

Attachment, Sleep Quality, and Depressed Affect

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This study examined the role of attachment insecurity in sleep problems among married adults ($N = 78$ couples). Using the Pittsburgh Sleep Quality Index and structural equation modeling, attachment anxiety was associated with higher levels of self-reported sleep difficulties for men and women, whereas attachment avoidance was not. Depressed affect was included as a control variable, and the effect of attachment anxiety remained significant. Men and women did not differ significantly in the magnitude of the effect of attachment anxiety on sleep quality. In addition, there were no cross-partner effects of attachment insecurity on sleep quality or depressed affect. Implications and future directions are discussed.

Keywords: attachment, couples, depressed affect, sleep quality

To appreciate the value of a good night's sleep, just ask someone who hasn't slept well. Good sleep is a period of recuperation and rejuvenation. While asleep, people become physically and emotionally refreshed from the exertions and mental strains of the day.

Poor sleep quality has been associated with various measures of impaired well-being, such as loneliness (Cacioppo et al., 2002); chronic pain (Smith, Perlis, Smith, Giles, & Carmody, 2000); immune, metabolic, and neuroendocrine dysfunction (e.g., Dinges, Douglas, Hammarman, Zaugg, & Zappor, 1995; Spiegel, Leproult, & Van Cauter, 1999); chronic hypothalamic–pituitary–adrenal activation (Vgontzas et al., 2001); and greater mortality risk (Newman et al., 2000). Sleep disturbance also impairs cognitive functioning (Bonnet, 1985; Bonnet & Rosa, 1987). There is a clear and growing consensus that sleep, in terms of both amount and quality, is a critically important activity (Pilcher, Ginter, & Sadowsky, 1997). Yet psychological factors that influence sleep have received relatively little empirical attention. Identifying psychological factors that aid or hamper sleep adds to understanding of the mechanisms by which dispositional factors promote health and prevent illness. In this research, we examine one dispositional factor, attachment security.

In a far-reaching review, Kiecolt-Glaser and Newton (2001) highlighted the need for research investigating the self-regulatory processes that underlie the well-known and influential link between marital dysfunction and diminished health and well-being. Attachment theory provides an ideal framework for such research because attachment processes describe the interface between the self and close relationships in a theoretically articulate manner.

Attachment theory has been implicated in health research in several ways. For example, attachment-related processes broadly predict personal well-being, coping, and emotional self-regulation, including health and health-related behaviors (see Cassidy & Shaver, 1999, for an overview). Feeney and Ryan (1994) showed that individuals with an anxious attachment style were more likely to report symptoms of ill health. Insecurely attached individuals are more likely to participate in risky behaviors (e.g., illegal drug use, excessive or inappropriate drinking), whereas securely attached persons are more likely to engage in health-promoting behaviors (e.g., getting regular medical checkups, taking vitamins; e.g., Brennan & Shaver, 1995; Scharfe & Eldredge, 2001).

Sleep may provide useful insights for understanding how attachment processes influence health. Early attachment relationships influence later behavior through mental representations of the self's lovability, attachment figures, and the trustworthiness of these persons to be available and supportive if needed (Cassidy & Shaver, 1999). These internal working models operate largely outside of awareness, involving automatic, defensive, and nonconscious processes (Pietromonaco & Feldman Barrett, 2000). Attachment-related concerns may surface as one attempts to relax at night, potentially interfering with sleep. During sleep onset, it is necessary to filter out worry and anxiety. Poor sleepers report more frequent worries and concerns during presleep cognitive activity, whereas good sleepers are more likely to think about "nothing in particular" (Harvey, 2000). If concerns about the availability of partners surface as individuals attempt to sleep, they may interfere with restful repose.

In the only published study of attachment security and sleep, Scharfe and Eldredge (2001) reported that among college students in committed relationships, higher scores on fearful and preoccupied attachment were positively associated with sleep difficulty. However, among students not in committed relationships, dismissing avoidance (denial of need for closeness with others) predicted worse sleep. Several limitations qualify their results. First, recent work on the structure and measurement of attachment indicates that two conceptually distinct dimensions, anxiety and avoidance, more accurately represent trait attachment (Fraley, Waller, & Brennan, 2000). Second, findings from college-student samples

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may not generalize to older adults, for at least four reasons: First, college students tend to live in noisy and often disruptive dormitories, which may foster sleep irregularities (Brown, Buboltz, & Soper, 2002). Second, college relationships differ from adult marriage and cohabitation. Even highly committed college couples are rarely financially interdependent, tend not to be coparents, and may not sleep in the same bed every night. Third, college relationships can be short-lived, and many do not qualify as true attachment relationships (i.e., providing a secure base and a safe haven when threat arises). Fourth, because sleep quality tends to decrease with age (e.g., Buysse et al., 1991), sleep-disruptive factors may be more influential among adults than among college students.

