

Attachment and Sleep: A Dyadic Intensive Longitudinal Actigraphy Study

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Abstract

Attachment and sleep are linked across the lifespan, but attachment regulation of sleep among couples is understudied. This study aimed to replicate and extend prior research by testing whether romantic partners' attachment orientations interacted to predict sleep, assessed via self-report and actigraphy over 14 days. Participants ($N = 208$ couples) completed measures of attachment anxiety and avoidance and the Pittsburgh Sleep Quality Index. They also wore actigraphy monitors to assess nightly sleep quality and duration. Anxious people self-reported worse sleep quality, replicating two prior studies. In contrast to previous studies, anxious and low-avoidant people slept significantly worse with avoidant partners, while avoidant people slept somewhat better with avoidant partners. Results indicted dyadic regulation of several sleep outcomes and provided new insights regarding how partner avoidance can exacerbate or buffer sleep quality.

Keywords: attachment, sleep, partner regulation

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Social contexts of sleep have emerged as a critical research area. Better sleep is associated with healthier, more satisfying relationships, while relationship distress is linked to sleep problems (Gunn et al., 2014; Troxel, 2010). Attachment, the psychobiological system that regulates responses to threat and security in close relationships, also regulates sleep in adult couples. Although several studies show that anxious and avoidant attachment are associated with worse sleep quality (Adams, Stoops, & Skomro, 2014), how romantic partners' attachment orientations interactively associate with sleep remains understudied. The present research, a large-scale dyadic longitudinal study using self-report and actigraphy, aimed to replicate and extend prior studies of how partners' attachment orientations interactively associate with sleep.

Key theoretical perspectives explain why close relationship partners regulate sleep. Evolutionarily, attachment relationships provide safe contexts in which to turn off threat-monitoring systems and achieve restorative rest (Troxel, 2010). Caregiver regulation of infant sleep is essential (Hofer, 1995), and sleep problems in infancy, childhood, and adolescence are tied to insecure attachment (Adams et al., 2014). For adults, sleeping beside a romantic partner is an attachment behavior (Troxel, 2010) that affords opportunities for proximity, vulnerability, and physical and psychological need-fulfillment. Attachment anxiety and avoidance are associated with worse sleep (Adams et al., 2014), in part because insecure people struggle to down-regulate their threat-monitoring systems. Additionally, romantic partners can quell or exacerbate attachment-related concerns that may arise during co-sleep, helping or hindering restful sleep (Kent de Grey et al., 2019; Overall & Simpson, 2015).

To date, only two studies have tested dyadic attachment effects on sleep, yielding mixed results. Carmichael and Reis (2005) found that anxiety was associated with worse sleep quality

but dyadic attachment interactions were unrelated to sleep quality. Kent de Grey et al. (2019) found that anxiety was associated with worse sleep, partners' concordance on high anxiety was associated with better sleep, and concordance on high avoidance was associated with worse sleep. Both studies measured retrospective self-reported sleep quality. Kent de Grey et al. (2019) concluded that longitudinal designs with objectively-measured sleep in normative samples are needed to contextualize and better understand these mixed findings.

To address these gaps, this study used an intensive longitudinal design that assessed self-reported and nightly objective sleep for two weeks in a large community sample of cohabiting couples. The objectives were to 1) replicate findings that anxiety, but not avoidance, is associated with worse self-reported sleep when both partners' attachment orientations are assessed and 2) extend prior studies by examining actor-partner attachment interactions for self-reported and objectively-measured sleep quality and duration.

Method

Participants

Participants ($N = 208$ couples) were recruited through announcements on websites and community listservs in western New England, United States. Inclusion required couples to be involved for at least 1 year, live together, and co-sleep. Shift workers and people with children under age 3 were excluded during recruitment. Mean relationship length was 4.1 years ($SD = 3.6$); 57.2% of couples were married or committed; 71.2% were heterosexual dyads. Mean age was 28.7 years ($SD = 5.5$); 51% had annual household incomes below \$50,000; 61% had a college degree; 13.9% identified as transgender or non-binary; 69.9% reported white or European race/ethnicity.

Procedure and Measures

Participants completed online surveys and a laboratory visit involving interviews and a discussion task. Then, every night for 14 days, participants wore actigraphy monitors (ActiGraph wGT3X-BT) to assess sleep at home. Participants were compensated US\$100. The Mount Holyoke College Institutional Review Board approved the procedure.

