

# When Sex Is More Than Just Sex: Attachment Orientations, Sexual Experience, and Relationship Quality

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The authors explored the contribution of individual differences in attachment orientations to the experience of sexual intercourse and its association with relationship quality. In Study 1, 500 participants completed self-report scales of attachment orientations and sexual experience. The findings indicated that whereas attachment anxiety was associated with an ambivalent construal of sexual experience, attachment avoidance was associated with more aversive sexual feelings and cognitions. In Study 2, 41 couples reported on their attachment orientations and provided daily diary measures of sexual experiences and relationship interactions for a period of 42 days. Results showed that attachment anxiety amplified the effects of positive and negative sexual experiences on relationship interactions. In contrast, attachment avoidance inhibited the positive relational effect of having sex and the detrimental relational effects of negative sexual interactions. The authors discuss the possibility that attachment orientations are associated with different sex-related strategies and goals within romantic relationships.

*Keywords:* attachment, gender differences, romantic relationships, sexuality

Within attachment theory, adult romantic love involves the integration of three distinct behavioral systems: attachment, caregiving, and sexual mating (Bowlby, 1969/1982; Shaver, Hazan, & Bradshaw, 1988). Because the attachment system is the earliest developing social-behavioral system (Cassidy, 1999), it plays a crucial role in molding the functioning of the caregiving and sexual systems and shaping cognitive models for social life. Nevertheless, the sexual behavior system may also influence attachment by fostering the development of emotional bonds between sexual partners (Hazan & Zeifman, 1994). Indeed, empirical evidence points to a reciprocal relationship between the attachment system and the sexual system: Sexual satisfaction contributes to a relationship's quality and stability (see review by Sprecher & Cate, 2004), and attachment orientations influence the way in which adolescents and adults construe their romantic relationships (see Feeney, 1999, for a review) and sexual interactions (see Feeney & Noller, 2004, for a review). However, although past research has provided substantial evidence about the role of attachment orientations in shaping sexual motives, attitudes, and behaviors, rela-

tively little attention has been given to the subjective experience of sexual intercourse as well as to the association between sexual experience and relationship quality. The current research was intended to add to our understanding of the attachment–sexuality link within romantic relationships by examining the association between attachment orientations and the multifaceted emotional and cognitive components of subjective sexual experience and by exploring the possible role of attachment in moderating the complex linkage between sexuality and relationship quality.

## Contribution of Attachment Orientations to Relationship Quality and Sex

According to attachment theory (Bowlby, 1969/1982, 1973), the quality of interactions with significant others in times of need shapes interaction goals, relational cognitions, and interpersonal behavior. When significant others are perceived as available and responsive to proximity-seeking attempts, a sense of attachment security is attained, intimacy and nurturance become primary interaction goals, and partners are thought to be trustworthy and reliable. However, when partners are felt to be emotionally unavailable, insecurities and doubts about close relationships predominate, leading to the adoption of either of two defensive strategies for dealing with these insecurities (Cassidy & Kobak, 1988; Mikulincer & Shaver, 2003). Under a *hyperactivation strategy*, the main goal is to get a relationship partner, perceived as insufficiently available and responsive, to provide support and

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protection. On the other hand, the main goal of *deactivation strategies* is to maintain emotional distance from relationship partners and to strive for self-reliance (Main, 1990; Mikulincer & Shaver, 2003).

These behavioral strategies are thought to underlie many phenomena associated with *attachment orientations*: the systematic patterns of relational expectations, emotions, and behaviors that result from a particular attachment history (Fraley & Shaver, 2000; Shaver & Mikulincer, 2002). In turn, these different strategies are closely related to the two major dimensions thought to underlie attachment orientations. Research, beginning with Ainsworth, Blehar, Waters, and Wall (1978) and continuing through recent studies of adult attachment, indicates that individual differences in attachment orientations are appropriately conceptualized as regions in a two-dimensional space (Brennan, Clark, & Shaver, 1998; Fraley & Waller, 1998). The first dimension, typically called *attachment avoidance*, reflects the extent to which a person distrusts a relationship partners' goodwill, strives to maintain behavioral independence, and relies on deactivating strategies for dealing with relational threats. The second dimension, typically called *attachment anxiety*, reflects the degree to which a person worries that partners will not be available in times of need and thereby hyperactivates cognitions and behaviors in an attempt to secure such availability (Mikulincer & Shaver, 2003). Attachment security is located in the region in which both anxiety and avoidance are low and is defined by comfort with closeness and faith in the reliability of caregivers.

Previous research has shown that attachment orientations help explain variations in the construal and experience of romantic relationships (see Feeney, 1999, for a review). Securely attached individuals, compared with insecure individuals, are more likely to have long, stable, and satisfying relationships characterized by high involvement, trust, intimacy, warmth, support, and cohesion (e.g., Hazan & Shaver, 1987; Kirkpatrick & Davis, 1994; Mikulincer & Florian, 1999; Simpson, 1990). In contrast, in line with their goal of deactivating attachment concerns, highly avoidant individuals are less likely to fall in love and are less interested in being involved in long-term committed relationships (Hatfield, Brinton, & Cornelius, 1989; Shaver & Brennan, 1992). Accordingly, avoidant individuals tend to have relatively less stable relationships characterized by fear of intimacy and low levels of emotional involvement, trust, cohesion, and satisfaction (e.g., Collins & Read, 1990; Hazan & Shaver, 1987; Kirkpatrick & Davis, 1994; Mikulincer & Florian, 1999; Shaver & Brennan, 1992). Highly anxious individuals' relationships, in contrast, tend to be organized around hyperactivation of the attachment system, manifested in obsessive and passionate romantic feelings; clinging, intrusive, and controlling patterns of relational behaviors; strong desire for merger with the partner; worries about rejection and abandonment; and bouts of jealousy and anger (e.g., Collins & Read, 1990; Hatfield et al. 1989; Hazan & Shaver, 1987; Mikulincer, Orbach, & Iavnieli, 1998). Paradoxically, highly anxious people's demands for security, combined with frequent demonstrations of distrust and rage, may lead their partner to reject their proximity-seeking attempts, which in turn may intensify their own insecurities and exacerbate relationship conflicts (Downey, Freitas, Michaelis, & Khouri, 1998; Mikulincer & Shaver, 2003).

Research has shown that attachment orientations are associated with the functioning of the sexuality system (e.g., D. Davis,

Shaver, & Vernon, 2004). In line with their pursuit of establishing intimate, faithful, and satisfying long-term relationships (Mikulincer & Shaver, 2003), securely attached people report preferring sexual activity in committed romantic relationships (e.g., Brennan & Shaver, 1995; Stephan & Bachman, 1999). As adolescents, securely attached individuals reported fewer one-night stands than their insecure counterparts (Cooper, Shaver, & Collins, 1998) and describe engaging in sexual intercourse mainly to express love for their partner (Tracy, Shaver, Albino, & Cooper, 2003). Tracy et al. (2003) also found that, compared with insecure adolescents, secure adolescents were less erotophobic (i.e., experienced fewer negative affective-evaluative responses to sexual cues) and experienced fewer negative emotions and more positive and passionate emotions during sexual activity. Similarly, in adulthood, secure individuals have more positive sexual self-schemas (Cyranski & Andersen, 1998), report greater pleasure from the use of touch to express affection and sexuality (Brennan, Wu, & Loev, 1998; Hazan, Zeifman, & Middleton, 1994), and enjoy exploratory sexual activities with long-term partners (Hazan et al., 1994). Together, these findings suggest that securely attached individuals' comfort with sexual intimacy and enjoyment of sexual interactions may contribute to their stable and satisfying romantic relationships.

Sexual activity, with its inherent demand for physical and psychological intimacy, may create discomfort for avoidant people, who, as noted above, habitually seek physical and emotional distance from their partners. Consequently, they may attempt to deactivate the attachment system, manifested in two ways: abstaining from sexual activity (Kalichman et al., 1993; Tracy et al., 2003) or engaging in relatively emotion-free sex in the context of casual, short-term relationships (e.g., Brennan & Shaver, 1995; Gentzler & Kerns, 2004; Schachner & Shaver, 2002). There is empirical evidence that avoidant adolescents are relatively erotophobic, low in perceived sex drive, and less likely to participate in sexual interactions (Tracy et al., 2003). Moreover, when sexual intercourse does occur, avoidant adolescents report less enjoyment and greater focus on self-enhancing motives, such as losing their virginity, than relationship-focused motives, such as expressing love for their partner (Tracy et al., 2003). In adulthood, relatively avoidant participants tend to dismiss motives related to the promotion of emotional closeness, whereas they emphasize motives related to partner manipulation and control, protection of the self from partners' negative affect, stress reduction, and prestige among peers (Cooper et al., 2006; D. Davis et al., 2004; Schachner & Shaver, 2004). Hence, avoidant persons are less likely to enjoy affectionate presexual activities (e.g., cuddling, kissing) and intimate copulatory positions (Brennan, Wu, & Loev, 1998; Hazan et al., 1994) and are more likely to make and respond favorably to short-term mate-poaching attempts (Schachner & Shaver, 2002). Overall, people high in avoidance may use sex to maximize control and distance even in the most intimate interactions.

