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Relationship Patterns and Dream Content: Attachment Security, Emotions and Relational Scenarios in Dreams Containing Romantic Partners.

A Dissertation Presented

by

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Abstract of the Dissertation

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The current study examined associations between attachment/relational variables in waking life

and in sleep mentation (dream content). The general prediction was that individuals in dating

relationships would have dreams about romantic partners and relational situations that reflected

the dynamics of their relationships in waking life, arising from personal feelings of security as

well as interactions with romantic partners on specific days. Sixty-one young adults in

committed dating relationships participated in the study. Participants completed measures of

attachment, relationship interdependence, and closeness, followed by a two-week daily diary of

dream reports and their interactions with romantic partners each day. Participants reported on

emotions felt in dreams (e.g., joy, anger, jealousy) and blind coders scored dreams for secure

base content and relational scenarios (e.g., dating, infidelity). The main hypotheses were

supported: secure attachment scores correlated with richer secure base content in dreams.

Furthermore, attachment interacted with daily love, conflict, and general interaction with romantic partners, such that secure people experienced more general positive emotion (e.g., joy) and less general negative emotion (e.g., anger) in dreams containing romantic partners depending on their daily activity. In contrast, dreams containing higher jealousy or guilt, as well as scenarios involving a partner's infidelity did not vary by daily feelings; they were driven solely as a function of dispositional insecurity. Interdependence was associated with lower likelihood of dreams involving alternative (extra-dyadic) partners following increased daily conflict, and higher likelihood of dreams involving marriage. Jealous emotion in dreams and dreams containing behavioral conflicts each predicted increased conflict with romantic partners the following day. Dreams involving infidelity predicted less love felt the following day, and any dream involving romantic partners produced less love and more conflict on the following day for individuals high in anxious attachment. The findings illuminate understanding of attachment mental representations and relationship interdependence, displaying how relational schemata manifest in dream content, and how dream affect/content influences people's post-dreaming behavior.

Dedication Page

This project is dedicated to my parents, Bonnie and Ken Selterman, who taught me about attachment before I was even old enough to walk.

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Acknowledgments

Introduction

Ample theories of interpersonal dynamics such as Attachment theory (Bowlby, 1969/1982; Mikulincer & Shaver, 2007), Interdependence theory (Rusbult, 1980a; Rusbult, 1983; Rusbult & Van Lange, 2003), and the Self-expansion Model (Aron, Aron, Tudor, & Nelson, 1991; Aron, Mashek, & Aron, 2004) have spawned considerable amounts of empirical research examining individual processes (cognitive, emotional, and behavioral) in relationships. However, little research has been done to investigate the potential connection between these relationship variables and sleep mentation (also known as dreaming). Dreams are an important component of human life, in need of critical scientific examination. From a research perspective, dreams are an excellent variable for content analysis, since they include emotional and behavioral content as well as cognitions (e.g., theory of mind) on the part of the dreamer. As noted by Hall (1991) and Blagrove (2007), manifest dream content contains a wealth of information about the dreamer. Dreams include direct expressions of the self-concept, ideas about the world, other individuals and groups, communication patterns, worries and apprehensions, hopes, and conflicts. Dreams are particularly important for analysis in the area of close relationships research, given the relevant theoretical and empirical evidence for the connection between REM-stage sleep and attachment bonding mechanisms. Through the lens of these broad theoretical underpinnings, the current research will investigate parallels between people's dreaming and waking lives with respect to close relationships.

Background on Relationship Research

Attachment theory (Bowlby, 1969/1982) in the realm of developmental psychology has focused on the application of mental representations from early childhood to adult relationships

(Waters & Cummings, 2000). Within social psychology, the study of attachment in close relationships has centered around individual differences involved with overcoming stress and conflict (e.g., Mikulincer & Florian, 2000), with secure people faring better than insecure people on a variety of cognitive, behavioral, and emotional domains (see Mikulincer & Shaver, 2007). In recent years, social psychologists have also turned their attention to normative processes in adult relationships, such as the secure base mechanism whereby people assist their loved ones in environmental exploration (e.g., Feeney & Van Vleet, 2010). Taken together, the study of attachment bonding consists of a variety of psychological mechanisms, ranging from personality development, close relationship functioning, and normative life maintenance.

Closeness between romantic partners, defined based on a cognitive mechanism known as "inclusion of the other in the self" (Aron, et al., 1991), allows individuals to include tangible or abstract aspects of their partner as part of their own self-concept. This can include aspects of personality, tangible resources, cognitive perspectives, etc. (see Aron, et al., 2004 for a review). To the degree that people feel close to their partner, there is a mental overlap of their self-schema and their schema of their partner (Aron, Aron, & Smollan, 1992). This interpersonal closeness impacts a variety of relationship outcomes including satisfaction and equity (Medvene, Teal, & Slavich, 2000), subjective reports of relationship quality (Carson, Carson, Gil, & Baucom, 2004), as well as cognitive interdependence and commitment (Agnew, Van Lange, Rusbult, & Langston, 1998).

Interdependence theory, in contrast, makes economic-based predictions for specific relationships based on interpersonal variables (Kelley & Thibaut, 1978; Rusbult & Van Lange, 2003). According to the theory, people make investments to sustain a relationship (time, resources, etc.), derive satisfaction from relationships, and bear in mind potential alternatives (or

lack thereof) to relationships. Measured separately but acting together (Rusbult, Martz, & Agnew, 1998), each of these variables affects relationship outcomes such as accommodating pro-relationship behavior (Finkel & Rusbult, 2008), couple well-being (Drigotas, Rusbult, & Verette, 1999), forgiveness (Finkel, Rusbult, Kumashiro, & Hannon, 2002), break ups (Drigotas & Rusbult, 1992), and infidelity (Drigotas, Safstrom, & Gentilia, 1999).

Considering the breadth of knowledge about how people think, feel, and act in their close relationships, very little is known about the dreams people have about their relationships and their romantic partners. The current research is an exploratory and phenomenological examination of the parallels between people's dreams and their lives with respect to close relationships. This gap in the literature on close relationships and dreams yields the following noteworthy questions: do people with different attachment orientations have qualitatively different dreams about their attachment figures? Do secure people have different amounts of negative and positive emotions in their dreams than insecure people? Does relationship length, quality (e.g. satisfaction, commitment), or closeness promote higher frequency of dreams containing romantic partners? Are people who experience low relationship quality more likely to dream of alternative partners and infidelity behavior, or are such dreams more a product of personality dimensions? Are highly committed individuals more likely to have dreams about marriage and future scenarios with their partner? These questions are addressed in the present research.

While attachment theory, interdependence theory, and self-expansion theory are distinct theories of relationships and have spawned different lines of empirical research, it stands to reason that each theory would be useful in making predictions for parallels between dream content and interpersonal relationships in waking life. Based on attachment theory, one would

predict that underlying personality constructs (e.g., the degree to which a person generally feels secure in close relationships) would trump relationship-specific variables (e.g., satisfaction or investments to a relationship with a particular individual) in determining dream content about a person's romantic partner or relationship. The reason being because deep-seated experiences stemming from early childhood would be solidified through dreams (see *REM-sleep and social bonding* below) and would remain stable over time despite any differences in relationship partners.

Interdependence theory and self-expansion theory might lead to the opposite prediction—that situational, relationship-specific variables are a more powerful determinant of dream content. This prediction is no less viable than the previous one, due to supporting research on recent events and current concerns appearing in dreams (see *Continuity Theory* below). To summarize, there are compelling reasons to support either theory's predictions for parallels between waking behaviors and dream content with respect to relationships.

Adding to the complexity, research has also demonstrated that there is a great deal of overlap between individual-difference variables and dyadic variables. For example, avoidant-attached individuals are more prone to desire less closeness and intimacy in relationships than secure and anxious-attached individuals (Edelstein & Shaver, 2004). In terms of differences in dreams containing romantic partners or relationships, it is not yet clear which of the two variables would be a more powerful predictor, given the studies demonstrating overlap and generally high correspondence between these variables. In terms of a connection to dreams, dispositional attachment and relationship-specific mechanisms might compete with each other or work in conjunction.

In either case, the current research can yield a clearer understanding of intra-individual and inter-individual relationship dynamics by illuminating how attachment and relationship variables bear on dream affect and content. As an example, research has shown that attachment security, interdependence, and closeness each influence rates of relationship dissolution and divorce (see Le, Dove, Agnew, Korn, & Mutso, 2010; Treboux, Crowell, & Waters, 2004) as well as rates of relationship infidelity (see Allen & Baucom, 2004; Aron, Aron, & Norman, 2004; Drigotas et al., 1999). Relationship research in these areas would benefit from data showing how individuals dream about such outcomes (e.g., conflicts, infidelity). These fields would also benefit from data showing the effect that dreams have on subsequent feelings and relational behavior after waking. This makes the current study compelling for those who wish to understand more about outcomes in romantic relationships.

Background on Dream Theories (and REM-Sleep)

Despite historically being an integral part of developmental and social psychology (Freud, 1910; Jung, 1963; 1974), studies on patterns and trends in dreaming are rare in current social psychological and personality research. Aside from a handful of recent studies (e.g., Mikulincer, Shaver, Sapir-Lavid, & Avihou-Kanza, 2009; Morewedge & Norton, 2009), mainstream psychologists have largely overlooked dream content as an important variable for study, possibly due to apparent intangibility and subjective quality of dreams. Dreams are presumed to have a bizarre, delusional quality (Hobson, 1999; Hobson, Pace-Schott, & Stickgold, 2000), or that they represent symbolic fantasies (Freud, 1900) or an incoherent struggle by the forebrain to form structure from chaotic brainstem signals (Hobson & McCarley, 1977). While some current research has focused on laypeople's seemingly biased interpretations of their dreams (Morewedge & Norton, 2009), it is implied that specific dream content is beyond

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scientific analysis. However, empirical evidence suggests that dreams are more similar to than

different from relaxed waking thought, which also contains abrupt movement in topics,

interrupting of thought patterns with irrelevant images and memories, etc. (Klinger, 1999;

Klinger & Cox, 1987-1988). Research eliciting thought samples from participants in a darkened,

calm environment showed greater than or equal amounts of discontinuity and rapid shifting

imagery as compared to REM dream reports (Foulkes & Fleisher, 1975; Reinsel, Wollman, &

Antrobus, 1992; Wollman & Antrobus, 1986; summarized in Wamsley & Antrobus, 2007).

Furthermore, stereotypes of dreams as intangible, bizarre, and "other-worldly" have been

reinforced by Freudian/Jungian and Activation-Synthesis (Hobson & McCarley, 1977) theories

of dreaming, which is ironic considering these theories have largely been abandoned by most

mainstream dream researchers (see Domhoff, 2007 for more commentary on this issue).

Sleep and dream researchers have discovered the behaviors, cognitions, and emotions

people experience in their dreams mirror those experienced by dreamers in waking life. The

continuity hypothesis of dreaming (Schredl, 2003) specifies that dream content reflects waking

activity. In the literature on the psychology of dreaming, "continuity" refers to the

correspondence between waking life and dream content. For example, as people experience an

event in their lives (e.g., a car accident), they would have dreams that contain such events.

People can incorporate emotions, behaviors, and people from their lives into their dreams, and

this process displays continuity.

Following this line of thinking, researchers have described dreaming consciousness as a

"remarkably faithful replica of waking life…Dreams generally involve clear, coherent accounts

of realistic situations in which the self is involved in mundane activities and preoccupations.

90% would have been considered credible descriptions of everyday waking experience" (Snyder,

1967, p. 133; cited in Domhoff, 2007). Findings from Foulkes (1985) revealed further evidence of the correspondence between waking life and dreaming. Young adults primarily dream about scenarios that mirror their experiences, such as "shopping, playing sports, visiting friends, arguing with parents, worrying about the faithfulness of their lovers, or feeling tempted to be unfaithful themselves" (cited in Domhoff, 2003, p. 31).

In addition, researchers have found evidence for "day-residue" effects (see Nielsen & Powell, 1992; Nielsen, Kuiken, Alain, Stenstrom, & Powell, 2004), where dream content contains events or behaviors from the immediately preceding day(s). The probability of observing dream content drops significantly after 1-2 days following the documented events. However, some studies have found a lack of "matching" correspondence between daily events and dream content evaluated by blind judges (Roussy, Brunette, Mercier, Gonthier, Grenier, Sirois-Berliss, Lortie-Lussier, & Koninck, 2000). Other researchers have reported similar findings (Fosse, Fosse, Hobson, & Stickgold, 2003). Adding to the complexity of this line of research, there is also evidence for delayed incorporation of events and behaviors into dreams, known as the "dream-lag" effect (see Nielsen et al., 2004 for a summary) with participants reporting a drop in correspondence followed by a peak increase in correspondence approximately 1 week later. Overall, there are mixed findings regarding the incorporation of short-term events into dreams, suggesting that while dream content may mirror activities and behaviors in waking life, there is not necessarily a strong, direct, day-to-day correspondence between the two. The function of dreams may be more geared toward events that reflect longer-term concerns and behavioral strategies.

Possible explanations for the discrepancies in the literature on continuity (or lack thereof) between waking life and dreams include (a) emotional impact or personal relevance of the day's

information/event, (b) the type of content (e.g., interpersonal problem solving, spatial locations, self actions), (c) differences between males and females' confidence in recall, and (d) confidence in memory for dreams. Research has indicated that incorporation of events into dreams can be delayed if they are emotionally intense (Powell, Nielsen, Cheung, & Cervenka, 1995; Sophie & Gross, 1994) and personally impactful (Nielsen, Alain, Kuiken, & Powell, 2003). Furthermore, dream recall varies across gender, as females are more likely to recall dreams than males, and describe them as more meaningful and impactful (Hall, 2984; Levin, 1994). All told, the body of studies on day residue and dream-lag effects is inconclusive, and warrants more research.

Dreams are also seen to promote emotional adaptation, also referred to as the mood regulatory hypothesis (Kramer, 1993), with implications for interpersonal emotional resilience. A similar concept in the dreaming literature is known as the social adaptation theory of dreams (Cartwright, 1991). Studies involving individuals' dreams after divorce show overlap between mental health, REM-sleep disturbances, and dream content. Cartwright and colleagues (Cartwright, 1991; Cartwright, Agargun, Kirkby, & Friedman, 2006; Cartwright, Young, Mercer, & Bears, 1998) found that divorced individuals who were also depressed (as a result of the divorce) experienced earlier onset of REM-period sleep, and more "evenly-distributed" REM cycles. In addition, the dreams they recalled were shorter, more repetitive, contained less imagery, and were more self-deprecating. Notable themes included self-blame, helplessness, low self-efficacy, and general negativity.

