respondents, 64 participants' partners did not also complete the survey making them single respondents. Of the remaining 250 respondents, five individuals had incomplete responses to the non-demographic measures so they and their partners were eliminated from the sample. The remaining sample consisted of 240 individuals, or 120 dyads with no missing data for the non-demographic measures. Sixteen of the 120 dyads identified as same-sex couples, the remaining 104 dyads identified as heterosexual couples. In dyadic analyses, heterosexual couples are generally treated as distinguishable partners, whereas same-sex couples are treated as indistinguishable partners. Considerations regarding distinguishability will be discussed later in the current chapter and in the results section. However, the final sample for analysis in the current study consisted only of the 104 heterosexual couples.

Measures

Demographic information. All participants completed a demographic questionnaire (Appendix A). Items were multiple choice or fill-in and included questions about age, relationship status, cohabitation status, average number of nights per week of co-sleeping, gender, race/ethnicity, sexual orientation, length of relationship, educational level, employment status, presence of children, and pregnancy status. Participants' ages ranged from 19 to 70 years old, with a mean age of 34.29 years (median and modal age was 33 years). Relationship length of the couples ranged from 3 to 441 months, with a mean relationship length of 96.74 months (approximately 8 years). See Tables 1, 2, and 3 for additional participant demographic

information. Participant information was not gathered for income levels. Although a majority of respondents indicated there were no children currently present at home, it is possible that for some of the sample, their children are in college or older. Meaning that they may have children, just not ones who currently live at home.

Table 1. *Demographic information for relationship status, gender, race/ethnicity, and sexual orientation.*

Demographic		Total (*n*=240)	Percentage (% of *n*)
Relationship Status	Married or in a long-term committed relationship	179	74.58
	Dating one person casually or seriously	61	25.42
Gender	Man	110	45.83
	Woman	125	52.08
	Transgender Man	1	0.42
	Gender Fluid or Queer	2	0.83
	Other	2	0.83
Race/Ethnicity	Asian, Asian American, or Pacific Islander	12	5.00
	Black or African American	15	6.25
	White or European American	170	70.83
	Hispanic or Latina/o	19	7.92
	Bi-racial	11	4.58
	Multi-racial	6	2.50
	Other	3	1.25
	Prefer not to respond	4	1.67
Sexual Orientation	Heterosexual/Straight	180	75.00
	Gay	7	2.92
	Lesbian	18	7.50
	Bisexual	22	9.17
	Questioning or unsure	1	0.42
	Other	7	2.92
	Prefer not to respond	3	1.25

Table 2. *Demographic information for education, employment status, and employment shift.*

Demographic		Total (*n*=240)	Percentage (% of *n*)
Education	Less than high school diploma	4	1.67

	High school diploma	18	7.50
	Some college	37	15.42
	Associates degree	14	5.83
	Bachelor's degree	57	23.75
	Some graduate/professional school	14	5.83
	Graduate/professional degree	86	35.83
	Other	10	4.17
Employment	Full-time	154	64.17
	Part-time	36	15.00
	Not employed	27	11.25
	Other	23	9.58
Employment Shift (*n*=213)	1st shift	153	63.75
	2nd shift	13	5.42
	3rd shift	3	1.25
	Variable shifts	43	17.92

Table 3. *Demographic information about children in the home, children who sleep with their parents, and current pregnancy.*

Demographic		Total (*n*=240)	Percentage (% of *n*)
Children at home	No	200	83.33
	Yes	40	16.67
Children sleep in parent's bed (n=40)	Always	15	37.5
	Most of the time	13	32.5
	About half of the time	3	7.5
	Sometimes	4	10.0
	Never	5	12.5
Pregnant?	Yes	16	6.67
	No	224	93.33

Adult Attachment. The Experiences in Close Relationship Scale-Short Form (Wei, Russell, Mallinckrodt, & Vogel, 2007) is a 12-item measure on attachment. Six items pertain to the avoidant attachment dimension and six items pertain to the anxious attachment dimension. The measure includes statements such as, "I want to get close to my partner, but I keep pulling back" and "I find that my partner(s) don't want to get as close as I would like" (Fraley, Waller,

& Brennan, 2000). Participants responded to these statements on a scale of 1 (“strongly disagree”) to 7 (“strongly agree”) with higher scores on indicating an insecure attachment in the form of either anxious or avoidant depending on which is greater (Fraley et al., 2000; Wei et al., 2007). Several items were reversed scored. The totals for each subscale were averaged, yielding two continuous scores that were used for analysis (Fraley, 2012). This variable was considered mixed as average scores varied both within partners in a couple and between the other couples.

As previously mentioned, there were no missing data as dyads who did not complete all measures pertinent for analysis, were removed from the sample. The scores that were lower on both scales are suggestive of a secure adult attachment orientation, but there are no clear categorical designations when using this measure (Fraley, 2012). The instructions prompted the participant to consider how they feel in “emotionally intimate relationships” generally, not only in their current relationship (Fraley et al., 2000), which helps capture the person’s attachment tendencies beyond what has been negotiated with their current romantic partner. Internal reliability for the current sample’s Avoidant subscale was adequate to good, Cronbach’s $\alpha = .791$ for men, .837 for women and .814 total, and adequate for the Anxiety subscale, Cronbach’s $\alpha =$ .792 for men, .756 for women, and .776 total.

The ECR-S is shortened version from the original 36-item Experiences in Close Relationships (ECR) scale by (Brennan, Clark, & Shaver, 1998) and it maintains strong reliability and validity and a consistent factor structure compared to the original version. All psychometric properties were comparable with the original measure (Wei et al., 2007). Internal consistency was adequate for a shorter measure with coefficient alphas ranging from .77 to .86 for the Anxiety subscale and from .78 to .88 for the Avoidance subscale (Wei et al., 2007). Correlation between the two subscales was low in the standalone measure ($r = .28$), but even

lower when embedded in the full measure (r = .19; [Wei et al., 2007]), providing evidence that the two constructs are sufficiently differentiated. Construct validity was maintained, as each dimension correlated in the expected direction to measures including negative emotional states, excessive reassurance seeking, and comfort with self-disclosure (Wei et al., 2007). Lastly, test-retest reliability over a three-week period was strong, Anxiety subscale (r = .82) and Avoidance subscale (r = .89; [Wei et al., 2007]).

The original ECR was a successful measure for examining adult attachment and the Short Form maintains its integrity while allowing for broader use due to the fewer total items. The ECR-S has been used in studies examining attachment, infidelity, and relationships satisfaction (DeWall et al., 2011); appreciation, responsiveness, and bonding in relationships (Gordon, Impett, Kogan, Oveis, & Keltner, 2012); and attachment, self-esteem, and relationship satisfaction (Erol & Orth, 2013), among many other related studies.

Cuddling. Preferences, feelings about, and patterns for cuddling were measured using an adapted questionnaire originally developed by van Anders et al. (2013) for a study on the sexual versus nurturant aspects of cuddling between romantic partners. The original survey was a 32-item questionnaire that consisted of fill-in-the-blank, multiple choice, and self-ratings that asked the respondent to consider their *typical* cuddling activities and preferences. Over 500 participants completed the original questionnaire by van Anders et al. (2013) but the results reported were only descriptive. van Anders et al. (2013) confirmed there were few to no significant differences in responses based on gender or sexual orientation. In a study on cuddling and attachment, Chopik et al. (2014) selected five items from van Anders et al.'s cuddling questionnaire and found significant inter-correlation. These five items loaded onto a single factor suggesting they measured a single construct of feelings about cuddling.

The current study included 13 items total to assess cuddling behaviors. Eleven of the items were from the original survey created by van Anders et al. (2013). Six of the 11 items gathered information, such as what activities took place when the partners cuddled, who initiated cuddling, and how long they typically cuddled for. The remaining five items were those also used by Chopik et al. (2014) that had demonstrated to measure a single construct related to feelings about cuddling. Three of the items used by Chopik et al. used a Likert-scale of 1 ("not at all') to 5 ("completely") to respond to how nurtured, protective, or relaxed each partner feels during cuddling. Two items used a Likert-scale of 1 ("not at all") to 7 ("very much") to respond to how much they enjoyed cuddling or how positively they feel about it. The researcher added one screening question at the beginning of the survey section on cuddling to assess whether the partners cuddled at all. The researcher also created the final 13th item to assess the couples' overall satisfaction with their cuddling arrangement, since that was an important factor not specifically addressed by the other questions. This item was also a Likert-scale of 1 ("not at all") to 7 ("very much"). The scores from the Likert-scale items were totaled, with higher scores reflecting more positively feelings about cuddling. The scores represent a mixed variable as totals differed within partners and between partners. There were no missing data. Internal reliability in the current sample for the six Likert-scale items that measured feelings toward cuddling was good, Cronbach's α = .821 for men, .808 for women, and .812 total.

Affectionate Communication. The Affectionate Communication Index (ACI: [Floyd & Morman, 1998]) captured types of affection, other than physical, that couples show each other throughout the day. It is originally a 19-item measure with three factors: nonverbal, verbal, and supportive affection. However, for the purpose of this study, only the verbal and supportive items were used, totaling 10 items. The participants self-rated statements on a Likert-type scale

of 1 (“never or almost never do this”) to 7 (“always or almost always do this”) with results summed and yielding one overall ACI score. The measure included statements such as “give him or her a compliment,” “say ‘I love you,’” and “share private information” (Floyd & Morman, 1998). Participants answered items thinking about how they show affection to their current partner, with greater scores equating to greater affectionate communication. Internal reliabilities for the two scales used for this study are good and fair, respectively; Cronbach’s α = .80 for verbal and α =.77 for supportive (Floyd & Morman, 1998). The average inter-correlation of items ranged from .40-.53, and good convergent and discriminant validity has been reported (Floyd & Morman, 1998). Floyd and Morman also reported test-retest scores over a 14-day period that yielded correlations between .83-.89 for the original three factors. Psychometric data supports use of subscales independently (Floyd & Mikkelson, 2005). In the current study, scores for the ACI were considered a mixed variable as totals varied within partners and between couples. There were no missing data. Internal reliabilities for the current sample were adequate, Cronbach’s α = .778 for men, .707 for women, and .738 total for the Supportive subscale and Cronbach’s α = .805 for men, .758 for women, and .781 total for the Verbal subscale. Internal reliability for the combined scale was good, Cronbach’s α = .854 for men, .825 for women, and .839 total.

Subjective Sleep Quality. Sleep quality was measured using two questionnaires. The first was the Patient-Reported Outcomes Measurement Information System (PROMIS) Sleep Disturbance-Short Form (SD), which is an 8-item measure intended for adults (Buysse et al., 2010). This questionnaire was developed by the National Institutes of Health Roadmap Initiative to advance measurement of patient-reported outcomes. The purpose of the SD is not to measure symptoms of specific sleep disorders, but rather measure qualitative aspects of sleep and wake

functionality (Yu et al., 2012). Respondents were asked to think about the past seven days of sleep and rate items such as “My sleep was restless,” “I got enough sleep,” and “My sleep quality was…” on scales of one to five (see Appendix E; [Yu et al., 2012]). Total scores ranged from 8 to 40 with greater scores suggesting more sleep disturbances and lower scores reflecting good sleep quality (Patient-Reported Outcomes Measurement Information System, 2015). There were no missing data in the current sample. Raw scores were converted to T-scores, which were used in the analysis. The measure is considered a mixed variable as responses varied within and between partners.

The PROMIS SD short-form has demonstrated good psychometric properties (Buysse et al., 2010). Discriminant and convergent validities are strong as the SD correlates in expected directions with dissimilar and similar measures respectively, such as the Pittsburgh Sleep Quality Index (Yu et al., 2012). Internal consistency has been reported to be between .90 and .95 (Yu et al., 2012). The measure was developed using Item-Response Theory and the short form is just as psychometrically strong as the full, 27-item measure (Yu et al., 2012). Internal reliability for the current sample was strong, Cronbach’s $\alpha = .925$ for men, .905 for women, and .915 total.

The second measure participants completed was the Epworth Sleepiness Scale (ESS; [Johns, 1991]), which is a short scale about the chances of dozing off in eight different situations, such as watching television or sitting idly in a car. Participants rated their likelihood of dozing off on a Likert-type scale from 0 (“never”) to 3 (“high chance”). The scores were summed with a maximum total of 24, which indicated excessive sleepiness. There were no missing data in the sample. Generally, internal reliability for the scale is good, Cronbach’s $\alpha = 0.84$ (Hagell & Broman, 2007). The ESS has been used widely with population and clinical samples which makes it applicable for use in this study (Buysse et al., 2008). The correlation between the ESS

and PROMIS SD-short form is .30, which demonstrates that they measure independent aspects of sleep (Yu et al., 2012). In the current study, the internal reliability was adequate to good, Cronbach's α = .833 for men, .766 for women, and .801 total. The final analysis utilized results from the PROMIS SD scale only, and not the ESS.

Relationship Satisfaction. Relationship satisfaction was measured using the Relationship Assessment Scale (RAS; [Hendrick, 1988]). There were seven items that all fall into one main dimension of satisfaction. Participants rated questions, such as "How well does your partner meet your needs?" and "How often do you wish you hadn't gotten into this relationship?" on a five-point Likert scale (Hendrick, 1988). Items were summed with a maximum score of 35 and where higher scores reflected greater relationship satisfaction (Vaughn & Baier, 1999). There were no missing data in the current sample. Scores were mixed, meaning they varied both within partners and between partners.

The scale is a face valid measure that is psychometrically sound. Generally, the RAS has very good internal consistency with a Cronbach's α = .91; and inter-item correlations range from .35 to .80 (Vaughn & Baier, 1999), with a mean of .49 (Hendrick, 1988). Convergent validity is strong, as the RAS correlates with other measures of relationship satisfaction, such as the Dyadic Adjustment Scale, a longer but widely used measure for relationship satisfaction (Hendrick, 1988). The RAS has high accuracy in assigning couples as "together" or "apart" based on scores, which demonstrates its sensitivity to measuring satisfaction (Hendrick, 1988). It also has implications for use as a screening and outcomes measure tool for couples in therapy (Hendrick, Dicke, & Hendrick, 1998). Internal reliability for the current sample was good, Cronbach's α = .845 for men, .886 for women, and .868 total.

Depression and Anxiety. The Depression, Anxiety and Stress Scale—21 Items (DASS-21) is a self-reported measure consisting of three scales with seven items per scale that assess the emotional states of depression, anxiety, and stress (Lovibond & Lovibond, 1995). For the purpose of this study, only the scales on depression and anxiety were included, totaling 14 items. The DASS-21 is a dimensional scale and is not intended for diagnostic purposes. Respondents were asked to reflect over the past week and answer statements such as "I felt that I had nothing to look forward to" and "I felt scared without any good reason" (Lovibond & Lovibond, 1995). They rated items on a scale of 0 ("did not apply to me at all") to 3 ("applied to me very much or most of them time") with each subscale score being totaled (Lovibond & Lovibond, 1995). Higher scores reflected higher distress in either depression or anxiety. The variables were mixed as totaled varied within and between partners. There were no missing data.

The Depression and Anxiety subscales on the DASS-21 generally have adequate internal consistency (Cronbach's $\alpha = .88$ and $\alpha = .82$, respectively) given that the number of items for each subscale is so few (Henry & Crawford, 2005). The DASS-21 has demonstrated good convergent and discriminant validity when compared with other measures of depression and anxiety (Henry & Crawford, 2005). Depressed affect and anxiety are being controlled for in the current study because they have been shown to relate to sleep, attachment, and relationship satisfaction, and there is a precedent for doing so in studies examining similar relationships (Carmichael & Reis, 2005; Troxel, Cyranowski, et al., 2007). Internal reliability for each subscales in the current sample were very good, Cronbach's $\alpha = .940$ for men, .908 for women, and .927 total for the Depression subscale and Cronbach's $\alpha = .908$ for men, .844 for women, and .880 total for the Anxiety subscale.

Design

The current study is based on a dyadic design. Each partner in the couple produced data for attachment insecurity, self-ratings for their feelings about cuddling, an affectionate communication score, subjective sleep disturbance, their relationship satisfaction score, and depression and anxiety scores intended as control variables. The independent variables are the attachment insecurity scores for anxious and avoidant for each partner in the couple. The mediating variables are the scores for cuddling, affectionate communication, and sleep disturbance. The main outcome, or dependent, variables are relationship satisfaction and sleep disturbance, depending on the research question/hypothesis being addressed. All variables are considered mixed variables, as the responses varied within partners and between partners. There were no scores that were constant either within the couple or across couples. Statistical analysis will be described below.

Procedures

Approval was first obtained from the Institutional Review Board (IRB). Participants were recruited by several methods. First, through a database of couples who had previously participated in relationship educational seminars throughout the state of Alabama. Second, the Director of Training for Auburn University's Counseling Psychology program distributed an email to counseling psychology programs across the US recruiting couples. Third, the primary investigator advertised for recruitment through the social media platform, Facebook. Participants were eligible to complete the survey if they were 19 years or older and were currently in a committed, monogamous relationship in which they cohabitated and/or co-slept with their partner three or more nights per week. Both partners in the couple were required to participate, as the study examined dyadic dynamics. Participants were first asked to enter their and their partner's email addresses as an initial step. From there, the principal investigator assigned each

couple a unique code in the survey program Qualtrics to ensure their responses were paired but confidential. Email addresses and other identifiers were not linked to participant responses. Each participant was emailed a separate link to the survey to complete it independently even though both partners were required to respond. When participants clicked on the link they received, they were presented with an information letter stating the purpose of the study, eligibility requirements, the procedure of the study, potential risks and benefits involved, incentives, and their right to terminate participation without penalty (see Appendix B). It also included contact information for the principal investigator and advisor in case participants had questions. Participants were notified that both they and their partner needed to complete the survey in order to be included in the data and to be eligible for selection in a drawing.