Highly anxious people's construal of sexual activities reflects their attempts to fulfill unmet attachment-related needs for security and love. As adolescents, highly anxious persons are more likely to engage in sex to avoid abandonment (Tracy et al., 2003), which, in turn, leads to more common unwanted sexual behaviors (Feeney, Peterson, Gallois, & Terry, 2000) and interferes with the experience of passionate emotions during sex (Tracy et al., 2003). As adults, highly anxious individuals score relatively high in eroto-

philia (Bogaert & Sadava, 2002) and report using sex as a means to achieve emotional intimacy, approval, and reassurance; to elicit a partner's caregiving behaviors; and to defuse a partner's anger (D. Davis et al., 2004; Schachner & Shaver, 2004). Ironically, however, unfulfilled relational expectations or their inappropriate channeling into the sexual realm, when combined with worry about the partner's reactions, make anxiously attached persons more prone to disappointing and dissatisfying sexual interactions (Birnbaum & Gillath, *in press*; Brennan, Wu, & Loev, 1998).

### The Current Research

Previous studies of the attachment–sexuality link have focused on attitudinal, motivational, and behavioral aspects of sexuality, but they have not fully captured the rich and complex picture of sexual experience described in theoretical and clinical literature. This experience includes a wide variety of positive and negative emotions and thoughts related to the self, the partner, the dyadic relationship, the sexual encounter, and the sexual response cycle (Birnbaum & Laser-Brandt, 2002). In addition, most prior studies have tended to be retrospective surveys that do not examine the dynamic interplay of sexuality and relationship quality in their natural context. The present research was designed to examine the association between attachment orientations and the cognitive and emotional components of sexual experience. This research also aimed to explore the possible role of attachment orientations in moderating the link between sexual experiences and daily relationship quality. Furthermore, to provide a more contextually informed view of how these processes unfold over time, we examined both retrospective and daily diary data.

Our first goal was to examine associations between attachment orientations and relational, aversive, and pleasurable components of the experience of heterosexual intercourse (Birnbaum & Laser-Brandt, 2002). On the basis of attachment theory and research, we made two main predictions. First, attachment avoidance would be related to a more aversive construal of sexual intercourse. Second, attachment anxiety would be related to a more complex and ambivalent construal of sexual experience. Whereas anxiously attached persons' erotophilic tendencies may lead them to channel their relational expectations into the sexual realm and intensify the pleasurable aspects of sex, their attachment-related worries may lead simultaneously to aversive feelings during sexual intercourse.

Our second goal was to explore the role of attachment orientations in explaining the link between sexual experiences and relationship quality. Growing empirical evidence has indicated that sexual satisfaction contributes to relationship's quality and stability (for a review, see Sprecher & Cate, 2004), that sexual dysfunction may lead to disharmonious relationships (e.g., Hartman, 1983; Hassebrauck & Fehr, 2002), and that successful sex therapy may increase relationship satisfaction (Wright, Perrault, & Mathieu, 1977). Nevertheless, clinical evidence has suggested that some harmonious couples have relatively distressed sexual interactions, whereas other couples have turbulent relationships but good sex lives (e.g., Edwards & Booth, 1994; Kaplan, 1974). Indeed, the substantial body of research that has explored the association between sex and relationship quality has yielded conflicting results (e.g., Henderson-King & Veroff, 1994; LoPiccolo, Heiman, Hogan, & Roberts, 1985). These inconsistencies are somewhat difficult to resolve because of methodological discrepancies (e.g.,

use of specific vs. general relational measures) and limitations (e.g., failure to consider potential moderators). Furthermore, the majority of past research was correlational and retrospective and has examined the sex–relationship linkage aggregated across time and instances (for a review, see Sprecher & Cate, 2004). Such global assessments may be biased by cognitive and motivational processes (e.g., motivated construal, sentiment override), resulting in random but also systematic errors in the reconstructed assessment of sexual experiences and relational interactions (Reis & Gable, 2000). Beyond these and other methodological problems, there is still a lack of a compelling theoretical framework for understanding the functional meaning of sex within romantic relationships, particularly the interplay between sexual activity and relational problems (e.g., the possibility that sex might compensate for, or contribute to, relational difficulties). As described below, we believe that attachment theory can provide such a framework.

The current studies adopted an attachment-theoretic perspective to clarify these inconsistencies. Because highly avoidant persons tend to engage in sexual intercourse for relatively self-enhancing, relationship-irrelevant reasons (D. Davis et al., 2004; Schachner & Shaver, 2004), we predicted that avoidant persons would experience a sense of disconnection between sexual activity and relationship quality. In contrast, as reviewed above, anxiously attached people use sex to meet attachment needs so that their sexual attitudes and behaviors are closely linked with strivings to induce partners to provide proximity, support, and protection (D. Davis et al., 2004; Schachner & Shaver, 2002, 2004; Tracy et al., 2003). In other words, by subordinating sexual activity to the attachment system, anxious persons' hyperactivating strategies may strengthen the link between sexuality and relationship quality. This propensity may be fueled by highly anxious individuals' tendency to report more pronounced vacillations in the daily quality of their romantic relationships following perceived positive or negative relational events (e.g., relationship conflict or support; Campbell, Simpson, Boldry, & Kashy, 2005). We therefore predicted that attachment anxiety would amplify the effects of positive and negative sexual experiences on relationship quality. Positive sexual interactions may temporarily satiate unmet attachment needs, mitigating relational worries, whereas frustrating and disappointing sexual experiences may be seen as additional signs of rejection and partner disapproval, thereby exacerbating attachment insecurities and relational worries. To date, the only evidence examining this hypothesis comes from one-time surveys.

In examining the associations among attachment orientations, sexual experiences, and relationship quality, we also take into account evolutionary (e.g., Buss, 1998; Buss & Schmitt, 1993; Trivers, 1972) and socialization perspectives (e.g., DeLamater, 1987; Gagnon & Simon, 1973; Reiss, 1981) positing that men and women tend to experience sexual activity differently. Although these approaches explain the distal determinants of gender differences in sexuality differently, they generally agree that women tend to adopt a more emotional–interpersonal orientation to sexuality, emphasizing interpersonal factors related to sexual intercourse, whereas men tend to adopt a more recreational orientation toward sexuality, emphasizing the expression and fulfillment of sexual needs. Empirical studies have shown that, compared with men, women are more concerned with their romantic relationships during sexual intercourse and tend to experience intercourse as a reflection of relationship quality (e.g., Birnbaum & Laser-Brandt,

2002). Consequently, during sexual interactions, women are likely to be relatively more attuned to affect-related cues implying their partner's intentions and willingness to invest resources (e.g., expressions of love; Birnbaum & Laser-Brandt, 2002; Birnbaum & Reis, in press). Men, on the other hand, have been shown to be relatively more motivated by physical release and to emphasize satisfaction derived from the sexual act itself (e.g., Carroll, Volk, & Hyde, 1985). On this basis, we expected that different qualities of sexual experience would predict relational interactions for highly anxious men and women. For anxious women, because they may be especially likely to use sex as an indicator of relationship quality (Birnbaum, in press; D. Davis et al., 2004), affects experienced during sex were expected to predict relational behaviors. On the other hand, for highly anxious men, relationship interactions were expected to be more strongly predicted by the fact of sexual intercourse having occurred (relative to feelings and cognitions experienced therein). Sexual experiences and relationship interactions were not expected to be associated for both highly avoidant men and women because both tend to dismiss the relational aspects of sexual interactions (Cooper et al., 2006; D. Davis et al., 2004; Schachner & Shaver, 2002). It might be noted that although the attachment literature generally shows few sex differences, we predicted that attachment anxiety would have sex-differentiated effects when it comes to sexuality, simply because, as described above, men's and women's experience of sexuality differs substantially.

In two studies, we examined the association between attachment orientations and the emotional and cognitive components of subjective sexual experience within close relationships. In Study 1, a sample of university and community adult participants completed self-report scales tapping attachment orientations and the multifaceted experiential aspects of subjective sexual intercourse. To control for retrospective, one-time recording bias characterizing survey studies, we used a daily experience methodology in our second study. This daily diary study can more accurately assess the processes underlying the sexuality–relationship linkage because aggregate correlations between sexual and relational quality found in past studies (as reviewed by Sprecher & Cate, 2004) might reflect unmeasured individual differences in attachment orientations. These results might also reflect the systematic effect of cognitive and motivational biases and predispositions. Study 2 provided the first empirical test of how individual differences in attachment orientations contributed to the dynamic and temporal interplay of sexuality and relationship quality, assessed in their natural context. Taken together, our research simultaneously examined between-persons and within-person processes and systematically examined the subjective construal and relational consequences of sexual experiences in everyday close relationships.

