

## Two in a bed: The influence of couple sleeping and chronotypes on relationship and sleep. An overview

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### ABSTRACT

**Objective:** To summarize research on couple sleeping with respect to gender-specific differences and chronotype. **Methods:** Systematic review of the literature. **Results:** Millions of adults around the world share their beds with a partner. This may be an expression of intimacy and attachment and tends to intensify romantic relationships. Yet, couple sleeping still has underestimated implications for the quality of the relationship, quality of sleep and for physical and psychological health which are not consistently positive. Implications for research and therapy are discussed. **Conclusions:** Despite the people involved perhaps not even being aware of their nocturnal interactions, it is important that sleeping together becomes a subject of discussion.

**Abbreviations:** REM: rapid eye movement; QOL: quality of life; OSA: obstructive sleep apnea; CPAP: continuous positive airway pressure

### KEYWORDS

Chronotype; cohabitation; marriage; sleep; women's health

### Introduction

Going to sleep and waking up together is one of the most intimate human actions that “optimally occurs when one feels sufficiently safe and secure to down-regulate vigilance and alertness” (Troxel et al., 2007). In Western societies, it is very common for couples to spend the nights in the same bed. However, little importance is attached to the link between couple sleeping and couple functioning. In more sociological terms, Meadows et al. (2008) state that couples have their own *sleep habitus* by the beginning of a relationship and that conflicts arise when these do not match. Although there is plenty of psychological and medical literature on human sleep and sleep problems, sleep is mostly viewed as an individual phenomenon and couple sleep is still a neglected topic (Rosenblatt, 2006). Men and women differ in terms of their reactions toward a bed partner. These differences in the nocturnal sleep reactions may be caused by cultural norms or parenting in women and the desire for group sleep in men (Dittami et al., 2007). Moreover, men and women tend to have different diurnal preferences and chronotypes. Both aspects may

contribute to sleep problems and may affect the daytime functioning of the relationship. Besides the effects on sleep architecture, couple sleeping also influences couples' daytime functioning, sexual activity, marital satisfaction as well as physical and psychological health.

Especially when it comes to sleeping disorders, couple sleeping should be in the focus of interest. Since sleep problems of one partner may also become a problem for the other, couple sleeping should be taken into consideration when dealing with sleep problems such as apnea or snoring. This paper aims to summarize the literature about couple sleeping with respect to gender- and chronotype-specific differences. The results open up interesting possibilities for the diagnosis and therapy of sleep disorders and conflict behavior in the context of relationships.

### Methods

Computerized literature searches in PubMed, PsycInfo, MedLine and Google Scholar were conducted using the following key words: couple

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sleep, co-sleep, pair sleep, chronotype, gender, depression, anxiety, mental health and sleep. Due to the limited research in the field of couple sleeping, additional studies and sources were identified by reference sections of relevant articles. For the chapter on the impact of chronotypes, an additional search of the literature was conducted in PubMed using the following search terms: (chronotype or “circadian preference” or morningness or eveningness or “early bird\*” or “night owl\*” or lark or larks or owl or owls or “morning type\*” or “evening type\*” or “morning orientation” or “evening orientation”) and (monogam\* or polygam\* or sexual\* or socio-sexual\* or sociosexual\* or mating or machiavell\* or narciss\* or psychopath\* or “dark triad” or “couple sleep”). This search yielded 40 results after filtering for literature about humans, of which 33 were excluded, either because they had already been identified in a prior search or for not focusing on interpersonal relationships.

### ***Gender-specific differences***

Sleep is not only a fundamental human need for the maintenance of cognitive performance, physical and mental health but it is also embedded in a social context (Troxel, 2010). From an evolutionary perspective, sleeping in pairs can enhance the perceived physical and emotional security, which leads to a reduction of arousal levels and to increased quality and quantity of sleep. Yet, men and women respond differently to the presence of a bed partner. The male perception of sleep is that sleep is important and a necessity, especially in relation to paid work. Men seem to have an understanding that their body will inform them when it is time to sleep and when their resources are used up (Meadows et al., 2008). Dittami et al. (2007) reported that co-sleeping is generally more disturbing for women than for men assessed by subjective reports, but also that a mitigation through sexual contact is possible (Table 1). Troxel (2010) however argued that due to lower physical strength and greater need for security against potential attackers, the soothing effect of co-sleeping is stronger among women. Moreover, women’s sleeping behavior is embedded in female social roles and responsibilities as a partner.