Procedural information (Stickgold, Hobson, Fosse, Fosse, 2001) and memories (Smith, 1995) are consolidated through processes active during REM-sleep, some of which may pertain to social relationships and situations.   This happens through the process of "re-playing" scenarios and associations (acquired while awake) during REM-sleep. Dream theorists have

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extrapolated based on this to suggest a survival and rehearsal theory of dreaming (see Jouvet, Vimont, & Delorme, 1964; Snyder, 1966). In addition to physical or sensorimotor rehearsal, there is social rehearsal in dream content. Researchers (e.g. Kahn & Hobson; 2005) have observed evidence for "theory of mind" in REM-stage dream reports, where dreamers expressed awareness of other characters' state of mind, emotions, and intentions. The authors propose that dreams that might serve to prepare people for subsequent social interactions (also see McNamara, McLaren, Kowalczyk, & Pace-Schott, 2007 for a review).

Another perspective on the role of dreams draws on the empirical links between REM-sleep mechanisms and "social-bonding" or attachment mechanisms (for an overview, see McNamara, 1996; Zborowski & McNamara, 1998). REM-sleep is associated with activation of the limbic system (Braun, Balkin, Wesensten, Carson, Varga, Baldwin, et al, 1997), which controls long-term emotional and attachment memories (Steklis & Kling, 1985), and the amygdala (Maquet, Péters, Aerts, Delfiore, et al., 1996), which is central for attachment processes and memories (e.g. Siegel & Varley, 2002). The brain in REM-state sleep is flooded with oxytocin, vasopressin, and arginine vasotocin (AVT) (Argiolas & Gessa, 1991; Carter, Williams, Witt, Insel, Pederson, Caldwell, et al., 1992; Forsling, 1993; Insel, 1992), which are associated with reproductive, care-giving and bonding mechanisms. REM-sleep also pertains to sexual neuro-mechanisms (see McNamara, 2004). Studies have demonstrated strong correspondence between sleeping patterns of infants and attachment security. For example, infant-mother sleeping patterns (specifically, home vs. communal setting) are related to insecure attachment (Sagi, van Ijzendoorn, Aviezer, Donnell, & Mayseless, 1994), and insecure attachment in infancy is associated with more frequent night awakenings and sleep disorders (Benoit, Zeanah, Boucher, & Minde, 1992; Scher, 2001). Links between attachment behaviors

and REM-sleep patterns have also been observed in non-human animal studies (Hofer, 1987; Kalin & Carnes, 1984; Reite & Capitanio, 1985; Reite & Field, 1985). According to McNamara (2004), models of developmental attachment processes (e.g. Belsky, Steinberg, & Draper, 1991; Chisholm, 1993) suggest the need for a physiological mechanism through which humans amass and assimilate such knowledge and experience pertaining to close bonding. REM-sleep is a viable candidate. Finally, in addition to evidence linking attachment and sleep processes, there is evidence for correspondence between attachment and dreaming processes (see *Research on Dreaming and Relationship Variables* below).

Just as the theories of attachment, interdependence, and self-expansion have spawned different lines of research (with some notable overlap), the theories of dreaming outlined above have also existed somewhat independently, and might yield different predictions for dream content involving close romantic relationships. Continuity theorists might expect individuals to dream more of their current romantic partner than other partners, on average, even if their current relationships are not as deep or meaningful as previous ones. Continuity theory also lends itself to the prediction that if individuals were in committed, long-term relationships, their dreams about current partners would mostly reflect recent events rather than past or future ones (e.g., a first date). In addition, continuity theory would predict situational variables weighing more heavily on dream content than long-term personality variables.

In contrast, social-emotional adaptation theory might yield the prediction that emotionally salient events in close relationships would appear more than more mundane, everyday events. For example, a scenario involving a big fight or conflict would sooner appear in dream content rather than a simpler scenario (e.g., going out to dinner). Because the theory stipulates that dreams serve to promote emotional adaptation and preparation for subsequent

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social interaction, one would expect to see dreams with higher emotional significance appear more, despite being from the past. In addition, dreams of possible future situations (e.g., marriage/wedding) would also be more likely. It is not clear that this theory would predict whether relationship-specific or dispositional variables would weigh more on dream content; it is possible that deep-seated concerns about relationships (attachment insecurity) could be dominant, but at the same time, emotionally significant concerns in a current relationship (interdependence, closeness) could be dominant.

On the surface, it may seem as though the social bonding theory of REM-sleep and dreams is most consistent with attachment theory in terms of predictions for dream content. If dreams are a manifestation of repeated experiences in relationships that form stable attachment schemata, then personality variables (e.g. attachment security) ought to guide dream content over and above relationship-specific variables. There is evidence for this, based on previous research (see below).

Research on Dreaming and Relationship Variables

Dreams tend to contain characters familiar to dreamers far more than strangers (Domhoff, Meyer-Gomes, & Schredl, 2005). Furthermore, people who are involved in close relationships incorporate their actual dating partners to a greater extent than single people incorporate hypothetical partners (Schredl, 2001), providing support for the theory of dreams as a social bonding mechanism. A sex difference found in dreaming patterns which reveals a higher male-female character ratio for men than women only appears for people who are not currently in relationships, suggesting that dreamers form scenarios which reflect their social networks and personal relationships in waking life (Schredl, 2001).

Research examining divorce/loss of a relationship and dreaming behavior, Cartwright and colleagues (1991; 2006) found that those individuals who incorporated aspects of their ex-partner or ex-relationship (and associated negative aspects) into their dreams fared better than those who dreamt about irrelevant content, as measured by a follow-up depression and mental health assessment. This effect remained even if the irrelevant dream content was more positive than the divorce-relevant content. The authors theorized that incorporation of waking concerns about relationships into dreams is a mark of adaptive mental functioning, and that dreams serve to consolidate information about waking concerns in relationships.

Other studies directly addressed proposed connections between dreams and attachment styles. McNamara, Andresen, Clark, Zborowski and Duffy (2001) found differences in general dream recall and dream content among anxious-preoccupied individuals compared to those with other attachment styles, measured by the Relationship Scales Questionnaire (RSQ; Griffin & Bartholomew, 1994). Anxiously attached individuals recalled more dreams per week, their dreams were longer in length and they contained more high intensity central images (CI). Dreams did not vary in terms of ratings for emotional levels (e.g. anxiety, pleasantness, etc.) as a function of attachment style; attachment status did not predict aloneness, connectedness, dependency, dreamer involvement, or sexual activity in dream characters. The authors theorized that anxious attachment promotes more frequent and longer dream reports due to the fact that dreaming helps promote attachment, and anxious-motivated individuals would therefore utilize dreams more. In contrast, avoidant people reported fewer dreams. In a follow-up study, McNamara et al. (2011) used the Hall/Van de Castle system for dream content coding (Domhoff, 1996; Hall & Van de Castle, 1966), found that anxiously attached people had dreams with more aggressive and self-denigrating themes than secure and avoidant people. The authors did not

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replicate the previous finding of differential dream recall across attachment style.

Summarized in Mikulincer & Shaver (2007), a dissertation study (Avihou, 2006) on an Israeli sample of young adults who recorded dreams each morning for 1 month revealed associations between general dream content and attachment orientation. Dimensions of anxiety and avoidance were assessed with the ECR scale (Brennan, Clark, & Shaver, 1998), and dreams were coded using the "Core Conflictual Relationship Themes" (CCRT; Luborsky & Crits-Christoph, 1998) to characterize how participants represented themselves and relationship partners. Dreams reported by anxious-attached individuals included more representations of the self as anxious, weak, helpless and unloved, while dreams reported by avoidant individuals included more representations of the self as unreceptive (distant, uncooperative, emotionally unexpressive or angry). In a follow up study (Mikulincer, Shaver, & Avihou-Kanza, 2011), the authors found that anxiously-attached individuals had dreams which contained a more negative conceptualization of the dreamer ("negative self"), and avoidant-attached individuals had dreams which contained more desires for distance from others ("avoidance wishes"). In addition, distressing events during the previous day interacted with attachment anxiety to produce an increase in "proximity wishes" (desires for closeness with others) in dreams, such that for people high in anxious attachment, distressing events during the day yielded more desires for proximity with others in dreams that night. A similar interaction was observed with negative representations of others in dreams, such that for highly anxious individuals, distressing events during the day yielded dreams with more negative representations of others.

As part of a larger examination of the "secure base script" (described in detail below) and its correspondence with self-reported attachment styles, Mikulincer, Shaver, Sapir-Lavid, and Avihou-Kanza (2009) collected dream reports from participants, and coded a subset of "distress"

dreams on three separate scales, each tapping into a component of the secure base script. The scales were a) support seeking, b) support availability, and c) distress relief. Attachment avoidance correlated negatively with seeking support and support availability in distress dreams, while attachment anxiety correlated negatively with support availability and distress relief. Again, attachment security was measured with the Experiences in Close Relationships Scale (Brennan, Clark, & Shaver, 1998).

Selterman and Drigotas (2009) collected dream diaries from participants in committed dating relationships, and analyzed emotions in dreams that contained romantic partners. Results demonstrated that avoidant and anxious attachment uniquely predicted stress, conflict, and anxiety in dreams containing romantic partners. In this study, attachment was measured using the Adult Attachment Questionnaire (AAQ; Collins & Read, 1990). Those effects were stronger for avoidance than anxiety, and remained significant after controlling for depression, generalized anxiety and stress (as measured by the DASS Scale; Lovibond & Lovibond, 1995). Anxious attachment also predicted jealousy, and avoidance also predicted anger and less affection, but those effects diminished after controlling for total number of dreams with romantic partners, as well as personal distress variables. As with McNamara et al. (2011), no association was found between dream recall and attachment style.

Dreams as Narratives

Although dreaming is not entirely confined to REM-stage sleep, many scientists equate the two, and even though some dreaming does occur in non-REM sleep, most dreaming occurs in REM-sleep (see Hobson et al, 2000; Nielsen, 2000). Furthermore, the two sleep stages produce structurally different dreams. It has been remarked that non-REM dreams are like photographs,

while REM dreams are like movies (Moorcroft, 2003). REM dreams are more 'story-like' (they contain more of a plot), more emotional, more vivid, and more easily recalled than non-REM dreams (Hobson, et al., 2000; Kuiken, Nielsen, Thomas & McTaggart, 1983). Foulkes and Schmidt (1983) clarified the temporal continuity or coherence in dream reports. In their content analysis of dreams, characters did not change arbitrarily with respect to settings. Instead, dreams followed a series of "temporal units," defined by the appearance of a new activity in the dream (ex: the sequence of "coming out of school, opening the gate, children saying goodbye to each other, and walking away down the street).

Given the narrative quality of REM-dreams, and previous research demonstrating an association between attachment styles and dream content, it is worth examining the connection between dream narratives and specific patterns of storytelling about attachment relationships. Research has demonstrated that people's representations of attachment behaviors and interactions manifest themselves in the form of a social script (Waters & Waters, 2006). Securely attached adults have well-formed schemata which guide attachment-relevant interactions. Waters & Rodrigues (2001) define a prototypic secure base script as a sequence in which the secure base figure (1) supports the child's (or romantic partner's) exploration, (2) exploration is interrupted by a distressing event or actor, (3) there is a bid for help, (4) the secure base provides aid, (5) the aid is accepted and the difficulty overcome, (6) the child is comforted by the secure base contact, and (7) the child returns to exploring the environment. Secure adults have ready access to the script, and follow it in their interactions with attachment figures. The underlying schemata that drive secure base knowledge can be assessed using a prompt-word storytelling procedure (detailed below).

The Current Study

The previous research represents important advances in examining affect, and cognitions within dream content through the lens of attachment. The current study elaborateed on this work by further investigating dream content and close relationships, specifically, the dreams of young adults in committed dating relationships. The theoretical framework is attachment theory (Bowlby 1969/1982; Mikulincer & Shaver, 2007), interdependence theory (Rusbult & Van Lange, 2003), and self-expansion theory (Aron, et al., 1991; Aron et al., 2004). The current study addressed correspondence between attachment/relational variables and affect, behaviors, and scenarios within dreams. The study also examined the narrative quality of dreams; specifically, dreams as narratives that reveal secure attachment "scripts." This analysis of dream "secure scriptedness" (in other words, the degree to which the dream follows the sequence of the secure base script) employs the same protocol and criteria as used for oral narratives/stories of relationships (Waters & Rodrigues, 2001).

On the basis of this literature, I predicted a general pattern of findings that dream content will contain characters that are significant people in the dreamers' lives (relationship partners), and the dreams would contain scenarios, emotions, and behaviors that involve attachment processes. I also predicted that such characters, scenarios, emotions, and behaviors would be similar (parallel to) those experienced by participants in their lives, as gauged by content analyzing dreams alongside reports and assessments of relationship interdependence, closeness and attachment security. More specifically, I proposed the following hypotheses:

Hypothesis 1: Differences in reports/assessments of attachment security, relationship quality, and closeness will be associated with differences in emotions, such that persons with low relationship quality, low closeness, and high attachment insecurity will feel greater negative emotions and less positive emotions in their dreams of romantic partners. This is based on

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previous findings that people experience emotions in relationships as a function of attachment (e.g., Simpson, 1992), and relationship variables such as interdependence (Agnew et al., 1998, Johnson & Rusbult 1989, Rusbult, Van Lange, Wildschut, Yovetich, & Verette, 2000). Although there has already been a link established between emotions in dreams and attachment (Selterman & Drigotas, 2009), the current study goes beyond those findings by examining dream emotions as reported by participants (rather than coded), and with an implicit measure of attachment security. The prediction that relationship quality will also affect emotional content of dreams stems from the continuity hypothesis (Schredl, 2003), such that as people experience negative or positive emotions in their life, it will surface in their dreams, independent of personality variables.

Hypothesis 2: Dreamers who are high in relationship quality (specifically commitment and satisfaction) and closeness, and lower on attachment anxiety/avoidance will dream more often of their partner in positive situations (dating, marriage/weddings, future scenarios, etc.). Conversely, dreamers low in relationship quality, closeness, and high on attachment avoidance/anxiety will dream more often of their partner in negative situations (arguments, break-ups, infidelity/cheating behavior, etc.). This hypothesis stems from previous theory and research examining dream content pertaining to relationships (e.g., Cartwright, 1991; Cartwright, et al., 2006; Cartwright, et al., 1998, McNamara, 1996; McNamara et al., 2001). The guiding principle is that positive elements will surface in dream content to the extent that they happen in people's everyday lives. If close relationships are functioning well and romantic partners are enjoying positive interactions, then interactions between romantic partners should also appear to function well in dreams, and vice versa.

Hypothesis 3: Differences in attachment security, relationship quality, and closeness will be associated with differences in frequency of dreams containing extra-dyadic partners, such that those with relationship difficulties will form dreams more-often containing alternatives to the relationship. This hypothesis is based on previous research examining predictors of attention to alternatives infidelity (e.g., Drigotas et al., 1999), as well as the continuity theory of dreaming (Schredl, 2003). If people are especially attuned to alternatives in waking life, it stands to reason that their minds will form scenarios in dreams that also contain greater alternatives.