Attachment Avoidance and Anxiety. The Experiences in Close Relationships-Relationships Structures survey (Fraley et al., 2011) assessed romantic avoidance and anxiety.

Subjective Sleep Quality. The Pittsburgh Sleep Quality Index (PSQI, Buysse et al., 1989) assessed subjective sleep quality. Global sleep problem scores were computed from PSQI components; higher scores indicate lower sleep quality.

Daily Actigraphy Measures. Sleep epochs were scored with the Cole-Kripke algorithm, yielding nightly measures of duration (total sleep time), efficiency (ratio of time asleep to time in bed), wakefulness after sleep onset (WASO), average awakening length, and total activity (i.e., movement; to aid presentation, total counts were divided by 10,000). We selected these measures to assess various aspects of sleep quality, including movement, total wakefulness, and wakefulness distribution (i.e., momentary vs. longer awakenings).

Covariates. The Center for Epidemiological Studies-Depression survey (Radloff, 1977) assessed depression symptoms; one item assessing sleep was omitted as per Kent de Grey et al. (2019). The Hendrick (1988) Relationship Assessment Scale assessed relationship satisfaction. Participants self-reported age, sex (women = 1, men = 0), education (college degree = 1, no degree = 0), and annual household income (1 = \$0-24,999; 2 = 25,000-49,999; 3 = 50,000-99,999; 4 = 100,000-149,999; 5 = 150,000-199,999; 6 = 200,000 and higher).

Results

Analysis Strategy

Because the sample included same-sex couples, partners were not distinguishable by sex. Hypotheses were tested with moderated over-time Actor-Partner Interdependence Models for indistinguishable dyads (Kenny, Kashy, & Cook, 2006). Power analyses indicated sufficient power to detect small ($r = .10$) main effects with 80% power, although precise power estimates for moderation effects are not available. All models included fixed effects of actor and partner avoidance and anxiety and all two-way interactions between actor and partner attachment. Models predicting sleep over time included fixed and random effects of time (see supplemental materials). Consistent with Kent de Grey et al. (2019), models controlled for age, sex, education, income, depression, and satisfaction. Continuous predictors were z-transformed. Descriptive statistics, within-dyad intraclass correlations, and associations between variables appear in Table 1. Attrition and missing data rates were low (see supplemental materials). Because multilevel models are robust to missing values, imputation was not performed. Given the possibility of Type 1 error, we interpreted patterns across multiple outcomes rather than individual tests.

Self-Reported Sleep Quality. Attachment anxiety, but not avoidance, was significantly associated with lower sleep quality (Table 2). No significant actor-partner interactions emerged.

Daily Actigraphy Measures. No significant interactions emerged for duration, but actor-partner interactions emerged for sleep quality measures (Table 2; Figures 1 and 2). Several significant interactions indicated that having a highly avoidant partner was associated with poor sleep quality for low-avoidant people. People low in avoidance slept less efficiently, were more active, spent more time awake, and had longer awakenings with highly avoidant (vs. less avoidant) partners. Some evidence indicated that highly anxious people also slept poorly with avoidant partners. Highly anxious people spent significantly more time awake and were more active with highly avoidant partners (vs. less avoidant partners) but other actor anxiety x partner

avoidance interactions were not significant. In contrast, some evidence indicated that highly avoidant people slept better with avoidant partners. Highly avoidant people were significantly less active with highly avoidant partners (vs. less avoidant partners). They also spent less time awake after sleep onset and slept more efficiently with highly avoidant partners (vs. less avoidant partners), but these effects were only marginally significant.

Discussion

This study is the first to use both self-report and longitudinal actigraphy to identify specific features of sleep associated with dyadic attachment interactions, providing new insights beyond prior studies that relied on retrospective self-reports. Anxiety, but not avoidance, was associated with worse self-reported sleep quality, replicating main effects observed by Kent de Grey et al. (2019) and Carmichael and Reis (2005). No actor-partner interactions were observed for self-reported sleep quality, replicating Carmichael & Reis (2005). Although Kent de Grey et al. (2019) found that highly anxious couples reported better sleep and highly avoidant couples reported worse sleep, the present study failed to replicate these effects for self-reported sleep quality. Moreover, we found evidence to the contrary for objective sleep measures: having a highly avoidant partner was associated with significantly worse sleep for low-avoidant and anxious people but provided a modest buffer for avoidant people.