### Study 1

The main goal of Study 1 was to examine the hypothesized associations between attachment orientations and the subjective experience of sexual intercourse. A large sample of adult participants completed self-report scales of attachment orientations (anxiety, avoidance) and three aspects of sexual experience (relational issues, sex-related worries, and pleasure-related feelings and cognitions). Consistent with the above theorizing, our main predictions were that (a) attachment anxiety would be associated with

stronger emphasis on desire for partner's emotional involvement and aversive affect and cognitions during sexual intercourse, and (b) attachment avoidance would be associated with stronger emphasis on the aversive aspects of sex.

### Method

#### Participants

Five hundred Israeli participants (224 women, 276 men) ranging from 17 to 48 years of age ( $M = 27.3$ ,  $SD = 8.43$ ) volunteered for the study without compensation. Participants were recruited from universities and community centers in the central area of Israel. All participants had had heterosexual intercourse either in a current or past relationship. Of the participants, 68.8% ( $n = 344$ ) were currently involved in a romantic relationship and 31.4% were married. The length of the current relationship ranged from 1 to 96 months ( $M = 18.91$ ,  $SD = 21.72$ ). Education ranged from 9 to 19 years of schooling ( $M = 13.28$ ,  $SD = 1.83$ ).

#### Measures and Procedure

Participants completed a randomly ordered battery of scales on an individual basis. Three scales assessed experience of heterosexual intercourse (Birnbaum & Laser-Brandt, 2002). Participants were instructed to recall a situation or a number of situations in which they had experienced sexual intercourse and to attempt to recollect, in as much detail as possible, what happened during the entire experience. Participants rated the extent to which each item matched their own experience on a 9-point scale, ranging from 1 (*does not match at all*) to 9 (*closely matches*).

The first scale, the relationship-centered sexual experience scale, concerns relational components of sex, including 29 items organized around four factors: (a) feelings of being loved by the partner (11 items; e.g., "I feel I am important to my partner"), (b) focus on the partner's state (8 items; e.g., "I'm focused on satisfying my partner"), (c) feelings of love toward partner (5 items; e.g., "I feel warmth toward my partner"), and (d) desire for partner's involvement" (5 items; e.g., "I want to receive attention from my partner"). In the current study, Cronbach alphas indicated adequate internal consistency for the four factors ( $\alpha = .76-.88$ ). Scores were computed by averaging the items of each factor. Correlations between the four factors were moderate and ranged from .24 to .41 ( $ps < .001$ ).

The second scale, the worry-centered sexual experience scale, focuses on aversive components of sex and includes 26 items organized around four factors: (a) sense of estrangement and vulnerability (7 items; e.g., "I feel alienated and detached"), (b) negative feelings (8 items; e.g., "I feel self-hatred"), (c) disappointment from partner's sexual behavior (5 items; e.g., "I feel my partner doesn't know how to excite me"), and (d) worries and interfering thoughts" (6 items; e.g., "Bothersome thoughts disturb my concentration"). In the current study, Cronbach alphas indicated adequate internal consistency for the four factors ( $\alpha = .74-.84$ ). Scores were computed by averaging the items of each factor. Correlations between the four factors were high and ranged from .55 to .68 ( $ps < .001$ ), reflecting the underlying presence of a global negative affectivity cluster.

The third scale, the pleasure-centered sexual experience scale, focuses on sex-related pleasure and ecstasy and includes 24 items that are organized around three main factors: (a) pleasure-related feelings (11 items; e.g., "I feel satisfied"), (b) "letting go" state (7 items; e.g., "I'm in a state of ecstasy"), and (c) sense of strength and focus on one's sexual needs (6 items; e.g., "I feel a sense of conquest"). In the current study, Cronbach alphas indicated adequate internal consistency for the three factors ( $\alpha = .77-.88$ ). Scores were computed by averaging the items of each factor. Correlations between the three factors were moderate, ranging from .15 to .41 ( $ps < .001$ ).

Participants also completed Mikulincer, Florian, and Tolmач's (1990) 10-item adult attachment style scale. This scale includes 5 items tapping



Table 1  
*Predicting the Experience of Heterosexual Intercourse From Attachment Anxiety, Attachment Avoidance, and Gender*

Measure	Anxiety	Avoid	Gender	Anxiety × Avoid	Anxiety × Gender	Avoid × Gender	Three-way interaction
Relationship-centered scale							
Being loved	-.13**	-.15***	.30***	.01	.00	.03	.07
Focus on partner's state	.11	-.16***	-.29***	-.11	.08	.01	-.08
Love toward partner	-.07	-.27***	.18***	-.08	.07	.08	.06
Desire for partner involvement	.24***	-.02	.13**	-.05	.08	.09	.02
Worry-centered scale							
Sense of estrangement	.26***	.32***	-.09	.17***	.00	-.07	.02
Negative feelings	.32***	.24***	-.16***	.22***	-.08	-.06	-.04
Disappointment	.30***	.24***	.03	.10	-.00	-.11	.02
Interfering thoughts	.26***	.28***	-.06	.07	-.10	.02	.05
Pleasure-centered scale							
Pleasure-related feelings	-.06	-.16***	.10	.04	.05	.00	.07
Letting go	.20***	.04	.25***	.07	-.07	-.01	.07
Focus on one's needs	.26***	.21***	-.02	.13**	-.08	-.06	.00

Note. Entries are the standardized regression coefficients for each effect at the step in which it was entered into the regression.  
 \*\*  $p < .01$ . \*\*\*  $p < .001$ .

the avoidance dimension (e.g., "I am somewhat uncomfortable being close to others") and 5 items tapping the anxiety dimension (e.g., "I often worry that my partner doesn't love me"). Items were constructed on the basis of Hazan and Shaver's (1987) prototypical descriptions of attachment styles. Participants were asked to think about their close relationships and to rate the extent to which each item was self-descriptive. Ratings used 7-point scales, ranging from 1 (*not at all*) to 7 (*very much*). Previous studies have found this scale to be reliable, valid, and correlated with other adult attachment scales (e.g., Mikulincer & Florian, 2000). In our sample, Cronbach alphas were adequate for brief measures of anxiety (.73) and avoidance (.61). We computed two total scores by averaging the 5 items in each dimension. The two scores were not significantly correlated ( $r = .09$ , *ns*).

### Results and Discussion

The data were analyzed by three-step hierarchical regressions examining the unique and interactive effects of attachment anxiety, attachment avoidance, and gender. In the first step, we examined main effects for gender—a contrast code variable comparing women (–1) to men (1)—and the attachment scores of anxiety and avoidance (entered as standard scores). The two-way interactions were examined in the second step, and the three-way interaction was entered in the third step. Because of the large number of statistical tests conducted in this study, we set the significance level for all coefficients at  $\alpha < .01$ . Table 1 presents the standardized regression coefficients ( $\beta$ ) for each effect at the step at which it was entered into the regression.

With regard to the relationship-centered sexual experience scale, attachment anxiety significantly predicted feelings of being loved and desire for partner involvement: The higher the anxiety, the lower the feelings of being loved and the higher the desire for partner involvement during sexual intercourse (see Table 1). Attachment avoidance made a significant unique contribution to three of four factors, such that the higher the avoidance, the lower the feelings of being loved and love toward partner and the less the focus on partner's state. Gender made a significant unique contribution to all four factors, such that women reported higher feelings

of being loved and love toward partner, higher desire for partner involvement, and less focus on partner's state than men. No interaction effects were significant.

With regard to the worry-centered sexual experience scale, both attachment anxiety and avoidance made significant unique contributions to all four factors: Higher anxiety and avoidance were associated with more aversive feelings and thoughts about sex. Also, women reported significantly less negative feelings about sexual intercourse than men did.<sup>1</sup> The interaction between attachment anxiety and avoidance was significant for the sense of estrangement and negative feelings. Using Aiken and West's (1991) procedure for examining simple slopes, we found that anxiety was significantly associated with sense of estrangement and negative feelings when attachment avoidance was high (one standard deviation above the mean;  $\beta$ s of .43 and .54,  $ps < .01$ ) but not when attachment avoidance was low (one standard deviation below the mean;  $\beta$ s  $< .10$ ). That is, the strongest aversive feelings were reported by participants scoring high on both attachment anxiety and avoidance dimensions (what Bartholomew & Horowitz, 1991, called "fearful avoidance," p. 227).