Research addressing women’s reactions toward a sleep partner draws an unclear picture. In a study consisting of 5142 women in their midlife, unintentional partner behaviors like snoring, going to the toilet during the night or restlessness turned out to be most disturbing for women’s sleep (Arber et al., 2007). The findings indicate that actions beyond the control of their male partners have a highly significant correlation with women’s sleep quality. Whereas intentional disruptions like waking the female partner up to talk, for sex or because she disrupts his sleep had a low and nonsignificant correlation with the overall quality of women’s sleep. In a study conducted by Pankhurst and Horne (1994), women more frequently reported nocturnal disturbances by their partners, such as discrete movements during the night. These are more often shown by men and sleeping with a partner was associated with a greater number of discrete movements than sleeping alone. Yet, differences in the individual perception occurred since most participants, men and women, reported to sleep better when a bed partner was present. Alike, Monroe (1969) found that although sleeping alone leads to a significant increase in stage 4 sleep and a decrease in REM sleep compared to nights when sleeping with a partner, participants report being less satisfied with their sleep in nights spent alone. Apparently, the objectively impaired sleep quality contrasts the subjective perception of a restful night. In a more recent study, Spiegelhalder et al. (2015) investigated the effect of the sleep location and co-sleeping on the quality of sleep while focusing on young couples. The sleep location did not have a strong effect on sleep quantity or quality but the perceived sleep quality was better in both sexes when sleeping together. Moreover, there was no discrepancy between objective and subjective sleep. Gender-specific differences occurred in the sleeping duration: men slept longer and got up later when sleeping with a partner. This may be a result of increased perceived security during the sleep in men. This effect may be counteracted in women by the disturbing effect of the partner. Moreover, among young couples, a high concordance of body movements when sleeping together was shown.

**Table 1.** Literature on co-sleeping.

Authors	Year	Title	Type of paper	Main findings	Sample size	Population background
Dittami et al.	2007	Sex differences in the reactions to sleeping in pairs versus sleeping alone in humans	Original	Co-sleeping is generally more disturbing for women than for men.	20	Healthy, heterosexual couples
Troxel	2010	It's more than sex	Review	Women may be more sensitive to both soothing and stressful effects of co-sleeping.		
Pankhurst & Horne	1994	The influence of bed partners on movement during sleep	Original	Co-sleeping increases nocturnal discrete movement. Women report more nocturnal disturbances by their partners. Both genders report better sleep when co-sleeping.	92	Heterosexual couples
Monroe	1969	Transient changes in EEG sleep patterns of married good sleepers	Original	Co-sleeping impairs objective, but increases subjective sleep quality.	28	Married, good sleepers
Spiegelhalter et al.	2015	Your place or mine?	Original	Co-sleeping leads to increased subjective sleep quality in both sexes and longer sleep in men.	30	Young, heterosexual couples
Troxel et al.	2007	Marital quality and the marital bed	Review	In couples, qualities of sleep and relationship are dynamically and reciprocally associated.		
Blumen et al.	2009	Effect of sleeping alone on sleep quality in female bed partners of snorers	Original	Objective sleep quality in female partners of snorers does not improve substantially when sleeping alone for one night.	16	Non-snoring female partners to snoring males
Ulfberg et al.	2000	Adverse health effects among women living with heavy snorers	Original	Spouses of snorers are more frequently affected by sleep-related problems (insomnia, morning headache, daytime sleepiness and fatigue), regardless of sleep situation (co-sleeping or separate bedrooms).	1032	Women
Cartwright & Knight	1987	Silent partners	Original	Suffering from OSA in one partner is associated with higher levels of stress and depression in both partners.	10	Wives of male OSA-patients
Parish & Lyng	2003	Quality of life in bed partners of patients with obstructive sleep apnea or hypopnea after treatment with continuous positive airway pressure	Original	Use of CPAP in treating OSA improves quality of life in both partners.	108	OSA-patients and their bed partners
El-Sheikh, Kelly, & Rauer	2013	Quick to berate, slow to sleep	Original	Interpartner psychological conflict can impair sleep in both partners. Symptoms of depression and anxiety can partly mediate this association.	270	Cohabiting or married couples
Revenson et al.	2015	Hey Mr. Sandman	Original	Men's symptoms of depression affect their wives' sleep. Depressive symptoms are more stable over time in women with shorter sleep duration.	1086	Middle-aged couples