Hypothesis 4: Differences in secure base knowledge (as measured by oral narratives) will be associated with differences in dream narratives reflecting secure base processes (comfort and ease in seeking attachment figures, availability, and responsiveness). This hypothesis is based on previous theory on attachment script representations (Waters & Waters, 2006) as well as the attachment-REM sleep association (McNamara, 1996; Zborowski & McNamara, 1998). Although recent empirical findings demonstrated supporting evidence for this hypothesis (Mikulincer et al., 2009), the current study goes beyond previous findings with the implicit measure of attachment security, as well as using the Secure Base Script Assessment as the coding strategy for dream analysis (see below).

In addition to the aforementioned hypotheses, I proposed the following research questions without specific hypothesized effects, given conflicting theoretical and empirical background:

Research Question 1: Do the number of dreams people have containing their romantic partners vary depending on closeness and attachment style, such that those higher in closeness and those higher in anxious (preoccupied) attachment will dream more often of their partners?

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Previous research on this question has produced mixed results with regards to attachment style (McNamara et al., 2001; Selterman & Drigotas, 2009). It is possible that this discrepancy in prior studies is due to differing questionnaires for attachment assessment, retrospective reports vs. diary methods, or different sample sizes.

Research Question 2: Do daily reports of interactions with romantic partners (e.g., love felt, conflict) produce increased or decreased amounts of positive and negative emotion in dreams containing romantic partners, as well as increased or decreased likelihood of specific dream scenarios (e.g., marriage, arguments, infidelity)? For example, increased conflict during the day may produce greater negative emotion and less positive emotion in dreams, as well as an increased likelihood of negative dream scenarios. Increased love felt during the day would produce the inverse effect.

Research Question 2a: Do associations between daily relationship variables and dream emotion levels arise both for the previous day's interactions and/or the next day's interactions? For example, Day 1's love felt may correlate with Night 1's dream emotions, and/or Night 1's dream emotions will also correlate with Day 2's love felt. Given the fact that prior research examining "dream-lag" effects and residual effects from daily events has produced mixed results (see Fosse et al., 2003; Nielsen & Powell, 1992; Nielsen et al., 2004; Roussy et al., 2000), it is possible that null results will arise for research questions 2 and 2a. It is also possible that there are assoociations for both day to night and night to day, but for different variables and in different directions (e.g., daily love affects dream emotion, but not the reverse, and dream emotion affects daily conflict, but not the reverse).

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Research Question 2b: Are there interactions between global (Level 2) relationship variables (attachment, relationship quality, and closeness) and daily (Level 1) interaction variables (love felt, conflict) in predicting daily dream content? For example, the association between daily love/conflict and emotions in dreams may be different depending on an individual's attachment style.

Taken together, the current research goals make a substantial advance in the fields of attachment, close relationships and dreaming psychology. While previous studies in this area have gathered dreams in a laboratory setting (mostly through daytime retrospective reports and seldom through overnight REM-sleep awakenings), the current study employed a naturalistic setting, which captures information from daily experiences. Most previous studies in this area have focused exclusively on general dream content rather than relationship-specific dream content, and have not considered the role of waking interactions with romantic partners influencing dream content (and vice versa). In contrast, the current study allowed for focus on the interplay between daily interactions with people in life, and dreams containing those same people.

The current study also focused on the dreams of people who are in committed dating relationships, and specifically addressed dreams containing current romantic partners (and alternatives). This research also addressed the effects of interdependence and closeness variables in addition to attachment security. The current research also gave an in-depth examination to attachment and dreams with multiple research tools (both implicit and explicit measures of attachment). If the current study demonstrates associations between relationship variables (e.g., interdependence) and dreams with specific relational content (e.g., conflict, infidelity) and

demonstrates links between relational behavior in life and dreams, that would also have implications for relationship therapy and counseling.

<center>Method</center>

Participants and Power Analysis

Sixty-one undergraduate students at Stony Brook University participated in the study (69 total participants were originally recruited but eight did not complete the diary portion of the study and were removed; these participants did not differ from those who completed the study, on any dispositional personality, attachment, or relational measures). Participants were recruited through subject pool participation in the psychology department at Stony Brook (for extra credit or for a chance to win a $200 raffle), as well as through flyers, in-class announcements, and word of mouth. The one requirement for participation was that participants be in a romantic dating relationship of at least 6 months duration. None of the participants were romantically involved with each other.

Materials

Main Self-Report Measures

The 36-item Experiences in Close Relationships Revised (ECR-R) questionnaire (Fraley, Waller, & Brennan, 2000) was used to assess dimensions of attachment avoidance and anxiety. A widely-used questionnaire, the ECR-R examines self-assessment of inclinations in relationships on two dimensions: anxiety (e.g. "My desire to be very close sometimes scares people away;" "I often worry that my partner doesn't really love me") and avoidance ("I don't feel comfortable opening up to romantic partners;" "I am nervous when partners get too close to

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me"). Reliability for both dimensions of attachment was strong, $\alpha = .94$ for anxiety, and $\alpha = .94$ for avoidance.

Interdependence in the current relationship, comprised of 4 subscales (satisfaction, investments, alternatives, and commitment) was assessed using a modified 9-item version the Rusbult Investment Model scale (Rusbult, Martz, & Agnew, 1998). A widely-used and well-established scale, the Rusbult Investment Model scale asks participants to answer questions such as "My relationship is close to ideal" (*satisfaction*), "I have put a great deal into our relationship that I would lose if the relationship were to end" (*investments*), "My alternatives are attractive to me (dating another, spending time with friends or own my own, etc.)" (*alternative quality*), "I want our relationship to last for a very long time" (*commitment*). Because each subscale only contained 2 items (3 for commitment), reliability was assessed for all subscales combined (9 total items), $\alpha = .71$.

Relationship satisfaction was also assessed using the 7-item Relationship Assessment Scale (Hendrick, 1988). Reporting on relationship satisfaction, participants answered questions such as "How well does your partner meet your needs?" Reliability was strong, $\alpha = .91$. Closeness was assessed using the 1-item Inclusion of Other in the Self (IOS) Scale (Aron, Aron & Smolan, 1990), which is a non-verbal graphic diagram displaying overlapping circles (see Appendix C). To the degree that participants indicate a larger overlap is the degree to which they feel close/intimate with their partner generally. Names of attachment figures (to use when coding dream narratives) were assessed using the WHOTO scale (Fraley & Davis, 1997).

Narrative Assessment of Attachment Security

The Secure Base Script Assessment (Waters & Rodrigues, 2001) was employed as an

implicit measure of attachment security/secure base knowledge. The instructions are explained in a matter of minutes and participants are then asked to create stories from 4-6 prompt word outlines depending on the goals of the particular study. Each story takes approximately 5 minutes to produce and typically results in a transcript that is less than one page per story. Each story is then rated for its similarity to the prototypical secure base script along a 7-point scale. An average score out of 7 is then assigned to the batch of stories, with scores above 3.5 assigned to individuals who show some knowledge of the secure base script.

Procedure

The study took place over 2 visits scheduled approximately 2 weeks apart. Participants reported to the laboratory individually at Time 1, which began with the gathering of informed consent and explanation of requirements for participation in the study. Then participants completed a questionnaire examining various demographic information and aspects of their relationship. Length and exclusivity of the relationship, as well racial/ethnic information, were assessed, along with all of the psychological questionnaires (see above).

After filling out the questionnaire, participants then completed 6 oral narratives as part of the secure base script assessment; two third-person parent-child stories and two third-person adult-adult stories from the standard script assessment (Waters & Rodrigues, 2001), along with two additional first person stories where participants are told to construct fictional stories that included themselves and their romantic partners as characters in the stories.

This assessment consists of word-prompt outlines designed to examine an individual's knowledge of, and access to, the secure base script (see Appendix A for example story outlines). Each outline contains a title explaining the theme of the story and 12 words arranged to suggest a

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storyline about an attachment-relevant scenario (e.g., resolution of a problem with the aid of an attachment figure). Participants are given one outline at a time and asked to use the words to construct a story of approximately one page in length. Participants have several minutes to review the outline and when they are ready the story is audiotaped and later transcribed for scoring. In total, the script assessment typically takes approximately 20 minutes. Two independent raters score the transcribed stories. Each story is assigned a score on a 7-point scale based on the quality of the secure base content (see Appendix B for scoring definitions), with a 7 representing a rich secure base narrative. A score of 3.5 and higher indicates an individual has at least some knowledge of the secure base script. Rater agreement between scorers is defined as being within 2 points of each other. Disagreements are solved through discussion and independent re-scoring of the story.

After the storytelling assessment was completed, participants were given a booklet containing pages for recording dreams for 14 days. Each day's worth of pages contained space for 2 dreams (participants were instructed to write extra dreams and rate emotions on looseleaf as necessary, and place additional sheets inside the booklet). Aside from space for dream recording, the diaries contained pages with questions about their feelings (love and closeness) and conflict with romantic partners, which were filled out at the end of each day. Participants also completed a set of sleep-related questions (bedtime, wake time, number of awakenings) each morning after writing down their dreams (see Appendix C).

Participants were instructed on how to complete the diaries while in the laboratory. They were told to follow directions explicitly stated (see Appendix C), but they were also given strategies to facilitate remembrance/recall of dreams. Participants were told (a) to keep the diary booklet and a pen/pencil close to their bed, (b) if they woke in the middle of the night and could

not stay awake to write down the dream in full, to write down keywords in the space provided, which would then jog their memory in the morning so they could write down the full dream, and (c) in the event that they cannot recall any dreams, simply write "no dreams" or leave the page blank (*not* invent or create any dreams). Participants were also instructed to complete all sections of the booklet while they are alone, so as to eliminate any third-party interference, and to write down any and all dreams that they have, regardless of content or perceived meaning. Participants were told to include as much detail as possible for each dream: what happened, in what time frame, with whom, etc. Instructions for recording dreams included thoughts, emotions, and behaviors in the dream, from the dreamer or another dream character that the participant is aware of.

Coding Strategies

Script Assessment. Two graduate students, trained by Harriet Waters, coded and scored all stories generated through the Secure Base Script Assessment. Raters are considered to be in agreement when their scores were within two points of each other. Scores greater than two points apart were be discussed and re-scored independently. Agreement in the coding was very high, with only three disagreements, (99% agreement; $r = .81$, $p < .001$ on scores). All disagreements were discussed and resolved.

Dream Assessment. Two graduate students (same as above) coded and scored all dream reports that contain the dreamer's romantic partner for presence and quality of the secure base script, using the same criteria as that which is used for scoring narratives produced in the laboratory. Of the 220 total dreams collected that contained dreamers' romantic partners, 176 of them were deemed "scorable" using the secure base script coding procedures. Forty-four dreams

were un-scoreable, due to bizarreness, insufficient content, etc. The following criteria

determined whether or not the dream could and should be coded for secure base content: (a) the

dreamer's romantic partner must be a focal character in the dream; (b) the dream must contain

significant behavioral interaction, reflecting a plot line or narrative (e.g., not simply a dream of

observations or imagery); and (c) both coders must be in agreement that the dream is scoreable.

As with the script narrative scoring, agreement in the dream coding for "secure scriptedness"

was very high, with only three disagreements, (99% agreement; $r = .90$, $p < .001$ on scores). All

disagreements were discussed and resolved.

Each dream was also scored for the following variables: (a) presence of an extra-dyadic

romantic partner (e.g., ex-partner); (b) argument/conflict between the dreamer and his/her

partner; (c) sexual behavior between the dreamer and his/her partner; (d) positive non-sexual

interaction between the dreamer and his/her partner (e.g., dates); (e) cheating behavior by the

dreamer, (f) cheating behavior by the dreamer's partner, (g) dreamer expressing temptation to

cheat, (h) dreamer expressing suspicion that his/her partner is cheating, (i) partner expressing

suspicion that the dreamer is cheating, (j) scenario taking place in the future with the dreamer's

partner; (k) scenario involving marriage/wedding with the partner.

Operationally, a dream that contained the dreamer's romantic partner (or an alternative

partner) was coded as such simply due to the mere presence of the character, regardless of the

amount/richness of the interaction between characters. A romantic partner must have been

identified as such, either by name or by the label (e.g., "boyfriend, girlfriend"). An alternative or

extra-dyadic partner was defined as any one or more of the following: a past partner (ex-

boyfriend/girlfriend), a person the dreamer described as attractive or expresses romantic desire

for, a person that made an advance on the dreamer (behaved in an amorous and non-threatening

way), regardless of the dreamer's response, or a person that was being "set up" with the dreamer in a romantic way by a third party character. The behaviors that transpired between the dreamer and the other characters were not central to identifying such an alternative/extra-dyadic partner. Feelings/thoughts expressed, as well as intended but unreciprocated behavior are the key components that reveal the presence of an alternative or extra-dyadic partner. The presence of an opposite-sex stranger or friend of the dreamer did not necessarily qualify as an alternative partner, if there was no romantic intent, feelings, or thoughts between the characters. Dream infidelity must contain one or more of the following: kissing, touching, naked displays, sexual behavior, dates, or weddings/marriages between the dreamer and the alternative. If a dream contained an alternative partner, the dreamer could be tempted to engage in infidelity with this character. This was coded as such if one or more of the following occurs: a) the dreamer literally expressed feelings of temptation for an alternative, b) the alternative presented him/herself in a way that the dreamer reacted to in a receptive way, c) the dreamer fantasized/considered becoming romantically involved with the alternative, or d) there was flirtation between the dreamer and the alternative. Actual infidelity was not a requirement for a dream to be coded for feelings of temptation.

In keeping with McNamara et al.'s (2007) dream content coding, each coder rated half the dreams in the sample (approximately 420 dreams each), and agreement between coders was assessed with an overlapping 20% of the entire dream sample. One hundred and twelve dreams were dually scored, with 90% agreement on the 11 relational dream content categories combined (labeled "a" through "k" above).

Results

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The current empirical questions involve the associations between relationship and personality variables in waking life and dream content. Therefore, the primary analyses were predicting dream content outcomes (e.g., emotions, scenarios in dreams) based on global assessment predictors (e.g., interdependence, attachment, closeness). Although theoretically it may be possible for dream content to predict attachment and relational variables as outcomes, that was not assessed in this study.

Additionally, the current study was designed to assess any associations between dream content and corresponding day-to-day variables (e.g., love felt or conflict with romantic partners on a given day) generated from the diaries. Associations can theoretically exist in either temporal direction; that is, between daily activity and subsequent dream activity that night, and/or between dream activity and subsequent waking activity the following day. Put another way, both dreams and daily waking activity were the units of analysis at Level-1, being predictors and outcomes. In tandem, the trait level predictors (attachment, interdependence, and closeness) were included in analyses as Level-2 predictors. Due to the fact that daily diary data points (both relationship activity and dreams) were nested within individual participants, I used multilevel modeling with PROC MIXED (with SAS v. 9 for Windows) for data analysis.