After participants agreed to continue the study, they were presented with a series of questions that were generated by the investigator using the program Qualtrics and based on the measures specified above. Participants were prompted to respond to all instruments beginning with the screening questionnaire and followed by the Experiences in Close Relationships-Short Form, adapted Cuddling Questionnaire, adapted Affectionate Communication Index, PROMIS Sleep Disturbance-Short Form, Epworth Sleepiness Scale, Relationship Assessment Scale, an adapted DASS-21, and a demographic questionnaire. After the screening questions, the remaining measures were counterbalanced in the order they are presented to control for order effects. However, the demographic questions were always presented at the end. It was expected that each participant needed approximately 20-40 minutes to complete their survey based on a pilot run with eight individuals ranging from 30-70 years old and varying in other demographic factors. Once they completed all of the measures, they were thanked for their participation and directed to another survey to enter their email address for the chance to win one of 20 50-dollar

Visa gift cards. The email provided for the drawing was not linked to the responses for the previous survey.

After the total number of required responses was obtained, the raw data were downloaded from Qualtrics and prepared for statistical analysis. If participants did not complete the entire questionnaire for non-demographic measures, their responses were eliminated from the sample. Therefore, for ease, there were no missing data when scoring measures or for data analysis. The programs used for data preparation and analysis were the IBM Statistical Package for Social Sciences Version 25 (SPSS), the added module called Analysis of Moment Structures Version 25 (AMOS), and an online program developed for APIM mediation analyses (*APIMeM*, [Kenny, 2015]).

Statistical Analysis. The Actor-Partner Interdependence Model (APIM; [Cook & Kenny, 2005]) with Structural Equation Modeling (SEM) were used to analyze the data and address Research Questions 1a and 2a. APIM with mediation (APIMeM) and SEM were used to address Research Questions 1b, 2b, 3a, 3b, and 4. The APIM as a standalone model is recommended for use in studies examining couples and outcome measures, and has been increasingly used in studies of attachment (Cook & Kenny, 2005). The APIMeM model has been recommended for use in dyadic studies that also examine a mediator (Ledermann, Macho, & Kenny, 2011). Although one strength of SEM is the use of latent variables, the measures for anxious and avoidant attachment were not combined into one latent independent variable. Maintaining separate models lost the ability to examine combinations of attachment, however, the use of latent variables required a larger sample size with a recommendation of 200 dyads or more (Ledermann & Kenny, 2017).

The APIM is an applicable model for this study because it allows for examination of dyadic relationships where, "One person's score on a predictor or causal variable may influence not only that person's score on an outcome variable, but also that person's partner's score on the outcome variable" (Kenny & Kashy, 2014, p. 595). Thus, the analysis produces actor effects, which demonstrates the effect of the independent variable for one person on their own outcome variable, and partner effects, which demonstrates the effect of an individual's independent variable on their partner's outcome variable. The model also yields measures of model fit. However, APIM models ran with distinguishable dyads are saturated (i.e. zero degrees of freedom), therefore measures of fit are not informative, but actor and partner effects can still be examined. APIM ran with indistinguishable dyads is an unsaturated model and produces both informative model of fit statistics and actor/partner effects.

The current study also sought to understand the role of mediators in the relationship between attachment and relationship satisfaction, and then attachment and sleep quality. Traditionally, a simple mediation looks at three paths (*a*, *b*, and *c'*). There are two indirect effects; one between the independent variable and the mediator (*a*), and one between the mediator and the outcome variable (*b*). There is also one direct effect that looks at the relationship between the independent variable and the outcome variable while controlling for the mediator (*c'*). In a dyadic mediation analysis, there are two sets of these paths, which total six actor effects (*A* in Figure 2 based on model depicted in Ledermann et al., [2011]). There are also six partner effects (*P*) to determine the relationship between the individual and their effect

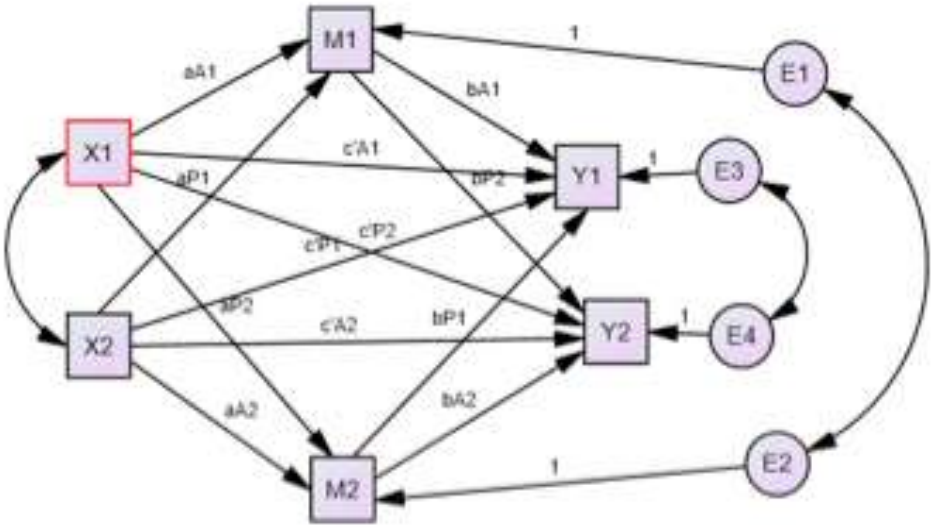


Figure 2. The APIM mediation model based on model from Ledermann et al. (2011, p. 597).

on their partner's mediator and outcome variables (Figure 2). The mediating effect, also called the indirect effect, of the independent variable on the outcome equals *ab* (i.e. the product of *a* and *b*; [Hayes, 2009]). The total effect (*c*) equals *ab* + *c'* (Ledermann et al., 2011).

As recommended by Ledermann and Macho (2009) assessing for mediation begins with selecting a good fitting model. To test whether there was a good fit of the model, several indices were used—the comparative fit index (CFI), the Tucker-Lewis indices (TLI), and the root mean square error of approximation (RMSEA). The recommended threshold for adequate fit are >0.95 for CFI and TLI (Kenny et al., 2006) and 0.06 to <0.08 for RMSEA (Hooper, Coughlan, & Mullen, 2008). The chi-square test for model fit was also conducted with a non-significant chi-square suggesting the model was a good fit (Hooper et al., 2008). Then it is necessary to actually test the mediation effect. To test whether the indirect or total effects were statistically significant, bias-corrected boot-strap analyses were conducted to estimate 95% confidence intervals for the indirect and direct effects based on 5000 bootstrap samples (Ledermann & Macho, 2009; Ledermann et al., 2011). Reviewing indirect and direct effects for direction and significance

determines whether the mediation was partial, complete, or inconsistent. Partial mediation occurs when the direct effect is non-zero, the indirect effect is significant and also non-zero, and is of the same sign as the direct effect (Ledermann et al., 2011). Full mediation is when there is zero direct effect between the independent variable and the outcome and the indirect effect is non-zero and significant (Ledermann et al., 2011).

Prior to analyses, a determination was made about whether the dyads were considered distinguishable or indistinguishable. Distinguishability is based on whether there is a substantive reason to consider the partners as falling into two distinct categories, such as father and child or husband and wife (Kenny et al., 2006). Friends, roommates, coworkers, and same-sex couples are considered indistinguishable as there are no theoretically-based differences between the two partners. There are several ways to examine whether dyad members are distinguishable or not, this includes examining equality of variances, equality of means, and equality of intrapersonal and interpersonal correlations (Kenny et al., 2006). When equality holds across all of these measures, the dyads are considered indistinguishable. Initially, the partners in all 120 dyads were randomly assigned as "actor" or "partner" in order to include same-sex couples and analyze the dyads as indistinguishable. Tests of distinguishability were performed on that sample, which included examining equality of variances and an omnibus test of distinguishability. There were statistically significant differences in the variances for cuddling and for sleep disturbance between "actors" and "partners." Variances for the other variables were not significantly different between actors and partners. Therefore, distinguishability was considered mixed in the sample where they were assigned as actor or partner. The decision was made to distinguish the dyads by gender rather than random assignment to "actor" or "partner" since random assignment did not meet the measure of equality of variance. This step required the removal of same-sex

couples, which decreased the total sample from 120 dyads to 104 dyads. Actors and partners were then distinguished as "women" and "men."

The next step in examining the data was to assess whether the assumption of nonindependence was met within the dyads. This confirms that the partnered data are more related to one another in the dyad than they are to random partners. A minimum of 35 dyads is required to test for non-independence and the current sample consisted of 104 dyads. The question of nonindependence is a theoretical one as much as a measured one (Kenny et al., 2006). In the current study, there is a base assumption that the partners are non-independent as they were in romantic relationships and research has established that these relationships affect outcomes for one another. This aspect will also be examined empirically in the next chapter.

Below are two sets of hypotheses, one for anxious attachment and one for avoidant attachment as the predicted effects for each type of insecure attachment differed. Based on the literature presented in Chapter 2, the hypotheses predicted actor and partner effects for the independent variables (insecure attachment) on the outcome variables (relationship satisfaction and sleep disturbance). They also predicted whether a partial mediation effect for the mediators of affectionate communication and sleep disturbance would be detected. Examination of cuddling as a mediator was explorative and no formal hypotheses were made. See Table 4 for a summary of research questions and hypotheses.

Hypotheses for Anxious Attachment

Hypothesis 1a: Women and men will demonstrate a negative relationship between scores for *anxious* attachment and relationship satisfaction. Women and men will also demonstrate a negative relationship between their own *anxious* attachment and their partner's relationship satisfaction.

Hypothesis 1b: Women and men will demonstrate a positive relationship between scores for *anxious* attachment and sleep disturbance. Women and men will also demonstrate a positive relationship between their own *anxious* attachment and their partner's sleep disturbance.

Hypothesis 1c: Affectionate communication will partially mediate the relationship between *anxious* attachment and relationship satisfaction for women and men and for their partners.

Hypothesis 1d: Affectionate communication will partially mediate the relationship between *anxious* attachment and sleep disturbance for women and men and for their partners.

Hypothesis 1e: Sleep disturbance will partially mediate the relationship between *anxious* attachment and relationship satisfaction for women and men and their partners.

Hypotheses for Avoidant Attachment

Hypothesis 2a: Women and men will demonstrate a negative relationship between scores for *avoidant* attachment and relationship satisfaction. Women and men will also demonstrate a negative relationship between their own *avoidant* attachment and their partner's relationship satisfaction.

Hypothesis 2b: Women and men will demonstrate a negative relationship between scores for *avoidant* attachment and sleep disturbance. However, women and men will demonstrate a positive relationship between their own *avoidant* attachment and their partner's sleep disturbance.

Hypothesis 2c: Affectionate communication will partially mediate the relationship between *avoidant* attachment and relationship satisfaction for women and men and their partners.

Hypothesis 2d: Affectionate communication will partially mediate the relationship between *avoidant* attachment and sleep disturbance for women and men and their partners.

Hypothesis 2e: Sleep disturbance will partially mediate the relationship between *avoidant* attachment and satisfaction for women and men and their partners.

Table 4. *Summary of research questions, outcome and mediating variables, with corresponding hypotheses.*

Research Question	Attachment	Mediator	Outcome	Hypothesis
RQ1a	Anxious		Relationship Satisfaction	H1a
	Avoidant			H2a
RQ1b	Anxious	Cuddling	Relationship Satisfaction	
	Avoidant			
RQ2a	Anxious		Sleep Quality	H1b
	Avoidant			H2b
RQ2b	Anxious	Cuddling	Sleep Quality	
	Avoidant			
RQ3a	Anxious	Affectionate Communication	Relationship Satisfaction	H1c
	Avoidant			H2c
RQ3b	Anxious	Affectionate Communication	Sleep Quality	H1d
	Avoidant			H2d
RQ4	Anxious	Sleep Quality	Relationship Satisfaction	H1e
	Avoidant			H2e

Chapter IV

Results

Descriptive Statistics

The predictor variables of attachment were centered for easier interpretation and to reduce multi-collinearity. They were centered across the grand means for anxious attachment and avoidant attachment as recommended by Kenny et al. (2006). Centering predictors was used instead of standardizing all variables for simplicity and ease of interpretation. Means were calculated for both women and men for anxious attachment (women's anxious attachment M = 3.6987; men's anxious attachment M = 3.3494) and then averaged (mean anxious attachment, M = 3.524). The same was calculated for avoidant attachment scores (women's avoidant attachment M = 2.1026; men's avoidant attachment M = 2.2083; mean avoidant attachment, M = 2.5545). The grand means for each predictor were then subtracted from each individual's respective score thereby creating new centered variables. The distribution of the variables were examined. Although some skew was present, it was not substantial enough to necessitate transformation at the expense of interpretability later in the analysis (Kim, 2013). Descriptive statistics for women and men are presented separately below for all predictor (prior to centering), mediating, outcome, and control variables (Tables 5 and 6).

Table 5. *Descriptive statistics for variables related to women participants.*

Women's	N	Mean	Median	Std. D.	Skew	Std. Error of Skew	Min	Max
Anxious Attachment	104	3.69	3.67	1.17	.230	0.24	1.17	6.833
Avoidant Attachment	104	2.10	1.83	0.98	1.15	0.24	1.00	5.17
Relationship Satisfaction	104	30.56	32.00	4.16	-1.23	0.24	14.00	35.00
Cuddling	104	30.28	31.00	4.05	-1.22	0.24	12.00	36.00
Affectionate Communication	104	57.88	58.00	9.30	-0.73	0.24	25.00	70.00

Sleep Disturbance	104	50.48	50.65	7.07	-0.22	0.24	28.90	69.00
Depression	104	3.29	2.00	3.82	1.97	0.24	0.00	19.00
Anxiety	104	3.07	2.00	3.49	1.68	0.24	0.00	18.00

Table 6. *Descriptive statistics for variables related to men participants.*

Men's	N	Mean	Median	Std. D.	Skew	Std. Error of Skew	Min	Max
Anxious Attachment	104	3.35	3.17	1.20	0.31	0.24	1.00	6.83
Avoidant Attachment	104	2.21	1.83	0.96	0.98	0.24	1.00	5.33
Relationship Satisfaction	104	30.54	31.00	4.13	-0.93	0.24	19.00	35.00
Cuddling	104	29.56	30.00	5.53	-1.87	0.24	6.00	36.00
Affectionate Communication	104	59.32	61.00	9.28	-1.31	0.24	21.00	70.00
Sleep Disturbance	104	48.95	48.45	8.61	-0.11	0.24	28.90	66.10
Depression	104	3.30	2.00	4.35	2.17	0.24	0.00	21.00
Anxiety	104	2.81	1.00	4.18	2.13	0.24	0.00	19.00

Cuddling. Couples reported information about their cuddling practices, which is presented here for descriptive purposes. Approximately 91% of the couples cohabitated. Across cohabitating and non-cohabitating participants, they reported sleeping in the same bed an average of 6.625 nights per week (min = 4, max = 7). Additionally, 62.8% of the sample said that when they go to bed, they cuddle "most of the time" to "always." Another 18% said they cuddle "half of the time," 17.7% said they cuddle "sometimes," and only 1% said they "never" cuddle. Women reported a range of cuddling from 0 to 360 minutes with a mean of 68.49 minutes. Men reported a range of cuddling from 0 to 480 minutes with a mean of 69.49 minutes. Couples also responded to questions about which partner initiates cuddling and whether cuddling is a planned activity, see Table 7.

Table 7. *Women and men's responses to questions about cuddling.*

Cuddling		Women n=104	Percentage (% of n)	Men n=104	Percentage (% of n)
Who initiates cuddling?	I always initiate	5	4.8	10	9.6
	I almost always initiate	6	5.8	6	5.8
	I sometimes initiate	8	7.7	9	8.7
	Both/neither of us initiates	62	59.6	51	49.0
	My partner sometimes initiates	14	13.5	19	18.3
	My partner almost always initiates	5	4.8	5	4.8
	My partner always initiates	4	3.8	4	3.8

Do you plan to cuddle?	Always planned	1	1.0	3	2.9
	Almost always planned	2	1.9	1	1.0
	Often planned	8	7.7	3	2.9
	Some planning	12	11.5	17	16.5
	Little planning	19	18.3	21	20.4
	Almost never planned	25	24.0	24	23.3
	Never planned	37	35.6	35	33.0

Test of Nonindependence

Nonindependence refers to the following: "If the two scores from the two members of the dyad are non-independent, then those two scores are more similar to (or different from) one another than are two scores from two people who are not members of the same dyad" (Kenny et al., 2006, p. 25). To empirically test nonindependence in distinguishable dyads, Kenny et al. (2006) recommend using Pearson product-moment correlation coefficient, *r*. The unit of analysis is the dyad, not the individual, therefore correlations are across 104 couples. Table 8 lists the correlations for all critical variables. The bolded results are those that show correlations between variables for women and men on the same measure. Results indicated that all correlations were significant, except the measure for sleepiness as measured by the Epworth Sleepiness Scale. Correlations ranged from small (*r* =.235) to large (*r* = .582), suggesting nonindependence between the partners across couples.