### **Impact of chronotypes**

Morningness–eveningness preferences are seen and understood both as a personality trait and as a trait based on biological factors (Duarte et al., 2014). The trait aspect is especially interesting for human mating behavior. Before couples even get closer together, chronotypes seem to be an important factor in assortative mating. Two extreme

chronotypes with different circadian rhythmicity are unlikely to meet because of their small overlap in their preferred active time. However, low dissimilarity in morningness–eveningness is not linked to higher relationship satisfaction (Randler & Kretz, 2011). Nevertheless, women would prefer a partner with a similar chronotype. Randler et al. (2014) compared the sleep–wake behavior of

women with that of their actual partners and that of a hypothetical, preferred partner. They could show that, given the choice, females would prefer a partner closer to their own sleep–wake rhythm, indicating that assortative mating according to sleep–wake rhythm may exist. Among various sleep–wake measures, women particularly prefer a partner going to bed at the same time. It should be noted that these preferences may depend on the phase of a woman's menstrual cycle.

Chronotypes and gender preferences also have consequences for a couple's sexual activity. Jankowski et al. (2014) have shown that there is a general major evening peak of sexual activity and desire in females, regardless of their chronotype. Whereas in males, the greatest need for sex occurred either in the morning or evening hours according to their chronotype (evening types at 9:00–12:00 and 18:00–3:00 and in morning types at 6:00–12:00 and 18:00–24:00). As a possible consequence, couples with mismatched chronotypes have more marital conflicts and less sexual intercourse than matched couples (Larson et al., 1991).

Chronotype can not only impact the timing of desire and sexual activity, but also the number of sexual partners: In males, eveningness seems to be associated with a higher number of sexual partners and while there was no such correlation found in females, associations between eveningness and behavioral traits that are instrumental in short-term mating strategies are stronger for women than men (Maestripieri, 2014). One possible explanation for this connection of eveningness and number of sexual partners may be that evening types tend to display higher risk-taking propensities which may be causally or functionally linked to their propensities for sensation- and novelty-seeking, impulsivity, and sexual promiscuity (Ponzi et al., 2014).

Furthermore, gender-specific differences concerning chronotypes can be found in the literature: Girls and women are significantly more morning oriented than boys and men, while men have a more pronounced eveningness preference (Randler, 2007). These differences could stem from a different interplay between the circadian pacemaker and the sleep–wake cycle processes, which could in turn help to make the circadian system in males more flexible and more able to

adapt to environmental change than that in females, whereas the genetically programmed circamensual rhythm in women may contribute to making their circadian systems less flexible and less adaptable to environmental change (Adan & Natale, 2002) (Table 2). Despite genetic predispositions, chronotypes seem to be able to change and adapt depending on the social circumstances: women are more morning-oriented than men until the age of 30, whereas women older than 45 years are more evening-oriented than men. The phase-delay of adolescents and the phase-advance of the elderly seem to be more present in men than in women (Duarte et al., 2014). Also *social zeitgeber* like the scheduling by children and family has a very large impact on a mother's lifestyle and sleep–wake rhythm, far beyond the first months of life. Children seem to be an even more important social factor than the male partner (Leonhard & Randler, 2009).

Finally, when considering gender as a moderating variable, according to a recent review of the literature by Fabbian et al. (2016), associations of eveningness with a number of negative outcomes in the domains of physical and psychological health, sleep and achievement may be stronger for women than for men.

### **Effect on relationships**

Sleep problems and relationship problems tend to co-occur, particularly during times of significant life events or transitions, such as adjustment to an illness, the birth of the first child, or relationship dissolution (Troxel, 2010). Thus, the link between sleep and relationship quality is supposed to be bidirectional, reciprocal and dynamic. The model of dynamic association between relationship functioning and sleep by Troxel et al. (2007) is based on reciprocal pathways and gives a possible theoretical framework of the interplay between sleep and relationship quality.