With regard to the pleasure-centered sexual experience scale, the higher the attachment anxiety, the stronger the letting go state of mind and the stronger the focus on one's own needs during

<sup>1</sup> Past research has shown that adolescent women have generally viewed their first sexual intercourse experience with more ambivalence, describing it as less enjoyable than did adolescent men (e.g., Guggino & Ponzetti, 1997; Sprecher, Barbee, & Schwartz, 1995). However, later sexual experience may minimize these differences (Darling, Davidson, & Passarello, 1992). In their meta-analysis of differences between men and women in sexuality, Oliver and Hyde (1993) found small to moderate differences for sexual anxiety and guilt, with women being generally more guilty and anxious, even though they did not find gender differences in sexual satisfaction. Baumeister, Catanese, and Vohs (2001) concluded that results regarding sexual enjoyment are mixed because women exhibit significantly higher within-person variance in correlates of sexual enjoyment than men.

sexual intercourse. Regressions also indicated that the higher the attachment avoidance, the weaker the pleasure-related feelings participants reported and the stronger the focus on their own needs (see Table 1). Gender made a significant unique contribution to letting go, with women reporting a stronger letting go state of mind during sexual intercourse than men did (see Table 1). Beyond these main effects, a significant interaction between anxiety and avoidance was found for focus on one's own needs. Using Aiken and West's (1991) procedure, we found that anxiety was significantly associated with focus on one's needs when attachment avoidance was one standard deviation above the mean ( $\beta = .39, p < .01$ ) but not when avoidance was one standard deviation below the mean ( $\beta = .13$ ). That is, fearful avoidance was associated with the strongest focus on one's own needs during sexual intercourse.

Finally, to determine whether associations between the attachment and sexual systems are manifested only in the context of ongoing romantic relationships or can be evident even among people not currently involved in committed relationships, we conducted three-step hierarchical regressions examining unique and interactive effects of attachment anxiety, attachment avoidance, and relationship status—a contrast code variable comparing participants who were currently involved in a romantic relationship (code = 1;  $n = 344$ ; 154 women and 190 men) to those who were not currently involved in such a relationship (code = -1;  $n = 156$ ; 70 women and 86 men). Alpha was again set at .01. These analyses revealed that the significant main effects for attachment orientations reported in Table 1 did not notably change and were still significant after the statistical control for relationship status. In addition, beyond two significant main effects for relationship status (involved people were higher on being loved,  $\beta = .13, p < .01$ ; and lower on negative feelings,  $\beta = -.11, p < .01$ ), the regression analyses revealed no other significant main effects for relationship status and no significant interaction between relationship status and attachment orientations. Overall, the associations between attachment orientations and sexual experience did not depend on participants' current involvement in a romantic relationship.

Overall, the findings of Study 1 were in line with predictions. Highly anxious persons reported relatively high levels of a letting go state of mind, attentional focus on their own needs, and desire for partner's emotional involvement, but at the same time, they also reported relatively strong aversive feelings during sexual intercourse as well as doubts about being loved. Highly avoidant persons reported relatively strong aversive feelings during sexual intercourse, low levels of pleasure-related feelings, and serious doubts about loving and being loved. Furthermore, they reported relatively high levels of attentional focus on their own needs during sexual intercourse, in line with their egocentric stance toward relationship partners (e.g., Mikulincer & Shaver, 2003).

## Study 2

In Study 2, we examined the hypothesis that attachment orientations would moderate the association between sexual experience and relationship quality, whereas we attempted to overcome the limitations of single-time, retrospective, cross-sectional studies (Sprecher & Cate, 2004) by relying on a daily diary methodology. Although past research has shown that sexual satisfaction is correlated with relationship's quality and stability at the aggregate

level (i.e., between-persons; Sprecher & Cate, 2004), these correlations may be a result of either unmeasured individual differences in attachment orientations or cognitive and motivational biases. The current study combined both between-persons and within-person levels of analysis, thereby enabling us to more accurately examine the processes underlying the sexuality-relationship linkage. Furthermore, this study addressed the limitations of cross-sectional studies for considering causal hypotheses by conducting lagged day analyses that examined temporal effects and whether these temporal effects interacted with attachment orientations.

To address these questions, we asked both members of heterosexual couples to report on their attachment orientations (anxiety, avoidance) and then to provide daily diary measures of relationship quality and sexual activity for a period of 42 consecutive days. In addition, each time they had sex during the 42-day study period, participants were asked to immediately report on their feelings and cognitions during that sexual intercourse.

Study 2 examined whether attachment orientations moderated the contribution of sexual activity, as well as affects experienced during that activity, on a given day to next-day reports of relationship quality (after controlling for relationship quality on that day). We also explored gender differences in the effects of attachment orientations on the associations between sex and relationship quality. In particular, we tested the following hypotheses: (a) Attachment anxiety would moderate the effects of having sex on relationship behaviors and quality, such that more attachment-anxious men should show a stronger association between having sex and next-day reports of relationship quality. (b) Attachment anxiety should amplify the possible effects of positive and negative sexual experiences on daily relationship quality. That is, the next-day relational effects of sex-related feelings would be particularly strong among highly anxious women. (c) Sexual experiences and daily relationship behaviors and quality would not be correlated in highly avoidant persons.

## Method

### Participants

Fifty heterosexual cohabiting Israeli couples participated in Study 2 in exchange for 400 NIS (about \$90). All participants were recruited via flyers or by word of mouth from universities, colleges, community centers, and sport clubs in the central area of Israel. Potential study participants were included in the sample if they (a) were in a steady monogamous relationship of longer than 6 months, (b) agreed to report on their daily relationship behaviors and quality each evening for a period of 42 days, (c) agreed to report on the feelings they experienced during sexual intercourse on each occurrence during the 42-day study period, and (d) were currently sexually active (defined as having had vaginal sex at least once a week in the 2 months preceding the study).

Six couples were excluded from analyses because at least one partner failed to complete the diary protocol on at least 1 day. Data from noncompliant participants are routinely excluded from analysis in diary research (e.g., Gable, Reis, & Elliot, 2000; Reis & Gable, 2000). Three other couples were excluded because they reported having sex fewer than six times during the 6-week period, which left too few sexual events to analyze the sex-relationship linkage. The final sample consisted of 41 couples with no missing data across the 42-day study period and who had sex at least once a week during the study period. Although the statistical power of these analyses is low, these 41 couples did not differ significantly from the 9 dropped couples in their attachment scores or reports of relationship quality across the study period.

Women ranged in age from 21 to 34 years ( $M = 25.97$ ,  $SD = 3.15$ ) and in education from 12 to 19 years of schooling ( $M = 14.31$ ,  $SD = 2.11$ ). Men ranged in age from 20 to 30 years ( $M = 26.58$ ,  $SD = 2.63$ ) and in education from 11 to 19 years of schooling ( $M = 13.88$ ,  $SD = 1.95$ ). Sixty-one percent of the couples were cohabiting, and 39% were married. None had children. Relationship length ranged from 6 to 138 months ( $M = 44.73$ ,  $SD = 31.22$ ).

Number of reported sexual intercourses (vaginal, oral, or anal sex) during the 42-day study period ranged from 6 to 23 ( $M = 13.14$ ,  $SD = 4.34$ ). Overall, the two members of the 41 couples agreed about having had sex 520 times. Beyond these 520 episodes, there were 13 instances (2.5%) in which one partner reported having had sex and the other did not (no more than one instance in a couple). We coded these cases as days without sex and did not enter reports of sex-related feelings to the statistical analyses.

### Measures and Procedure

Couples who fulfilled the inclusion criteria were invited to the laboratory, were asked to fill out a background questionnaire, and were trained to complete the diary questionnaires. Participants were instructed to fill out forms independently and to refrain from discussing responses with their partner until completion of the study. They took the entire package of diaries to their home and every evening for 42 days reported on the behaviors and quality level that characterized their relationship on that day. In addition, immediately after every occasion in which they had sexual intercourse, participants completed a brief questionnaire assessing feelings experienced during that intercourse. We contacted couples by telephone every 2 days to improve compliance with the diary protocol. Participants reported full compliance with the protocol while explicitly telling us that they reported all the instances of sexual intercourse that they had had. At the end of each week, we collected completed forms from each participant. At the end of the study, participants were debriefed and thanked for their participation. They did not comment during the debriefing as to whether they had increased or decreased sexual activity as a result of participating in the study.<sup>2</sup>

**Person-level measure.** Attachment orientations were assessed with the 36-item Experience in Close Relationships Scale (Brennan, Clark, & Shaver, 1998), tapping variations in attachment anxiety and attachment avoidance (18 items per dimension). Participants rated the extent to which each item described their feelings in close relationships on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). In the current sample, Cronbach's alphas were high for both anxiety (.90 for women, .86 for men) and avoidance items (.91 for women, .85 for men). On this basis, two global attachment scores were computed for each participant by averaging the relevant items. Pearson correlations between anxiety and avoidance scores were not significant among women,  $r(39) = .22$ , nor among men,  $r(39) = .16$ .

Correlations between couple members in attachment anxiety and avoidance approached statistical significance,  $r(39) = .28$  for anxiety,  $r(39) = .30$  for avoidance,  $ps < .10$ , indicating moderate correspondence in partner's attachment orientations. Attachment avoidance was significantly higher among men ( $M = 3.25$ ,  $SD = 0.85$ ) than among women ( $M = 2.72$ ,  $SD = 1.05$ ),  $t(40) = 3.01$ ,  $p < .01$ . No significant difference between partners was found in anxiety.