Table 8. *Pearson r correlations for nonindependence.*

	WAxAt	*WAvAt*	*WRS*	*WCud*	*WAff*	*WSD*	*WESS*	*WDep*	*WAnx*
MAxAt	**.295****	.495**	-.372**	.076	-.088	.154	.145	.330**	.260**
MAvAt	.182	**.235***	-.350**	-.073	-.064	.182	.253**	.297**	.267**
MRS	-.250*	-.416**	**.582****	.178	.306**	-.227*	-.163	-.364**	-.206*
MCud	-.102	-.072	.189	**.412****	.174	-.213*	-.241*	-.089	-.059
MAff	.028	-.177	.265**	.394**	**.328****	-.272**	-.100	-.082	-.005
MSD	.049	.189	-.206*	-.094	-.202*	**.317****	.075	.219*	.211*

MESS	.144	.265**	-.298**	-.195*	-.159	.300**	**.177**	.256**	.209*
MDep	.281**	.254**	-.350**	-.057	-.191	.327**	.180	**.351****	.388**
MAnx	.357**	.181	-.274**	.149	-.116	.264**	.296**	.391**	**.426****

Note: WAxAt = women anxious attachment; WAvAt = women avoidant attachment; WRS = women relationship satisfaction; WCud = women cuddling; WAff = women total affection; WSD = women sleep disturbance; WESS = women sleepiness; WDep = women depression; WAnx = women anxiety; MAxAt = men anxious attachment; MAvAt = men avoidant attachment; MRS = men relationship satisfaction; MCud = men cuddling; MAff = men total affection; MSD = men sleep disturbance; MESS = men sleepiness; MDep = men depression; MAnx = men anxiety.
** p < 0.05 level (2-tailed) ** p < 0.01 level (2-tailed).*

Correlations for measures within each gender are also presented below (Tables 9 and 10). Several variables were significantly correlated for both women and men. Insecure attachment for men and women were negatively related to relationship satisfaction. For women, avoidant attachment had a significant negative relationship with cuddling (r = -.285) and other affection (r = -.392). Anxious attachment was significantly and negatively correlated with affection (r = -.195) and cuddling (r = -.049). Sleep disturbance was significantly and negatively correlated with relationship satisfaction (r = -.339), cuddling (r = -.239), and affection (r = -.300). Measures for depression and anxiety were also significantly correlated with several of the other variables.

Table 9. *Correlations for women's measures.*

	WAxAt	*WAvAt*	*WRS*	*WCud*	*WAff*	*WSD*	*WESS*	*WDep*	*WAnx*
WAxAt	1								
WAtAv	.458**	1							
WRS	-.486**	-.602**	1						
WCud	-.049	-.285**	.368**	1					
WAff	-.195*	-.392**	.552**	.525**	1				
WSD	.259**	.311**	-.339**	-.239*	-.300**	1			
WESS	.279**	.238*	-.247*	-.051	-.092	.062	1		
WDep	.468**	.469**	-.500**	-.137	-.314**	.389**	.222*	1	
WAnx	.475**	.353**	-.329**	-.049	-.194*	.302**	.194*	.752**	1

Note: WAxAt = women anxious attachment; WAvAt = women avoidant attachment; WRS = women relationship satisfaction; WCud = women cuddling; WAff = women total affection; WSD = women sleep disturbance; WESS = women sleepiness; WDep = women depression; WAnx = women anxiety.
** p < 0.05 level (2-tailed) ** p < 0.01 level (2-tailed).*

For men, avoidant attachment was significantly and negatively related to cuddling (r = -.391) and affection (r = -.442). Relationship satisfaction was significantly and negatively related to sleep

disturbance (r = -.312), sleepiness (r = -.302), depression (r = -.303), and anxiety (r = -.231). Affection was also significantly and negatively correlated to sleep disturbance (r = -.283) and sleepiness (r = -.315).

Table 10. *Correlations for men's measures.*

	MAxAt	*MAtAv*	*MRS*	*MCud*	*MAff*	*MSD*	*MESS*	*MDep*	*MAnx*
MAxAt	1								
MAvAt	.209*	1							
MRS	-.302**	-.663**	1						
MCud	.081	-.391**	.288**	1					
MAff	.023	-.442**	.431**	.461**	1				
MSD	.266**	.303**	-.312**	-.165	-.283**	1			
MESS	.266**	.332**	-.302**	-.140	-.315**	.351**	1		
MDep	.499**	.335**	-.303**	-.026	-.180	.493**	.486**	1	
MAnx	.479**	.263**	-.231*	.079	-.055	.395**	.350**	.764**	1

Note: MAxAt = men anxious attachment; MAvAt = men avoidant attachment; MRS = men relationship satisfaction; MCud = men cuddling; MAff = men total affection; MSD = men sleep disturbance; MESS = men sleepiness; MDep = men depression; MAnx = men anxiety.
** $p < 0.05$ level (2-tailed) ** $p < 0.01$ level (2-tailed).*

Importantly, cuddling for women and men was not significantly correlated to anxious attachment, which is informative for exploratory purposes. Although this might appear to be an issue for mediation analyses because previous understandings of mediation suggested all variables of interest should be significantly correlated (Baron & Kenny, 1986), the more recent perspective states indirect effect are based on the product of indirect paths (*ab)* (Hayes, 2009; Ledermann & Macho, 2009). Therefore, it is possible for either *a* or *b* to be low or non-significant, since the product of the two are used in the tests of mediation below.

Actor-Partner Interdependence Models (APIM)

Research Question 1a (Hypotheses 1a and 2a)

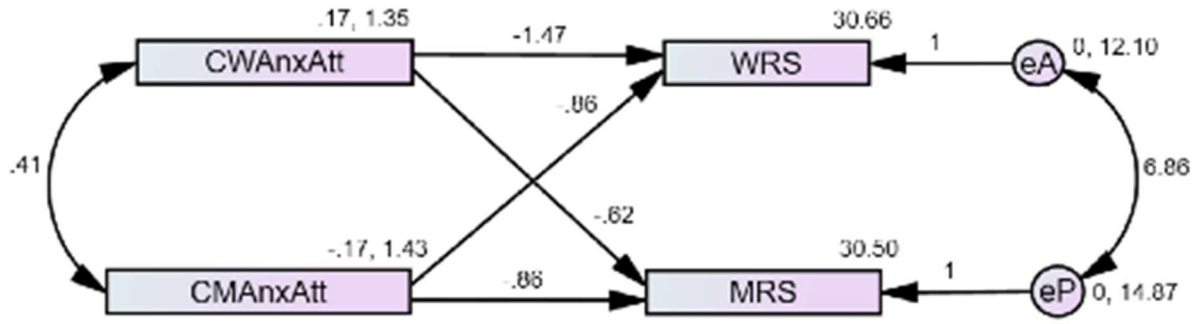
Research Question 1a sought to test whether a negative relationship existed between attachment insecurity and relationship satisfaction in the current sample. The corresponding Hypotheses 1a (anxious) and 2a (avoidant), were tested by the APIM, which yielded actor and

partner effects for insecure attachment and relationship satisfaction. There were 104 dyads with no missing data. All variables in the analysis were mixed variables, meaning they differed both within each dyad and had different averages between all of the dyads. Alpha was set to $\alpha = .05$.

Hypothesis 1a. The first model examined women and men's anxious attachment with women and men's relationship satisfaction. The model was ran with dyad members treated as distinguishable by gender, which resulted in a saturated model ($X^2(0) = .000$). Measures of fit were not informative due to model saturation, but actor and partner effects were (see *Figure 3* and Table 11). Actor effects were significant for both women and men. The relationship was negative, suggesting that those with higher scores in anxious attachment had lower scores in relationship satisfaction. A partner effect was significant but only for men. Men's scores for anxious attachment were significantly and negatively related to their partner's outcome of relationship satisfaction ($\beta = -.865$, $p = .004$). The same was not significant for women's effect on their partner's outcome for relationship satisfaction ($\beta = -.622$, $p = .069$). Therefore, there was partial support for Hypothesis 1a. Women and men's anxious attachment had a negative association with their own relationship satisfaction. Also, men's anxious attachment was negatively related to their partner's relationship satisfaction. The exception was that women's anxious attachment did not significantly relate to their partner's relationship satisfaction.

Control variables for depression and anxiety were added to the model, which made it unsaturated. However, the model did not demonstrate a good fit ($X^2(18) = 273.727$, $p = .000$; RMSEA = .371; CFI = .254; TLI = -.160). The model with controls did not reflect the most accurate representation of the data.

Figure 3. APIM with unstandardized estimates for anxious attachment and relationship satisfaction.



Note: CWAnxAtt = centered variable for women's anxious attachment; WRS = women's relationship satisfaction; CMAnxAtt = centered variable for men's anxious attachment; MRS = men's relationship satisfaction; eA = error for actor; eP = error for partner.

Table 11. *Women and Men's actor and partner effects for anxious and avoidant attachment and relationship satisfaction.*

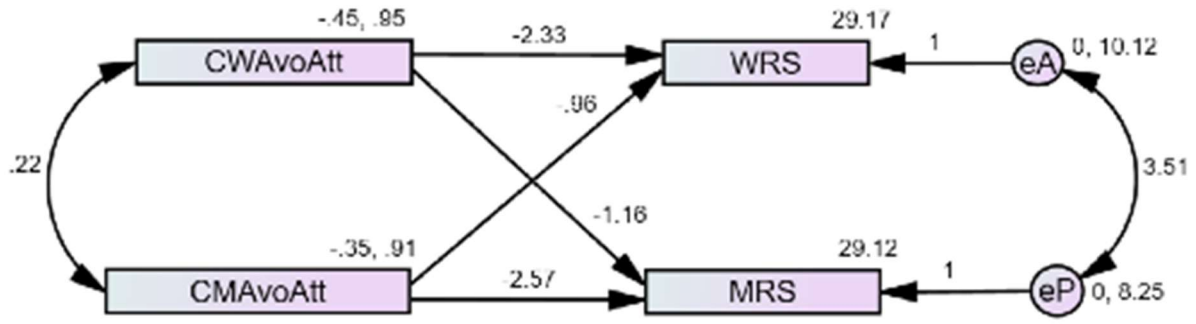
Effect	Estimate	*SE*	*p*	Std. estimate
Anxious Attachment				
Women Actor Effect	-1.466*	0.309	<.001	-.412
Men Actor Effect	-.857*	0.332	.010	-.250
Women Partner Effect	-.622	0.342	.069	-.176
Men Partner Effect	-.865*	0.299	.004	-.250
Avoidant Attachment				
Women Actor Effect	-2.329*	0.330	<.001	-.550
Men Actor Effect	-2.571*	0.305	<.001	-.598
Women Partner Effect	-1.159*	0.298	<.001	-.276
Men Partner Effect	-0.958*	0.337	.005	-.221

Note: SE = standard error; std. = standardized.

Hypothesis 2a. The second model examined women and men's avoidant attachment with women and men's relationship satisfaction. The model was ran with dyad members treated as distinguishable by gender, which resulted in a saturated model ($X^2(0) = .000$). Measures of fit were not informative due to model saturation, but actor and partner effects were (see *Figure 4* and Table 11). Actor effects were significant for both women and men. The relationship was negative, suggesting that those with higher scores in avoidant attachment also had lower scores in relationship satisfaction. Partner effects were also significant for both women and men,

suggesting that higher scores in their own avoidant attachment were related to lower scores in their partner's relationship satisfaction (women's partner effect, β = -1.16, p <.001; men's partner effect, β = -.96, p = .005). There was full support for Hypothesis 2a. Women and men's avoidant attachment was negatively related to their own relationship satisfaction and to the satisfaction of their partners.

Figure 4. APIM with unstandardized estimates for avoidant attachment and relationship satisfaction.



Note: CWAvoAtt = centered variable for women's avoidant attachment; WRS = women's relationship satisfaction; CMAvoAtt = centered variable for men's avoidant attachment; MRS = men's relationship satisfaction; eA = error for actor; eP = error for partner.

When control variables for depression and anxiety were added to the model, it was no longer saturated. However, the new model did not demonstrate a good fit ($X^2(18) = 247.323$, p = .000; RMSEA = .352; CFI = .390; TLI = .052). The model with controls did not reflect the most accurate representation of the data. Table 12 presents women and men's actor and partner effects for the models including controls depression and anxiety. Women's depression was significantly related to their own relationship satisfaction in the anxious attachment model (β = -.309, p = <.001) and the avoidant attachment model (β = -.259, p = <.001). There were no significant relationships for men's depression or anxiety and their own relationship satisfaction.

Table 12. *Women and Men's actor and partner effects for anxious and avoidant attachment on relationship satisfaction with control variables for depression and anxiety.*

Type of Effect	Estimate	*SE*	*p*	Std. estimate
Anxious Attachment				
Women Actor Effect	-1.240*	0.292	<.001	-.361
Men Actor Effect	-.690*	0.328	.036	-.206
Women Partner Effect	-.565	0.338	.095	-.163
Men Partner Effect	-.713*	0.283	.012	-.214
Effect on Relationship Satisfaction				
Women's Depression	-.309*	.075	<.001	-.294
Women's Anxiety	.141	.083	.088	.122
Men's Depression	-.098	.077	.204	-.105
Men's Anxiety	-.004	.080	.957	-.004
Avoidant Attachment				
Women Actor Effect	-1.958*	0.317	<.001	-.490
Men Actor Effect	-2.576*	0.305	<.001	-.598
Women Partner Effect	-1.163*	0.298	<.001	-.276
Men Partner Effect	-0.790*	0.324	.015	-.193
Effect on Relationship Satisfaction				
Women's Depression	-.259*	.074	<.001	-.252
Women's Anxiety	.051	.081	.530	.045
Men's Depression	.009	.061	.881	.010
Men's Anxiety	-.007	.063	.913	-.007

Note: SE = standard error; std. = standardized.

Research Question 1b

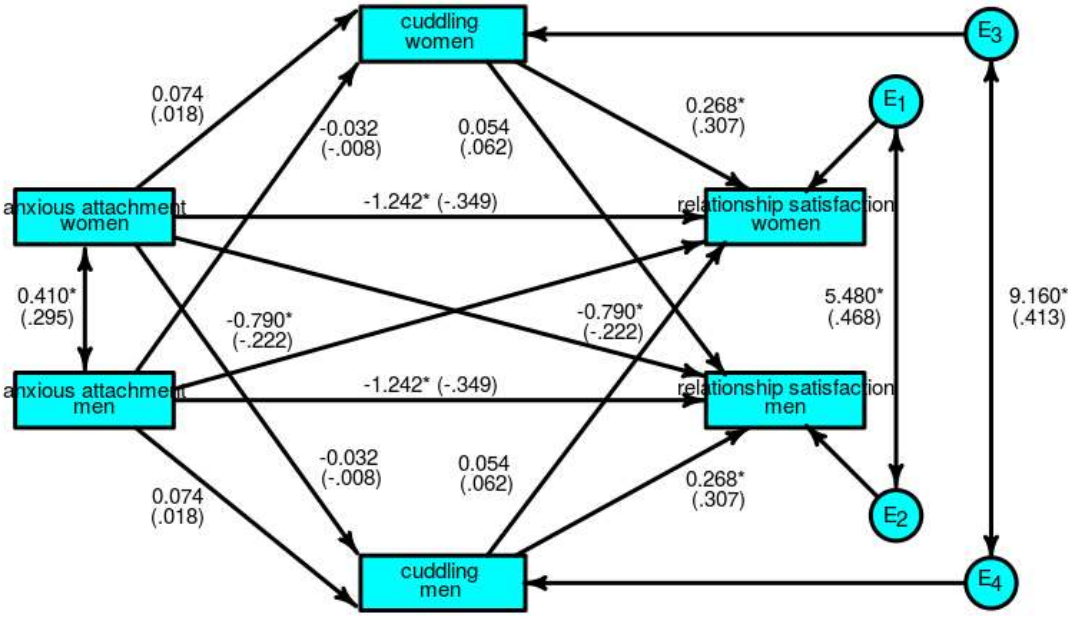
Research Question 1b sought to understand the mediation effect of cuddling on insecure attachment and relationship satisfaction. It was tested using APIMeM, which yielded model fit statistics and actor and partner effects for each path in the model (*a*, *b*, and *c'*). To determine whether the indirect effect or total effects were statistically significant (i.e. test for mediation), the bias-corrected bootstrap with a 95% confidence interval was used for unstandardized effects. Bootstrap estimates were based on maximum likelihood and on 5,000 bootstrap samples. Alpha (α) was set to .05 for all of the analyses. Model fit statistics, actor/partner effect estimates, and confidence intervals for indirect and total effects are presented below.

RQ1b Anxious. As recommended by Ledermann et al. (2011), APIMeM ran a test of distinguishability for the model to determine if it could be simplified due to its otherwise inherent complexity. The test of distinguishability for the mediation model with anxious attachment was non-significant ($X^2(6) = 11.247$, $p = .081$; RMSEA = 0.092, CFI = .959 and TLI = .897). This meant the model with anxious attachment, cuddling, and relationship satisfaction, had no statistically significant differences in actor or partner effects based on gender; they were empirically indistinguishable. The model was thus simplified for parsimony by constraining the direct effects and setting them to equivalent (Ledermann et al., 2011).

Adding the control variables for depression and anxiety to the model worsened the fit ($X^2(22) = 281.849$, $p = .000$; CFI = .330; TLI = -.371; RMSEA = .339). The control variables also eliminated the option to simplify the model for parsimony as indistinguishability no longer held true. Therefore, control variables were removed from the model on the recommendation that for mediation analysis, the simplest model with the best fit should be used (Ledermann & Macho, 2009).

Table 13 and Figure 5 illustrate that the actor effect for cuddling and relationship satisfaction (*b*) was significant ($\beta = .268$, $p < .001$). The actor and partner effects for anxious attachment and relationship satisfaction (*c'*) were also significant (actor: $\beta = -1.224$, $p < .001$; partner: $\beta = -.790$, $p < .001$).

Figure 5. Results for APIMeM with anxious attachment and relationship satisfaction mediated by cuddling.



Note: E1 and E3 = error for women; E2 and E4 = error for men. Figure produced by APIMeM program (Kenny, 2015).