Kent de Grey et al. (2019) argued that avoidant partners sleep poorly together because the intimacy of sleep forces them to confront emotional needs they may have suppressed throughout the day. The present finding that avoidant partners exacerbated low-avoidant and anxious people's sleep problems but buffered avoidant people's sleep points to a different interpretation. Sleep itself may be an effective defensive strategy for avoidant people. By sleeping soundly, one need not attend to attachment needs or partner bids for intimacy and support. When two avoidant

partners adopt this strategy, both partners' sleep may be supported by mutually keeping attachment concerns at bay. However, this strategy may negatively affect anxious and low-avoidant people's sleep: their needs may go unmet by avoidant partners who suppress their own and partners' attachment concerns before or during sleep.

Kent de Grey et al. (2019) further argued that anxious dyads reported better sleep because co-sleep helps ward off abandonment concerns. However, this study failed to replicate that effect for self-reported sleep quality, replicating Carmichael and Reis's (2005) null findings instead. Additionally, no actor-partner anxiety interactions were observed for objective sleep outcomes. Nonetheless, significant main effects of actor and partner anxiety suggest that individual-level anxiety plays an important role in objective and self-reported sleep quality.

Discrepancies between self-reported quality and objective sleep measures raised questions about (in)accurate perception of partner influence on sleep. Follow-up analyses revealed that consistency between actor-partner interactions for PSQI subscales and objective measures was mixed (see supplemental materials) and suggested one possible mechanism driving discrepancies. Anxious and avoidant people with anxious partners reported differences in efficiency that were not observed in analyses of objective measures. In contrast, low-avoidant people's reports of lower efficiency with avoidant partners were consistent with objective findings. The possibility that secure people more accurately perceive partner influence on sleep while anxious and avoidant people misread partner influence should be investigated in future research.

Despite this study's strengths, findings should be interpreted alongside several caveats. Sample differences may account for discrepant findings across studies. Prior studies included older married couples, while the present sample was younger, had newer relationships, and only

25% were married. Strategies for managing attachment dynamics may be less established in newer relationships in which attachment-relevant concerns and expectations are still emerging. The present sample may also have captured greater variability in relationship quality, in contrast to prior studies of longer, more durable relationships. Additionally, this sample reported slightly lower sleep quality and avoidance than the Carmichael and Reis (2005) and Kent de Grey et al. (2019) samples. More research is needed to determine how links between attachment and sleep may change across these demographic, developmental, and psychological differences.

This study contributes new evidence that adult attachment regulates sleep, documenting dyadic attachment regulation of objectively measured sleep for the first time. Consistent with attachment theory's claim that (mal)adaptive implications of insecurity are context-dependent, whether avoidance was a risk factor for poor sleep depended on both partners' attachment orientations. Although the direction of dyadic effects on sleep differed from Kent de Grey et al.'s (2019) results, findings suggest a similar conclusion: attachment regulation of sleep hinges on whether interactions between partners activate or assuage attachment concerns. Having an avoidant partner may aid or impede sleep depending on whether that partner activates or suppresses attachment concerns, which depends in part on the target's attachment orientation. To elaborate these findings, future studies should examine proximal attachment-relevant contexts of sleep – such as daily conflict, stress, rumination, and support – to better understand precise mechanisms that explain links between dyadic attachment and sleep.

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Table 1

Descriptive Statistics and Associations Between Continuous Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 PSQI Global Score	-.01													
2 Duration	.00	.35***												
3 WASO	.02**	.03***	.55***											
4 Avg. Awakening	.05***	-.36***	.03***	.03 [†]										
5 Total Activity	.12***	-.01	.07***	.35***	.17***									
6 Efficiency	-.22*	.02***	-.09***	-.01***	-.32***	.15***								
7 Anxiety	.83***	.03	.03	.19*	.29*	-.00	.27***							
8 Avoidance	.55***	-.08	.01	.07	.10	-.00	.48***	.28***						
9 Partner Anxiety	.54***	-.10*	.04 [†]	.24**	.26*	-.01*	.60***	.24***	.27***					
10 Partner Avoidance	.35*	-.03	.03	.12	.18	-.00	.24***	.17***	.48***	.28***				
11 Age	.03	-.16**	-.04 [†]	.07	-.02	.00	.01	.06	.03	.06	.70***			
12 Income	-.39**	-.03	-.06*	-.05	-.21	.01 [†]	-.07	-.06	-.08	-.11*	.21***	.77***		
13 Depression	1.28***	.03	.03	.05	.20*	-.00	.36***	.15**	.21***	.20***	-.07 [†]	-.11**	.24***	
14 Satisfaction	-.63***	.05	-.00	-.09	-.16	.00	-.53***	-.59***	-.43***	-.37***	-.05	.08 [†]	-.39***	.57***
Mean	6.26	7.25	1.03	3.23	4.84	.86	2.12	1.56	2.12	1.56	28.66	2.40	13.81	6.14
SD	2.95	1.60	.66	3.35	3.59	8.25	1.48	.77	1.48	.77	5.48	1.02	9.80	.79

Note. [†] $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$. $N = 416$ for cross-sectional associations; $N = 404$ for repeated measures. Intraclass correlations appear on the diagonal.