In a healthy relationship, a partner serves as a successful stress-buffer by providing downregulating physiological and psychological stress responses and counteracting health behaviors that could have a negative impact on sleep. In contrast, stressful relationships lead to increased physiological and emotional arousal, poor health behaviors,

**Table 2.** Literature on circadian preferences and sleep concordance.

Authors	Year	Title	Type of paper	Main findings	Sample size	Population background
Jankowski, Diaz-Morales, & Randler	2014	Chronotype, gender, and time for sex	Original	Chronotype can have an impact on the time of day when humans feel the greatest need for sex and the time of day they actually undertake sexual activity.	565	
Maestriperi	2014	Night owl women are similar to men in their relationship orientation, risk-taking propensities, and cortisol levels	Original	Night-owl pattern is more prevalent in men than in women, particularly between puberty and menopause. Eveningness may have evolved relatively recently in human evolutionary history and may be advantageous in pursuing short-term mating strategies. Eveningness in males seems to be associated with a higher number of sexual partners, but associations between eveningness and behavioral traits that are instrumental in short-term mating strategies are stronger for women.	501	Master's students
Ponzi, Wilson, & Maestriperi	2014	Eveningness is associated with higher risk-taking, independent of sex and personality	Original	Higher risk-taking propensities among evening types may be causally or functionally linked to their propensities for sensation- and novelty-seeking, impulsivity, and sexual promiscuity.	172	
Fabbian et al.	2016	Chronotype, gender and general health	Review	Associations of eveningness with negative outcomes in various domains may be stronger for women than for men.		
Hida et al.	2012	Individual traits and environmental factors influencing sleep timing	Original	The sleep timings of a couple are mainly associated with the chronotypes of the husband and wife, but also significantly influenced by certain environmental factors.	450	Married Japanese couples, living together for >1 year
Gunn, Buysse, Hasler, Begley, & Troxel	2015	Sleep concordance in couples is associated with relationship characteristics	Original	Wives' marital satisfaction is associated with couples' sleep concordance, measured by actigraphy, regardless of husbands' attachment style (anxious or avoidant).	96	Heterosexual, healthy, married couples, sharing beds
Hasler & Troxel	2010	Couples' nighttime sleep efficiency and concordance	Original	In men, higher diary-based sleep efficiency predicted less negative partner interaction the following day. Vice versa for women, less negative partner interaction during the day predicted greater actigraphy-based sleep efficiency that night.	58	Heterosexual couples, sharing beds
Meadows et al.	2009	Exploring the interdependence of couples' rest-wake cycles	Original	The variables of sleep most significantly interdependent in couples are actual bed time, sleep latency, light/dark ratio and wake bouts.	72	Heterosexual couples
Randler & Kretz	2011	Assortative mating in morningness-eveningness	Original	Two extreme chronotypes are unlikely to meet each other because they have the smallest overlap in their preferred active time during the day due to the circadian rhythmicity.	96	Heterosexual couples
Randler et al.	2014	Women would like their partners to be more synchronized with them in their sleep-wake rhythm	Original	Assortative mating according to sleep-wake rhythm exists, but for long-term pair-bonds, women would like their partners more synchronized.	167	Women



and a greater risk for sleep disturbance and disorders. Empirically there seem to exist some gender differences: for females, less negative partner interaction during the day predicted greater sleep efficiency in the following night, whereas vice versa for males, higher sleep efficiency predicted less negative partner interaction the following day (Hasler & Troxel, 2010). Similarly, wives' marital satisfaction is associated with couples' sleep concordance measured by actigraphy, regardless of husbands' attachment style (anxious or avoidant) (Gunn et al., 2015). The variables with the most significant couple interdependency are: timing of going to bed, sleep latency, light/dark ratio, and wake bouts (Meadows et al., 2009).

Over time, couples evolve interactional rules and sleep routines that bind them together. These behaviors need some time to emerge in a new relationship and often imply a modification of sleep behavior (Hislop, 2007).