Table 13: *Effect estimates for mediation of cuddling treating dyad members as indistinguishable, anxious attachment.*

Effect	Estimate	*SE*	*p*	Std. estimate
a effects (Anxious Attachment → Cuddling)				
Actor Effect	0.074	0.266	.781	.018
Partner Effect	-0.032	0.264	.904	-.008
b effects (Cuddling → Relationship Satisfaction)				
Actor Effect	0.268*	0.050	<.001	.307
Partner Effect	0.054	0.047	.246	.062
c′ effects (Anxious Attachment → Relationship Satisfaction)				
Actor Effect	-1.242*	0.195	<.001	-.349
Partner Effect	-0.790*	0.194	<.001	-.222

Note. a = indirect effect, b = indirect effect, c' = direct effect, SE = standard error, std. = standardized.

Table 14 shows no significant indirect effects in the mediation analysis for actors or partners.

However, the direct effect from anxious attachment to relationship satisfaction was statistically

significant for both actors and partners. The direct actor effect for this model was -1.242 (confidence interval: -1.630 to -0.855) with a standardized effect of -.349 and explained 98.55 percent of the total effect (*ab* + *c'*) for actors. The direct partner effect equaled -0.790 (confidence interval: -1.177 to -0.403) with a standardized effect of -.222 and it explained 99.37 percent of the total effect for partners. There was no evidence for mediation in this model based on these effects.

Table 14: *Total, Direct, and Indirect Effects for anxious attachment, cuddling, and relationship satisfaction.*

Type	Effect	Estimate	*p*	95% CI Lower & Upper		Percent Total
Actor	Total	-1.260*	<.001	-1.637	-0.811	
	Direct	-1.242*	<.001	-1.630	-0.855	98.55
	Total Indirect	0.018	.807	-0.133	0.171	1.45
	Actor-Actor Indirect	0.020	.781	-0.161	0.284	1.61
	Partner-Partner Indirect	-0.002	.905	-0.145	0.169	0.16
Partner	Total	-0.795*	<.001	-1.207	-0.382	
	Direct	-0.790*	<.001	-1.177	-0.403	99.37
	Total Indirect	-0.004	.952	-0.155	0.146	0.50
	Actor-Partner Indirect	0.004	.786	-0.132	0.189	0.51
	Partner-Actor Indirect	-0.009	.904	-0.212	0.225	1.13

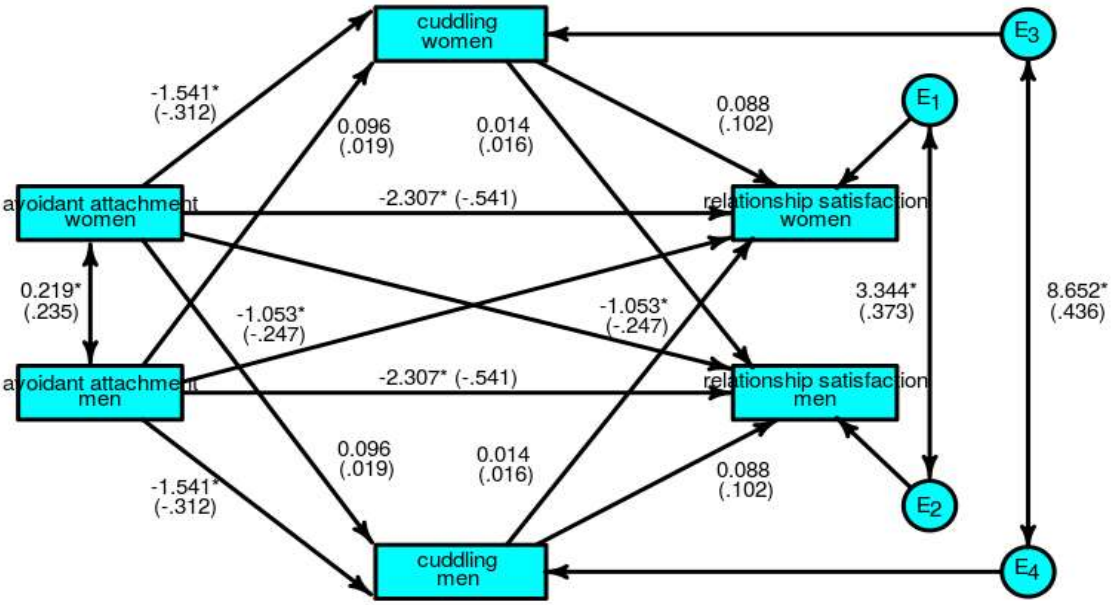
RQ1b Avoidant. This model tested cuddling as a mediator for avoidant attachment on relationship satisfaction. As recommended by Ledermann et al. (2011), APIMeM ran a test of distinguishability for the model to determine if it could be simplified. The test of distinguishability was non-significant ($X^2(6) = 8.444$, $p = .207$; RMSEA = 0.063, CFI = .987 and TLI = .968). Thus, the model with avoidant attachment, cuddling, and relationship satisfaction had no statistically significant differences in actor or partner effects based on gender; they were

empirically indistinguishable. The model was simplified for parsimony by constraining the direct effects and setting them to equivalent.

Adding the control variables of depression and anxiety to the model worsened its fit ($X^2(22) = 258.221$, $p = .000$; CFI = .449; TLI = -.127; RMSEA = .304). It also eliminated the option of simplifying the model for parsimony because the model no longer met indistinguishability. Therefore, control variables were removed from the model on the recommendation that for mediation analysis, the simplest model with the best fit should be used (Ledermann & Macho, 2009).

Table 15 and Figure 6 show that the actor effect for avoidant attachment on cuddling (a) was significant ($\beta = -1.541$, $p < .001$). Both the actor and partner effects were significant for avoidant attachment on relationship satisfaction (c'); (actor: $\beta = -2.307$, $p < .001$; partner: $\beta = -1.053$, $p < .001$).

Figure 6. Results for APIMeM with avoidant attachment and relationship satisfaction mediated by cuddling.



Note: E1 and E3 = error for women; E2 and E4 = error for men. Figure produced by APIMeM program (Kenny, 2015).

Table 15: *Effect estimates for mediation of cuddling treating dyad members as indistinguishable, avoidant attachment.*

Effect	Estimate	*SE*	*p*	Std. estimate
a effects (Avoidant Attachment → Cuddling)				
Actor Effect	-1.541*	0.304	<.001	-.312
Partner Effect	0.096	0.306	.754	.019
b effects (Cuddling → Relationship Satisfaction)				
Actor Effect	0.088	0.046	.056	.102
Partner Effect	0.014	0.047	.761	.016
c′ effects (Avoidant Attachment → Relationship Satisfaction)				
Actor Effect	-2.307*	0.224	<.001	-.541
Partner Effect	-1.053*	0.224	<.001	-.247

Note. a = indirect effect, b = indirect effect, c' = direct effect, SE = standard error, std. = standardized.

Table 16 showed there were no significant indirect effects in the mediation model. The direct actor effect for this model was -2.307 (confidence interval: -2.753 to -1.861) with a standardized effect of -.541 and explained 94.51 percent of the total effect (*ab* + *c'*) for actors. The direct partner effect equaled -1.053 (confidence interval: -1.495 to -0.612) with a standardized effect of -.247 and it explained 98.73 percent of the total effect for partners. Therefore, there was no evidence for mediation in this model based on these effects.

Table 16: *Total, Direct, and Indirect Effects for avoidant attachment, cuddling, and relationship satisfaction.*

Type	Effect	Estimate	*p*	95% CI Lower & Upper		Percent Total
Actor	Total	-2.441*	<.001	-2.860	-2.022	
	Direct	-2.307*	<.001	-2.753	-1.861	94.51
	Total Indirect	-0.134	.084	-0.308	0.013	5.49
	Actor-Actor Indirect	-0.135	.078	-1.021	0.864	5.55
	Partner-Partner Indirect	0.001	.827	-0.159	0.271	-0.06

Partner	Total	-1.067*	<.001	-1.485	-0.649	
	Direct	-1.053*	<.001	-1.495	-0.612	98.73
	Total Indirect	-0.014	.862	-0.176	0.142	1.27
	Actor-Partner Indirect	-0.022	.762	-0.903	1.022	2.06
	Partner-Actor Indirect	0.008	.757	-0.147	0.305	-0.79

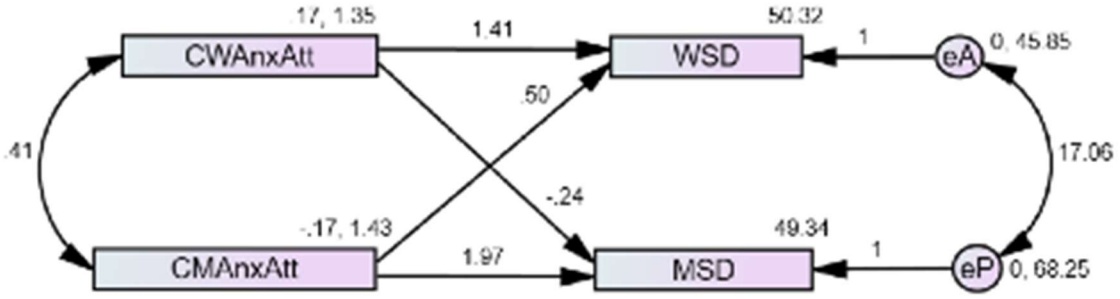
Research Question 2a (Hypotheses 1b and 2b)

Research Question 2a sought to test whether there was a positive or negative relationship between attachment insecurity and sleep disturbance in the current sample. The corresponding Hypotheses 1b (anxious) and 2b (avoidant), were tested using the APIM, which yielded actor effects and partner effects for insecure attachment on sleep disturbance. There were 104 dyads with no missing data. All variables in the analysis were mixed, with responses varying between and within the dyads. Alpha was set to α =.05.

Hypothesis 1b. The first model examined women and men's anxious attachment with women and men's sleep disturbance. The model was ran treating dyad members as distinguishable by gender, which results in a saturated model ($X^2(0) = .000$). Measures of fit were not informative due to model saturation, but actor and partner effects were (see *Figure 7* and Table 17). Actor effects were significant for both women and men. The relationship was positive, suggesting higher scores in anxious attachment were related to higher scores in sleep disturbance. Partner effects were non-significant. Therefore, there was partial support for Hypothesis 1b, since actor effects were present and in the hypothesized direction but partner effects were not. When control variables were added (i.e. depression and anxiety), the model became unsaturated but the fit of the model was poor ($X^2(18) = 268.009$, $p = .000$; CFI = .171;

TLI = -.289; RMSEA = .367). Thus, the model with controls did not reflect the most accurate representation of the data.

Figure 7. APIM with unstandardized estimates for anxious attachment and sleep disturbance.



Note: CWAnxAtt = centered variable for women's anxious attachment; WSD = women's sleep disturbance; CMAnxAtt = centered variable for men's anxious attachment; MSD = men's sleep disturbance; eA = error for actor; eP = error for partner.

Table 17. *Women and Men's actor and partner effects for anxious and avoidant attachment on sleep disturbance.*

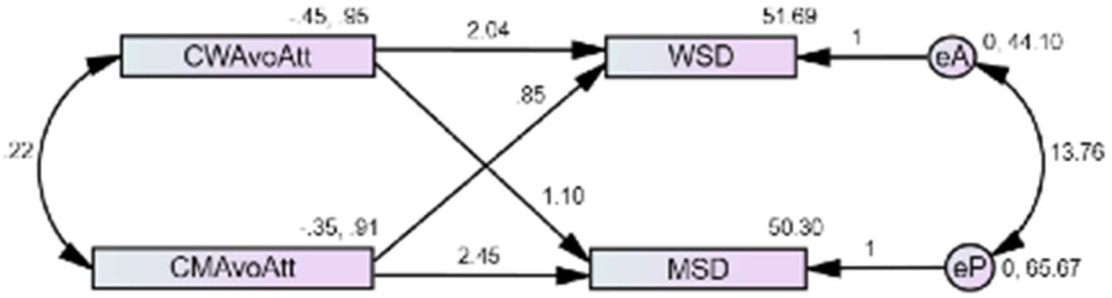
Effect	Estimate	*SE*	*p*	Std. estimate
Anxious Attachment				
Women Actor Effect	1.414*	0.601	.019	.234
Men Actor Effect	1.969*	0.711	.006	.275
Women Partner Effect	-.240	0.733	.743	-.033
Men Partner Effect	.499	0.583	.392	.085
Avoidant Attachment				
Women Actor Effect	2.042*	0.689	.003	.284
Men Actor Effect	2.454*	0.860	.004	.274
Women Partner Effect	1.097	0.841	.192	.125
Men Partner Effect	.846	0.704	.230	.115

Note. SE = standard error, std. = standardized.

Hypothesis 2b. The second model examined women and men's avoidant attachment with women and men's sleep disturbance. The APIM model was run treating dyad members as distinguishable by gender, which resulted in a saturated model ($X^2(0) = .000$). Measures of fit were not informative, but actor and partner effects were (see *Figure 8* and Table 17). Actor effects for both women and men were significant. The relationships were positive, suggesting

that individuals with higher scores in avoidant attachment also had higher scores in sleep disturbance, which was not what was predicted by Hypothesis 2b. Partner effects were non-significant. Therefore, there was no support for Hypothesis 2b. When control variables were added (i.e. depression and anxiety) the model became unsaturated but the fit was poor ($X^2(18)$ = 243.508, p = .000; CFI = .185; TLI = -.268; RMSEA = .349).

Figure 8. APIM with unstandardized estimates for avoidant attachment and sleep disturbance.



Note: CWAvoAtt = centered variable for women's avoidant attachment; WSD = women's sleep disturbance; CMAvoAtt = centered variable for men's avoidant attachment; MSD = men's sleep disturbance; eA = error for actor; eP = error for partner.

Controlling for depression and anxiety for women and men made actor effects non-significant in the APIM (see Table 18). However, because the model was a poor fit, it is not clear what the implications of this were. For both anxious and avoidant attachment, women and men's scores for depression were significantly related to their sleep disturbance, but not their anxiety scores. The relationships were positive, suggesting those with higher scores in depression also had higher scores in sleep disturbance. The effect for women's depression on their sleep disturbance in the anxious model was significant (β = .599, p <.001) and in the avoidant model (β = .524, p = .001). The effect for men's depression on their sleep disturbance in the anxious model was (β = .782, p <.001) and in the avoidant model (β = .715, p <.001).

Table 18. *Women and Men's actor and partner effects for anxious and avoidant attachment on sleep disturbance with control variables of depression and anxiety.*

Type of Effect	Estimate	*SE*	*p*	Std. estimate
Anxious Attachment				
Women Actor Effect	.642	.572	.262	.108
Men Actor Effect	.428	.637	.502	.062
Women Partner Effect	-.819	.657	.212	-.116
Men Partner Effect	.106	.555	.848	.019
Effect on Sleep Disturbance				
Women's Depression	.599*	.164	<.001	.331
Women's Anxiety	-.018	.179	.919	-.009
Men's Depression	.782*	.165	<.001	.412
Men's Anxiety	.178	.172	.300	.090
Avoidant Attachment				
Women Actor Effect	1.133	.663	.087	.163
Men Actor Effect	1.401	.779	.072	.165
Women Partner Effect	.451	.762	.554	.054
Men Partner Effect	.404	.678	.551	.057
Effect on Sleep Disturbance				
Women's Depression	.524*	.163	.001	.293
Women's Anxiety	.042	.178	.813	.021
Men's Depression	.715*	.164	<.001	.381
Men's Anxiety	.106	.171	.535	.054

Note: SE = standard error; std. = standardized.

Research Question 2b

Research Question 2b sought to understand the mediation effect of cuddling on insecure attachment and sleep disturbance, which was tested using APIMeM. The analysis yielded model fit statistics and results for actor and partner effects for each path in the model (*a*, *b*, and *c'*). To determine whether the indirect effect or total effects were statistically significant (i.e. test for mediation), the bias-corrected bootstrap with a 95% confidence interval was used for unstandardized effects. Bootstrap estimates were based on maximum likelihood and on 5,000 bootstrap samples. Alpha was set to α =.05 for all of the analyses. Model fit statistics,

actor/partner effect estimates, and confidence intervals for significant indirect and total effects are presented below.

RQ2b Anxious. As in the previous mediation analyses, the test of distinguishability was performed. The model was non-significant ($X^2(6) = 4.540$, $p = .604$; RMSEA = 0.000, CFI = 1.000 and TLI = 1.070). This meant that the direct effects were empirically indistinguishable across gender. The model was simplified by constraining the direct effects and setting them to equal. Adding control variables for depression and anxiety worsened the model fit ($X^2(22) = 279.320$, $p = .000$; RMSEA = .337, CFI = .221, TLI = -.593). The control variables were omitted since the model did not represent a good fit.