**Daily relationship measures.** The diary questionnaire dealing with relational behaviors and quality included two parts. In the first part, participants rated the quality of the relationship with their partner on that day. Ratings were made on a 9-point scale, ranging from 1 (*poor*) to 9 (*excellent*;  $M = 7.62$ ,  $SD = 1.87$  for women;  $M = 7.71$ ,  $SD = 1.94$  for men). The sample means of within-person variance for daily reports of relationship quality were 1.73 for women and 1.47 for men. The difference between variances was not significant.

In the second part, participants reported whether or not they had enacted each of 19 specific behaviors toward their partner on a given day, and with

a parallel item, whether their partner had enacted each of the same 19 behaviors toward them. The list included 10 relationship-enhancing behaviors (e.g., "I told my partner I loved him/her—My partner told me he/she loved me"; "I was concerned about some problem, and my partner provided me support and reassurance—My partner was concerned about some problem and I provided support and reassurance to him/her") and 9 relationship-damaging behaviors (e.g., "I was inattentive and unresponsive to my partner—My partner was inattentive and unresponsive to me"; "My partner criticized me—I criticized my partner"). These behaviors were sampled from previous diary studies examining couple interactions (Gable, Reis, & Downey, 2003; Tidwell, Reis, & Shaver, 1996). Participants indicated a behavior's occurrence by checking a box next to the item.

We computed two scores for each participant on each day. First, we counted the number of participants' own and perceived partners' relationship-enhancing behaviors (scores ranged from 0 to 16;  $M = 8.50$ ,  $SD = 3.15$  for women;  $M = 8.17$ ,  $SD = 3.08$  for men). The sample means of within-person variance for daily reports of relationship-enhancing behaviors were 9.01 for women and 9.72 for men. Second, we counted the number of participants' own and perceived partners' relationship-damaging behaviors (scores ranged from 0 to 8;  $M = 2.03$ ,  $SD = 1.21$  for women;  $M = 2.04$ ,  $SD = 0.96$  for men). The sample means of within-person variance for daily reports of relationship-damaging behaviors were 4.38 for women and 4.52 for men. For each type of behavior (enhancing, damaging), we decided to collapse a participant's reports of what he or she did in the relationship and what he or she reported having received from his or her partner into a single score because these two scores were highly correlated,  $r(39) = .78$  for relationship-enhancing behaviors,  $r(39) = .83$  for relationship-damaging behaviors.<sup>3</sup>

In both sexes, daily reports of relationship quality showed significant positive associations with daily reports of relationship-enhancing behaviors ( $rs = .53$  and  $.54$ ,  $ps < .01$ ) and significant inverse associations with daily reports of relationship-damaging behaviors ( $rs = -.48$  and  $-.38$ ,  $ps < .01$ ). The two types of behaviors showed small but significant correlation ( $rs = -.24$  and  $-.14$ ,  $ps < .01$ ). These associations strengthened our confidence in the construct validity of the computed scores and supported our decision to treat them separately in the main analyses. The dyadic correlations between men's relational scores and women's relational scores across the study period were strong ( $rs = .56$  and  $.65$ ,  $ps < .01$ ). No significant difference between partners was found for the three relational variables.

**Sex diary measures.** The sex diary questionnaire included 12 items tapping sex-related feelings and cognitions during the reported intercourse. The items included 6 positive sexual feelings and cognitions (e.g., "During the sexual intercourse, I felt passionately attracted to my partner"; "During

<sup>2</sup> Notably, this diary format has been criticized because participants' compliance rates cannot be confirmed, particularly with regard to the timing of diary reports (e.g., Stone, Shiffman, Schwartz, Broderick, & Hufford, 2002). Nevertheless, three studies conducted recently by Green, Rafaeli, Bolger, Shrout, and Reis (in press) have shown that both paper and electronic methods of collection yielded data that were comparable in compliance rates, psychometric properties, and pattern of results. Their findings suggested that compliance is more dependent on participant motivation than on methods of collection. Our participants' motivation was fostered, and related compliance was facilitated through promoting their rapport with the researchers, generating a sense of personal involvement in the research, as well as constant deadline and partners' reminders. Thus, although we did not have data verifying compliance, our research was likely to produce valid data that were less likely to be affected by the choice of data collection mode (Green et al., in press).

<sup>3</sup> All of the correlations reported for daily measures were computed within person or within a dyad (in case of dyadic correlations) and then, by means of Fisher's  $r$  to  $z$  transformation, were averaged across the sample.

the sexual intercourse, I reached a satisfying orgasm”) and 6 negative sexual feelings and cognitions (e.g., “During or after the sexual intercourse, I felt some frustration and disappointment”; “During sexual intercourse, I felt bored and apathetic”).

Two total scores were computed for each participant on each day he or she reported having sex. First, we computed the total number of positive sexual feelings and cognitions reported during that intercourse (scores ranged from 0 to 6;  $M = 3.28$ ,  $SD = 0.87$  for women;  $M = 3.41$ ,  $SD = 1.05$  for men). The sample means of within-person variance for daily reports of positive sexual feelings behaviors were 2.14 for women and 2.02 for men. Second, we computed the total number of reported negative sexual feelings and cognitions (scores ranged from 0 to 4;  $M = 0.54$ ,  $SD = 0.61$  for women;  $M = 0.29$ ,  $SD = 0.34$  for men). The sample means of within-person variance for daily reports of negative sexual feelings were 1.04 for women and 0.87 for men. In both sexes, the association between these two scores was small but significant ( $r_s = -.27$  and  $-.28$ ,  $p_s < .01$ ). Again, these associations supported our decision to treat them separately in the main analyses. The dyadic correlations between men’s and women’s sex-related feelings were significant but moderate ( $r_s = .30$  and  $.32$ ,  $p_s < .01$ ). Although partners did not differ significantly in the overall amount of sex-related positive feelings, women tended to report significantly more negative feelings than men did,  $t(522) = -5.09$ ,  $p < .01$ .

### Results and Discussion

#### *The Contribution of Sexual Intercourse to Relational Behaviors and Quality*

In this section, we examine (a) whether relational behaviors (enhancing, damaging) and relationship quality on a given day were affected by having had sexual intercourse on the previous day and (b) whether this association was moderated by participants’ and partners’ attachment orientations (anxiety, avoidance). These questions were analyzed as follows. First, to examine how sexual intercourse on a given day relates to changes in relational behaviors and quality from that day to the next day, we controlled for prior-day reports of relational behaviors and quality (i.e., prior day’s quality and relational behaviors were entered as an additional predictor to control for its contribution to next-day changes in relational behaviors and quality). Therefore, we regressed for each participant his or her daily reports of each relational variable on his or her previous-day reports of the same variable, which effectively makes the unexplained residual variance the dependent variable for the main statistical analyses. Second, we coded a *having sex* variable by assigning  $-1$  to days in which at least one partner reported having no intercourse and  $1$  to days in which the two partners reported having sex. Third, we conducted hierarchical linear modeling (HLM6; Bryk & Raudenbush, 2002) and examined the main and interactive effects of having sex on a given day and dispositional attachment orientations (anxiety and avoidance) on the next day’s relational behaviors and quality (unexplained by the prior day’s relational behaviors or quality). These analyses included both between-participants (attachment anxiety and avoidance) and within-participant (daily reports of sexual intercourse and relational variables) variables.

Because male and female partners’ behaviors were necessarily dependent on each other, we used a multilevel analysis (see Bolger, Davis, & Rafaeli, 2003, for a fuller description of the application of two-level nested models for couples’ research). Thus, we included both the male partner and female partner in the same HLM analysis. This procedure provides separate estimates of

the effects of having sex on relational behaviors and quality for men and women, but the estimates are determined simultaneously and take into account nonindependence of the couple members. In addition, this analysis simultaneously estimates (a) the unique contribution of each participant’s (man or woman’s) attachment anxiety and avoidance scores to the association between having sex and relational behaviors and quality and (b) the unique contribution of his or her partner’s attachment anxiety and avoidance scores to such an association.<sup>4</sup> This analysis required two new dummy variables, one representing the male partner (where 1 = male and 0 = female) and the other representing the female partner (where 1 = female and 0 = male). To facilitate interpretation, we centered each partner’s attachment anxiety and avoidance and variables at the lower, or day, level around the sample grand mean.