Table 2

Actor x Partner Attachment Interactions Predicting Sleep Quality and Duration

	PSQI Global						Duration					Efficiency				
	<i>B</i>	<i>SE</i>	<i>p</i>	<i>CI</i> ₉₅	<i>r</i>		<i>B</i>	<i>SE</i>	<i>p</i>	<i>CI</i> ₉₅	<i>r</i>	<i>B</i>	<i>SE</i>	<i>p</i>	<i>CI</i> ₉₅	<i>r</i>
Anxiety	.38*	.17	.02	.05, .71	.11		3.13	3.61	.39	-3.97, 10.23	.05	-.23	.36	.52	-.94, .48	.03
Avoidance	.21	.17	.23	-.13, .55	.06		-7.28†	3.76	.05	-14.68, .12	.10	-.47	.38	.21	-1.21, .26	.07
Part. Anxiety	.12	.16	.45	-.19, .43	.04		-3.46	3.48	.32	-10.29, 3.38	.05	-.59†	.35	.09	-1.27, .09	.09
Part. Avoidance	-.22	.16	.17	-.54, .09	.07		-1.62	3.46	.64	-8.42, 5.19	.03	-.30	.34	.39	-.98, .38	.05
Anxiety x Part. Anxiety	.03	.15	.82	-.25, .32	.02		-.53	4.09	.90	-8.59, 7.53	.01	-.33	.40	.42	-1.11, .46	.06
Anxiety x Part. Avoidance	.01	.17	.93	-.33, .36	.00		-1.35	3.92	.73	-9.07, 6.37	.02	-.52	.39	.19	-1.28, .25	.08
Avoidance x Part. Avoidance	.08	.17	.66	.26, .42	.03		6.49	4.42	.14	-2.23, 15.20	.10	1.19**	.43	.01	.33, 2.04	.18
Avoidance x Part. Anxiety	-.14	.17	.41	-.47, .19	.04		-2.58	3.88	.51	-10.21, 5.06	.04	-.42	.38	.28	-1.17, .34	.06
	Average Awakening						WASO					Total Activity				
	<i>B</i>	<i>SE</i>	<i>p</i>	<i>CI</i> ₉₅	<i>r</i>		<i>B</i>	<i>SE</i>	<i>p</i>	<i>CI</i> ₉₅	<i>r</i>	<i>B</i>	<i>SE</i>	<i>p</i>	<i>CI</i> ₉₅	<i>r</i>
Anxiety	.14*	.06	.02	.02, .26	.12		1.65	1.68	.33	-1.65, 4.95	.05	.25†	.14	.07	-.02, .53	.10
Avoidance	.01	.06	.84	-.11, .13	.01		1.51	1.75	.39	-1.93, 4.95	.05	.12	.15	.42	-.17, .41	.04
Part. Anxiety	.21***	.06	.00	.09, .32	.20		2.52	1.61	.12	-.65, 5.69	.08	.22	.14	.10	-.04, .49	.09
Part. Avoidance	-.04	.06	.50	-.15, .07	.04		.69	1.60	.67	-2.46, 3.84	.02	.11	.13	.40	-.15, .38	.05
Anxiety x Part. Anxiety	.11	.07	.12	-.03, .25	.11		2.20	1.86	.24	-1.47, 5.88	.08	.24	.16	.15	-.08, .56	.10
Anxiety x Part. Avoidance	.04	.07	.50	-.09, .17	.03		3.51†	1.81	.05	-.05, 7.08	.11	.31*	.15	.046	.01, .61	.12
Avoidance x Part. Avoidance	-.18*	.08	.02	-.33, -.03	.16		-6.64**	2.02	.00	-10.63, -2.65	.21	-.59**	.18	.00	-.93, -.24	.22
Avoidance x Part. Anxiety	.09	.07	.16	-.04, .22	.08		2.53	1.79	.16	.97, 6.05	.08	.19	.15	.21	-.11, .49	.07

Note. *N* = 404. †*p* < .10, **p* < .05, ***p* < .01, ****p* < .001. *CI*₉₅ = confidence intervals. Models controlled for age, sex, education, income,

depression, and satisfaction. Effect size $r = \sqrt{\frac{t^2}{t^2 + df}}$.