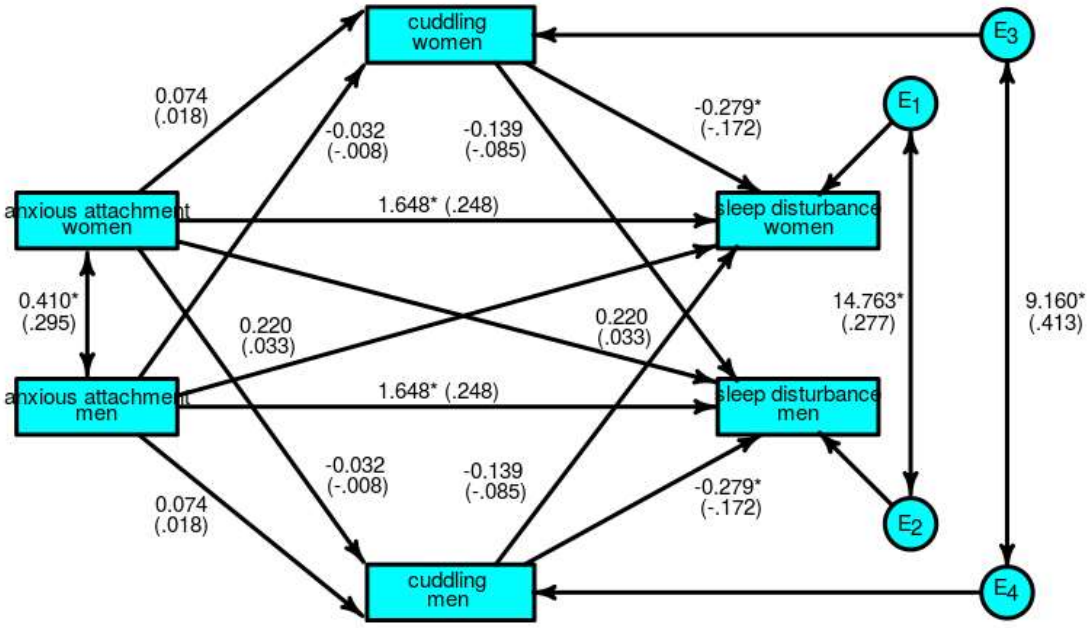
Table 19 and Figure 9 illustrate that the actor effect for cuddling on sleep disturbance (*b*) was negative and significant ($\beta = -.279$, $p = .012$). The relationship between anxious attachment scores and sleep disturbance was positive and significant ($\beta = 1.648$, $p < .001$).

Table 19: *Effect estimates for mediation of cuddling on sleep disturbance treating dyad members as indistinguishable, anxious attachment*

Effect	Estimate	*SE*	*p*	Std. estimate
a effects (Anxious Attachment → Cuddling)				
Actor Effect	0.074	0.266	.781	.018
Partner Effect	-0.032	0.264	.904	-.008
b effects (Cuddling → Sleep Disturbance)				
Actor Effect	-0.279*	0.111	.012	-.172
Partner Effect	-0.139	0.178	.180	-.085
c′ effects (Anxious Attachment → Sleep Disturbance)				
Actor Effect	1.648*	0.428	<.001	.248
Partner Effect	.220	0.425	.606	.033

Note. a = indirect effect, b = indirect effect, c' = direct effect, SE = standard error, std. = standardized.

Figure 9. Results for APIMeM with anxious attachment and sleep disturbance mediated by cuddling.



Note: E1 and E3 = error for women; E2 and E4 = error for men. Figure produced by APIMeM program (Kenny, 2015).

Table 20 shows there were no significant indirect effects in the mediation analysis for actors or partners. However, the direct effect from anxious attachment to sleep disturbance was statistically significant for actors only. The direct effect (*c'*) for actors in this model was 1.648 (CI: .808 to 2.487) with a standardized effect of .248 and explained 97.46 percent of the total effect (*ab* + *c'*). None of the partner effects were statistically significant. There was no evidence for mediation in the model based on these effects.

Table 20: *Total, Direct, and Indirect Effects for anxious attachment, cuddling, and sleep disturbance.*

Type	Effect	Estimate	*p*	95% CI Lower & Upper		Percent Total
Actor	Total	1.691*	<.001	0.776	2.487	
	Direct	1.648*	<.001	0.808	2.487	97.46
	Total Indirect	-0.016	.851	-0.214	0.176	1.00
	Actor-Actor Indirect	-0.021	.782	-0.245	0.205	1.27

	Partner-Partner Indirect	0.004	.905	-0.146	0.204	0.27
Partner	Total	0.243	.616	-0.633	1.069	
	Direct	0.220	.606	-0.616	1.055	90.56
	Total Indirect	-0.001	.987	-0.196	0.191	0.65
	Actor-Partner Indirect	-0.010	.785	-0.179	0.172	4.72
	Partner-Actor Indirect	0.009	.904	-0.188	0.257	4.07

RQ2b Avoidant. This model tested cuddling as a mediator for avoidant attachment and sleep disturbance. The test of distinguishability for the model was non-significant ($X^2(6) = 4.555$, $p = .602$; RMSEA = 0.000, CFI = 1.000, TLI = 1.049). Meaning the model with avoidant attachment, cuddling, and sleep disturbance had no statistically significant differences in actor or partner effects based on gender; they were empirically indistinguishable. The model was simplified by constraining direct effects and setting them as equivalent. Adding control variables worsened the model and were therefore omitted ($X^2(22) = 255.01$, $p = .000$; RMSEA = 0.321, CFI = .288, TLI = -.456). Table 21 and Figure 10 show significant actor effects for avoidant attachment and cuddling ($\beta = -1.541$, $p < .001$) and avoidant attachment and sleep disturbance ($\beta = 1.985$, $p < .001$).

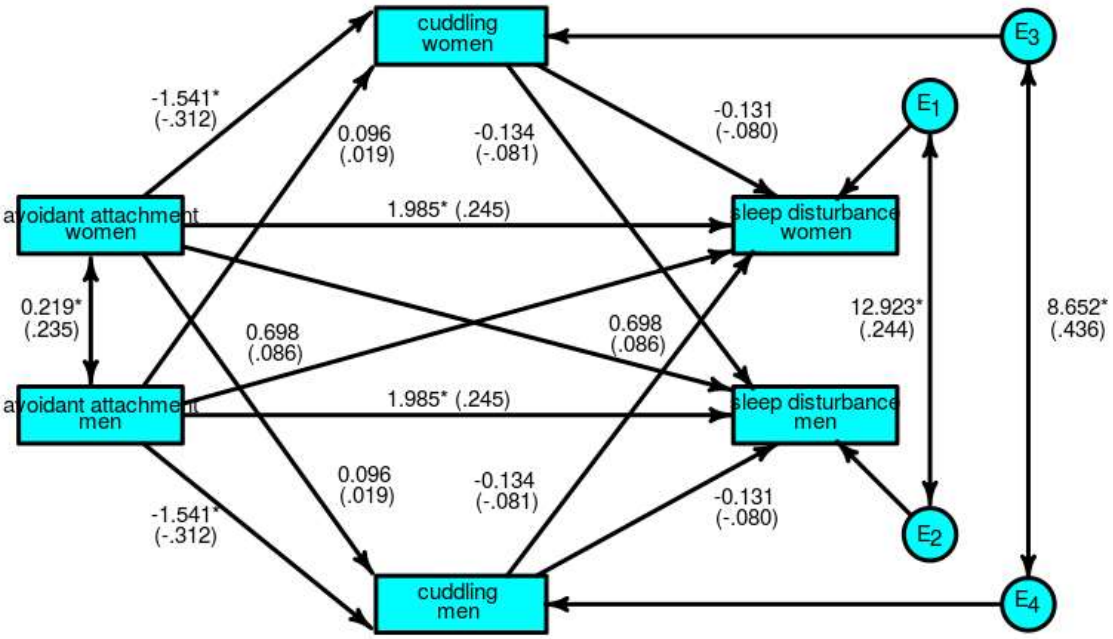
Table 21: *Effect estimates for mediation of cuddling on sleep disturbance treating dyad members as indistinguishable, avoidant attachment*

Effect	Estimate	*SE*	*p*	Std. estimate
a effects (Avoidant Attachment → Cuddling)				
Actor Effect	-1.541	0.304	<.001	-.312
Partner Effect	0.096	0.306	.754	.019
b effects (Cuddling → Sleep Disturbance)				
Actor Effect	-0.131	0.119	.271	-.080
Partner Effect	-0.134	0.112	.232	-.081
c′ effects (Avoidant Attachment → Sleep Disturbance)				
Actor Effect	1.985	0.548	<.001	.245

Partner Effect	.698	0.547	.202		.086

Note. a = indirect effect, b = indirect effect, c' = direct effect, SE = standard error, std. = standardized.

Figure 10. Results for APIMeM with avoidant attachment and sleep disturbance mediated by cuddling.



Note: E1 and E3 = error for women; E2 and E4 = error for men. Figure produced by APIMeM program (Kenny, 2015).

Table 22 shows there were no significant indirect effects in the mediation model. The direct actor effect (*c'*) for this model is 1.985 (confidence interval: 0.911 to 3.095) with a standardized effect of .245 and it explains 91.30 percent of the total effect for actors (*ab* + *c'*). None of the partner effects were significant. There was no evidence for mediation in the model based on these effects.

Table 22: *Total, Direct, and Indirect Effects for avoidant attachment, cuddling, and sleep disturbance.*

Type	Effect	Estimate	*p*	95% CI Lower & Upper		Percent Total
Actor	Total	2.174*	<.001	1.159	3.188	
	Direct	1.985*	<.001	0.911	3.059	91.30

	Total Indirect	0.189	.334	-0.193	0.606	8.70
	Actor-Actor Indirect	0.202	.281	-0.676	1.272	9.28
	Partner-Partner Indirect	-0.013	.762	-0.210	0.252	-0.59
Partner	Total	0.891	.087	-0.131	1.913	
	Direct	0.698	.210	-0.393	1.789	78.32
	Total Indirect	0.193	.298	-0.173	0.586	21.68
	Actor-Partner Indirect	0.206	.244	-0.668	1.276	23.09
	Partner-Actor Indirect	-0.013	.763	-0.210	0.251	-1.41

Research Question 3a (Hypotheses 1c and 2c)

Research Question 3a sought to understand the mediation effect of affectionate communication on insecure attachment and relationship satisfaction. The corresponding Hypotheses were 1c (anxious) and 2c (avoidant), which were tested using APIMeM. The analysis yielded model fit statistics and results for actor and partner effects for each path in the model (*a*, *b*, and *c'*). To determine whether the indirect effect or total effects were statistically significant (i.e. test for mediation), the bias-corrected bootstrap with a 95% confidence interval was used for unstandardized effects. Bootstrap estimates were based on maximum likelihood and on 5,000 bootstrap samples. Alpha was set to α =.05 for all of the analyses. Model fit statistics, actor/partner effect estimates, and confidence intervals for significant indirect and total effects are presented below.

Hypothesis 1c. As in the previous mediation analyses, the test of distinguishability was performed. The model was non-significant ($X^2(6) = 6.698$, $p = .350$; RMSEA = 0.034, CFI = .995 and TLI = .988). This meant that the direct effects were empirically indistinguishable across gender. The model was simplified by constraining the direct effects and setting them to equal. Adding control variables for depression and anxiety worsened the model fit ($X^2(22) = 272.461$, *p*

= .000; RMSEA = .332, CFI = .381, TLI = -.267). The control variables were omitted since the model did not represent a good fit.

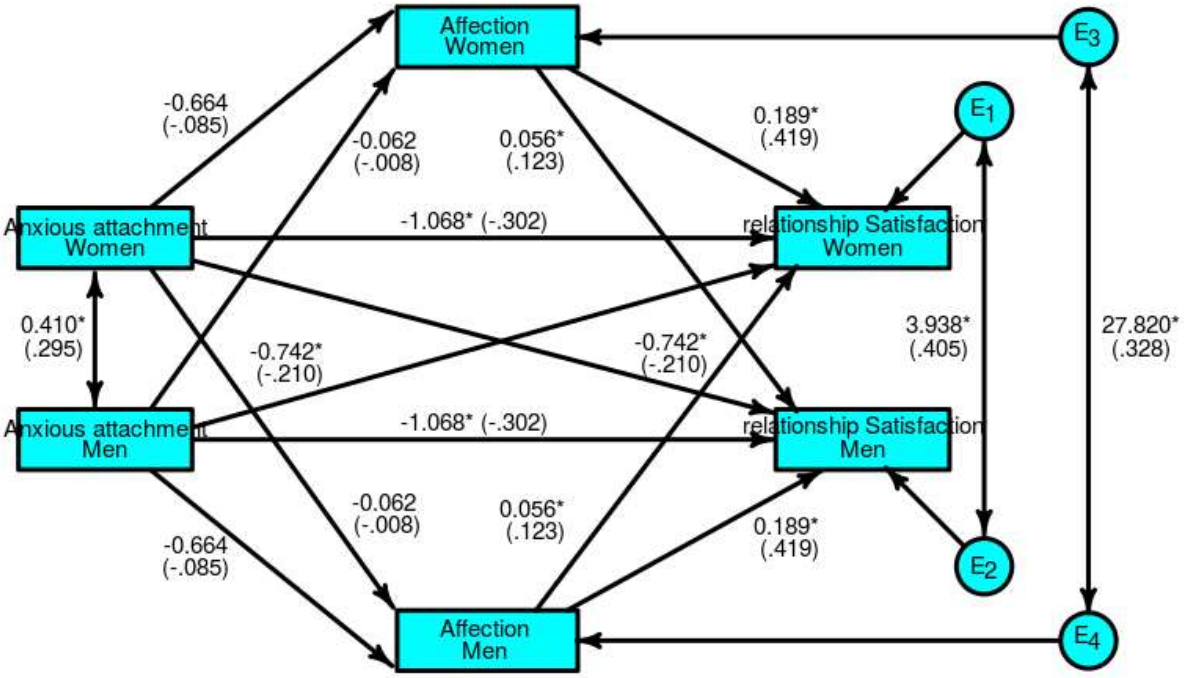
Table 23 and Figure 11 illustrate that the actor and partner effects for affectionate communication and relationship satisfaction were significant and positive (actor: $\beta = 0.189$, $p < .001$; partner: $\beta = 0.056$, $p = .015$). The actor and partner effects were significant and negative for the relationship between anxious attachment and relationship satisfaction, as previously reported.

Table 23: *Effect estimates for mediation of affection on relationship satisfaction treating dyad members as indistinguishable, anxious attachment*

Effect	Estimate	*SE*	*p*	Std. estimate
a effects (Anxious Attachment → Affection)				
Actor Effect	-0.664	0.541	.220	-.085
Partner Effect	-0.062	0.541	.908	.008
b effects (Affection → Relationship Satisfaction)				
Actor Effect	0.189*	0.023	<.001	.419
Partner Effect	0.056*	0.023	.015	.100
c′ effects (Anxious Attachment → Relationship Satisfaction)				
Actor Effect	-1.068*	0.180	<.001	-.302
Partner Effect	-0.742*	0.179	<.001	-.210

Note. a = indirect effect, b = indirect effect, c' = direct effect, SE = standard error, std. = standardized.

Figure 11. Results for APIMeM with anxious attachment and relationship satisfaction mediated by affectionate communication.



Note: E1 and E3 = error for women; E2 and E4 = error for men. Figure produced by APIMeM program (Kenny, 2015).

Table 24 shows that there were no significant indirect effects in the mediation analysis for actors or partners. However, the direct effect of anxious attachment to relationship satisfaction was significant for actors and partners. The actor direct effect (*c'*) was -1.068 (CI: -1.423 to -.712) with a standardized effect of -0.302 and it explained 89.23% of total actor effect in the model (*ab* + *c'*). The partner direct effect (*c'*) was -0.742 (CI: -1.093 to -0.390) with a standardized effect of -0.210 and it explained 93.85% of the total partner effect (*ab* + *c'*). There was no evidence for mediation in the model based on these effects. Therefore, Hypothesis 1c was not supported as it had predicted that affectionate communication would partially mediate the effect of anxious attachment on relationship satisfaction.

Table 24: *Total, Direct, and Indirect Effects for anxious attachment, affection, and relationship satisfaction.*

Type	Effect	Estimate	*p*	95% CI Lower & Upper		Percent Total
Actor	Total	-1.197*	<.001	-1.610	-0.783	
	Direct	-1.068*	<.001	-1.423	-0.712	89.23
	Total Indirect	-0.129	.241	-0.350	0.084	10.77
	Actor-Actor Indirect	-0.125	.229	-1.206	0.825	10.48
	Partner-Partner Indirect	-0.003	.908	-0.617	0.686	0.29
Partner	Total	-0.790*	<.001	-1.200	-0.381	
	Direct	-0.742*	<.001	-1.093	-0.390	93.85
	Total Indirect	-0.049	.656	-0.271	0.167	6.15
	Actor-Partner Indirect	-0.037	.277	-1.011	0.973	4.66
	Partner-Actor Indirect	-0.012	.908	-0.674	0.696	1.49

Hypothesis 2c. This model tested affectionate communication as a mediator for avoidant attachment and relationship satisfaction. The test of distinguishability for the model was non-significant ($X^2(6) = 8.601$, $p = .197$; RMSEA = 0.065, CFI = .988, TLI = .970). Meaning the model with avoidant attachment, affectionate communication, and relationship satisfaction did not significantly differ by gender; the direct effects were empirically indistinguishable. Thus, the model was simplified by constraining direct effects. Adding control variables for depression and anxiety worsened the fit and were omitted ($X^2(22) = 249.07$, $p = .000$; RMSEA = .317, CFI = .489, TLI = -.045).