The equations for the Level 1 model were as follows:

$$Y = B1*(\text{male partner}) + B2*(\text{having sex}*\text{male partner}) \\ + B3*(\text{having sex}*\text{female partner}) + R.$$

The Level 2 model was the following:

$$B1 = G10 + U1$$

$$B2 = G20 + G21*(\text{male's anxiety}) \\ + G22*(\text{male's avoidance}) + G23*(\text{female's anxiety}) \\ + G24*(\text{female's avoidance}) + U2$$

$$B3 = G30 + G31*(\text{male's anxiety}) \\ + G32*(\text{male's avoidance}) + G33*(\text{female's anxiety}) \\ + G34*(\text{female's avoidance}) + U2.$$

The coefficient G10 represents gender differences in relational behaviors and quality across the study’s period. The coefficient G20 represents the main effect of having sex on men’s next-day reports of relational behaviors and quality and the coefficient G30 represents the main effect of having sex on women’s next-day reports of relational behaviors and quality. The remaining coefficients represent interactive effects between having sex and participants’ dispositional attachment orientations on their own and partners’ next-day reports of relational behaviors and quality. Within-participant coefficients are represented by G21 and G22 (the contributions of a male participant’s attachment anxiety and avoidance to the effects of sexual intercourse on his own next-day reports of relational behaviors and quality) and G33 and G34 (the contributions of a female participant’s attachment anxiety or avoidance to the effects of sexual intercourse on her own next-day reports of relational behaviors and quality). Dyadic coefficients are represented by G23 and G24 (the contributions of a female participant’s attachment anxiety and avoidance to the effects of sexual intercourse on her male partner’s next-day reports of relational

<sup>4</sup> We also conducted three-level HLM analysis including within-couple effects for gender and interactions between gender and the other study variables. However, because of the small sample, we had relatively low levels of power to adequately examine high-level interactions among gender, attachment orientations, and day-level variables. On this basis, we decided to focus exclusively on the two-level effects reported in the text.



behaviors and quality) and G31 and G32 (the contributions of a male participant's attachment anxiety or avoidance to the effects of sexual intercourse on his female partner's next-day reports of relational behaviors and quality).

Table 2 presents relevant HLM coefficients. Because the coefficient G10 (gender differences in relational behaviors and quality across the study period) was not significant in any of the HLM analyses, we present in Table 2 the main effects for having sex and its interactive effects with each partner's attachment orientations. As Table 2 shows, sexual intercourse had significant main effects on men's next-day reports of relationship-enhancing behaviors (unexplained by previous-day reports), and its effects on men's next-day reports of relationship-damaging behaviors and relationship quality approximated statistical significance ( $p < .10$ ): Men reported heightened relationship-enhancing behaviors and relationship quality following days in which they had sex with their partner. Men also tended to report a decrease in relationship-damaging behaviors following days in which they had sex with their partner. The main effect of having sex also approximated statistical significance for women's next-day reports of relationship-damaging behaviors ( $p < .10$ ): Women tended to report a decrease in relationship-damaging behaviors following days in which they had sex with their partner. Having sex had no significant main effect on women's next-day reports of relationship-enhancing behaviors and relationship quality.

Examination of within-participant interactive effects revealed that men's attachment anxiety significantly moderated the effects of having sex on men's next-day reports of relationship-enhancing behaviors, relationship-damaging behaviors, and relationship quality (see Table 2). The simple slope relating sex to men's next-day reports of relationship behaviors and quality was higher for men one standard deviation above the attachment anxiety mean ( $Bs = 0.80, -0.64, \text{ and } 0.27$  for relationship-enhancing behaviors, relationship-damaging behaviors, and relationship quality, respectively) than for men one standard deviation below the attachment anxiety mean ( $Bs = -0.12, 0.06, \text{ and } -0.05$ , respectively). In other words, more attachment-anxious men showed greater gains on their own daily reports of relationship-enhancing behaviors and relationship quality and a greater reduction in their own daily reports of relationship-damaging behaviors following days in which they had sex. In other words, attachment anxiety intensified the positive effects of sex on men's daily reports of relationship behaviors and quality.

Table 2 also shows that men's attachment avoidance did not significantly moderate the effects of having sex on their own next-day reports of relationship behaviors and quality. In addition, attachment anxiety or avoidance did not significantly moderate the effects of sexual intercourse on women's next-day reports of relationship behaviors and quality.

Examination of dyadic interactive effects revealed the following significant findings. First, women's attachment anxiety significantly moderated the effects of having sex on men's next-day reports of relationship-damaging behaviors and relationship quality (see Table 2). The simple slope relating sex to men's next-day reports of relationship behaviors and quality was higher for women one standard deviation above the attachment anxiety mean ( $Bs = -0.67 \text{ and } 0.31$  for relationship-damaging behaviors and relationship quality, respectively) than for women one standard deviation below the attachment anxiety mean ( $Bs = 0.09 \text{ and } -0.09$ ). In other words, men with more anxiously attached female partners showed greater positive gains on their own daily reports of relationship quality and a greater reduction in their own daily reports of relationship-damaging behaviors following days in which they had sex. Women's attachment anxiety intensified the positive effects sex had on men's relational behaviors and appraisals.

Second, men's attachment avoidance significantly moderated the effects of having sex on women's next-day reports of relationship-damaging behaviors (see Table 2). The simple slope relating sex to women's next-day reports of relationship-damaging behaviors was higher for men one standard deviation below the attachment avoidance mean ( $B = -0.65$ ) than for men one standard deviation above the attachment avoidance mean ( $B = 0.01$ ). In other words, women whose male partner was less avoidant showed a greater reduction in their daily reports of relationship-damaging behaviors following days in which they had sex. Men's attachment avoidance inhibited the positive effects sex had on women's relational behaviors.

It is important that men's attachment anxiety and women's attachment avoidance did not significantly moderate the effects of having sex on their partners' next-day reports of relationship behaviors and quality.

Overall, HLM analyses revealed that having sex had significant positive effects on daily reports of relationship behaviors and quality among highly anxious men or among men whose partner was highly anxious. In addition, having sex led to a decrease in the daily report of relationship-damaging behavior among women

Table 2  
*Hierarchical Linear Modeling Coefficients Predicting Fluctuations in Daily Relational Behaviors and Quality From Previous-Day Sexual Intercourse and Dispositional Attachment Orientations*

Effects and interactions of previous-day sexual intercourse	Relationship-enhancing behaviors		Relationship-damaging behaviors		Relationship quality	
	Women	Men	Women	Men	Women	Men
Main effects	0.14	0.34**	-0.32†	-0.29†	-0.01	0.11†
Interactions with						
Women's anxiety	0.15	0.02	0.07	-0.38*	0.07	0.20**
Women's avoidance	-0.14	-0.07	-0.03	0.09	0.01	0.05
Men's anxiety	-0.14	0.46**	0.19	-0.35*	0.01	0.16*
Men's avoidance	0.11	0.03	0.33*	0.19	0.02	-0.01

†  $p < .10$ . \*  $p < .05$ . \*\*  $p < .01$ .

whose partner scored relatively low in attachment avoidance. It bears noting that because all four attachment scores were included in the same analyses, we can be sure that both partner's scores had independent effects; that is, there is no confound from the correlation between partners' attachment scores.

### *The Contribution of Sex-Related Feelings to Daily Relational Behaviors and Quality*

In these analyses, we focused on days in which couples had sex and examined (a) whether relational behaviors (enhancing, damaging) and relationship quality on the next day were affected by the feelings and cognitions (positive, negative) participants reported having experienced during intercourse and (b) whether this association was moderated by participants' and partners' attachment orientations. For these purposes, we conducted a series of HLM analyses similar to those described in the previous section: The dependent variables were residuals of next-day reports of relationship behaviors and quality unexplained by previous-day reports of these variables, and the between-persons level variables were male partner's and female partner's attachment anxiety and avoidance scores. Instead of a dichotomous code for whether or not the participant reported having sex, the within-person level included the extent to which participants reported experiencing either positive or negative feelings during sex.

In one series of HLM analyses, we examined the main effects of positive sex-related feelings (main effects of men's reports of positive sex-related feelings on their own next-day reports of relationship behaviors and quality; main effects of women's reports of positive sex-related feelings on their own next-day reports of relationship behaviors and quality) and the extent to which these effects were moderated by men's and women's attachment anxiety

and avoidance. In another series of HLM analyses, we examined the main effects of negative sex-related feelings (main effects of men's reports of negative sex-related feelings on their own next-day reports of relationship behaviors and quality; main effects of women's reports of negative sex-related feelings on their own next-day reports of relationship behaviors and quality) and the extent to which these effects were moderated by men's and women's attachment anxiety and avoidance. Table 3 presents the relevant HLM coefficients.

With regard to positive sex-related feelings, HLMs revealed significant associations between women's feelings during sex and next-day relationship behaviors and appraisals (see Table 3): The higher the positive feelings reported during sex, the greater the gains on their own next-day reports of relationship-enhancing behaviors and relationship quality and the greater the reduction in their own next-day report of relationship-damaging behavior. Men's positive sex-related feelings had no significant main effect on their own next-day reports of relationship behaviors and quality (see Table 3).