Correlations, along with means and standard deviations for attachment and relational variables are displayed in Table 1. Interdependence was computed based on the standardized Z-scores from satisfaction, quality of alternatives, and investment. Relationship satisfaction measured by the Relationship Assessment Scale (RAS) correlated very highly with relationship satisfaction measured by the Rusbult Interdependence scale, $r = .92$, $p < .001$, and with the standardized interdependence composite score (representing satisfaction, investments, and alternatives) $r = .78$, $p < .001$. In order to minimize redundancy and maximize clarity/efficiency,

the RAS was not included in any of the subsequent analyses. Relationship length was transformed through a log function, which reflects the fact that differences in relationship length earlier on in the progression of a relationship are more meaningful than equivalent differences later on in a relationship. For example, one month is more meaningful in a relationship that is 6 months old than a relationship that is 12 months old. Participants' age, gender, and length of the relationship (log transformed) did not correlate with any of the main study variables, except for a significant association between relationship length (transformed) and attachment anxiety ($r = -.26, p < .05$).[1]

In total, 842 dreams were collected for the entire sample ($M = 13.82$; $SD = 4.16$ per participant, ranging from 6 to 27 dreams). All dreams were coded for specific content (presence of characters, behaviors, situations), and participants also rated the emotions experienced in each dream (see Appendix D for examples of dreams in the current sample). Therefore, each participant's received a 0 or 1 score on each of the content variables representing whether that content appeared in a given dream. With regards to the emotion variables, the scores represent how much of that particular emotion a participant reported feeling in a given dream, on a 0-8 scale. For analyses involving specific content, all of the dream data was included (final $N = 61$), despite some participants having zero dreams in one or more categories (for these analyses, zero represents a meaningful value; the absence of specific dream content is theoretically relevant). For analyses involving emotions experienced in dreams containing romantic partners, *only* the data from participants who had one or more dreams containing their romantic partners was included (final $N = 53$). These analyses drew on emotion ratings from 220 dreams out of the total sample that contained romantic partners ($M = 3.61$; $SD = 2.66$ per participant, ranging from 0 to 13 dreams). The total number of dreams reported by participants over the two-week period

correlated significantly with the number of dreams people had containing their romantic partners ($r = .32$, $p < .05$), indicating that the more frequently people reported dreams, the more frequently they had dreams that contained their partners. Eight participants did not have any dreams containing their romantic partner. Thus, these participants did not contribute any data to the analyses on emotional content of dreams that contained romantic partners. Comparative t-tests revealed these eight participants did not significantly differ from those participants who did report such dreams, on any attachment, relational, or personality measures. Out of the 220 dreams that contained romantic partners, 176 of them were deemed "scorable" by the secure base script criteria.

Correlations, along with means and standard deviations for the dream emotion variables are displayed in Table 2. For efficiency purposes, and in order to reduce the likelihood of a Type 1 error, I computed composite dream emotion scores based on an exploratory factor analysis (see Table 3). The principal components analysis (with varimax rotation) for all dreams in the sample yielded 4 distinct emotion factors: a) general negative emotion, comprised of anger, anxiety, stress, frustration, and sadness, b) general positive emotion, comprised of joy, affection, eroticism, and calmness, c) jealousy and betrayal, and d) guilt and embarrassment. I also ran identical analyses using one dream for each participant rather than the entire set of dreams, using dreams reported towards the beginning of the diary (day 2) and the end of the diary (day 13). Both revealed the same set of factors. Oblimin rotation also yielded the same set of factors. Conceptually, I labeled these factors (and will refer to them from this point forward) as: a) negative emotion, b) positive emotion, c) jealousy, and d) guilt.

Means, standard deviations, and frequencies (per individual and the entire sample) for coded dream content are displayed in Table 4. In a similar fashion as with the dream emotions, I

grouped dream scenarios according to conceptually/behaviorally similar content. Specifically, dreams that contain one or more of the following: a) temptation with an alternative partner, b) dating, kissing, or other romantic interaction with an alternative, c) sexual behavior with an alternative, or d) dreamer's partner expressing suspicion, were grouped under the category of "*dreamer infidelity*." Conversely, dreams that contain one or more of the following: a) dreamer's romantic partner engaging in some romantic activity with another person (including dating, kissing, sexual activity) or b) the dreamer expressing suspicion that his/her romantic partner is cheating, were grouped under the category of "*partner infidelity*." All positive non-sexual interaction in dreams between the dreamer and his/her romantic partner, including dating, weddings, and elicited positive emotion were grouped under the category "*positive interaction*."[2] All negative interaction between the dreamer and the romantic partner, including arguments, conflicts, or elicited negative emotion were grouped under the category "*conflict*." The mere presence of a romantic partner or alternative was categorized separately.

Given that the number of dreams containing romantic partners was unequal across participants, frequency of dream content could be a confounding variable. Thus, a composite score representing the total number of dreams containing romantic partners was included as a control variable in all analyses pertaining to dream emotions and "secure scriptedness" in dreams. The particular day a dream occurred (e.g., day 3 out of 14) was not of theoretical interest and not integral to the research questions, so the variable representing day of the dream was not included in the analyses. The passage of time itself could have been a confounding factor, in that emotions or content could accumulate over the duration of the daily diaries. However, preliminary analyses revealed that the prevalence of dream affect or content did not increase or decrease as a function of time. Put another way, the presence or intensity of

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emotions experienced in dreams, as well as the likelihood of specific dream content, did not fluctuate in a meaningful or significant way over the 14 days of the study.

Regression analyses for dream "secure scriptedness"

Hypothesis 4 predicted[3] that differences in secure base knowledge (as measured by oral narratives) would be associated with differences in the secure base content of dreams (e.g., "secure scriptedness" in dream content). The analysis for dream "secure scriptedness" was run with standard multiple regression methods (not multilevel regression), since the research hypothesis involved a direct correspondence between implicit attachment working models in waking life and in dreams. Attachment theory proposes that mental models of attachment are stable over time, whether they manifest in conscious narratives or dream content (daily fluctuations within a two week period would not impact general attachment security). The specific prediction was that attachment script scores derived from the narrative assessment in the laboratory would be associated with script scores in dreams. Put another way, people who tell stories that reflect secure base content will have dreams that also reflect secure base content.

In the regression equation, the criterion (outcome) variable was dream "secure scriptedness," which showed significant bivariate correlations with attachment avoidance measured by the ECR ($r = -.32$, $p < .05$), interdependence ($r = .29$, $p < .05$), the first person attachment script score ($r = .30$, $p < .05$), the number of dreams per participant that were scored for secure scriptedness ($r = .24$, $p < .05$), and gender ($r = -.33$, $p < .01$). Gender's negative association with dream script scores reflects the fact that females' dreams were scored as less secure than males' dreams. Those variables, along with length of the participants' current relationship, were entered as simultaneous predictors. Attachment anxiety measured by the ECR

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and closeness were excluded because they were not relevant to the research hypothesis and were not associated with either the attachment script scores or "secure scriptedness" in dreams.

As can be seen in Table 5, the number of dreams maintained a marginally significant unique association with dream secure scriptedness (β = .23, p < .10), as did attachment avoidance measured by the ECR (β = -.26, p < .10) and the first person attachment script score (β = .25, p < .06). Gender was the only significant unique predictor of attachment (β = -.29, p < .05), although the first person attachment script approached significance. The overall regression model was significant (R^2 = .34, p = .01). Because gender was significantly associated with dream secure scriptedness, I ran a separate regression model for females alone. In that group, the unique association between the first person script scores and secure scriptedness in dreams was significant (β = .38, p < .05), and the overall regression model for females was significant (R^2 = .29, p < .05).   No other predictors yielded a significant unique association with secure scriptedness in dreams. Overall, hypothesis 4 was supported.

Multilevel Analyses

The primary empirical questions in the current research involve associations between attachment, interdependence, and closeness with emotional/behavioral content of dreams. Beyond that, associations may exist between daily feelings/behavior with romantic partners and emotional dream content, over and above the predicted associations with attachment style. In order to examine the effects of global (dispositional) and daily associations between relationships and dream content (as well as cross-level interactions), I used multilevel modeling with PROC MIXED (SAS v.9 for Windows). The analyses closely follow related research on attachment and dream content (Mikulincer et al., 2009; 2011).

Dream Emotions

Hypothesis 1 made the prediction that attachment anxiety and avoidance (measured by the ECR), attachment security (measured by the secure base script narrative assessment), interdependence, and/or closeness (IOS) would influence emotions experienced in dreams containing romantic partners, over and above any potential contribution of the control variables. Specifically, secure attachment, high interdependence, and high closeness would be associated with more positive and less negative dream emotion, and the opposite would be true for insecure attachment, low interdependence, and low closeness. In this set of analyses, the outcome variables (DVs) are scores representing the amount of emotion experienced in dreams that contained romantic partners.

In predicting dream emotions, each multilevel model was built starting with Level-2 predictors (attachment, interdependence, and closeness), and from there, Level-1 predictors (daily love/closeness felt, general amount of interaction, and conflict) were added into the model, as well as cross-level interactions between the Level-1 and Level-2 predictors. The variable indicating the day of the dream (ranging from 1-14, corresponding to the endpoints of the two-week diary) did not have any inherent theoretical importance to the analyses; change over time was not integral to the research questions. Thus, the variable representing day of the dream was dropped from the analyses. However, it is important to control for the number of dreams people reported which contained romantic partners, in case frequent dreamers have different emotional content or different associations than seldom dreamers. Therefore, a composite score representing the total number of dreams a person had (containing their romantic partner) was included in the analyses, as a Level-2 covariate, along with gender and length of the relationship. To facilitate interpretation, all Level-2 variables were centered according to the grand mean,

while all Level-1 variables were centered according to the group (individual) mean. Hierarchical linear coefficients for dream emotion are displayed in Table 6.

The first criterion variable was general negative emotion in dreams. Attachment avoidance and anxiety (both measured by the ECR), attachment security (the first person attachment script), interdependence, closeness, gender, length of the relationship, and the total number of dreams were entered individually as Level-2 predictors, with a random intercept. Daily love/closeness, daily general interaction, and daily conflict were entered as Level-1 predictors, such that each corresponding (previous) day's content was set to predict dream emotion that particular night.[4] Random slopes were not included.[5] In addition, cross-level interaction effects between each of the attachment/relational variables with each of the daily variables were included. Results are displayed in Table 5. As can be seen from the table, the number of dreams significantly predicted a decrease in negative dream emotion $b = -.28$, $p < .05$, while closeness predicted a significant increase $b = .43$, $p < .05$. Attachment security (first person script) predicted a marginal increase in negative dream emotion $b = .36$, $p < .10$, while interdependence and daily feelings of love/closeness each predicted a significant decrease $b = -.58$, $p < .05$ and $b = -.46$, $p < .05$, respectively. In addition to the main effects, there were several interactions.

Attachment security (first person script) interacted with daily general interaction and daily conflict to produce negative emotion in dreams about romantic partners. Simple slopes analysis revealed that greater general interaction during the day was associated with somewhat less negative dream emotion when attachment security was high (1 SD above the mean) $\gamma = -.19$, but substantially more negative dream emotion when attachment security was low (1 SD below the mean) $\gamma = .76$. In addition, simple slopes analysis revealed that conflict with romantic

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partners during the day was associated with more negative dream emotion when attachment security was high (1 SD above the mean) $\gamma = .28$, but the association was reversed when attachment security was low (1 SD below the mean) during the day $\gamma = -.48$.

The second multilevel analysis had general positive emotion in dreams as the criterion (outcome) variable. The same set of predictors and interaction effects were included. The number of dreams people had containing their romantic partner uniquely predicted greater amounts of positive emotion in such dreams $b = .37$, $p < .01$. In addition, gender was associated with positive emotion, such that men experienced a marginally significant amount more than women $b = -.92$, $p < .10$. Attachment avoidance (ECR) was associated with less positive dream emotion $b = -.56$, $p < .05$. Daily feelings of love and closeness were also associated with more positive dream emotion $b = .67$, $p < .05$.

Attachment avoidance (ECR) interacted with daily feelings of love and closeness. Simple slopes analysis revealed a strong association between daily love/closeness and positive emotion in dreams for people lower (1 SD below the mean) in attachment avoidance $\gamma = 1.38$, but a weak association between daily love/closeness and positive dream emotion for people higher (1 SD above the mean) in attachment avoidance $\gamma = -.04$. Attachment security (measured by the first person script) interacted with daily general interaction with romantic partners, such that daily general interaction predicted a decrease in positive dream emotion for people low in attachment security (1 SD below the mean) $\gamma = -.41$ but not for people high in attachment security (1 SD above the mean) $\gamma = .05$.

The third multilevel analysis had jealous emotion in dreams as the criterion (outcome) variable. The same set of predictors and interaction effects were included. Attachment

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avoidance (ECR) and closeness were both associated with increased feelings of jealousy in dreams $b = .49$, $p < .05$ and $b = .40$, $p < .05$, respectively. None of the variables interacted significantly. The fourth multilevel analysis had guilt emotion in dreams as the criterion (outcome) variable. The same set of predictors and interaction effects were included. Number of dreams predicted a marginal decrease in guilt dream emotion $b = -.17$, $p < .10$, while closeness predicted a significant increase $b = .38$, $p < .05$. No other main effects or interactions reached significance.

To summarize, hypothesis 1 was partially supported. Interdependence was associated with less negative dream emotion, and attachment avoidance (ECR) was associated with more dream jealousy and less positive dream emotion. In contrast to prediction, attachment security (first person script) was associated with increased negative dream emotion (however, that association was qualified by an interaction with daily conflict). Also in contrast to prediction, closeness was associated with general negative emotion, jealousy, and guilt in dreams. However, when the effects of closeness were examined alone (without the other Level-2 predictors entered in the equation), the effects were small and did not approach significance. Thus, closeness was only associated with dream content when the variance from interdependence was controlled for.

Predicting Subsequent Daily Activity From Dream Emotions

In addition to the question of whether daily emotions, interaction, or conflict influences subsequent dream emotion, there is also the question of whether dream emotion influences subsequent emotions, interaction, or conflict the following day (addressing Research Question 2). To test this, I conducted multilevel regressions with daily feelings of love and closeness,

daily general interaction, and daily conflict as the outcome variables, with dream emotion as the Level-1 independent variables and attachment, interdependence, and closeness as the Level-2 independent variables. Essentially, all that differs between this set of multilevel analyses and the previous set is that the Level-1 variables were switched from being predictors to being outcomes, and vice versa. Dream emotions were centered according to the group (individual) mean. In addition, to control for stability across time, the previous day's feelings of love and closeness, general interaction, and conflict were also entered as Level-1 predictors. Coefficients are displayed in Table 7.

The first multilevel analysis in this set had feelings of love and closeness on days following dreams containing romantic partners as the criterion (outcome). The predictors were attachment avoidance and anxiety (measured by the ECR), attachment security (measured by the first person secure base script), interdependence, and closeness, as well as the four types of dream emotion from the previous night. Gender was marginally associated with feelings of love and closeness, such that women felt marginally less than men overall. Interdependence was associated with a significant increase in feelings of love and closeness overall $b = .44$, $p < .05$. Although none of the dream emotion variables were uniquely associated with love and closeness the following days, interdependence interacted with positive dream emotion to predict subsequent feelings of love and closeness. Simple slopes analysis revealed that for people high in interdependence (1 SD above the mean), positive dream emotion was associated with subsequent love and closeness to a much greater extent $\gamma = .67$ than for people low in interdependence (1 SD below the mean) $\gamma = .21$.