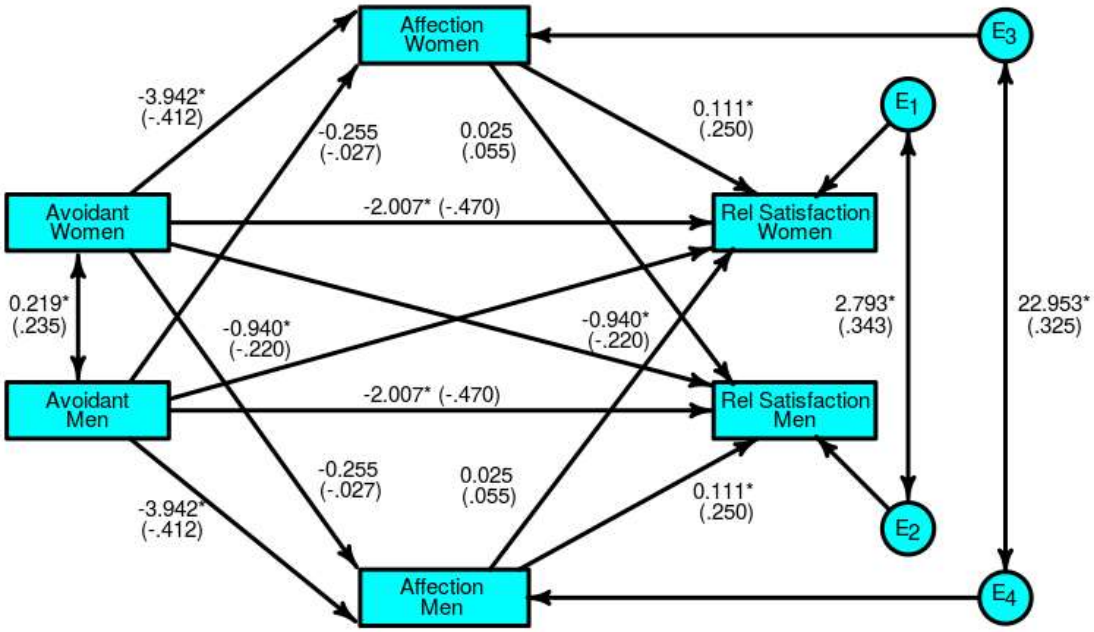
Table 25 and Figure 12 show that the actor effects for avoidant attachment and affection (*a*) are significant ($\beta = -3.942$, $p < .001$), as are actors effects for affection and relationship satisfaction (*b*); ($\beta = 0.111$, $p < .001$). Both the actor and partner direct effects (*c'*) were significant as previously reported.

Table 25: *Effect estimates for mediation of affection on relationship satisfaction treating dyad members as indistinguishable, avoidant attachment*

Effect	Estimate	*SE*	*p*	Std. estimate
a effects (Avoidant Attachment → Affection)				
Actor Effect	-3.942*	0.599	<.001	-.412
Partner Effect	-0.255	0.599	.670	-.027
b effects (Affection → Relationship Satisfaction)				
Actor Effect	0.111*	0.024	<.001	.250
Partner Effect	0.025	0.024	.296	.055
c′ effects (Avoidant Attachment → Relationship Satisfaction)				
Actor Effect	-2.007*	0.224	<.001	-.407
Partner Effect	-0.940*	0.223	<.001	-.220

Note. a = indirect effect, b = indirect effect, c' = direct effect, SE = standard error, std. = standardized.

Figure 12. Results for APIMeM with avoidant attachment and relationship satisfaction mediated by affectionate communication.



Note: E1 and E3 = error for women; E2 and E4 = error for men. Figure produced by APIMeM program (Kenny, 2015).

Table 26 shows that the mediation model demonstrated significant indirect effects for actors and significant direct effects for actors and partners. The total indirect effect for actors

(*ab*) was -0.445 (CI: -0.697 to -0.232) with a standardized effect of -0.104 and it explained 18.15% of the total actor effect in the model (*ab + c'*). The direct effect (*c'*) for actors was -2.007 (CI: -2.448 to -1.565) with a standardized effect of -0.470 and it explained 81.85% of the total effect. The direct effect (*c'*) for partners was -0.940 (CI: -1.376 to -0.505) with a standardized effect of -0.220 and it explained 88.22% of the total effect for partners (*ab + c'*).

Table 26: *Total, Direct, and Indirect Effects for avoidant attachment, affection, and relationship satisfaction.*

Type	Effect	Estimate	*p*	95% CI Lower & Upper		Percent Total
Actor	Total	-2.452*	<.001	-2.871	-2.032	
	Direct	-2.007*	<.001	-2.448	-1.565	81.85
	Total Indirect	-0.445*	<.001	-0.697	-0.232	18.15
	Actor-Actor Indirect	-0.439*	<.001	-5.061	4.328	17.89
	Partner-Partner Indirect	-0.006	.693	-0.771	0.930	0.26
Partner	Total	-1.066*	<.001	-1.485	-0.647	
	Direct	-0.940*	<.001	-1.376	-0.505	88.22
	Total Indirect	-0.126	.280	-0.368	0.100	11.78
	Actor-Partner Indirect	-0.097	.302	-4.683	4.703	9.12
	Partner-Actor Indirect	-0.028	.671	-0.815	0.883	2.66

The evidence reflected a partial mediation for affectionate communication on avoidant attachment and relationship satisfaction since both the indirect and direct effects were significant and in the same direction. The mediation held true for actors but not for partners, where only the direct effects were significant. Therefore, there is partial support for Hypothesis 2c.

Research Question 3b (Hypotheses 1d and 2d)

Research Question 3b sought to understand the mediation effect of affectionate communication on insecure attachment and sleep disturbance. The corresponding Hypotheses were 1d (anxious) and 2d (avoidant) were tested using APIMeM, which yielded model fit

statistics and results for actor and partner effects for each path in the model (*a*, *b*, and *c'*). To determine whether the indirect effect or total effects were statistically significant (i.e. test for mediation), the bias-corrected bootstrap with a 95% confidence interval was used for unstandardized effects. Bootstrap estimates were based on maximum likelihood and on 5,000 bootstrap samples. Alpha was set to α =.05. for all of the analyses. Model fit statistics, actor/partner effect estimates, and confidence intervals for significant indirect and total effects are presented below.

Hypothesis 1d. As in the previous mediation analyses, the test of distinguishability was performed. The mediation model with anxious attachment was non-significant ($X^2(6) = 5.587$, $p = .471$; RMSEA = 0.000, CFI = 1.000, TLI = 1.019). Therefore, direct effects were empirically indistinguishable across gender. The model was simplified by constraining the direct effects and setting them to equal. Adding control variables for depression and anxiety worsened the model fit ($X^2(22) = 269.531$, $p = .000$; RMSEA = .331, CFI = .246, TLI = -.542). The control variables were omitted since the model did not represent a good fit.

Table 27 and Figure 13 illustrate that the actor and partner effects for affectionate communication and sleep disturbance (*b*) were significant for effect estimates (actor: β = -0.177, $p = .001$, partner: β = -0.134, $p = .013$). Table 27 also reflects a significant relationship between anxious attachment and sleep disturbance (*c'*) for actors as previously reported (β = 1.512, $p < .013$).

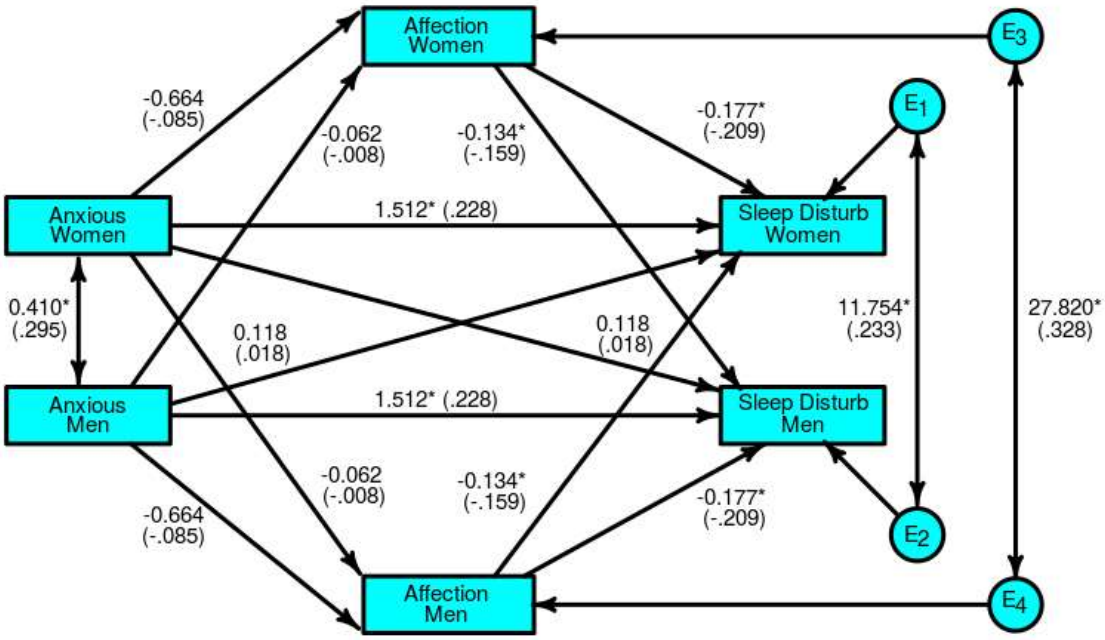
Table 27: *Effect estimates for mediation of affection on sleep disturbance treating dyad members as indistinguishable, anxious attachment*

Effect	Estimate	*SE*	*p*	Std. estimate
a effects (Anxious Attachment → Affection)				
Actor Effect	-0.664	0.541	.220	-.085
Partner Effect	-0.062	0.541	.908	.008

b effects (Affection → Sleep Disturbance)				
Actor Effect	-0.177*	0.054	.001	-.209
Partner Effect	-0.134*	0.054	.013	-.159
c′ effects (Anxious Attachment → Sleep Disturbance)				
Actor Effect	1.512*	0.422	<.001	.228
Partner Effect	.118	0.419	.778	.018

Note. b = indirect effects, *c'* = direct effects, *SE* = standard error, std. = standardized.

Figure 13. Results for APIMeM with anxious attachment and sleep disturbance mediated by affectionate communication.



Note: E1 and E3 = error for women; E2 and E4 = error for men. Figure produced by APIMeM program (Kenny, 2015).

Table 28 shows there were no significant indirect effects in the mediation analysis for actors or partners. However, the direct effect for actors was significant in this model, the estimate was 1.512 (CI: 0.686 to 2.339) with a standardized effect of 0.228 and it explained 92.32 percent of the total effect for actors (*ab* + *c'*). None of the partner effects were significant. There was no evidence for mediation in the model based on these effects. Therefore, Hypothesis 1d was not

supported in the current sample as it predicted affectionate communication would mediate the relationship between anxious attachment and sleep disturbance.

Table 28: *Total, Direct, and Indirect Effects for anxious attachment, affection, and sleep disturbance.*

Type	Effect	Estimate	*p*	95% CI Lower & Upper		Percent Total
Actor	Total	1.638*	<.001	0.781	2.495	
	Direct	1.512*	<.001	0.686	2.339	92.32
	Total Indirect	0.126	.329	-0.126	0.413	7.68
	Actor-Actor Indirect	0.117	.255	-0.777	1.286	7.17
	Partner-Partner Indirect	0.008	.908	-0.611	0.710	0.51
Partner	Total	0.218	.616	-0.635	1.071	
	Direct	0.118	.778	-0.701	0.937	54.05
	Total Indirect	0.100	.435	-0.157	0.380	45.95
	Actor-Partner Indirect	0.089	.274	-0.810	1.219	40.90
	Partner-Actor Indirect	0.011	.908	-0.601	0.761	5.05

Hypothesis 2d. This model tested affectionate communication as a mediator for avoidant attachment and sleep disturbance. As in the previous mediation analyses, the test of distinguishability was performed and it was found to be non-significant ($X^2(6) = 1.568$, $p = .955$; RMSEA of 0.000, CFI = 1.000, TLI = 1.135). The model was simplified by constraining the direct effects and setting them to equal. Adding control variables for depression and anxiety worsened the model fit ($X^2(22) = 246.536$, $p = .000$; RMSEA = .315, CFI = .322, TLI = -.386). The control variables were omitted since the model did not represent a good fit.

Table 29 and Figure 14 show that the actor effects for all three paths were significant: (*a*: $\beta = -3.942$, $p < .001$; *b*: $\beta = -0.127$, $p = .032$; *c'*: $\beta = 1.658$, $p = .003$). Similar to anxious attachment, avoidant attachment was negatively related to affectionate communication and

positively related to sleep disturbance. Affectionate communication was negatively related to sleep disturbance.

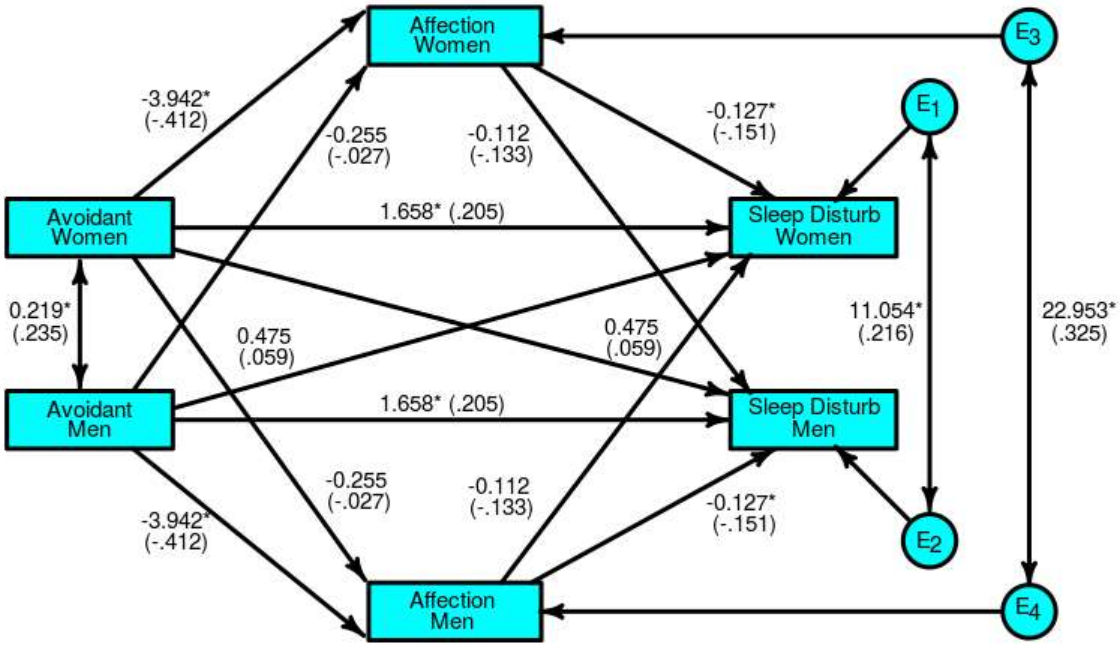
Table 29: *Effect estimates for mediation of affection on sleep disturbance treating dyad members as indistinguishable, avoidant attachment.*

Effect	Estimate	*SE*	*p*	Std. estimate
a effects (Avoidant Attachment → Affection)				
Actor Effect	-3.942*	0.599	<.001	-.412
Partner Effect	-0.255	0.599	.670	-.027
b effects (Affection → Sleep Disturbance)				
Actor Effect	-0.127*	0.060	.032	-.151
Partner Effect	-0.112	0.060	.061	-.133
c′ effects (Avoidant Attachment → Sleep Disturbance)				
Actor Effect	1.658*	0.560	.003	.205
Partner Effect	.475	0.563	.399	.059

Note. b = indirect effect, *c'* = direct effect, *SE* = standard error, std. = standardized.

Table 30 shows that the mediation model demonstrated significant indirect effects and direct effects for actors. The total indirect effect for actors (*ab*) was 0.531 (CI: 0.043 to 1.067) with a standardized effect of 0.066 and it explained 24.26% of the total effect (*ab* + *c'*) for actors. The direct effect (*c'*) for actors was 1.658 (CI: 0.568 to 2.749) with a standardized effect of 0.205 and it explained 75.74% of the total effect (*ab* + *c'*). None of the partner effects were significant. The data reflect a partial mediation for affectionate communication on avoidant attachment and sleep disturbance since both the indirect and direct effects were significant and in the same direction. The mediation held true for actors but not for partners. Therefore, there is partial support for Hypothesis 2d.

Figure 14. Results for APIMeM with avoidant attachment and relationship satisfaction mediated by affectionate communication.



Note: E1 and E3 = error for women; E2 and E4 = error for men. Figure produced by APIMeM program (Kenny, 2015).

Table 30: Total, Direct, and Indirect Effects for avoidant attachment, affection, and sleep disturbance.

Type	Effect	Estimate	*p*	95% CI Lower & Upper		Percent Total
Actor	Total	2.189*	<.001	1.173	3.206	
	Direct	1.658*	.003	0.568	2.749	75.74
	Total Indirect	0.531*	.038	0.043	1.067	24.26
	Actor-Actor Indirect	0.502*	.041	-4.120	5.421	22.95
	Partner-Partner Indirect	0.029	.677	-0.691	1.023	1.31
Partner	Total	0.951	.068	-0.070	1.971	
	Direct	0.475	.398	-0.627	1.577	49.95
	Total Indirect	0.476	.064	-0.018	1.018	50.05
	Actor-Partner Indirect	0.443	.070	-4.075	5.343	46.62
	Partner-Actor Indirect	0.033	.676	-0.701	1.046	3.42

Research Question 4 (Hypotheses 1e and 2e)

Research Question 4 sought to understand the mediation effect of sleep disturbance on insecure attachment and relationship satisfaction. The corresponding Hypotheses 1e (anxious) and 2e (avoidant) were tested using APIMeM, which yielded model fit statistics and actor and partner effects for each path in the model (*a*, *b*, and *c'*). To determine whether the indirect effect or total effects were statistically significant (i.e. test for mediation), the bias-corrected bootstrap with a 95% confidence interval was used for unstandardized effects. Bootstrap estimates were based on maximum likelihood and on 5,000 bootstrap samples. Alpha was set to α =.05 for all of the analyses. Model fit statistics, actor/partner effect estimates, and confidence intervals for significant indirect and total effects are presented below.

Hypothesis 1e. As in the previous mediation analyses, the test of distinguishability was performed. The model was non-significant ($X^2(6) = 6.068$, $p = .416$; RMSEA = 0.011, CFI = .999, TLI = .998), so it was simplified by constraining the direct effects and setting them to equal. Adding control variables for depression and anxiety worsened the model fit ($X^2(22) = 278.013$, $p = .000$; RMSEA = .336, CFI = .346, TLI = -.538). The control variables were omitted since the model did not represent a good fit.

