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Covariation in couples' nightly sleep and gender differences

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ABSTRACT

Objectives: For most partnered adults, sleep is not an individual-level behavior—it is a shared health behavior with a partner. This study examined whether perceived nightly sleep duration and sleep quality covaried within couples and whether the unique influence of partner sleep on individual sleep differed by gender.
Design: Eight consecutive days of diary data.
Participants: US hotel employees and their spouses/partners (N = 76 from 38 couples, 600 daily observations).
Measurements: Each day, couples separately reported their previous night's sleep duration (in hours) and sleep quality (1 = very unsatisfactory to 5 = very satisfactory). Analyses adjusted for sociodemographic, family, work, and day-level characteristics.
Results: Dyadic multilevel modeling revealed positive covariation in nightly sleep duration within couples. After controlling for the effects of contextual covariates, partner influence on individual sleep duration was more apparent in men's sleep. When a female's sleep duration was longer or shorter than usual, their male partner's sleep duration was also longer or shorter than usual, respectively. However, a female's sleep was not significantly predicted by her male partner's sleep duration after taking into account the effects of her sleep on the male partner's sleep and contextual covariates. Sleep quality covaried on average across days between partners, and this association did not differ by gender.
Conclusions: Our results demonstrate positive covariation in sleep duration and sleep quality within couples. Couples' sleep duration covaried night-to-night, and their sleep quality covaried on average across days. A male's sleep duration is predicted by the female partner's sleep duration but not vice versa. Future research should examine health consequences of couple sleep covariation.

Introduction

Sleep is a biological need also influenced by social contexts. One such social context is the couple relationship, where an individual's sleep can be influenced by the paired partner's sleep. Yet most research has assessed sleep as an individual-level behavior, limiting the ability to understand the dyadic nature of sleep.[1] Emphasizing the importance of dyadic relationships, previous research documents health concordance within couples. For example, a systematic review of 103 studies[2] shows similarity of mental and physical health within couples. There is also evidence that an individual's momentary affect and physiology positively covary with the partner's momentary affect and physiology.[3] These studies suggest that couples may also covary in their sleep characteristics. The purpose of this study is to examine whether and how sleep duration and sleep quality covary within couples across multiple diary days.

The shared resource hypothesis[4] suggests that married or partnered couples share a pool of resources and environment. Couples also tend to share temporal resources on a daily basis, such as spending leisure time together.[5] Shared environment and time may translate into shared health risks or benefits within couples. For example, if one spouse smokes, the other spouse is more likely to be a smoker or exposed to secondhand smoke.[6] This suggests that if one spouse gets less sleep, the other spouse may also be more likely to have less sleep. Consistent with this view, a small but growing line

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of research has shown a positive covariation in sleep-wake timing (or "sleep concordance") within couples measured via actigraphy.[7,8] Actigraphy has a number of benefits, such as the ability to objectively measure sleep[9]; however, it does not provide participants' subjective assessments of their sleep. Using dyadic daily diary, the current study tests whether couples covary in their perceived sleep duration and sleep quality. Building on the prior work on sleep concordance based on actigraphic sleep timing,[7,8] we expect to find a positive covariation in nightly perceived sleep duration and sleep quality within couples. We further assess whether an individual's sleep covaries with their partner's sleep, averaged across multiple diary days, or on a day-to-day basis. Multilevel sleep covariation has not been examined in prior research but is important to understand the specific nature of covariation that may differ by sleep duration and quality.

Moving beyond sleep covariation within couples, this study also tests gender differences in sleep covariation. Although sleep covariation may be a by-product of couples' shared environments,[4] there may be gender differences in how individuals' sleep uniquely predicts or is predicted by their partner's sleep beyond the effects of contextual factors. Women, in general, experience more sleep disruption than men due to work-family responsibilities.[10] Women's frequent role as a primary caregiver at home can generate more causes for their sleep disruption.[11] For example, the presence of a young child may be a more important predictor of a female's sleep than her male partner's sleep. For working women, their sleep may also be more sensitive to differences in demands by daily contexts, such as workday vs nonworkday or weekdays vs weekends, rather than to their partner's sleep. Moreover, Umberson's[12] social control perspective suggests that wives are more likely to attempt to influence the health behaviors of their husbands. As women's socialization and experiences are more oriented toward nurturance and caring for others than are men's, women are more likely to exert control over others' health behaviors, especially those of their spouses/partners. Indeed, several studies have found stronger and more successful social control strategies by women than by men and that male partners' health behaviors (eg, diet, exercise, smoking cessation) are more affected by their female partner's social control than the reverse.[13,14] Taken together, the social control perspective[12] suggests that, after controlling for the effects of contextual factors on individual sleep, a male's sleep may be predicted by the female partner's sleep but not vice versa. In this study, we consider sociodemographic, family, work, and day characteristics as contextual factors found important for individual sleep.[11,15]