Scharfe and Eldredge's study also did not control for depressed affect. Much research documents the association between poor sleep quality and depression. According to the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM-IV*; American Psychiatric Association, 1994), depressed persons tend to either sleep more (hypersomnia) or less (insomnia) than needed, both undesirable states. In fact, many researchers view sleep disturbance as a prodromal symptom in major and recurrent depression (Perlis et al., 1997).¹ Because attachment insecurity is also associated with depression (Roberts, Gotlib, & Kassel, 1996), it remains to be demonstrated whether attachment insecurity predicts sleep quality independent of depressed affect.

Which Dimensions of Attachment Predict Sleep Disturbance?

Our analysis suggests that both the anxiety and avoidance dimensions might be expected to predict sleep quality. Attachment anxiety is characterized by excessive worry about the availability of partners, whereas avoidance is characterized by discomfort with closeness and defensive denial of needs for closeness. Although both are manifestations of insecurity, the two are functionally distinct. For individuals high in anxiety, as noted earlier, concerns over the availability of attachment figures may surface at bedtime, preventing restful sleep. Individuals high in avoidance might also have difficulty sleeping. As coping mechanisms relax at bedtime, awareness of closeness needs may emerge, preventing rest. Also, cognitive activity during sleep may allow cognitions to surface that are actively and effortfully excluded from awareness when awake.

We evaluated these hypotheses with structural equation modeling (SEM) in order to examine simultaneous effects for husbands and wives. Husbands' and wives' attachment insecurity were allowed to correlate both within and across partners, and the disturbances of husbands' and wives' sleep quality and depression were also allowed to correlate. Because debate exists whether depressed affect is better conceptualized as cause or effect of reduced sleep quality (Van Moffaert, 1994), we allowed their disturbance terms to correlate, thereby controlling covariation without specifying directionality.²

Method

Participants

Seventy-eight married couples (156 individuals; husbands $M_{\text{age}} = 39.3$, wives $M_{\text{age}} = 37.2$) from an urban location in western New York participated as a supplement to a longitudinal marital processes study. The only

criterion for participation was that couples had to be married. The mean length of marriage was 10.6 years. Of the 78 couples, 69 (88.5%) slept in the same bed, 8 (10.3%) did not sleep in the same bed, and 1 couple (1.3%) did not agree about their sleeping arrangements. Each couple was compensated with \$15 and two coupons for free coffee at a local coffee shop.

Materials

Attachment. An 18-item version of the Experiences in Close Relationships measure (Fraley et al., 2000), adapted slightly for married persons, was used to evaluate levels of attachment anxiety and avoidance (9 items each). Participants responded on a scale ranging from 1 (*disagree strongly*) to 7 (*agree strongly*). The Anxiety subscale showed adequate internal consistency for husbands ($\alpha = .63$) and wives ($\alpha = .78$), as did the Avoidance subscale (wives $\alpha = .88$, husbands $\alpha = .84$).

Sleep quality. The Pittsburgh Sleep Quality Index (PSQI; Buysse, Reynolds, Monk, Berman, & Kupfer, 1989) was used to assess sleep quality. Participants responded to questions about their sleep over the last month, spanning 7 categories, including sleep quality (1 item), sleep latency (2 items), sleep duration (1 item), habitual sleep efficiency (2 items), sleep disturbances (9 items), use of sleeping medication (1 item), and daytime dysfunction (2 items). Internal consistency was somewhat low for husbands ($\alpha = .54$) but higher for wives ($\alpha = .69$). Several studies have indicated that the PSQI has high reliability as well as content validity and ecological validity (e.g., Backhaus, Junghanns, Broocks, Riemann, & Hohagen, 2002; Carpenter & Andrykowski, 1998; Doi et al., 2000).

Depressed affect. The Center for Epidemiological Studies—Depression (CES-D; Radloff, 1977) Scale was used to assess depressed affect. Responses were provided on a scale ranging from 1 (*rarely or none of the time*) to 4 (*most or all of the time*). Reverse worded items were reversed scored (such that a higher score indicates a greater level of depressed affect), and all 20 items were averaged to form an index of depressed affect. Internal consistency was excellent for both husbands ($\alpha = .87$) and wives ($\alpha = .90$).