The second multilevel analysis in this set had general interaction on days following dreams containing romantic partners as the criterion (outcome). The predictors were the same as

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the previous analysis, and similar to love and closeness as an outcome, the dream emotions did not uniquely predict changes in general interaction. However, attachment avoidance interacted with negative dream emotion to predict subsequent general interaction. Simple slopes analysis revealed that for people high in avoidance (1 SD above the mean), negative dream emotion was associated with less general interaction with romantic partners on subsequent days $\gamma = -.23$ but for people low in avoidance (1 SD below the mean) the association was positive $\gamma = .21$, such that greater amounts of negative dream emotion predicted more general interaction on subsequent days.

The third multilevel analysis in this set had conflict on days following dreams containing romantic partners as the criterion (outcome). The predictors were the same as the previous analysis. The number of dreams predicted greater conflict $b = .10$, $p < .05$. In addition, dream jealousy uniquely predicted greater conflict on subsequent days $b = .31$, $p < .05$. None of the cross-level interactions reached significance.

Dream Content/Behaviors/Scenarios

Hypothesis 2 and 3 made the prediction that attachment anxiety and avoidance (measured by the ECR), attachment security (measured by the secure base script narrative assessment), interdependence, and/or closeness (IOS) would influence dream content (behaviors and/or scenarios), over and above any potential contribution of the control variables. Specifically, secure attachment, high interdependence, and high closeness would be associated with more positive dream scenarios and relational behaviors (e.g., positive interaction), whereas insecure attachment, low interdependence, and low closeness would be associated with negative dream scenarios and relational behaviors (e.g., infidelity), as well as increased dreams of alternative

partners (the current analyses also address Research Question 1, which deals with whether or not the number of times people dream about their romantic partner is influenced by attachment, interdependence, closeness, relationship length, etc.). In these analyses, the outcome variables (DVs) are all dichotomous; they represent the presence or absence of certain behavioral content or scenarios in dreams. That is, the outcome in each dream is binary. To test the impact of global or daily variables on dream content, the analyses involve a prediction of the likelihood of such a dream "event" occurring, and employed multilevel logistic regression (PROC GLIMMIX function in SAS). Coefficients displayed do not represent linear increases/decreases in raw quantity; they represent increases/decreases in likelihood of the event occurring. Coefficients are displayed in Table 8.

The first analysis in this set had dreams containing romantic partners as the criterion (outcome) variable. No Level-1 or Level-2 predictors were associated with an increase in the likelihood of having a dream containing romantic partners, except for interdependence, which yielded a marginally significant increase in having such dreams $b = .42, p < .10$.[6] None of the cross-level interactions approached significance.

The second analysis in this set had dreams containing alternative (extra-dyadic) partners as the criterion (outcome) variable. No Level-1 or Level-2 predictors were associated with an increase in the likelihood of having a dream containing an alternative partner.[7] However, interdependence interacted with daily conflict, such that for individuals low in interdependence (1 SD below the mean), conflict during the day predicted an increase in the likelihood of having a dream with an alternative partner $b = .36$, but this association was reversed for individuals high in interdependence (1 SD above the mean) $b = -.22$.

The third analysis in this set had dreams containing an argument or conflict between the dreamer and his/her romantic partner as the criterion (outcome) variable. No Level-1 or Level-2 predictors were uniquely associated with an increase in the likelihood of having a dream containing an argument or conflict. However, overall closeness (IOS) interacted with daily feelings of love and closeness, such that for individuals low in general closeness (1 SD below the mean), love and closeness during the day predicted an decrease in the likelihood of having a dream with an argument or conflict $b = -.41$, but this association was reversed for individuals high in closeness (1 SD above the mean) $b = .87$.

The fourth analysis in this set had dreams containing sexual behavior between the dreamer and his/her romantic partner as the criterion (outcome) variable. Gender was associated with the likelihood of such dreams, such that women were less likely to have them $b = -1.75$, $p < .05$. Closeness was marginally associated with a decrease in likelihood of having such dreams $b = -.61$, $p < .10$. None of the cross-level interactions approached significance.

The fifth analysis in this set had dreams containing a wedding or marriage between the dreamer and his/her romantic partner as the criterion (outcome) variable. Interdependence was associated with an increased likelihood of having this kind of dream $b = 2.24$, $p < .05$, while closeness was marginally associated with a decreased likelihood $b = -.80$, $p < .10$. In addition, daily general interaction was associated with a marginally significant decrease in the likelihood of such dreams $b = -.84$, $p < .10$. Closeness interacted with daily conflict, such that for those high in closeness (1 SD above the mean) daily conflict was associated with an increase in the likelihood of having a marriage/wedding dream $b = 1.37$, and for those low in closeness (1 SD below the mean), daily conflict was associated with a decrease in the likelihood of having a marriage/wedding dream $b = -.39$.

In addition, interdependence interacted with each of the three daily variables. The association between feelings of love and closeness predicted an increase in the likelihood of having a marriage/wedding dream $b = 2.97$ for individuals higher in interdependence (1 SD above the mean) and a decrease in the likelihood of such a dream $b = -.80$ for those low in interdependence (1 SD below the mean). The association between general interaction during the day and the likelihood of a marriage/wedding dream was positive $b = .50$ for those individuals higher in interdependence (1 SD above the mean) and negative $b = -2.11$ for those individuals lower in interdependence (1 SD below the mean). Finally, the association between conflict during the day and the likelihood of a marriage/wedding dream was negative for those individuals higher in interdependence (1 SD above the mean) $b = -.90$ but positive for those individuals lower in interdependence (1 SD below the mean) $b = 1.81$.

The sixth analysis in this set had dreams containing dreamer engaged in infidelity (romantic feelings, thoughts, or behavior with an alternative partner) as the criterion (outcome) variable. None of the Level-1 or Level-2 variables predicted an increase or decrease in the likelihood of such a dream, except for interdependence, which was associated with a marginally significant decrease in the likelihood of such a dream $b = -.65, p < .10$.[8] None of the cross-level interactions approached significance.

The seventh analysis in this set had dreams containing dreamer's partner engaged in infidelity (romantic feelings, thoughts, or behavior) as the criterion (outcome) variable. Attachment avoidance (ECR) was associated with a significant increase in the likelihood of such a dream, $b = .65, p < .05$. None of the cross-level interactions reached significance. The eighth analysis in this set had dreams containing the dreamer and the dreamer's partner engaged in positive interaction as the criterion (outcome) variable. None of the Level-1 or Level-2 variables

were associated with an increase or decrease in the likelihood of such a dream, except for daily feelings of love and closeness, which was associated with a marginally significant increase in the likelihood of such a dream $b = .35$, $p < .10$. None of the cross level interactions approached significance.

Overall, hypothesis 2 and 3 were partially supported. Individuals reporting greater interdependence were less likely to have dreams of alternative partners following increased conflict during the day, whereas individuals low in interdependence showed the opposite association. Higher interdependence was also associated with increased likelihood of having dreams containing marriage to the dreamer's romantic partner, especially following increased feelings of love and increased interaction during the day. Contrary to prediction, those individuals who reported greater closeness were more likely to dream about arguments/conflicts following increased love felt during the day, whereas individuals low in closeness showed the opposite association. Attachment did not contribute much in the way of predicting dream content outcomes, except for dreams about partner infidelity, which was associated with attachment avoidance.

Predicting Subsequent Daily Activity From Dream Content/Behaviors/Scenarios

As with the above analyses examining dream emotions, the question arises regarding whether dream content influences subsequent emotions, interaction, or conflict the following day (addressing Research Question 2). To test this, I conducted multilevel regressions with daily feelings of love and closeness, daily general interaction, and daily conflict as the outcome variables, with dream content as the Level-1 independent variables and attachment, interdependence, and closeness as the Level-2 independent variables. Dreams of alternative

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partners correlated strongly with dreams of infidelity ($r = .77, p < .001$), so to reduce

redundancy, the variable representing presence of an alternative partner was excluded from the

analyses. In addition, to control for general stability in behavior across time, the previous day's

feelings of love and closeness, general interaction, and conflict were also entered as Level-1

predictors for each relevant analysis. Hierarchical linear model coefficients are displayed in

Table 9.

The first analysis in this set had feelings of love and closeness (subsequent to dreaming)

as the criterion (outcome) variable. Interdependence was associated with increased feelings of

love and closeness, $b = .81, p < .01$. Having a dream involving infidelity on the part of the

dreamer was uniquely associated with less feelings of love and closeness on the following day b

$= -.49, p < .01$. Attachment anxiety (ECR) interacted with having dreams containing romantic

partners, such that when individuals high on anxiety (1 SD above the mean) had a dream that

contained their romantic partners, they felt less love and closeness the following day $\gamma = -.42$

whereas those low on anxiety (1 SD below the mean) had a dream that contained their romantic

partners, they felt more love and closeness the following day $\gamma = .39$.

The second analysis in this set had general interaction with romantic partners (subsequent

to dreaming) as the criterion (outcome) variable. Interdependence was associated with increased

general interaction, $b = .52, p < .05$. Attachment security (measured by the first person script)

interacted with dreams of romantic partners, such that when people high on attachment security

(1 SD above the mean) dreamt of their romantic partner they reported more interaction with their

partner the following day $\gamma = .64$, but people who were low on attachment security (1 SD below

the mean) dreamt of their romantic partner, they reported less interaction the following day $\gamma =$

$-.54$.

A similar pattern emerged for dreams containing positive interaction with romantic partners, such that when people high on attachment security (1 SD above the mean) dreamt of positive interaction with their romantic partner they reported more general interaction with their partner the following day $\gamma = 1.20$, but when those who were low on attachment security (1 SD below the mean) had such dreams, they reported less general interaction the following day $\gamma = -.26$. Positive interaction in dreams also interacted with interdependence, such that when people high on interdependence (1 SD above the mean) had such dreams, they reported more interaction with their partner the following day $\gamma = 1.37$, but when those who were low on interdependence (1 SD below the mean) had such dreams, they reported less interaction the following day $\gamma = -.38$.

The third analysis in this set had conflict with romantic partners (subsequent to dreaming) as the criterion (outcome) variable. Interdependence was associated with decreased conflict, $b = -.37, p < .05$, while attachment security (measured by the first person sure base script) was associated with increased conflict $b = .20, p < .05$.[9] Dreams of arguments/conflicts with romantic partners was uniquely associated with greater conflict the following day $b = 1.01, p < .01$. In addition, attachment anxiety (ECR) interacted with dreams of romantic partners, such that when people high on attachment anxiety (1 SD above the mean) dreamt of their romantic partner they reported more conflict with their partner the following day $\gamma = .45$, but people who were low on attachment anxiety (1 SD below the mean) dreamt of their romantic partner, they reported less conflict the following day $\gamma = -.53$. Attachment anxiety (ECR) also interacted with dreams of positive interaction with romantic partners, such that when people high on attachment anxiety (1 SD above the mean) dreamt of positive interactions with their romantic partner they reported more conflict with their partner the following day $\gamma = .65$, but people who were low on

attachment anxiety (1 SD below the mean) had such dreams, they reported less conflict the following day $\gamma = -1.03$.

Discussion

Summary of main findings

The current study revealed attachment and relational themes in people's dream content. Participants dreamt of dating and shared activities with their partner, sexual behavior, romantic rivals, alternative/extra-dyadic partners, infidelity, conflict, and secure base behavior. The current study also provided evidence that individual differences in attachment, interdependence, and closeness are associated with differences in the presence of relational dream content (behaviors, scenarios, etc.) as well as affect in dreams containing romantic partners. In addition, the study demonstrated that fluctuations in daily waking activity (feelings of love, general interaction, and conflict) are also associated with differences in dream content.

Hypothesis 1 was supported. Interdependence was associated with a significant decrease in negative emotion in dreams containing romantic partners. Attachment avoidance (ECR), conversely, predicted a decrease in positive emotion in such dreams, as well as an increase in jealous emotion. Daily feelings of romantic love were associated with less negative emotion and more positive emotion in dreams of romantic partners. In addition, individuals experienced differing amounts of negative and positive dream emotion as a function of their level of attachment security (measured by the secure base script and by the ECR) in tandem with daily fluctuations in romantic love felt, general interaction, and conflict.

Hypothesis 2 and 3 were supported. Individuals dreamt of alternative partners and infidelity as a function of interdependence (and daily conflict). Individuals also dreamt of

marriage to their current partner to the extent they reported greater interdependence (and as a function of three kinds of daily waking activity), and dreamt of their partner's infidelity to the extent they reported greater avoidant attachment. Hypothesis 4 was also supported. Specifically, there was correspondence between attachment working models in waking life and in dreams, such that relationship specific mental models of participants' romantic relationships (first person attachment script scores) correlated significantly with dream "secure scriptedness," and maintained a unique association above and beyond other attachment/relational variables that was just beyond the cutoff for significance.

Implications for Theory and Future Research

Changes in daily waking activity, such as romantic love felt on a particular day, was associated with general positive and negative emotion, but such daily activity was not associated with specific relational emotions in dreams (jealousy and guilt), which seemed to be associated only with dispositional variables (attachment avoidance). While general dream emotions (e.g., anxiety, joy, anger) may be subject to day-to-day fluctuations, relational emotions manifest in dreams as a function of general attachment insecurity or overarching relationship dynamics. This suggests that if individuals are insecure and/or have poor general relationship functioning, they will experience greater amounts of relational negative emotion (e.g., jealousy) regardless of daily fluctuation in waking behavior or emotion.

The fact that attachment security (measured by the first person script) predicted secure base content in dreams that contained romantic partners indicates that this is a relationship-specific attachment mechanism. The first person script correlated highly with the third person adult narrative script, but the third person script (which was included in the design but not in the

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analyses) was not significantly associated with dream content containing dreamer's current romantic partners. Only when people had a high degree of attachment security in their current relationship did their dreams (of the specific partner) reflect that security.

The continuity theory of dreams received some support from the current analyses, but not fully. Feelings of love and closeness on a given day were associated with general positive and negative emotion in subsequent dreams that night. However, associations did not exist for specific dream content; that is, participants were no more/less likely to dream about interacting with romantic partners or alternatives based on their daily waking activity.

Adding to the complexity, continuity between daily activity and dreams was moderated by individual differences in attachment security and interdependence. Individuals high on secure attachment (measured by both the first person script) were more adept at integrating daily affect/activity from their romantic lives into their dreams. This contribution of secure attachment was not universally positive in valence. Securely attached individuals experienced more negative emotion in their dreams of romantic partners if they experienced more behavioral conflict during the day. Insecure individuals did not display this association. General interaction with romantic partners was also associated with more positive and less negative dream emotion for secure people, but not for insecure people (measured by the first person script). Despite the increased negative dream affect, which may feel unpleasant, this mechanism might prove more accurate and adaptive for secure individuals' relationships.