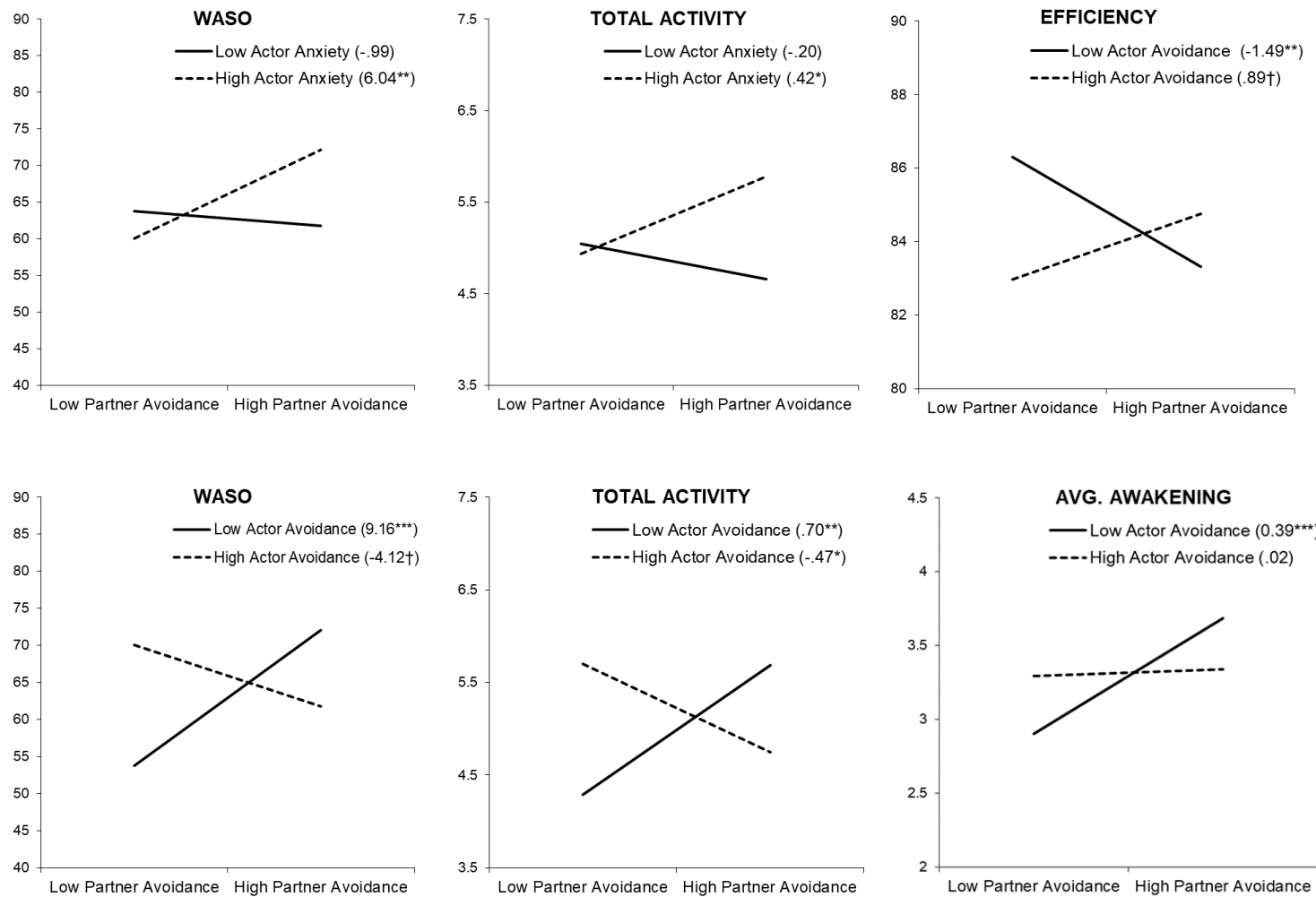


Figure 1. Actor-partner attachment interactions predicting wakefulness after sleep onset (WASO), efficiency, average awakening length, and total activity counts. Simple slopes appear in the legends.