Procedure

The materials used in this study were collected as part of a follow up to an earlier marital study. In Phase 1 of the study, married couples were recruited via advertisements in a local grocery store. Approximately 2 years later couples were contacted via telephone to participate in a brief (30 min.) follow-up session to take place in our laboratory or their home (whichever they preferred). Seventy-eight of the original 89 couples (88%) agreed to participate in this follow-up study. Of the 156 participants, 1 man (.6%) did not complete the entire sleep quality measure because one page of the questionnaire was accidentally missing from his packet.

At the beginning of the session, the couple was seated together and given instructions for completing the packet of materials. They were then asked to sit separately while completing the measures and were asked not to discuss their responses until afterward. When finished, participants were compensated and thanked.

¹ Our research focused on depressed affect rather than clinical depression. Komada, Yamamoto, Shirakawa, and Yamazaki (2001) found that self-reported depressed affect inhibited sleep in a similar manner as clinical depression did. Other research corroborates this conclusion, showing poor sleepers tend to report higher levels of depressed affect (e.g., Pilcher, Ginter, & Sadowsky, 1997; Pilcher & Ott, 1998) and negative mood (Brisette & Cohen, 2002).

² This procedure is equivalent to an alternative model that posits a directional relationship between the sleep quality and depressed affect variables. All fit indexes would remain identical; however, path coefficients may change slightly.

Results

Table 1 reports the means and standard deviations of, and correlations among, all variables. Attachment anxiety was correlated with sleep quality—marginally for husbands ($r = .21, p < .07$) and significantly for wives ($r = .42, p < .01$)—whereas attachment avoidance was correlated significantly with sleep quality for wives ($r = .32, p < .01$) but not for husbands ($r = .02, ns$). Husbands' and wives' attachment anxiety was significantly correlated ($r = .41, p < .01$), but husbands' and wives' avoidance was not ($r = .11, ns$). Also, husbands' and wives' depressed affect was significantly correlated ($r = .30, p < .01$), but husbands' and wives' sleep quality was not ($r = .16, ns$). There were no significant differences between husbands and wives in attachment anxiety, $t(77) = -.60, ns$; attachment avoidance, $t(77) = -1.13, ns$; or depressed affect, $t(77) = -.15, ns$. However, there was a marginally significant difference in sleep quality such that wives reported slightly worse sleep ($M = 6.65$) than did their husbands ($M = 5.83$), $t(76) = -1.84, p < .07$. In all, 57% of the sample (43 husbands, 46 wives) qualified as poor sleepers, scoring greater than 5 on the PSQI global composite (Buysse et al., 1989).

The structural model was evaluated with Amos 4.01 (Arbuckle, 1999) using maximum likelihood estimation. The hypothesized model, shown in Figure 1, fit the data very well, $\chi^2(10, N = 78) = 6.71, p = .75$, comparative fit index (CFI) = 1.00, Tucker Lewis index (TLI) = 1.07, root-mean-square error of approximation (RMSEA) = .00. With depressed affect controlled for, attachment anxiety significantly predicted own sleep quality for both husbands ($\beta = .23, p = .05$) and wives ($\beta = .35, p < .01$), supporting the main hypothesis of this study. Attachment avoidance did not significantly predict sleep quality for wives ($\beta = .12, ns$) after depressed affect was controlled and still did not predict sleep quality for husbands ($\beta = -.07, ns$). Sleep quality and depressed affect were positively and significantly associated for wives ($r = .39, p < .05$) but not for husbands ($r = .09, ns$). Husbands' and wives' sleep quality was not significantly correlated ($r = .05, ns$), nor was husbands' and wives' depressed affect ($r = .13, ns$).

In order to examine the possibility that these results might reflect mood bias, an additional model was estimated excluding the "general sleep quality" item from the PSQI composite. The excluded item resembles the other measures most closely in content

(and hence in method variance) and is presumed to be most sensitive to mood bias. Excluding that item, the model fit the data equally well, $\chi^2(10, N = 78) = 8.92, p = .54$, CFI = 1.00, TLI = 1.02, RMSEA = .00. Moreover, all path coefficients were virtually identical to those in the first model, suggesting that global evaluations and current mood were not a spurious cause of our results. The remaining analyses were conducted on the model including all items in the sleep quality variable.

To determine whether there was a significant sex difference in the anxiety-sleep quality effect, we constrained those paths to be equal for husbands and wives. A significant difference (i.e., the paths differ significantly in magnitude) would be indicated if this model fit significantly worse than the unconstrained model. This was not the case; the decrease in model fit when comparing the two models was not significant, $\Delta\chi^2(1, N = 78) = .56, p = .46$, CFI = 1.00, TLI = 1.07, RMSEA = .00. Thus, husbands and wives did not differ in the degree to which attachment anxiety predicted sleep disruption.