Women's attachment anxiety significantly moderated the effects of their positive sex-related feelings on next-day reports of relationship quality (see Table 3). The simple slope was greater for women one standard deviation above the attachment anxiety mean ( $B = 0.23$ ) than for women one standard deviation below the attachment anxiety mean ( $B = 0.05$ ). In other words, more attachment-anxious women showed a stronger association between positive feelings during sexual intercourse and next-day reports of relationship quality. Women's attachment anxiety seemed to intensify the relational benefits of experiencing positive feelings during sex. Other within-participant interactive effects were not significant (see Table 3).

Table 3  
*Hierarchical Linear Modeling Coefficients Predicting Fluctuations in Relational Behaviors and Quality Following Days of Sexual Intercourse From Feelings During the Intercourse and Dispositional Attachment Orientations*

Effects and interactions	Relationship-enhancing behaviors		Relationship-damaging behaviors		Relationship quality	
	Women	Men	Women	Men	Women	Men
Positive feelings during previous-day intercourse						
Main effects	0.36**	0.20	-0.23**	-0.01	0.14**	0.08
Interactions with						
Women's anxiety	0.01	0.07	0.04	-0.05	0.09*	0.12**
Women's avoidance	-0.02	0.01	0.01	0.02	-0.06	-0.04
Men's anxiety	-0.08	0.01	0.02	0.07	0.03	0.06
Men's avoidance	0.08	0.05	0.05	0.02	-0.02	0.03
Negative feelings during previous-day intercourse						
Main effects	-0.15	0.19	0.13	0.18	-0.11*	-0.09
Interactions with						
Women's anxiety	-0.49**	-0.16	0.43**	0.06	-0.10*	-0.26**
Women's avoidance	0.13	-0.21	-0.23**	0.13	0.10*	0.06
Men's anxiety	0.19	0.15	-0.07	0.17	-0.03	0.04
Men's avoidance	-0.05	0.01	0.15	0.02	0.03	0.02

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

Examination of dyadic interactive effects revealed that women's attachment anxiety significantly moderated the effects of men's positive sex-related feelings on their own next-day reports of relationship quality (see Table 3). The simple slope was greater for men whose female partner was one standard deviation above the attachment anxiety mean ( $B = 0.20$ ) than for men whose female partner was one standard deviation below the attachment anxiety mean ( $B = -0.04$ ). In other words, male partners of more anxiously attached women showed a stronger association between positive feelings during sexual intercourse and next-day reports of relationship quality. Women's attachment anxiety intensified their male partner's relational gains from experiencing positive feelings during sex. Other dyadic interactive effects were not significant (see Table 3).

With regard to negative sex-related feelings, HLMs revealed only one significant main effect, that between women's feelings during sex and their next-day report of relationship quality (see Table 3): The more negative feelings reported during sex, the lower their next-day reports of relationship quality. The examination of within-participant interactive effects revealed that women's attachment anxiety significantly moderated the effects of negative sex-related feelings on their own next-day reports of relationship behaviors and quality (see Table 3). The simple slope was greater for women one standard deviation above the attachment anxiety mean ( $Bs = -0.64, 0.56, \text{ and } -0.21$  for relationship-enhancing behaviors, relationship-damaging behaviors, and relationship quality, respectively) than for women one standard deviation below the attachment anxiety mean ( $Bs = 0.34, -0.30, \text{ and } -0.01$ , respectively). In other words, women scoring high in attachment anxiety (as compared with less anxious women) showed lower levels of next-day relationship-enhancing behaviors and relationship quality and higher levels of next-day relationship-damaging behaviors after experiencing more negative feelings during sex. Among women, attachment anxiety seemed to intensify the detrimental relational effects of negative feelings experienced during sex.

The HLMs revealed one additional within-participant interactive effect: Women's attachment avoidance significantly moderated the effects of women's negative sex-related feelings on their own next-day reports of relationship behaviors and quality (see Table 3). The simple slope was larger for women one standard deviation below the attachment avoidance mean ( $Bs = 0.36$  and  $-0.21$  for relationship-damaging behaviors and relationship quality, respectively) than for women one standard deviation above the attachment avoidance mean ( $Bs = -0.10$  and  $-0.01$ , respectively). In other words, women scoring low in attachment avoidance (as compared with more avoidant women) showed lower levels of next-day relationship quality and higher levels of next-day relationship-damaging behaviors when they experienced more negative feelings during sex. Women's attachment avoidance seemed to inhibit the detrimental relational effects of experiencing negative feelings during sex.

Our analyses of dyadic interactive effects revealed that women's attachment anxiety significantly moderated the effects of men's negative sex-related feelings on their own next-day reports of relationship quality (see Table 3). The simple slope was greater for men whose female partner was one standard deviation above the attachment anxiety mean ( $B = -0.35$ ) than for men whose female partner was one standard deviation below the attachment anxiety mean ( $B = 0.17$ ). In other words, men whose female partner was

more anxiously attached showed a stronger association between negative feelings during sexual intercourse and next-day reports of relationship quality. Women's attachment anxiety seemed to intensify their male partner's relational distress after having experienced negative feelings during sex. Other dyadic interactive effects were not significant (see Table 3).

In sum, our multilevel analyses revealed that sex-related feelings had significant relational effects among highly anxious women and among women who score relatively low in attachment avoidance. In these cases, women's experience of positive feelings during sexual intercourse or the lack of sex-related negative feelings had strong positive effects on their next day relational behaviors and appraisals. The next-day relational effects of sex-related feelings were also particularly strong among men whose female partner was highly attachment anxious. In couples with highly anxious women, men's experience of positive feelings during sexual intercourse or the lack of sex-related negative feelings had strong positive effects on their next-day relational behaviors and appraisals.<sup>5</sup>

## General Discussion

The current research adds to our understanding of romantic relationships by examining both retrospectively and on a daily basis the associations between attachment orientations, sexual experiences, and relationship quality. Study 1 showed that, regardless of gender, attachment anxiety was associated with a relatively ambivalent construal of sexual experience, whereas attachment avoidance was associated with more aversive sexual feelings and cognitions. Study 2 indicated that attachment anxiety amplified the effects of positive and negative sexual experiences on relationship interactions. Specifically, the relationship quality of couples with a more anxiously attached partner was more affected by daily fluctuations in sexual experiences, with some findings differing for men and women. Attachment avoidance, on the other hand, inhibited the effects of sexual experiences on daily relationship interactions, such that daily relationship interactions of couples with a highly avoidant partner were less affected by sexual experiences.

As expected, attachment avoidance was associated with aversive sexual experiences. Our findings expand the existing picture of avoidant people's sexuality by portraying its aversive experiential nature and related foci of distress. Past research has indicated that highly avoidant people exhibit a more erotophobic disposition and are less likely to enjoy sex, in general (e.g., Tracy et al., 2003), and affectionate sexual activities, in particular (Brennan, Wu, & Loev, 1998; Hazan et al., 1994). This pattern may reflect discomfort with the intimacy imposed inherently by the sexual interaction, which of course includes relational aspects beyond the sexual activity itself. The current findings imply that this discomfort may also be manifested in aversive feelings (e.g., sense of estrangement and disappointment), intrusive thoughts, doubts about love and being

<sup>5</sup> Relationship length was not significantly associated with either men's or women's attachment scores ( $r_s < .07$ ). Moreover, the introduction of relationship length as an additional Level 2 variable in HLM analyses revealed that this variable did not significantly moderate the effects of sex-related variables on relationship quality and behaviors and did not modify the moderating effects of attachment orientations reported in Tables 2 and 3.

loved, lack of pleasurable feelings, and difficulty focusing on a partner's needs.

Whereas highly avoidant people's aversive sexual experience seems to reflect tension between the demand for closeness implied by sexual interactions and fears about intimacy and closeness, the ambivalent nature of highly anxious people's sexuality seems to be more of a manifestation of their difficulty meeting attachment needs. Study 1 showed that in describing their experiences of sexual intercourse, highly anxious people reported strong aversive feelings and doubts about being loved. At the same time, they also reported relatively high levels of a letting go state of mind; attending to their own needs; and desires for emotional involvement, warmth, and attention from their partner. Highly anxious individuals' erotophilic tendencies (Bogaert & Sadava, 2002) may reflect their use of sex to satisfy unmet attachment-related needs (D. Davis et al., 2004; Schachner & Shaver, 2004). However, sex, a prominent route for seeking proximity and attaining emotional and physical closeness, may fail to meet their unrealistic relational expectations and seemingly endless demands for greater closeness and result in frustrated attachment needs and sexual disappointment along with feelings of loneliness and alienation.