Present study

Using daily dyadic data collected from male and female partners on the same nights, this study evaluates the shared nature of nightly sleep in a sample of couples in midlife. Our daily diary approach enhances ecological validity by examining couples' sleep in their everyday life.[16] Multiple days of data from both male and female partners also allow us to test how sleep covaries within couples over a week. Figure 1 shows our research model. We first tested whether there is positive covariation in couples' diary reports of sleep in terms of duration and quality in a multilevel framework. In testing this, we assessed whether an individual's sleep covaried with their partner's sleep on average across days (at the between-person level) or on a daily basis (at the within-person level). Then, we examined gender differences in the influence of partner sleep beyond the influence of contextual factors on their sleep. To examine this, we adopted dyadic multilevel modeling.[17–19] This method not only accounts for statistical interdependence within couples but also gives higher confidence in examining the effect of female partner's sleep on the paired male partner's sleep, after taking into account the effect of male partner's

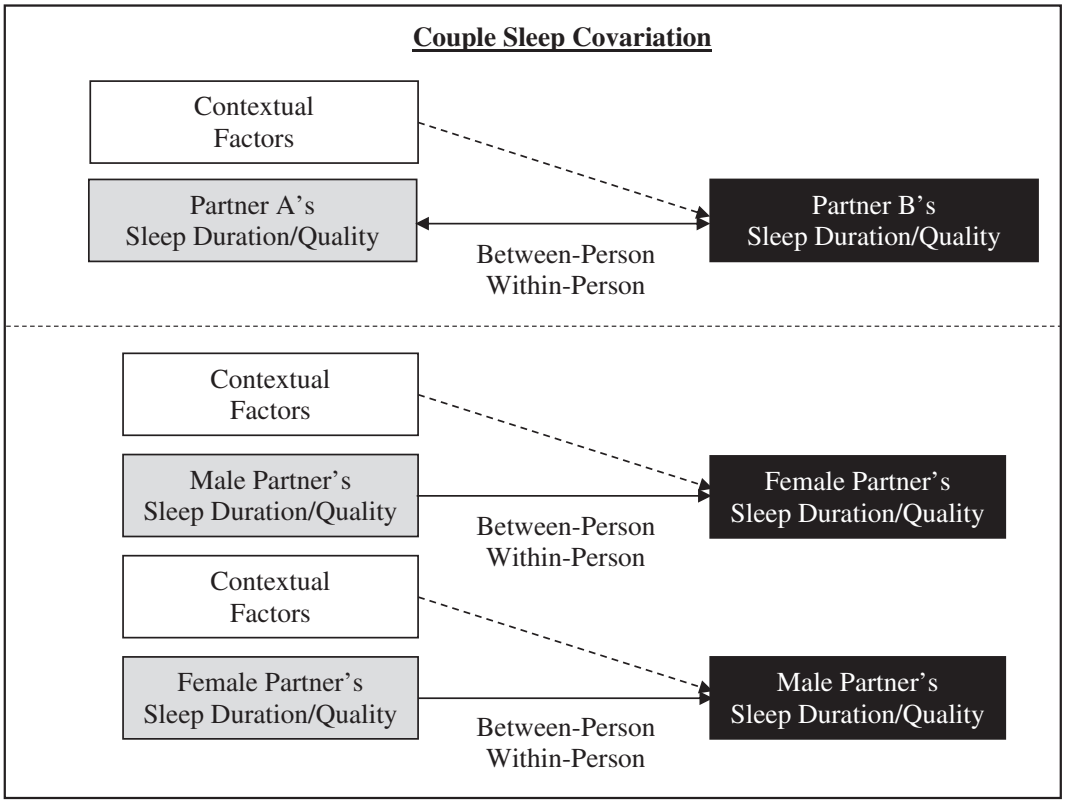

Fig. 1. Research model testing multilevel couple sleep covariation and gender differences. White boxes indicate covariates; gray boxes indicate predictors; black boxes indicate outcomes.

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