Because sleep patterns might be influenced by a partner's attachment concerns, an additional model was estimated including all cross-partner effects (i.e., wives' anxiety and avoidance predicting husbands' sleep quality, and so forth). This model did not result in a significant improvement in fit, $\Delta\chi^2(8, N = 78) = 3.89, p = .87$, CFI = .99, TLI = .91, RMSEA = .07. Furthermore none of the individual cross-partner path coefficients was significant.

An additional concern arose as to whether attachment anxiety uniquely predicts reduced sleep over and above more general (trait) negative affectivity. To address this issue we included a measure of individual differences in behavioral inhibition system (BIS) sensitivity (which was assessed in the first wave of data collection) as a control in the structural model. BIS is characterized by a proneness to experience anxiety and negative affect (Carver & White, 1994) and is highly correlated with Neuroticism in many studies. Including BIS allowed us to differentiate between general trait negative affectivity and the more relationship-specific negative affect associated with attachment anxiety in the reduction of sleep quality. BIS scores were positively correlated with attachment anxiety for husbands ($r = .40, p < .001$) and wives ($r = .29, p < .05$). When added to the structural model, husbands' and wives' BIS scores were allowed to correlate with each other and

Table 1
Means, Standard Deviations, and Correlations for all Variables ($N = 78$)

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7 ^a	8
Wife										
1. Anxiety	2.29	1.06	—							
2. Avoidance	2.14	1.00	.56	—						
3. Sleep quality	6.63	3.32	.42	.32	—					
4. Depressed affect	1.46	0.40	.56	.56	.55	—				
Husband										
5. Anxiety	2.36	0.87	.41	.35	.26	.36	—			
6. Avoidance	2.34	1.05	.30	.11	.15	.13	.37	—		
7. Sleep quality ^a	5.83	2.60	.19	.19	.16	.16	.21	.02	—	
8. Depressed affect	1.47	0.37	.17	.19	.27	.30	.40	.22	.16	—

^a $N = 77$ (1 man had missing data on the sleep quality measure).

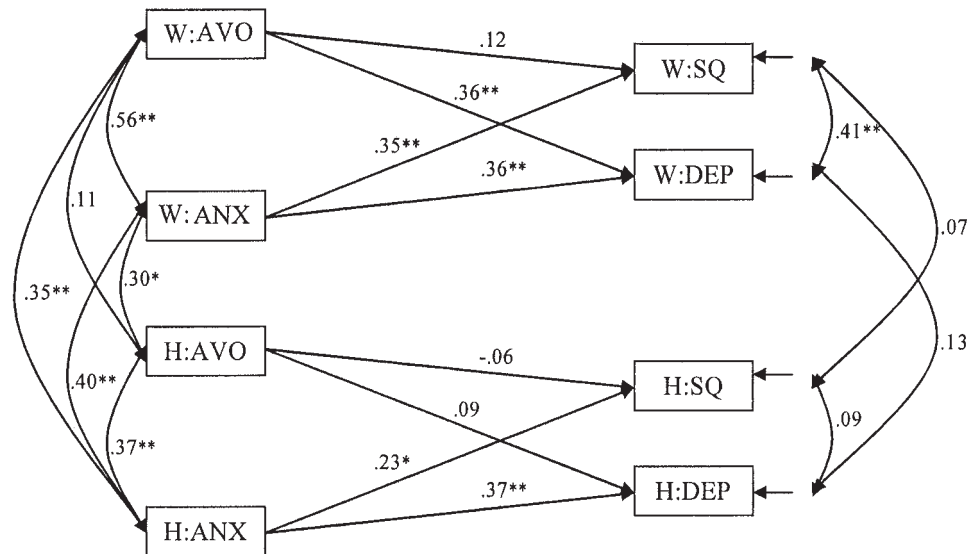


Figure 1. Estimated structural model. W = wife; H = husband; ANX = attachment anxiety; AVO = attachment avoidance; SQ = sleep quality; DEP = depression. * $p \leq .05$. ** $p < .01$.

with one's own attachment anxiety and avoidance. Paths were included predicting one's own sleep quality and depressed affect from BIS (but not partners). Partner paths were not included in this analysis, as the aim was simply to examine the relationship between attachment anxiety and sleep quality when controlling for the influence of one's own trait negative affectivity (BIS) on sleep quality. The resulting model continued to provide good fit, $\chi^2(18, N = 78) = 13.85, p = .74, CFI = 1.00, TLI = 1.07, RMSEA = .00$. More important, BIS was not a significant predictor of sleep quality for husbands ($\beta = .03, ns$) or wives ($\beta = -.05, ns$), whereas attachment anxiety continued to predict sleep quality marginally for husbands ($\beta = .22, p = .09$) and significantly for wives ($\beta = .37, p < .01$).