It is interesting that although both attachment avoidance and attachment anxiety were positively associated with aversive sexual experiences, attachment anxiety and avoidance differed in the way they moderated the association between daily sexual experiences and relationship interactions. Having sex or the feelings experienced during sexual intercourse had stronger relational effects among highly anxious persons, which is consistent with other available evidence. Highly anxious persons rely heavily on the sexual route to fulfill attachment needs (D. Davis et al., 2004; Schachner & Shaver, 2004), and these powerful, sometimes obsessive motives may lead them to experience rejection and abuse (e.g., K. E. Davis, Ace, & Andra, 2002; Feeney et al., 2000). However, our findings also imply that sex may be beneficial for anxiously attached persons in established relationships. Having sex or experiencing positive feelings during sexual intercourse was shown to satisfy highly anxious persons' needs for intimacy, closeness, reassurance, and caregiving, bringing at least next-day relief from relationship worries and related destructive behaviors. Whether this relief is temporary or more lasting is a question for future research.

Although both highly anxious men and women showed the expected association between daily sexual experiences and relationship quality, the nature of this linkage differed somewhat between the two sexes. Whereas the quality of highly anxious women's relationship interactions was mainly affected by feelings and cognitions experienced during sexual intercourse, highly anxious men's relationship interactions were more strongly affected by the mere engagement in sexual intercourse than by the feeling and cognitions experienced therein. These findings support evolutionary models (e.g., Buss, 1998; Buss & Schmitt, 1993; Trivers, 1972), as well as more social approaches (Gagnon & Simon, 1973; Reiss, 1981), to gender differences in human sexuality, which posit that women are more likely than men to rely on sexual experiences as a means for evaluating (or reevaluating, in the case of ongoing relationships) the suitability of relationship partners and to expect partners to be responsive to their emotional needs during sexual intercourse. Women may thus react to positive and negative feelings during sexual activity with a congruent increase or decrease in

perceived relationship quality (Birnbaum & Reis, in press). Experiencing a frustrating and dissatisfactory sexual intercourse may raise doubts about the suitability of the sexual partner for long-term relationships, which in turn may impair relationship quality. In contrast, positive feelings during sexual intercourse, such as perceiving a sexual partner as caring and responsive, may signal an advantageous mating choice (Birnbaum & Reis, in press) and thereby contribute to relationship-enhancing interactions. Our findings show that these heightened relational reactions to sexual experiences are more pronounced among anxiously attached women who tend to view sexual interactions as a barometer of relationship quality (Birnbaum, in press; D. Davis et al., 2004). This pattern also accords with a recent retrospective study that has found that sexual satisfaction mediated the association between women's attachment anxiety and relationship satisfaction (Birnbaum, in press).

Study 2's findings reveal that attachment anxiety may intensify the association between sexual and relational interactions. This pattern of results is consistent with Campbell et al.'s (2005) findings that more attachment-anxious people weigh daily relational events more heavily when judging the quality of their relationships. This tendency may reflect highly anxious individuals' sensitivity to cues that imply changes in perceived rejection and support from attachment figures (Fraleigh & Shaver, 2000). Highly anxious persons may therefore use sex as one particularly potent barometer of a partner's feeling toward them as well as a means for earning security. Alternatively, highly anxious people, particularly women, may have difficulty differentiating between sexual desire and other relational components, such as affection, intimacy, caregiving, and commitment.

These associations between sexual experiences and one's own relationship outcomes were paralleled by partner effects that revealed that the partners of highly anxious women, as compared with partners of less anxious women, also displayed stronger associations between sexual experiences and daily relationship interactions. Women's attachment anxiety amplified their male partners' relational distress after having experienced negative feelings during sex. As mentioned above, we found that highly anxious women reacted to negative sexual experiences with increases in daily relationship-damaging behaviors. Their partners might react negatively to this pattern of destructive behavior, thereby heightening relationship conflicts. In this way, a self-exacerbating dyadic cycle of sexual and relational dissatisfaction could be created, similar to the pattern shown more generally for rejection sensitivity (Downey et al., 1998). Women's attachment anxiety also intensified their male partner's relational gains from positive sexual interactions and merely having sex. These findings suggest that just as there may be a negative cycle, so there may also be a favorable self-amplifying dyadic cycle of positive sexual experiences and relationship-enhancing behaviors. Although these processes warrant deeper scrutiny, the current findings indicate that attachment anxiety makes sex more influential to relational well-being.

Attachment avoidance, on the other hand, inhibited both the detrimental relational effects of negative sexual interactions and the positive relational effect of having sex. Highly avoidant women's relationships were less adversely affected by negative sexual experiences as compared with those of less avoidant women. Furthermore, women whose male partner was more avoidant, as



compared with women whose partner was less avoidant, showed lesser reductions in daily reports of relationship-damaging behaviors following days in which they had had sex. This pattern of relative disconnection between sexual and relationship interactions may indicate that avoidant persons engage in sexual intercourse for relationship-irrelevant, extraneous reasons (i.e., reasons other than intimacy and attachment; Cooper et al., 2006; D. Davis et al., 2004; Schachner & Shaver, 2004). Having sex with a highly avoidant male partner may therefore contribute minimally to women's intimacy goals in close relationships (Cooper et al., 2006). Highly avoidant people's detached stance may have the somewhat ironic benefit of inhibiting the translation of negative sex-related experiences into relationship distress. However, this apparently defensive strategy impedes the experience of genuine intimate interactions.

On the whole, our findings suggest that attachment avoidance and attachment anxiety may represent two extremes relevant to the linkage between sex and relationships. Highly anxious individuals, particularly women, tend to conflate sex and other relationship qualities, such that sex-related feelings and cognitions are more likely to be transferred onto the broader functioning of romantic relationships. In contrast, highly avoidant individuals tend to detach sex from other relationship qualities, even within the context of ongoing romantic relationships. More generally, the fact that the associations between sexual experiences and relationship interactions varied as a function of attachment dimensions also implies that although there may be reciprocal relationships between sex and other components of romantic love (e.g., intimacy, caregiving, lust, etc.), the nature and strength of these interconnections among components may themselves vary in ways that are theoretically and pragmatically important. This conclusion is consistent with Fisher's (Fisher, 1998; Fisher, Aron, Mashek, Li, & Brown, 2002) contention that lust and attachment are separate emotion-motivation systems that became independent during human evolution. It is also consistent with Diamond's (2003) theory that the processes underlying sexual desire and affectional bonding are functionally distinct. However, it suggests that rather than focusing attention on questions of separability, researchers might constructively consider how these (and other) behavioral systems coordinate and mutually influence each other in the context of ongoing close relationships. After all, in adulthood romantic partners typically function simultaneously as sexual partners and attachment figures (Hazan & Zeifman, 1994). Our findings suggest that optimal functioning of the attachment system involves neither high nor low levels of dependence between the various relationship-relevant behavioral systems. Instead, among established couples, intermediate levels of interdependence between sexual and relationships interactions provided more adaptive relationship maintenance mechanisms. Of course, there may well be differences for newly established or later life couples (Kotler, 1985; Reedy, Birren, & Schaie, 1981; Sternberg, 1986).

### Limitations

Our results should be interpreted in the context of several limitations. The sample of Study 2 was relatively small. Although participants were instructed to complete a diary each day, we collected the completed forms only weekly and therefore were unable to verify levels of timeliness (see Green et al., in press, for

discussion of these issues.) Additionally, although participants were instructed to fill out their forms independently, their responses may still reflect worry about their partner's reaction, should the records become known, as well as other types of reactivity (Catania, Gibson, Chitwood, & Coates, 1990). Future studies should use methods of administration that minimize these potential sources of error (see Reis & Gable, 2000, for alternatives). Finally, although our research used both university and community samples, it is unclear how well our findings would generalize to a broader range of couples. Further research with more diverse and representative samples is needed to establish and extend the robustness of these findings across different groups (e.g., long-term married couples, distressed couples, couples with sexual dysfunction).

### Conclusions

This research raises important questions about the interplay between attachment and sexual behavioral systems within romantic relationships. Although pair bonding and sexual mating systems represent distinctive behavioral systems with different primary functions (Bowlby, 1969/1982; Diamond, 2003; Fisher, 1998), their impact on relationship well-being may reflect interdependence more than independence. We found that the functional significance of the sexual system for relationship maintenance and deterioration was influenced by attachment-related concerns about acceptance and closeness. This association suggests other questions that might be profitable for future research. For example, do chronic anxieties and worries about one's sexual attractiveness, the extent to which one is able to gratify one's partner, and the partner's responses to one's sexual appeals contribute to relationship quality? Can attachment-related behaviors compensate for sexual difficulties and temper sexual anxieties and worries? Does a long-term pattern of sexual satisfaction contribute to earned security among initially anxious persons? Do aversive sexual experiences trigger highly avoidant persons' mate-poaching tendencies and indirectly contribute to their relatively low relationship quality or are these merely unrelated manifestations of deactivating strategies? Alternatively, does poor relationship quality lead avoidant persons to become more interested in extramarital involvement? Does anxious persons' dissatisfaction lead them to pursue more promising alternative partners? Although a growing body of research links attachment orientations with sexual motivation, emotions, cognitions, and behaviors (Shaver & Mikulincer, in press), much more research is needed to explore the intricate interplay between these two behavioral systems.

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