In addition, people low in attachment avoidance (secure people; measured by the ECR) experienced greater amounts of positive emotion in their dreams when they felt more love/closeness during the day, but highly avoidant people did not show this association; their

dream affect did not improve based on daily waking affect. People high in attachment avoidance were also more likely to dream about their partner's infidelity, which is consistent with previous research demonstrating avoidant individuals' distrust of their romantic partners (Mikulincer & Shaver, 2007).

Interdependence also interacted with daily conflict such that people who reported low interdependence were more likely to dream about an alternative partner following increased conflict but people who reported high interdependence showed the opposite pattern. This is consistent with the literature on interdependence theory and "accommodative" relational behaviors (Finkel et al., 2008). Those individuals who expressed more satisfaction and investments along with lower alternatives seemed to be resisting exposure to alternative partners in their dreams, even following increased conflict with their romantic partners that day. Individuals high in interdependence were less likely to cheat on their partners (engage in infidelity) in their dreams, and also more likely to dream of marriage (or wedding) to their current partners, suggesting fidelity and commitment mechanisms at work in dream content. This was especially true when people high in interdependence also had greater feelings of love/closeness, greater general interaction with their partner, and less conflict during the day.

Although the results were not perfectly identical across the different measures of attachment (the ECR and the secure base script), the current study did reveal conceptually and theoretically consistent results for the two attachment measures. For example, when securely attached individuals (measured by the secure base script) dreamt of their partner, they reported more general interaction on subsequent days. When anxiously attached individuals (measured by the ECR) dreamt of their partners, they reported less love and more conflict on subsequent days. These behavioral patterns are consistent with previous theory and research on attachment, and

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also consistent with what attachment theorists would predict regardless of which measure is employed.

Attachment was a stronger predictor of dream affect, while interdependence was a stronger predictor of specific dream content. This may reflect the fact that people's specific relational concerns or preoccupations with specific behaviors vary and do not manifest as a function of secure/insecure attachment. Rather, attachment may simply be associated with a more positive or negative affective relational state. In contrast, interdependence may act to help facilitate people's understanding of specific relational behaviors or concerns through dreaming. The one notable exception to this framework is with dreams that involve a partner's infidelity behavior, which manifested as a function of insecure attachment (avoidance).

None of the attachment variables were associated with frequency of dreams containing romantic partners. This result is unsurprising given previous research (McNamara et al., 2011; Mikulincer et al., 2011; Selterman & Drigotas, 2009). However, the tendency to dream frequently was associated with more frequent dreams containing individuals' romantic partners, which is also consistent with prior research (Selterman & Drigotas, 2009). Based on these findings, it is reasonable to conclude that all individuals (regardless of attachment orientation or relational disposition) have dreams about their romantic partners, and that more frequent dreaming goes hand in hand with more frequent dreams about significant others. This behavioral trend may indicate that dreams serve a functional purpose, either to consolidate information regarding affectional/social bonds or to prepare individuals for future social interaction (e.g., Cartwright, et al., 1991).

Along the same line of reasoning, results from the current study revealed that dream

frequency played a significant role in predicting affect and content. To the extent people dreamt of their romantic partners, they experienced less negative emotion and more positive emotion in such dreams, and more "secure" dreams as rated by the secure base script criteria. More frequent dreaming of romantic partners was also associated with more general waking interaction with romantic partners and more conflict. In addition, interdependence was associated with an increase in frequency of dreams containing romantic partners, although the effect was only marginally significant and should be interpreted with caution. Considering that increased frequency of dreams containing romantic partners was associated with greater attachment security in dreams, this may also indicate dreams serving an attachment bonding function or a way for individuals to consolidate/rehearse attachment scenarios (e.g., McNamara, 1996).

Aside from the associations between waking activity and dream affect/content, dream affect/content was also associated with subsequent waking activity, over and above the influence of dispositional variables and the previous day's waking activity. For people reporting greater interdependence, positive dream emotion was associated with greater romantic feelings on following days. Having a dream involving infidelity on the part of the dreamer had the opposite effect, resulting in less love/closeness felt on subsequent days. In addition, simply having a dream containing one's romantic partner was associated with less love/closeness for individuals high on attachment anxiety but not for individuals low on anxiety (secure individuals).

When people high in attachment avoidance (ECR) dreamt of their partners with greater negative emotion, they interacted with their partners less on subsequent days. This is consistent with minimizing and distancing strategies often employed by avoidant individuals (Mikulincer & Shaver, 2007). People high in attachment anxiety (ECR) felt less love/closeness and experienced more conflict subsequent to dreaming about their partners, even if the dream was comprised of

positive behavioral interaction with their partners. This could reflect anxious individuals' preoccupation with their relationships and fears of abandonment; these findings are consistent with the emotions and behaviors of anxiously attached people documented in previous literature (Mikulincer & Shaver, 2007). In addition, when people high on secure attachment (measured by the first person script) dreamt about their partner (or dreamt about positive interaction with their partner) they reported more interaction with their partners the following day. The same was true for people reporting greater interdependence.

Implications for Clinical Management of Relational Conflict

Jealous emotion in dreams containing significant others was associated more conflict with romantic partners on subsequent days, as were dreams containing an argument/conflict with romantic partners. In addition, dreams involving infidelity were associated with decreased feelings of love and closeness on subsequent days. These effects were stable across individual differences in attachment or relationship quality, and remained even when controlling for the previous day's behavior/affect. These findings demonstrate that negative relational dream states carry over into relational dynamics and behavior, supporting the emotional adaptation theory of dreaming (Cartwright et al., 1991) and also suggesting implications for relationship therapy and marital counseling. Dream content and dream affect can now be added to the list of variables that can potentially influence loving feelings and conflict in couples. If counselors and therapists help individuals and couples understand and reflect on their dreams, this has the potential to help mitigate conflict in romantic relationships.

More broadly, the process of "dream work" in the realm of clinical or counseling psychology may need to be tailored based on individual differences. For individuals who are

securely attached, an understanding of their dreams could accurately illuminate their

interpersonal processes. Clients who are securely attached could bring concerns from their

dreams to their partners and counselors, drawing on their dreams in a constructive and direct

fashion. Insecure individuals, on the other hand, may be suffering from inaccurate perceptions

of their relationships in dreams (e.g., avoidant individuals' frequent dreams of their partners'

infidelity and frequent jealous emotion), with may reflect either incoherence or negative

illusions/assumptions of others' behavior. Dream work for insecure individuals could be more

productive with cognitive reframing techniques; perhaps an examination of dreams could assist

individuals in overcoming aspects of their own insecurity. In either case, understanding and

reflecting on dream affect and content can be a useful addition to counseling and psychotherapy

(see Hill & Spangler, 2007 for more on this topic).

Limitations and Caveats

Results concerning closeness (IOS) ran contrary to prediction. Closeness predicted

higher amounts of negative emotion (general negative emotion, jealousy, and guilt) in dreams

that contained romantic partners, and fewer dreams of sex and marriage with romantic partners.

However, it is important to note that none of the associations between closeness and dream affect

approached significance when closeness was examined in isolation (without partialling out other

variables). That is, *only* when the other Level-2 predictors (including interdependence) were

entered simultaneously in the regression equations was closeness associated with dream affect.

To some extent, it is unclear as to why this would be, since closeness correlated highly

with interdependence, and interdependence generally predicted more positive and less negative

dreams. In addition, previous literature has shown closeness to be associated with a variety of

positive relational outcomes (see Aron et al., 2004). Because of the substantial overlap in variance between interdependence and closeness, the results generated may be explained by the fact that the unique effects of closeness include none of the positive relational benefits normally associated with high relationship quality/interdependence. This "extra" closeness may in fact be a mark of dysfunction or insecurity.

It is also possible that associations between closeness and dream affect/behavior could be more heavily influenced by the dreamer's partner than the dreamer himself/herself, through a dyadic cognitive confusion mechanism. If a dreamer reports greater closeness with a partner who experiences less positive/more negative affect in their own life, they would experience dream emotions in a parallel fashion. However, this is speculative, especially given that the current study presents data only on individuals, and not on dyads. Future research can work to uncover if and how closeness between romantic partners influences dream content in one or both members of the couple.

In the analyses predicting subsequent daily activity using previous nights' dream content, the previous day's activity was included as a control. However, the analyses predicting dream content using daily activity did not include previous dream content/emotions as a control. This is due to the fact that people did not always report dreams every day, especially dreams with romantic relational content. There was a great deal of variation in the spacing between dreams containing romantic partners (some participants reported having relational dreams spaced a full week apart). Thus, the comparison between results for daily activity predicting dreams and dreams predicting daily activity is not a parallel comparison. Future research should investigate whether dreams from previous nights have predictive power with regards to subsequent dream content, over and above daily activity.

There was an effect of gender on dream "secure scriptedness" such that women's dreams were rated as less secure than men's, however, this should be interpreted cautiously given that the sample was highly skewed in terms of gender representation. There are documented differences in dream content based on gender (Schredl, 2007); the consistently documented gender differences involve sexuality and aggression, not normative relationship or attachment behaviors (other gender differences have been reported in studies on dream content, but these effects have either not been replicated or they have been shown to be driven by other social variables). Furthermore, no gender differences have been reported in previous research linking attachment/relationship dynamics and dream content (e.g., Mikulincer et al., 2011; Selterman & Drigotas, 2009). Future research should investigate any potential differences in attachment or relational behavior in dreaming.

Concluding Thoughts

The current research demonstrated correspondence between attachment orientations and relational tendencies in waking life and in dreams. The study went beyond previous work in its assessment of emotions, behaviors, and cognitive representations (scripts) in dream content. Daily waking activity in tandem with general and relationship-specific attachment, interdependence, and closeness were associated with dream content, and dream content was also associated with subsequent waking behavior. These results have implications not only for attachment theory and dream theory, but also for all research concerned more broadly with romantic relationships.

In the current study, emotions, behaviors, scenarios, and relationship-specific attachment cognitions all manifested themselves in dream content. Going forward, these findings also lend

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support for the idea that dream content analysis can be brought into the realm of mainstream social cognition research, particularly within the scope of interpersonal relationships. In line with this claim are research findings that demonstrate evidence for higher-order cognitive processes in dreams, including theory of mind, problem solving, metacognitive thought, and counterfactual thought (Kahn, 2007; Kahn & Hobson, 2005; McNamara, 2000; McNamara, Andresen, Arrowood, & Messer, 2002; White & Taytroe, 2003). Viewed in this light, dreams are a fruitful source of information about individuals and their social lives (see Blagrove, 2007; Hall, 1991 for more on this point). The scientific study of dreams, integrated further into the realm of mainstream social, developmental, personality, and clinical psychology, could yield very profitable programmatic research. In sum, to dismiss the significance of dreams is to dismiss a lucrative means to understand and illuminate psychological mechanisms, particularly with respect to interpersonal relationships.

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Appendix 1: Script Assessment Story Prompts

A.   Baby's Morning

mother	hug	teddy bear
baby	smile	lost
play	story	found
blanket	pretend	nap

B.   The Doctor's Office

Tommy	hurry	mother
bike	doctor	toy
hurt	cry	stop
mother	shot	hold

C.   Bob and Jane's Camping Trip

Bob	tent	campfire
Jane	wind	shadow
bags	collapse	sounds
hurry	upset	hug

D.   Sue's Accident

Sue	wait	home
road	Mike	dinner
accident	tears	bed
hospital	doctor	hug

E.   Food Poisoning

Girlfriend/Boyfriend and I	drive	bed
restaurant	home	relax
eat	vomiting	hug
I get sick	hold	sleep

F.   Internship Offer

phone call	pacing	sleep
for Girlfriend/Boyfriend	uncertain	morning
internship offer	dinner	decision
surprise	we talk	hug

Appendix 2: Script Scoring System

Score	Description

Score   **Description**

7   These are the very best examples of secure base content in the narrative. There is a rich interplay between the two principle characters. There is a great deal of attention to the psychological state of the other, and the "secure base" is very responsive to that psychological state. Important to the secure base script is the resolution of the problem/distress with a return to normalcy.

6   These narratives fall short of the richness of secure base content that is evidenced in stories ranked "7". Nonetheless, these stories to contain a reasonable amount of secure base content.

5   These narratives have a medium amount of secure base content, but not as much elaboration as those that are ranked "7" or "6".

4   These narratives have some secure base content, but not very much. Thus, they are weak on secure base content but there is no unusual or atypical content contained in the story either.

3   These narratives are mostly event-related stories in which what is happening is presented with very little commentary, or the give and take between with the characters, or on the psychological content of the story.

2   These are event-related as well but so brief as to seem disjointed. Also included in this category are narratives that contain some unusual or atypical content that is inconsistent with a secure base script. The intrusion of this content however is not as consistent or pervasive as the narratives that are scored "1."

1   These narratives are theme-based variations that come across as quite peculiar interpretations of the implied story line. Not only is the secure base script not recognized, but a quite different script is in its place. The narratives can be quite detailed, with content generated consistent with the peculiar interpretation of the story line. These are not that common. Narratives that have significant unusual or atypical content, but fall short of a complete theme-based variation also receive a "1."

Appendix 3: Dream Booklet Questions/Instructions

Interaction Diary: To be filled out each night before going to sleep.

Time: _____ (AM/PM)   Day_____   Your Code_____

INSTRUCTIONS: This questionnaire is completely confidential. Please fill out the first three questions using the following scale:

1	2	3	4	5	6	7
Not at All			**Moderate**		**Very much**	

_____1 How much love did you feel FOR your partner today?

_____2 How much love did you feel FROM your partner today?

_____3 How much interaction did you have with your partner today?

_____4 How much conflict did you have with your partner today?

_____5 How bored were you today?

6. Rate the amount of effort you put into each activity <u>today</u>:

___ a. School (e.g., paying attention in class, doing homework)

___ b. Work (e.g., completing assigned tasks)

___ c. Partner (e.g., spending time together, doing things for the other)

___ d. You (e.g., spend time on a hobby, relax)

7) Did anything dramatic happen today in your life or in your relationship?