Discussion

This study found that married persons who are high in attachment anxiety reported poorer sleep quality, controlling for reductions in sleep quality associated with depressed affect. In addition, although attachment avoidance was associated with poorer sleep quality among wives, when depression and attachment anxiety were controlled no significant association between attachment avoidance and poorer sleep quality remained.

This work adds to our understanding of the predictors of sleep dysfunction in several respects. First, it extends the findings of Scharfe and Eldredge (2001) by showing that the link between attachment anxiety and poor sleep quality is also present in married adults and holds even when depressed affect is controlled. Controlling for depressed affect establishes the unique contribution of attachment insecurity to poor sleep quality in a theoretically clear way. In addition, nearly all research concerning the health correlates of attachment has been conducted with parent-child relationships or on the general attachment styles of college students. Arguably, marriage is the most significant attachment relationship for most adults, and it is important to demonstrate health

consequences of insecurity and security in actual married couples across the age range. Third, this research extends the nomological net of factors that predispose individuals to sleep problems to include attachment-related processes. Theoretically, attachment processes describe the adaptations that people make in response to early relationships with caregivers. Increasingly, these adaptations, and their cognitive and emotional consequences, have demonstrated important and increasingly influential links to adult close relationships, ability to cope with stressful life circumstances, and emotional well-being. Our results suggest that sleep may provide one such mechanism; more specifically, worry over the emotional unavailability and trustworthiness of attachment figures (usually spouses) may spill over to sleep dysfunction.

Equally important was the demonstration that attachment anxiety remained a predictor of diminished sleep quality while controlling for BIS sensitivity. Controlling for the generalized tendency to experience anxiety, while still demonstrating that relationship-specific anxiety is associated with reduced sleep quality, provides useful evidence for an attachment-theoretic explanation of these findings.

Although attachment avoidance was correlated with sleep problems among women, we found that when it was included in the SEM with controls for anxiety and depressed affect, this relationship became nonsignificant; this replicated Scharfe and Eldredge's (2001) findings among uncommitted college students. Thus, the earlier correlation may be spurious, that is, a reflection of shared variance. It may also be that the most avoidant individuals do not get married (although no studies have reported such a result).

An interesting secondary finding was that attachment anxiety (but not avoidance) was positively correlated for married partners. Research has largely left the effects of attachment congruence unexplored. Banse (2004) recently demonstrated that positive effects of security and negative effects of insecurity on marital satisfaction may be amplified or attenuated by a spouse's attach-

ment style. For example, husbands' satisfaction was higher when both partners scored above average on security (congruence), as compared with when she was secure and he was insecure (incongruence). In our model we tested the interaction of husband and wife attachment anxiety and found no effect of congruence on either husbands' or wives' sleep quality, indicating that one's attachment anxiety affects sleep quality independently of a partner's anxiety. Although attachment congruence did not affect sleep quality, it may be that other, more diverse or sensitive health outcomes will reflect spousal attachment congruence.

One limitation to this project is the use of the PSQI, a self-report measure. It will be necessary next to extend this research to objective indicators of sleep quality, perhaps in a sleep laboratory study. We were able to provide some evidence that the obtained results were not due to mood bias, demonstrating that the results replicated when excluding the item most likely to be subject to mood effects (the global perception item). Moreover, there is good validity evidence indicating that self-reports of sleep quality (such as the PSQI) are concordant with physiological and somnographic measures of sleep behaviors (e.g., Bastien et al., 2003; Rotenberg et al., 2000; Shaver, Giblin, & Paulsen, 1991). Several sleep diary studies have even used the PSQI as a validity criterion for reports of sleep problems (e.g., Brisette & Cohen, 2002). Clearly, though, it would be desirable to concurrently investigate objective and subjective measures of sleep, thereby resulting in a better understanding of which types of measures of sleep quality are related to which different antecedents.

Despite increasing evidence as to the importance of sleep for well-being across most human endeavors, the impact of psychological factors on sleep dysfunction remains poorly understood. This research suggests one useful theoretical framework, attachment theory, for identifying those effects and delineating the mechanisms responsible.

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