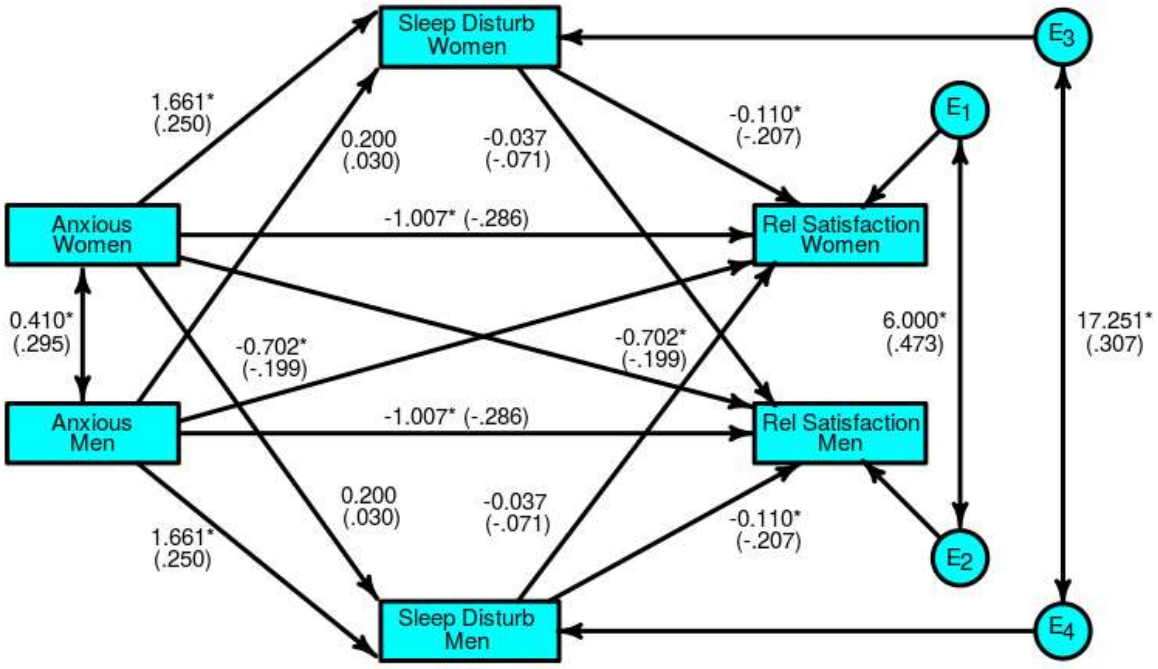
Table 31 and Figure 15 illustrate that the actor effects for all three paths are significant (*a*: $\beta = 1.661$, $p < .001$; *b*: $\beta = -0.110$, $p = .032$; *c'*: $\beta = -1.007$, $p = .003$). Notably, the effect for sleep disturbance and relationship satisfaction is negative. The partner effect for anxious attachment and relationship satisfaction was also significant ($\beta = -0.702$, $p < .001$).

Table 31: *Effect estimates for mediation of sleep disturbance on relationship satisfaction treating dyad members as indistinguishable, anxious attachment.*

Effect	Estimate	*SE*	*p*	Std. estimate
a effects (Anxious Attachment → Sleep Disturbance)				
Actor Effect	1.661*	0.422	<.001	.250
Partner Effect	.200	0.419	.644	.030
b effects (Sleep Disturbance → Relationship Satisfaction)				
Actor Effect	-0.110*	0.032	<.001	-.207
Partner Effect	-0.037	0.031	.233	-.071
c′ effects (Anxious Attachment → Relationship Satisfaction)				
Actor Effect	-1.007*	0.180	<.001	-.286
Partner Effect	-0.702*	0.179	<.001	-.199

Note. *b* = indirect effect and *SE* = standard error, std. = standardized.

Figure 15. Results for APIMeM with anxious attachment and relationship satisfaction mediated by sleep disturbance.



Note: E1 and E3 = error for women; E2 and E4 = error for men. Figure produced by APIMeM program (Kenny, 2015).

Table 32 shows that the mediation model demonstrated significant indirect effects for actors and significant direct effects for actors and partners. The total indirect effect for actors

(*ab*) was -0.190 (CI: -0.359 to -0.060) with a standardized effect of -0.054 and it explained 15.88% of the total actor effect in the model (*ab + c'*). The direct effect (*c'*) for actors was -1.007 (CI: -1.428 to -0.587) with a standardized effect of -0.286 and it explained 84.12% of the total effect (*ab + c'*). The direct effect (*c'*) for partners was -0.702 (CI: -1.115 to -0.288) with a standardized effect of -0.199 and it explained 89.29% of the total effect for partners (*ab + c'*).

Table 32: *Total, Direct, and Indirect Effects for anxious attachment, sleep disturbance, and relationship satisfaction.*

Type	Effect	Estimate	*p*	95% CI Lower & Upper		Percent Total
Actor	Total	-1.198*	<.001	-1.616	-0.779	
	Direct	-1.007*	<.001	-1.428	-0.587	84.12
	Total Indirect	-0.190*	.011	-0.359	-0.060	15.88
	Actor-Actor Indirect	-0.183*	.011	-1.726	1.289	15.26
	Partner-Partner Indirect	-0.007	.667	-0.473	0.443	0.63
Partner	Total	-0.786*	<.001	-1.197	-0.374	
	Direct	-0.702*	<.001	-1.115	-0.288	89.29
	Total Indirect	-0.084	.253	-0.245	0.057	10.71
	Actor-Partner Indirect	-0.062	.253	-1.559	1.442	7.91
	Partner-Actor Indirect	-0.022	.647	-0.513	0.423	2.80

The evidence shows that sleep disturbance partially mediated the relationship between anxious attachment and relationship satisfaction. Both the indirect and direct effects were significant and in the same direction. The mediation held true for actors but not for partners, where only the direct effects were significant. Therefore, there is partial support for Hypothesis 1e.

Hypothesis 2e. This model tested sleep disturbance as a mediator for avoidant attachment and relationship satisfaction. The test of distinguishability for the model was non-

significant ($X^2(6) = 1.808$, $p = .936$; RMSEA = 0.000, CFI = 1.000, TLI = 1.062). The model was simplified for parsimony by constraining direct effects to be set as equal.

Table 33 and Figure 16 show that the actor effects for all three paths were significant (*a*: $\beta = 2.193$, $p < .001$; *b*: $\beta = -0.057$, $p = .038$; *c'*: $\beta = -1.007$, $p < .003$). The partner effect for avoidant attachment and relationship satisfaction was also significant ($\beta = -1.012$, $p < .001$).

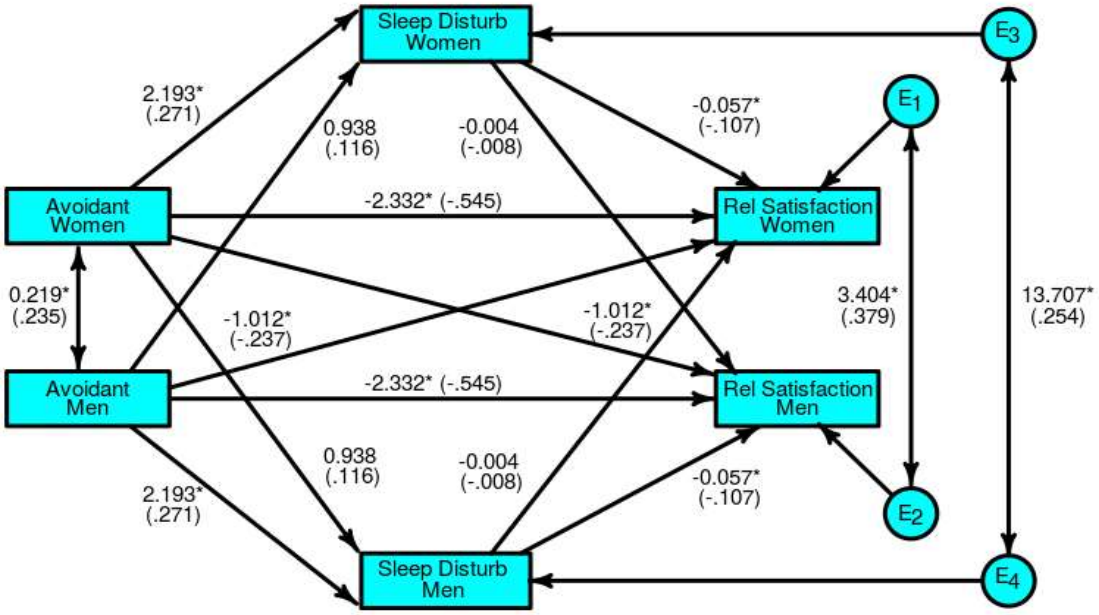
Table 33: *Effect estimates for mediation of sleep disturbance on relationship satisfaction treating dyad members as indistinguishable, avoidant attachment.*

Effect	Estimate	*SE*	*p*	Std. estimate
a effects (Avoidant Attachment → Sleep Disturbance)				
Actor Effect	2.193*	0.548	<.001	.271
Partner Effect	0.938	0.547	.072	.116
b effects (Sleep Disturbance → Relationship Satisfaction)				
Actor Effect	-0.057*	0.027	.038	-.107
Partner Effect	-0.004	0.028	.886	-.008
c′ effects (Avoidant Attachment → Relationship Satisfaction)				
Actor Effect	-2.332*	0.224	<.001	-.545
Partner Effect	-1.012*	0.224	<.001	-.237

Note. b = indirect effect and *SE* = standard error, std. = standardized.

Table 34 shows there were no significant indirect effects in the mediation model. However, there were significant direct effects for actor and partner. The actor direct effect equaled -2.332 (CI: -2.769 to -1.894) with a standardized effect of -.545 and it explained 94.78 percent of the total effect. The partner direct effect equaled -1.012 (CI: -1.448 to -0.576) with a standardized effect of -.237 and it explained 94.23 percent of the total effect.

Figure 16. Results for APIMeM with avoidant attachment and relationship satisfaction mediated by sleep disturbance.



Note: E1 and E3 = error for women; E2 and E4 = error for men. Figure produced by APIMeM program (Kenny, 2015).

Table 34: Total, Direct, and Indirect Effects for avoidant attachment, sleep disturbance, and relationship satisfaction.

Type	Effect	Estimate	*p*	95% CI Lower & Upper		Percent Total
Actor	Total	-2.460*	<.001	-2.878	-2.042	
	Direct	-2.332*	<.001	-2.769	-1.894	94.78
	Total Indirect	-0.128	.086	-0.297	0.011	5.22
	Actor-Actor Indirect	-0.125	.062	-2.502	2.242	5.06
	Partner-Partner Indirect	-0.004	.886	-1.178	1.191	0.15
Partner	Total	-1.074*	<.001	-1.491	-0.657	
	Direct	-1.012*	<.001	-1.448	-0.576	94.23
	Total Indirect	-0.062	.411	-0.225	0.084	5.77
	Actor-Partner Indirect	-0.009	.886	-2.337	2.381	0.81
	Partner-Actor Indirect	-0.053	.173	-1.271	1.120	4.96

There was no evidence for mediation in the model based on these effects. Hypothesis 2e was not supported since it predicted that sleep disturbance would partially mediate the relationships between avoidant attachment and relationship satisfaction.

Chapter V

Discussion

The present study sought to examine the role of attachment systems in romantic relationships, examine mediating associations between attachment security and relationship satisfaction, and examine sleep in a dyadic context. As Rosenblatt's (2006) study highlighted, many couples have little time together on a day-to-day basis. The time they do have together is often at night in bed. The current study used APIM and APIMeM to examine the associations between partners' attachment styles, feelings toward cuddling, affectionate communication, sleep, and overall relationship satisfaction. The intention was that this knowledge could continue informing couples and couple's therapists in their approach to relationship concerns and the interventions used to address them.

Several outcomes of the study were significant. See Table 35 for a summary of the results from each APIM and APIMeM analysis. The examination between partners' attachment style and relationship satisfaction without mediators demonstrated significant actor and partner effects in the avoidant attachment model, and significant actor effects in the anxious attachment model. The partner effect was significant for men only in the anxious attachment model. The examination between partners' attachment styles and sleep disturbance without mediators demonstrated significant actor effects in both models of attachment, but no significant partner effects. There was a significant actor mediation present in the models looking at affectionate communication as a mediator between avoidant attachment and relationship satisfaction, and

between avoidant attachment and sleep disturbance. Sleep disturbance was also a significant mediator for actors between anxious attachment and relationship satisfaction.

Table 35. *Summary of results for each analysis.*

Research Question	Attachment	Mediator	Outcome	Hypothesis	Result
RQ1a	Anxious		Relationship	H1a	Actor effect, partial partner effect
	Avoidant		Satisfaction	H2a	Actor and partner effects
RQ1b	Anxious	Cuddling	Relationship		No mediation
	Avoidant		Satisfaction		No mediation
RQ2a	Anxious		Sleep Quality	H1b	Actor effect, no partner effect
	Avoidant			H2b	Actor effect, no partner effect
RQ2b	Anxious	Cuddling	Sleep Quality		No mediation
	Avoidant				No mediation
RQ3a	Anxious	Affectionate	Relationship	H1c	No mediation
	Avoidant	Communication	Satisfaction	H2c	Actor mediation present
RQ3b	Anxious	Affectionate	Sleep Quality	H1d	No mediation
	Avoidant	Communication		H2d	Actor mediation present
RQ4	Anxious	Sleep Quality	Relationship	H1e	Actor mediation present
	Avoidant		Satisfaction	H2e	No mediation

Relationship Satisfaction

As shown in Table 35, three outcomes related to relationship satisfaction are of note. Hypothesis 1a was tested and partially supported. The model demonstrated that individuals who reported higher anxious attachment also tended to report lower relationship satisfaction for themselves. The partners of men who reported higher anxious attachment, also tended to report lower relationship satisfaction. The same effect was not seen in partners of women who reported higher anxious attachment. Perhaps because some attributes common in anxious attachment are ones that are socio-culturally deemed acceptable in women (e.g. desire for closeness), but stereotypically less socially accepted in men, such as expressions of dependence or neediness. Similarly, Hypothesis 2a was fully supported. The outcome demonstrated that those who reported higher avoidant attachment also reported lower relationship satisfaction for themselves. The partners of both men and women who reported higher avoidant attachment also reported lower relationship satisfaction. Perhaps the partner effect was present across gender because as

Decuyper et al.'s (2018) findings suggested, personality and character factors related to avoidant attachment are among the most detrimental for relationship satisfaction. Behaviors of distancing emotional closeness and intimacy are clearly harmful to the relationship regardless of the individual's gender.

The effects between insecure attachments and relationship satisfaction were still present when controlled for depression and anxiety. Women's depression was significantly related to their relationship satisfaction, such that women who reported higher levels of depression also tended to report lower levels of relationship satisfaction. However, the relationship did not eliminate the effects between insecure attachments and relationship satisfaction. Men's depression did not appear to have a significant association with their relationship satisfaction. Studies have shown differences in rates and expression of depression by gender, which may inform the difference seen here (Cavanagh, Wilson, Kavanagh, & Caputi, 2017). Ultimately, the current findings are in line with previous research that demonstrated insecure attachment is negatively related to relationship satisfaction (Collins et al., 2006; R. M. Diamond et al., 2018; Feeney, 2008; Kane et al., 2007; Karney & Bradbury, 1995).

Affectionate communication partially mediated the relationship between avoidant attachment and relationship satisfaction. Individuals with higher avoidant attachment also reported lower affectionate communication, and in turn, reported lower relationship satisfaction (Hypothesis 2c). Both the direct and total indirect effects for actors were significant and negative, supporting presence of a partial mediation. There was no partner mediation effect. The effect estimate between affectionate communication and relationship satisfaction, however, was positive, suggesting those reporting higher affectionate communication also reported higher relationship satisfaction. This finding is in line with other studies on affection and satisfaction

(Floyd & Riforgiate, 2008; Rauer & Volling, 2013). Luerssen et al. (2017) found that individuals low in security tended to express affection less, experienced less positive reactions to it, and thought their partners did not enjoy it either. Re-education around actual effects of affection versus perceived effects, or ambivalent internalization, for insecure individuals could be helpful in couple's therapeutic work. When working with individuals who report higher avoidant attachment, it could be helpful to identify one type of affection (i.e. verbal, supportive, or physical) they are the least uncomfortable with, and work to increase that type. It is possible that increasing one type of affection may increase their relationship satisfaction and confidence as a romantic partner.

Cuddling did not mediate the relationship between insecure attachments and relationship satisfaction, suggesting further investigation into this construct and its mechanisms may be beneficial. The outcome was surprising, since physical affection has repeatedly been demonstrated to improve relationship satisfaction (Floyd et al., 2009; Gulledge et al., 2003; Sheldon et al., 2014). It is particularly effective at reducing stress, which makes cuddling at the end of the day a logical activity. Only 1% of the current sample reported that they never cuddled. Perhaps there was too little variability in the practice of cuddling in the current sample regardless of attachment security. It is also possible that the measure for cuddling did not target the construct intended. However, it was largely based on items used by Chopik et al. (2014) who found that individuals with higher avoidant attachment had trouble with cuddling and felt less positively toward it, and that individuals with higher anxious attachments experienced ambivalent feelings toward cuddling (i.e. desire and suspicion of partner's motives).