INSTRUCTIONS: Please circle the picture below that best describes your relationship with your romantic partner **today**.
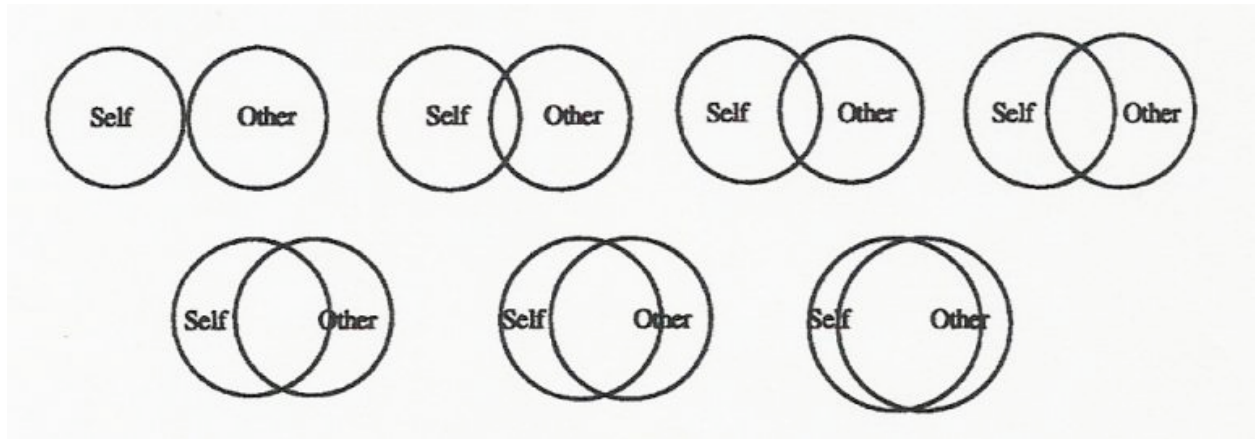
Dream Diary: To be filled out for each dream AS THEY HAPPEN. Please do not delay in recording dreams! If you experience a dream in the middle of the night, jot down keywords to help you remember, then write down the ENTIRE dream in the morning.

Time: _____ (AM/PM)   Your Code_____

*Use this blank space to write down the dream in its entirety. Describe **everything** in your dreams, with as much detail as possible: What happened, in what time frame, with whom, etc. Describe the cognitions, emotions, and behaviors you experienced in your dreams, as well as the cognitions, emotions and behaviors of all other parties included in your dreams (if evident to you). If it was a lucid dream, state so. Continue on the reverse side of this sheet if needed.*

INSTRUCTIONS: Please rate the intensity of each emotion you felt in the dream on a 0-8 scale. If you did not feel a particular emotion, please mark it 0.

None   0   1   2   3   4   5   6   7   8   A great deal

_____Anxiety/Fear   _____Calmness

_____Anger   _____Embarrassment

_____Stress   _____Frustration/Annoyance

_____Guilt/Shame   _____Other

_____Sadness/Depression

_____Jealousy

_____Betrayal

_____ Joy/Elation

_____Affection

_____Eroticism

Appendix 4: Example Dreams

Scored low for "secure scriptedness":

¨In my dream…my mom and dad walked into my room, sat on the foot of my bed (one on each side) and…they told me my Uncle died. His sons, who live in Florida and Puerto Rico, were still on the planes over. They didn't get to see him before he passed away and they didn't even know yet. <u>My parents left</u> my room together and I slowly got out of bed and got dressed. <u>I was feeling very sad and confused</u>… ¨<u>I looked to [boyfriend] for comforting</u>. I texted him and messaged online. He simply responded with "Oh" and "sorry." Suddenly I felt very lonely and like I had no one to talk to. I unplugged my computer, turned off my phone and went to my aunt's with my family."

Scored high for "secure scriptedness":

¨[Boyfriend] and I wake up and decide to go for a run…I remember thinking that it was particularly foggy, but [he] <u>said we should be fine because he was going to take me on a different route</u>…We begin to run and I begin to feel refreshed. As we go in further the scenery begins to change…we pass really strange things, each with a different theme…[he] was really pumped and excited, and <u>because he didn't seem worried, I stopped worrying</u> and began to have fun."

Betrayal:

"A girl named ____ left a message on my boyfriend's Facebook page saying that she loved him. I find out that he called her and they were talking..after badgering him about what they talked about <u>he finally lets me know that he told her he loved her</u> but he didn't mean it. <u>I become even more upset</u> and start smacking him across the face, yelling and crying 'how could

he do this to me.' He just keeps saying he doesn't know and I continue yelling and crying until finally waking myself out of the dream."

Jealousy:

"In this dream I was friends with my boyfriend's ex-girlfriend. We were hanging out at my house. We were having fun. Singing karaoke. Every time I looked at her I thought very few girls are as beautiful as she is. Then my boyfriend comes over. I was glad that there was no awkwardness between us. Then my boyfriend wanted to take a picture with her. Then I got all jealous and pulled him aside to ask him if he thought she was prettier than me…I was giving him a lot of attitude and I knew it but I didn't care because of the position we were in. I had every right to be jealous and bitchy. He ignored my question and ignored me for the night. Then when I confronted him again he told me he was very turned off by my attitude and behavior. I was left questioning my behavior and wondering if maybe I overreacted."

Feelings of temptation:

"In my dream I was on the side of a pool with some famous actress. She was in a red one piece bathing suit (kind of like a lifeguard). We were on a diving board that was up really high in the air. She was sitting on it and pulling me towards her. I knew that I could not touch her so I tried to resist it. I believe I succeeded in doing so. I remember it being extremely difficult to pull away from her."

Infidelity:

¨I had met this wonderful, cute, and affectionate guy. He gave me attention, gifts and wanted to meet my parents. He even said he wanted to marry me some day. One particular part, I

remember best. He took me to this extravagant store, it was all gold and silver. He gave me jewelry to try on with this beautiful champagne dress. I felt so happy the entire dream that I didn't want to wake up.

Conflict and Infidelity:

¨I was at a party with my fraternity brothers, with a bunch of sorority girls I know from school. I remember <u>being called constantly from my girlfriend checking up on me</u>. It got to the point where <u>we got into a fight because I told her she didn't trust me</u>. <u>I ended up getting beyond drunk and hooking up with some random girl</u>. I brought her back to my house where we had sex. I remember <u>feeling guilty</u> before it went down, but satisfied after.

Positive Interaction:

"I dreamt I was at a carnival with my girlfriend. She likes them and we decided to go to one that stopped in our town…<u>we were having lots of fun</u> and running around kissing and tickling each other. We played the whack-a-mole game and she kept beating me even though I thought I was winning by a lot…In the end she still won a big teddy bear as a prize <u>which is apparently what she wanted so I was happy</u>…"

Positive Interaction (with minor secure base support):

"This was a memory. It was our first date, and we were watching Saw II around November. I was so scared of the movie I kept ducking my head into his shoulder and squeaking when some gory part appeared. <u>He just laughed and comforted me, somewhere in the middle of the movie I rested my head on his shoulder and he put his arm around me and kissed me</u>. He was sweet and I remember feeling tingly. We continued to kiss and hug each other."

Positive Interaction (and future scenario):

"I dreamt of the future. I don't remember much but I know I had become a teacher of psychology at my old high school. I had come home and my wife (current girlfriend) was home and she was cooking dinner. When I walked in <u>she hugged me from behind</u> said 'Hey stranger!' <u>she gave me a kiss on the cheek</u> and slipped into the kitchen again. We started talking about our days at work. It was weird because <u>I became a teacher which was what she wanted to be and she became a relationship counselor which is something I wanted to do.</u> I was complaining about how stupid some kids are and she was laughing and talking about how she had some crazy couples. I remember <u>laughing with her about all our stories</u> and then we laid down for the night on the couch and watched TV."

Appendix 5: Tables.

Table 1: Intercorrelations Among Attachment and Relational Variables at Time 1 ($N = 61$).

	1	2	3	4	5	6
1. Attachment Anxiety (ECR)						
2. Attachment Avoidance (ECR)	.38**					
3. Adult 3rd Person Attachment Score (SB Script Assessment)	-.14	-.12				
4. 1st Person Attachment Score (SB Script Assessment)	-.02	-.15	.76***			
5. Closeness (IOS)	-.34**	-.54***	.12	.13		
6. Interdependence (Sat, Inv, Alt)	-.20	-.59***	.09	.21	.67***	
Mean	2.48	2.40	3.52	3.40	5.15	5.27
Standard Deviation	1.32	1.09	0.93	1.13	1.54	1.27

$+ p < .10$ $* p < .05$ $** p < .01$ $*** p < .001$

Table 2: Intercorrelations Among Dream Emotions, Averaged Over 2 Weeks (*N* = 61)

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Anxiety													
2. Anger	.70***												
3. Stress	.81***	.78***											
4. Guilt	.60***	.55***	.56***										
5. Sadness	.68***	.75***	.72***	.53***									
6. Jealousy	.39**	.52***	.45***	.48***	.53***								
7. Betrayal	.40**	.65***	.52***	.41**	.69***	.80***							
8. Joy	.11	.14	.10	.18	.06	-.12	.03						
9. Affection	.29*	.27*	.30*	.37**	.29*	.12	.14	.63***					
10. Eroticism	.28*	.33**	.21	.34**	.19	.32*	.26*	.35**	.61***				
11. Calmness	-.06	.05	.09	.23	.06	-.08	.04	.60***	.48***	.14			
12. Embarrassment	.14	.28*	.23+	.46***	.08	.25*	.15	.28*	.18	.15	.20		
13. Frustration	.74***	.81***	.78***	.55***	.62***	.45**	.51***	.05	.17	.17	.06	.34*	
Mean	3.26	2.30	3.44	1.11	1.85	.70	.88	2.91	2.33	1.00	2.22	1.19	3.20

Standard Deviation	1.50	1.28	1.47	1.01	1.44	.79	.83	1.31	1.46	1.02	1.23	.90	1.36

+ $p < .10$ * $p < .05$ ** $p < .01$ *** $p < .001$

Table 3: Factor Loadings for Principal Components Analysis (with Varimax Rotation) for Dream
Emotions in All Dreams (N = 822)

	1	2	3	4
1. Anxiety	.85	-.10	-.12	.07
2. Anger	.65	-.20	.43	.14
3. Stress	.86	-.18	.07	.11
4. Guilt	.40	.17	.12	.68
5. Sadness	.67	-.04	.36	.13
6. Jealousy	.03	-.02	.87	.16
7. Betrayal	.23	-.01	.86	.02
8. Joy	-.32	.74	-.13	-.02
9. Affection	-.01	.88	-.03	-.02
10. Eroticism	-.02	.72	.07	.15
11. Calmness	-.36	.60	-.07	-.19
12. Embarrassment	.07	-.09	.11	.90
13. Frustration	.64	-.29	.30	.24
Eigenvalues	4.63	2.06	1.33	1.00
% Variance Explained	36	16	10	8

Factor 1: General Negative Emotion

Factor 2: General Positive Emotion

Factor 3: Jealousy

Factor 4: Guilt

Table 4: Means, Standard Deviations, and Frequencies for Specific Types of Dream Content (*N* = 61).

	Partner Present	Alternative Partner Present	Argument/ Conflict with Partner	Sexual Behavior with Partner	Sexual Behavior with Alternative Partner
Mean (Frequency Per Participant)	3.61	1.74	.89	.26	.13
Standard Deviation	2.66	2.32	1.11	.54	.43
Minimum	0	0	0	0	0
Maximum	13	10	5	2	2
Total Content Frequency	220	106	54	16	8
Percent of Participants ≥ 1 Dream	88%	56%	56%	21%	10%

	Positive Non-Sexual Interaction with Partner	Dreamer Expresses Temptation with Alternative Partner	Dreamer Infidelity	Partner Infidelity
Mean	1.15	.79	.41	.13
Standard Deviation	1.67	1.56	1.00	.39
Minimum	0	0	0	0
Maximum	7	8	5	2
Total Content Frequency	70	48	25	8
Percent of Participants ≥ 1Dream	52%	31%	21%	11%

	Dreamer Expresses Suspicion of Partner Infidelity	Partner Expresses Suspicion of Dreamer Infidelity	Scenario of Future Interaction with Partner	Scenario of Wedding/ Marriage with Partner
Mean	.36	.15	.21	.23
Standard Deviation	.73	.44	.76	.46
Minimum	0	0	0	0
Maximum	4	2	4	2
Total Content Frequency	22	9	13	14
Percent of Participants ≥ 1Dream	26%	11%	10%	21%

Table 5: Multiple Regression Predicting Dream "Secure Scriptedness" Based Upon Time 1 Attachment, Interdependence, Gender, and Relationship Length ($N = 51$)

Dream "Scriptedness":

	r	β	R^2 Overall
Number of Dreams	.24*	.23+	
Gender		-.33**	-.29*
Relationship Length	-.07	-.03	
Attachment Avoidance (ECR)	-.32*	-.26+	
Interdependence	.29*	.07	
Attachment Script (1st Person)	.30*	.25++	.34**

$+ p < .10$ $++ p < .06$ $* p < .05$ $** p < .01$ $*** p < .001$

Table 6: Hierarchical linear model coefficients for emotions in dreams containing romantic partners as a function of attachment, interdependence, closeness, daily love, daily conflict, and daily interaction.

	Negative Emotion	Positive Emotion
	_b_	_b_

Between-participants

Number of Dreams	-.28*	.37**
Gender	.78	-.92+
Relationship Length	.00	.00
Attachment Avoidance (ECR)	.17	-.56**
Attachment Anxiety (ECR)	.17	.04
First Person Attachment Script	.36+	.21
Interdependence	-.58*	-.32
Closeness	.43*	.23

Within-participants

Daily Love/Closeness	-.46*	.67**
Daily Interaction	.13	-.18
Daily Conflict	-.10	.14
Avoidance (ECR) X Daily Love	.32	-.65**
Avoidance (ECR) X Daily Interaction	-.04	.18
Avoidance (ECR) X Daily Conflict	-.11	-.18

Anxiety (ECR) X Daily Love	-.30	.15
Anxiety (ECR) X Daily Interaction	.05	-.05
Anxiety (ECR) X Daily Conflict	.04	-.11
First Person Script X Daily Love	.22	-.27
First Person Script X Daily Interaction	-.28*	.20*
First Person Script X Daily Conflict	.34*	-.08
Interdependence X Daily Love	-.30	.39
Interdependence X Daily Interaction	.15	-.08
Interdependence X Daily Conflict	-.13	.05
Closeness X Daily Love	.12	-.21
Closeness X Daily Interaction	.03	.06
Closeness X Daily Conflict	-.05	.00

$* \ p < .05 \qquad ** \ p < .01 \qquad *** \ p < .001$

	Jealousy/Betrayal	Guilt/Embarrassment
	b	*b*
Between-participants		
Number of Dreams	-.08	-.17+
Gender	.64	-.41
Relationship Length	.00	.00
Attachment Avoidance (ECR)	.49*	.41
Attachment Anxiety (ECR)	.02	.02
First Person Attachment Script	.13	.00
Interdependence	-.39	-.19
Closeness	.40*	.38*
Within-participants		
Daily Love/Closeness	-.14	-.14
Daily Interaction	-.02	-.05
Daily Conflict	-.04	.00
Avoidance (ECR) X Daily Love	.07	.16
Avoidance (ECR) X Daily Interaction	-.13	.00
Avoidance (ECR) X Daily Conflict	.03	.00
Anxiety (ECR) X Daily Love	.05	-.32
Anxiety (ECR) X Daily Interaction	.00	.13

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Anxiety (ECR) X Daily Conflict	.00	-.03
First Person Script X Daily Love	.30	.21
First Person Script X Daily Interaction	-.21	-.18
First Person Script X Daily Conflict	-.03	.23
Interdependence X Daily Love	-.07	.14
Interdependence X Daily Interaction	-.00	.01
Interdependence X Daily Conflict	-.11	.10
Closeness X Daily Love	-.06	-.15
Closeness X Daily Interaction	.09	.03
Closeness X Daily Conflict	-.01	-.08

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*$p < .05$ ** $p < .01$ *** $p < .001$

Table 7: Hierarchical linear model coefficients for feelings of love and closeness, general interaction, and conflict with romantic partners during the day as a function of the previous night's dream emotion, attachment, interdependence, and closeness.