A drawback in the current study was the lack of measurement of secure attachment to serve as a comparison to the results for insecure attachment. The scale used to measure

attachment, the ECR-S (Wei et al., 2007), does not have a method for assessing security beyond a respondent yielding low scores for both insecure subscales, and there is no set understanding for "low" scores. It has been established that both insecure attachment types experience lower levels of relationship satisfaction, but for different reasons (R. M. Diamond et al., 2018). Avoidant individuals tend to limit intimacy and seem unavailable to partners, while anxious individuals are hyper-vigilant for signs of abandonment and experience great distress and needs for reassurance as a result (Campbell et al., 2005; R. M. Diamond et al., 2018). The current study could have benefitted from comparing results to secure individuals to observe possible differences in significant associations in the tested models.

Sleep Quality

Three outcomes related to sleep disturbance are of note. Hypothesis 1b was tested and partially supported initially. The model demonstrated that individuals who reported higher anxious attachment also tended to report higher sleep disturbance. There were no significant partner effects in this model. The findings suggested that a partner's type of attachment did not affect one's own sleep disturbance. Although from a logical stance it is surprising that partner effects were not found, this was in line with research demonstrating that insecure attachment is related to poor sleep quality for actors (Adams et al., 2014; Carmichael & Reis, 2005; L. M. Diamond et al., 2008; Hicks & Diamond, 2011; Troxel, Cyranowski, et al., 2007). Significant partner effects have been demonstrated on a limited basis in the literature (Troxel, Robles, et al., 2007). Hypothesis 2b was also partially supported initially, in that those reporting higher avoidant attachment, also reported higher sleep disturbance.

However, the results reported above were eliminated when adding control variables for depression and anxiety, namely depression. Actor effects between insecure attachments and

sleep disturbance became non-significant when including measures for depression. Depression for men and women were significantly related to their own sleep disturbance. There were no partner effects detected. One issue was that the model with control variables also represented a poor fit, so it is not entirely clear what the relationships are between the variables. Although Carmichael and Reis (2005) found effects for insecure attachment on sleep quality even when controlling for depression, those findings could not be replicated here. Sleep is affected by a whole host of issues that may have not been adequately captured in this study (Banks & Dinges, 2007; El-Sheikh et al., 2015; Ma et al., 2018; Medina et al., 2009; Troxel, Robles, et al., 2007). For example, the current participants endorsed high levels of education, which has been shown to have an inverse relationship with poor sleep (Grandner, Patel, et al., 2010). Greater examination of factors that include sleep disorders or other diagnosed medical conditions and that account for the effects of children may yield more informative results.

Affectionate communication partially mediated the relationship between avoidant attachment and sleep disturbance. Individuals with higher avoidant attachment reported lower affectionate communication, and in turn, reported higher sleep disturbance (Hypothesis 2d). Both the direct and total indirect effects for actors were significant and positive, supporting presence of a partial mediation. There was no partner mediation effect. The effect estimate between affectionate communication and sleep disturbance was negative, however, suggesting that those reporting higher affectionate communication also reported lower sleep disturbance. Perhaps this aspect of the relationship tapped in to a couple's communication style more generally, as approaches to conflict have been significantly related to sleep quality (El-Sheikh et al., 2015; El-Sheikh, Kelly, & Rauer, 2013). Couples that generally incorporate verbal affection and supportive actions may also demonstrate adaptive ways of arguing and resolving conflict.

However, as was supported in the model, individuals who identify as avoidant attachment are less likely to engage in affectionate communication and are more likely to report greater sleep disturbance.

Cuddling did not mediate the relationships between insecure attachments and sleep disturbance. It is possible that physical affection more generally may have shown more significant relationships with insecure attachments and sleep disturbance. However, the measure for cuddling asked individuals to specifically think about their feelings regarding cuddling at bedtime, with the notion that cuddling may increase feelings of security and relaxation, which would enable better sleep. The verbal and supportive affection measure was broad without designating a time of day. The findings related to verbal and supportive affection bode well for couples who sleep separately, since the data suggest a positive relationship between those behaviors and sleep quality.

Sleep Quality and Relationship Satisfaction

Sleep disturbance partially mediated the effects of actor's anxious attachment and relationship satisfaction, such that individuals with higher anxious attachment also reported higher sleep disturbance, and in turn, reported lower relationship satisfaction (Hypothesis 1e). Both the direct and total indirect effects for actors were significant and negative. The findings are in line with a great deal of research that has suggested bidirectional effects for sleep and satisfaction (Hasler & Troxel, 2010; Troxel, 2010; Troxel, Buysse, Hall, & Matthews, 2009; Troxel, Robles, et al., 2007). Although most current studies have found evidence for actor effects between sleep and relationship satisfaction, it seems important to determine what effects partners' outcomes related to sleep and relationship satisfaction, since no partner effects were detected in this model. Conflicts tend to increase as sleep decreases and vice versa (Hicks &

Diamond, 2011), and Troxel, Robles, et al. (2007) found bidirectional relationships for sleep quality and relationship satisfaction across partners. Therefore, it seems noteworthy that partner effects were not detected in these models and is an area for consideration in future research.

Limitations

In considering generalizability of the current sample, the average relationship length was eight years. A majority of respondents (74.58%) identified as being married or in a long-term committed relationships versus dating. Punyanunt-Carter (2004) found that there were differences in the types of affection most used depending on the couple's stage of relationship. Those who were married tended toward supportive affection and those who were dating or in the earlier stages in their relationships, tended toward physical and verbal affection. The measure used for affection in the current study combined verbal and supportive types, while measuring physical affection separately. It is possible that the measurement missed nuances in types of affection expressed, and the results may not generalize to couples that are in earlier stages of their relationship, or who have been together well beyond the average relationship length of eight years in this study.

Another note regarding generalizability of the current participants is the high level of education present. Approximately 65% of respondents had college or graduate degrees. This is not representative of the general population, as only 32.5% of individuals 25 years or older have a Bachelor's degree in the US and 12% have an advanced degree (Ryan & Bauman, 2016). Higher levels of education have been linked to greater sleep quality (Grandner, Patel, et al., 2010). Additionally, a small portion of the participants reported having children or being pregnant, which are confounds with relationship satisfaction and sleep quality (Medina et al., 2009; Meijer & van den Wittenboer, 2007). Of those who said that they have children at home

(*n*=40), about 77% said that their children sleep with them in the same bed some portion of the time. Co-sleeping with children affects sleep disturbance, but was not controlled for in the current analyses as they were designed due to limitations regarding controls and complexity of the models (discussed below).

Other limitations to the study are worth noting. First, the standard APIM does not explicitly demonstrate a mechanism for treating partners as interdependent, or nested, within the dyad. The model states that it accounts for this, but does not state how it achieves this, whereas the multilevel (MLM) APIM has an explicit mechanism for separating variance within couples and variance between couples (Ledermann & Kenny, 2017). MLM enables greater accuracy in accounting for error in variance, but requires data restructuring that can be time consuming and was not used in the current study. MLM's mechanism to account for nesting may have yielded slightly different results, potentially more accurate, but could have also contributed cumbersome steps in an already complex analysis. There was no clear evidence to suggest that MLM would have been a significantly better option than SEM for this analysis, rather it is important to note that there are other options in analysis for dyadic studies. There were several advantages to using the standard SEM APIM model, as it has been deemed "superior" in mediation analyses (Ledermann & Kenny, 2017, p. 446), since that requires a multi-equation approach and has more than one outcome. It also evaluates model fit which allows adjustments to ensure use of the best fitting model (Ledermann & Kenny, 2017). Future studies may compare outcomes between MLM APIM and SEM APIM studies.

Ledermann et al. (2011) acknowledge that the APIMeM analysis is complicated and that its complexity can deter its use in studies. Treating members as indistinguishable, when that is statistically valid, is one way the model and analysis can be made more accessible, while

increasing parsimony and power in the analysis. However, the complexity of the model still created challenges. When running the mediation models with control variables for depression and anxiety, the software program AMOS presented a message that required several of the variables to be treated as uncorrelated to proceed with analysis. It was unclear what the implication of accepting these terms would be and reflected a disintegration of the model as it was entered. Not only was it difficult to interpret the effect of treating several of the relationships as uncorrelated, the resulting model fit statistics were poor, thereby not yielding a full understanding of the roles of depression and anxiety in these models.

The independent variables could not be created into latent variables due to participant sample size not meeting set standards for use of latent variables in analysis (e.g. 200 dyads; [Ledermann & Kenny, 2017]). As a result, it was not possible to examine dynamics that would have come to light through combinations of anxious and avoidant attachments in actor-partner relationships, which is an important drawback in the current study. Another limitation of the study is its cross-sectional data. Only associations can be determined from this study, not directionality of the relationships. Directionality may be the reverse of the models as they are depicted and examination of this can only be tested with longitudinal data, not cross-sectional as presented here.

Running several analyses with the same participant pool may have increased chances for Type I errors (false positives). The Bonferroni correction is sometimes used to address this, but was not used in this preliminary examination of the proposed relationships so as to not decrease the potential for catching possible observable effects. Fourteen analyses were run, so results could be compared with all analyses set to $\alpha = .00357$ or various combinations of alpha totaling

.05 across the analyses. Although, it is not required to use this correction, future research may choose to employ greater statistical sophistication and utilize it if deemed necessary.

The execution of the study may have inadvertently presented an issue. Respondents answered the survey online rather than in person. It is possible that one individual completed both surveys since there was no way to verify that they did not have access to their partner's email. It was also difficult to motivate the second partner to respond, hence losing 64 responses for participants that completed their survey, but their partners did not. Conducting this study in person, would have been difficult due to the necessary resources, but could have negated these potential issues. Although the total sample size was adequate, detection of partner effects could be improved with a greater sample size. With a sample size of 100 dyads, the predicted power for partner effects was only 0.6. Generally, a power of 0.8 or higher is adequate so future research could adjust the design to improve partner response rates and therefore, increase power.

Future Research

One important development for future studies would be to examine combinations of attachment styles, either through the use of latent variables or other statistical methods. There is a benefit to examining varying combinations of secure-secure, secure-insecure, and insecure-insecure dyads as differences have been found (Kane et al., 2007). Future studies could examine the intersections of gender and attachment style. They could also focus on same-sex couples to determine whether different or similar dynamical patterns emerge, or if there are other romantic roles or partner intersectionality that leads to similar outcomes.

Affectionate communication in the form of verbal and supportive gestures was a mediator only in the relationship between avoidant attachment and the outcomes of relationship satisfaction and sleep disturbance in the current study. It was not a mediator between anxious

attachment and the two outcomes. Future studies may examine avoidant individuals and their relationships more closely to increase understanding of how affection is communicated among those who identify as having this attachment style. Specific tools that address the discomfort of those who are avoidant, while also sharing the benefits of engaging in affectionate behaviors may be useful to discuss explicitly with couples. Separating out measures of affection may also increase our understanding of the mechanisms at work. It might be possible that cuddling is so generally common that distinctions did not come to light in the current study. Narrowing the range of individuals in a study to those who actively dislike cuddling and reported lower rates, may better highlight reasons for differences, such as past-trauma, potential mental health or medical diagnoses, or other possible factors. Researching the absence of cuddling in couples and comparing factors to couples that do cuddle may be informative.

Replicating studies with populations more generalizable to the national landscape would be a contribution to the research. This could include individuals with lower educational levels as the current study was skewed toward higher education, or including more individuals with children would increase representation of the population. Capturing the effects of children on these variables may shed light on shifts in affectionate expressions when children are present, changes in sleep patterns and quality, and ways couples renegotiate for increased or stable relationship satisfaction. Running these studies longitudinally would enable increased understanding of the directionality of the relationships proposed in the present study. Without ongoing data, determinations cannot be made about the direction of paths and relationships, which could in turn inform couples interventions further.

Summary

The results of the present study contribute to our understanding of romantic couples in several ways. Particularly in the role of mediators. Affectionate communication in the form of verbal and supportive actions partially mediated the relationship between avoidant attachment and relationship satisfaction, as well as the relationship between avoidant attachment and sleep quality. Those who were higher in affectionate communication also reported higher relationship satisfaction and lower sleep disturbance. Additionally, sleep disturbance partially mediated the relationship between anxious attachment and relationship satisfaction, such that those with higher anxious attachment, reported more sleep disturbance and in turn reported less relationship satisfaction. Those who were lower in sleep disturbance also reported higher relationship satisfaction. Therefore, interventions around affectionate communication and sleep quality seem particularly important to address when working with couples where insecure attachments are present. It may particularly be of value for couples who sleep separately since cuddling was not shown to be a significant mediator in relationship satisfaction or sleep quality. However, further investigation into this is necessary.

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Appendix A

Screening and Demographic Questionnaire

Screening Questions

1. What is your age?
    a. 18 or younger
    b. 19 or older

2. What is your current relationship status?
    a. Single, divorced, or widowed
    b. Married or in a long-term committed relationship
    c. Dating one person, casually or seriously
    d. Dating more than one person, casually or seriously

3. Do you and your romantic partner live in the same home?
    a. Yes
    b. No

4. On average, how many nights per week do you and your romantic partner sleep together in the same bed?
    a. 7
    b. 6
    c. 5
    d. 4
    e. 3
    f. 2 or less

Demographic Questions:

5. What is your age? _____

6. What is your gender or gender identify:
    a. Man
    b. Woman
    c. Transgender Man
    d. Transgender Woman
    e. Gender Fluid/Queer
    f. Or please specify: _____

7. What is your racial/ethnic identity?
    a. American Indian or Native American
    b. Asian, Asian American, or Pacific Islander
    c. Black or African American
    d. White (non-Hispanic or Latino)
    e. Hispanic or Latino
    f. Biracial or Multiracial
    g. Or please specify: _____
    h. I prefer not to respond

8. What is your sexual orientation?
    a. Heterosexual/Straight
    b. Gay
    c. Lesbian
    d. Bisexual
    e. Questioning or unsure
    f. Or please specify:_____
    g. I prefer not to respond

9. How long have you been in a relationship with your current partner? _____ years and/or _____ months

10. Your highest level of education completed?
    a. Less than high school diploma
    b. High school diploma
    c. Associate's degree
    d. Some college
    e. Bachelor's degree
    f. Post Bachelor's degree
    g. Graduate/Professional degree
    h. Or please specify: _____

11. What is your current employment status?
    a. Full-time
    b. Part-time
    c. Not currently employed
    d. Or please specify: _____

12. What shift do you typically work?
    a. 1st; generally 7am-4pm
    b. 2nd; generally 4pm-12am
    c. 3rd; generally 12am-8am
    d. Variable shifts

13. Do any children live in the home that sleep with you and/or your partner?
    a. Yes

b. No

14. How often do the children sleep with you and/or your partner?
    a. Always
    b. Most of the time
    c. About half the time
    d. Sometimes
    e. Never

15. Are you or your partner currently pregnant?
    a. Yes
    b. No

Appendix B

Information Letter

Information Letter

You are invited to participate in a research study about romantic relationships and factors that affect sleep quality and relationship satisfaction. We are looking for participants who are at least 19 years old and are currently in a committed romantic relationship. Both partners in the couple will need to participate. You must either live together or, sleep together three or more nights per week on average. The study is being conducted by Ana Cikara, M.A., an Auburn University doctoral candidate in Counseling Psychology as a dissertation project, under the supervision of Joseph A. Buckhalt, Ph.D., professor in the Auburn University department of Special Education, Rehabilitation, and Counseling. The Auburn University Institutional Review Board has approved this document for use from May 01, 2018 to April 30, 2019. Protocol #18-078 EP 1805.

What will be involved if you participate? If you decide to participate in this study, you will be asked a series of questions about your demographic information and questions about your thoughts, feelings, and behaviors related to your relationship and partner. Your total time commitment will be approximately 20-40 minutes. Since we are researching couples, both you and your partner will need to complete the questionnaires, but separately from one another to maintain privacy.

Are there any risks or discomforts? There are minimal risks involved in participation in this study. You may experience slight discomfort while answering personal questions that are sensitive in nature. However, the questions we ask are commonly used in this type of research and have no right or wrong answers. While risks of participation are considered to be minimal, should you experience any discomfort as a result of this study, you can contact your local marriage and family therapy center or call the National Suicide Prevention Lifeline at 1-800-273-8255.

Are there any benefits to yourself or others? There are no direct benefits to you for participating. However, you may experience benefit from increased self-awareness after reflecting on questions and also contributing to scientific research about romantic relationships.

Will you receive compensation for participating? To thank you for your time, you will have the opportunity to enter yourself in a drawing for one of 20 $50 Visa gift cards. You will be able to enter the drawing only if you have completed the survey and all the following criteria are met:

1. You are 19 years of age or older.
2. You are currently in a committed relationship with one person.

3. You and your partner either live together in the same home or you live separately and have arrangements where you sleep together three or more nights per week.
4. You provide an email address at the end of the survey so you can be contacted and provided the gift card electronically. Your email address will not be linked to responses provided in the survey.

If you change your mind about participating, you can withdraw at any time during the study and your responses will not be used. Your participation is completely voluntary.

Any data obtained in connection with this study will remain confidential. To protect your privacy, we will not ask you to provide your name or other identifying information. If you choose to enter the drawing, you will be redirected to a different webpage so that the email address you provide is not linked to your survey responses.

If you have questions about this study, please contact Ana Cikara at azc0036@auburn.edu or the project advisor, Dr. Joseph Buckhalt at (334) 844-2875 or buckhja@auburn.edu. If you have questions about your rights as a research participant, you may contact the Auburn University Office of Research Compliance or the Institutional Review Board by phone (334) 844-5966 or e-mail at hsubjec@auburn.edu or IRBChair@auburn.edu.

Thank you for your time and participation with this research.

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE IF YOU WISH TO PARTICIPATE IN THIS RESEARCH STUDY. IF YOU DECIDE TO PARTICIPATE, THE DATA YOU PROVIDE WILL SERVE AS YOUR AGREEME