	Love/Closeness	General Interaction
	_b_	_b_

Between-participants		
Number of Dreams	.05	.17**
Gender	-.45+	-.27
Relationship Length	.00	.00
Previous Day's Love/Closeness	.10	-----
Previous Day's Interaction	-----	.18*
Attachment Avoidance (ECR)	.05	-.03
Attachment Anxiety (ECR)	-.08	.09
First Person Attachment Script	-.11	.17
Interdependence	.44**	.17
Closeness	.09	.05
Within-participants		
Negative Dream Emotion	.08	-.01
Positive Dream Emotion	.02	.04
Jealous Dream Emotion	-.07	.08
Guilt Dream Emotion	-.01	.08
Avoidance (ECR) X Negative Dream Emotion	-.13	-.20*

Avoidance (ECR) X Positive Dream Emotion	-.08	.03
Avoidance (ECR) X Jealous Dream Emotion	.15	.09
Avoidance (ECR) X Guilt Dream Emotion	-.01	.01
Anxiety (ECR) X Negative Dream Emotion	-.01	.12
Anxiety (ECR) X Positive Dream Emotion	-.01	-.09
Anxiety (ECR) X Jealous Dream Emotion	-.11	.18
Anxiety (ECR) X Guilt Dream Emotion	.03	-.24
First Person Script X Negative Dream Emotion	.04	.01
First Person Script X Positive Dream Emotion	-.05	-.02
First Person Script X Jealous Dream Emotion	-.04	.04
First Person Script X Guilt Dream Emotion	-.10	-.10
Interdependence X Negative Dream Emotion	.02	-.02
Interdependence X Positive Dream Emotion	.15*	.18
Interdependence X Jealous Dream Emotion	.12	.09
Interdependence X Guilt Dream Emotion	.02	.10
Closeness X Negative Dream Emotion	-.06	.00
Closeness X Positive Dream Emotion	-.02	-.12
Closeness X Jealous Dream Emotion	.04	.02
Closeness X Guilt Dream Emotion	-.11	-.13

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*p < .05   ** p < .01   *** p < .001

| | Conflict |
| | *b* |

Between-participants

    Number of Dreams   .10*

    Gender   .15

    Relationship Length   .00

    Previous Day's Conflict   .29**

    Attachment Avoidance (ECR)   -.16

    Attachment Anxiety (ECR)   .07

    First Person Attachment Script   .17+

    Interdependence   -.16

    Closeness   -.01

Within-participants

    Negative Dream Emotion   -.09

    Positive Dream Emotion   .04

    Jealous Dream Emotion   .31*

    Guilt Dream Emotion   -.01

    Avoidance (ECR) X Negative Dream Emotion   .19

    Avoidance (ECR) X Positive Dream Emotion   -.01

    Avoidance (ECR) X Jealous Dream Emotion   -.09

    Avoidance (ECR) X Guilt Dream Emotion   .01

Anxiety (ECR) X Negative Dream Emotion	.09
Anxiety (ECR) X Positive Dream Emotion	-.12
Anxiety (ECR) X Jealous Dream Emotion	.16
Anxiety (ECR) X Guilt Dream Emotion	-.19
First Person Script X Negative Dream Emotion	.05
First Person Script X Positive Dream Emotion	.04
First Person Script X Jealous Dream Emotion	.06
First Person Script X Guilt Dream Emotion	-.08
Interdependence X Negative Dream Emotion	.11
Interdependence X Positive Dream Emotion	.05
Interdependence X Jealous Dream Emotion	-.07
Interdependence X Guilt Dream Emotion	.03
Closeness X Negative Dream Emotion	.13
Closeness X Positive Dream Emotion	-.09
Closeness X Jealous Dream Emotion	-.09
Closeness X Guilt Dream Emotion	-.01

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p < .05   ** *p* < .01   *** *p* < .001

Table 8: Hierarchical linear model coefficients for the likelihood of dream content ("events") as a function of attachment, interdependence, closeness, daily love, daily conflict, and daily interaction.

	Alternative Partner	Argument/Conflict
	b	*b*

Between-participants		
Number of Dreams	-.02	-.05
Gender	-.02	.39
Relationship Length	-.02	-.02
Attachment Avoidance (ECR)	.16	.27
Attachment Anxiety (ECR)	-.30	-.26
First Person Attachment Script	-.15	-.29+
Interdependence	-.45	.15
Closeness	-.12	-.06
Within-participants		
Daily Love/Closeness	.21	.24
Daily Interaction	-.14	-.25
Daily Conflict	.08	.12
Avoidance (ECR) X Daily Love	-.06	.17
Avoidance (ECR) X Daily Interaction	-.06	-.14
Avoidance (ECR) X Daily Conflict	-.03	.13

Anxiety (ECR) X Daily Love	.21	.05
Anxiety (ECR) X Daily Interaction	-.20	.07
Anxiety (ECR) X Daily Conflict	.00	.04
First Person Script X Daily Love	-.06	.27
First Person Script X Daily Interaction	.03	-.10
First Person Script X Daily Conflict	-.01	-.01
Interdependence X Daily Love	.35	-.22
Interdependence X Daily Interaction	-.32	.02
Interdependence X Daily Conflict	-.36*	.06
Closeness X Daily Love	.12	.42*
Closeness X Daily Interaction	.03	-.21
Closeness X Daily Conflict	-.05	.18

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*$p < .05$ ** $p < .01$ *** $p < .001$

	Marriage/Wedding	Partner Infidelity
	b	*b*
Between-participants		
Number of Dreams	.02	.13
Gender	1.79	.07
Relationship Length	.00	.01
Attachment Avoidance (ECR)	-.49	.65*
Attachment Anxiety (ECR)	-.23	.20
First Person Attachment Script	.13	-.25
Interdependence	2.24*	.33
Closeness	-.80+	.01
Within-participants		
Daily Love/Closeness	1.04	-.26
Daily Interaction	-.84+	.35
Daily Conflict	.49	-.03
Avoidance (ECR) X Daily Love	-.32	.121
Avoidance (ECR) X Daily Interaction	-.08	-.33
Avoidance (ECR) X Daily Conflict	-.20	-.07
Anxiety (ECR) X Daily Love	.27	.23
Anxiety (ECR) X Daily Interaction	.34	-.06

Anxiety (ECR) X Daily Conflict	.02	.20
First Person Script X Daily Love	-.05	.21
First Person Script X Daily Interaction	-.43	.01
First Person Script X Daily Conflict	.02	.12
Interdependence X Daily Love	2.33*	-1.24+
Interdependence X Daily Interaction	1.61*	-.66
Interdependence X Daily Conflict	-1.67**	-.12
Closeness X Daily Love	.48	-.37
Closeness X Daily Interaction	.22	.01
Closeness X Daily Conflict	.57*	.06

$* \, p < .05$ $** \, p < .01$ $*** \, p < .001$

Table 9: Hierarchical linear model coefficients for feelings of love and closeness, general interaction, and conflict with romantic partners during the day as a function of the previous night's dream content, attachment, interdependence, and closeness.

	Love/Closeness	General Interaction
	b	*b*

Between-participants		
Number of Dreams	.01	.03
Gender	-.18	-.23
Relationship Length	.00	.00
Previous Day's Love/Closeness	.06	-----
Previous Day's Interaction	-----	.18**
Attachment Avoidance (ECR)	-.01	-.06
Attachment Anxiety (ECR)	-.03	.04
First Person Attachment Script	-.14	-.05
Interdependence	.81**	.52*
Closeness	.13	.06
Within-participants		
Partner	-.02	.05
Argument/Conflict	-.21	.14
Positive Interaction	.27	.47
Sexual Behavior	.04	-.52
Marriage/Wedding	-.36	-.27
Infidelity Dreamer	-.49**	-.18

Infidelity Partner	.10	-.01
Avoidance (ECR) X Partner	.00	-.24
Avoidance (ECR) X Argument/Conflict	.00	-.04
Avoidance (ECR) X Positive Interaction	-.10	.52
Avoidance (ECR) X Sexual Behavior	.37	-.45
Avoidance (ECR) X Marriage/Wedding	.01	-1.24
Avoidance (ECR) X Infidelity Dreamer	-.16	.08
Avoidance (ECR) X Infidelity Partner	.15	.37
Anxiety (ECR) X Partner	-.31*	.15
Anxiety (ECR) X Argument/Conflict	-.02	-.09
Anxiety (ECR) X Positive Interaction	.34+	-.18
Anxiety (ECR) X Sexual Behavior	.24	.22
Anxiety (ECR) X Marriage/Wedding	-.33	-.45
Anxiety (ECR) X Infidelity Dreamer	.15	-.23
Anxiety (ECR) X Infidelity Partner	.22	-.01
First Person Script X Partner	.21	.52*
First Person Script X Argument/Conflict	-.32	-.47
First Person Script X Positive Interaction	-.29	.65*
First Person Script X Sexual Behavior	.37	.82
First Person Script X Marriage/Wedding	.11	.30
First Person Script X Infidelity Dreamer	-.10	-.22
First Person Script X Infidelity Partner	-.03	-.22

Interdependence X Partner	-.12	-.52
Interdependence X Argument/Conflict	-.07	-.12
Interdependence X Positive Interaction	-.20	1.08*
Interdependence X Sexual Behavior	1.08	-.12
Interdependence X Marriage/Wedding	.38	-1.51
Interdependence X Infidelity Dreamer	-.45	.56
Interdependence X Infidelity Partner	-.06	-.06
Closeness X Partner	-.21	.02
Closeness X Argument/Conflict	-.11	.12
Closeness X Positive Interaction	.14	-.17
Closeness X Sexual Behavior	.27	.06
Closeness X Marriage/Wedding	-.30	-.72
Closeness X Infidelity Dreamer	.06	-.23
Closeness X Infidelity Partner	.32	.45

$* \ p < .05 \qquad ** \ p < .01 \qquad *** \ p < .001$

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-------------------------------------------------------------------------------------
                                        Conflict

                                           b
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Between-participants

    Number of Dreams   .03

    Gender   -.28

    Relationship Length   .00

    Previous Day's Conflict   .12**

    Attachment Avoidance (ECR)   -.03

    Attachment Anxiety (ECR)   .06

    First Person Attachment Script   .20*

    Interdependence   -.37*

    Closeness   -.05

Within-participants

    Partner   -.04

    Argument/Conflict   1.01**

    Positive Interaction   -.19

    Sexual Behavior   .08

    Marriage/Wedding   -.39

    Infidelity Dreamer   .27

    Infidelity Partner   -.20

    Avoidance (ECR) X Partner   -.36

Avoidance (ECR) X Argument/Conflict	.17
Avoidance (ECR) X Positive Interaction	.53
Avoidance (ECR) X Sexual Behavior	-.59
Avoidance (ECR) X Marriage/Wedding	-.20
Avoidance (ECR) X Infidelity Dreamer	-.08
Avoidance (ECR) X Infidelity Partner	.37
Anxiety (ECR) X Partner	.37*
Anxiety (ECR) X Argument/Conflict	-.10
Anxiety (ECR) X Positive Interaction	.64*
Anxiety (ECR) X Sexual Behavior	-.12
Anxiety (ECR) X Marriage/Wedding	.46
Anxiety (ECR) X Infidelity Dreamer	.16
Anxiety (ECR) X Infidelity Partner	-.48
First Person Script X Partner	.03
First Person Script X Argument/Conflict	.28
First Person Script X Positive Interaction	-.05
First Person Script X Sexual Behavior	.10
First Person Script X Marriage/Wedding	.08
First Person Script X Infidelity Dreamer	.13
First Person Script X Infidelity Partner	.05
Interdependence X Partner	.09
Interdependence X Argument/Conflict	-.50

Interdependence X Positive Interaction	.86
Interdependence X Sexual Behavior	-.19
Interdependence X Marriage/Wedding	-.96
Interdependence X Infidelity Dreamer	.10
Interdependence X Infidelity Partner	.28
Closeness X Partner	.21
Closeness X Argument/Conflict	.37
Closeness X Positive Interaction	-.23
Closeness X Sexual Behavior	-.44
Closeness X Marriage/Wedding	.46
Closeness X Infidelity Dreamer	.16
Closeness X Infidelity Partner	-.35

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p < .05   ** *p* < .01   *** *p* < .001

Appendix 6: Footnotes

[1] Direct relationship length (without the log transformation) did not correlate with any of the study variables.

[2] The reason for excluding sexual behavior from general positive interaction in dreams was because some in some cases, people describe sexual behavior in dreams as not enjoyable, even when it occurs within a committed relationship (Selterman & Drigotas, 2009). However, for some participants, there was overlap between these variables within individual dreams. If the dreamer engaged in some positive interaction (e.g., dating) and sexual behavior with his/her partner in the same dream, then the dream would be coded for the presence of both. But due to the fact that some descriptions of sexual behavior were less than pleasant (this does *not* include forced or unwanted intercourse with one's partner), the variables were considered distinct.

[3] Hypothesis 4 was evaluated before the others, using standard multiple regression, in order to group the other analyses by a distinct statistical technique (multilevel modeling).

[4] Dream emotion from the previous night was not included as a Level-1 predictor. This is due to the fact that dreams were not spaced out evenly across the two-week diary period (some participants did not report dreams every day), and there was increased disbursement for dreams with romantic relational content. This point is addressed further in the Discussion section.

[5] In the analyses that included cross-level interactions, random effects for slopes were either not significant or could not be estimated in the models. At best they only achieved marginal significance in some preliminary models examining only main effects. Thus, the random slopes effects were dropped, due to the lack of variance accounted for.

[6] In preliminary models examining the effects of each Level-2 predictor with separate equations, interdependence was significantly associated with a higher likelihood of dreams containing romantic partners $b = .30$, $p < .05$.

[7] In preliminary models examining the effects of each Level-2 predictor with separate equations, interdependence and closeness were each significantly associated with a lower likelihood of dreams containing alternative partners $b = -.68$, $p < .01$, and $b = -.25$, $p < .05$, respectively.

[8] In preliminary models examining the effects of each Level-2 predictor with separate equations, attachment security (measured by the secure base script) and interdependence were each significantly associated with a lower likelihood of dreams containing infidelity $b = -.38$, $p < .05$, and $b = -.77$, $p < .01$, respectively.

[9] These main effects were qualified by a marginally significant interaction, such that attachment security was associated with increased daily conflict only when interdependence was low, and not when it was high. This interaction was excluded from the analyses because it is not central to the research questions/hypotheses.