### ***Couple sleeping and sleeping disorders***

Most of the literature about couple sleeping does not deal with this subject as a daily phenomenon but within a clinical context with regard to sleep disorders. Females sleeping with male snorers have decreased sleep quality and increased sleep fragmentation. However, it cannot be suggested that objective sleep quality improves substantially in the female non-snoring partner when she sleeps alone for one night (Blumen et al., 2009). In a study conducted by Ulfberg et al. (2000) spouses of snorers also more frequently report sleeping problems, insomnia, daytime fatigue and sleepiness. No differences were found between spouses of snorers who sleep in the same room and those who sleep in separate rooms. Wives of patients suffering from obstructive sleep apnea (OSA) perceive their marriages as more stressful, and they perceive no regeneration by social activities and leisure time. Therefore, wives should be integrated in the treatment of their husbands suffering from sleep apnea (Cartwright & Knight, 1987). Patients suffering from OSA can improve their quality of life through continuous positive airway pressure (CPAP). Parish and Lyng (2003) showed that the use of CPAP also improves the quality of life in their sleeping partners in the domains of role-

physical, vitality, social functioning, role-emotional and mental health. Moreover, wives can even have a supportive effect on the use of CPAP. In a study by Cartwright (2008), treatment adherence was strongly related to the wife sharing the bed. After 2 weeks of CPAP, men's score on the Sleep Apnea Quality of Life index improved and was significantly higher than the wife's score, indicating that the man was better adjusted to his diagnosis and treatment than she was. Husbands who slept separately used their CPAP machine less frequently than regular bed sharers. Furthermore, the sleep of the non-sharing wives was negatively impacted by their partners' CPAP use. Previous findings indicate that relationship quality plays an important role when diagnosing sleep disorders and that it may lead to important information concerning the etiology and maintenance of the disorder. Furthermore, a healthy relationship and a motivating co-sleeper may be an important motivating factor to initiate and adhere to treatment. Conversely, if relationship problems are presumed to be a significant factor in the etiology or maintenance of a sleep disorder, couples' counseling may be an important adjunct to treatment (Troxel et al., 2007).

### ***Couple sleeping and mental health***

Recent research indicates that there are some connections between couple sleep and mental health. El-Sheikh et al. (2013) investigated a possible intervening effect of mental health variables on interpartner psychological conflict and couple sleep in 135 couples. The authors showed that depression and anxiety symptoms functioned as intervening variables and affected both the own and the partner's sleep. Women being the recipient of interpartner psychological conflict had more symptoms of anxiety, which was associated with reduced sleep efficiency. Results also indicate depression symptoms to be an intervening variable in the association of being recipient of interpartner psychological conflict and sleep quality. Also the perpetration of interpartner psychological conflict was found to be related to increased anxiety within the partner, which was related to longer sleep latencies for the actor.

Revenson et al. (2016) investigated associations between anxiety and depression symptoms and couple sleep in a sample of 543 middle-aged couples. Results indicate that high levels of anxiety and depression had an influence on the partner's sleep duration. The effect of the men's mental health on their wives was stronger than vice versa, for example women with husbands showing high levels of depression had a shorter sleep duration one year later, while the reverse effect from husbands' depression symptoms on their wives' sleep duration was not significant. Also a small moderating effect of sleep duration was found in the sample: in women with shorter sleep duration, depressive symptoms were more strongly related to depressive symptoms one year later than in those with longer sleep duration. Troxel et al. (2007) examined the relationship between attachment anxiety, marital status, bed-partner status, and sleep in 107 women suffering from recurring major depression. Relationship measures had no main effect or interactional effect on subjective sleep quality, but a polysomnography indicated that women with a bed partner had better sleep efficiency. Married women showed shorter sleep latencies compared to never married women. A reduced percentage of stage 3 and 4 sleep was found in anxiously attached women. In addition, a significant interaction was found between attachment anxiety and marital status: anxiously attached women who were divorced, separated or widowed displayed a particularly low percentage of stage 3 and 4 sleep. Overall results indicate that depressed women are a high-risk group vulnerable to psychological and physical health threats. Past and current relationship experiences seem to have important implications for present sleep.

### **Implications and limitations**

For most couples, the reality of sleeping in the same bed is a compromise, with each partner experiencing less than satisfactory sleep. It would seem that the logical solution to sleep disruption would be to relocate; moving into another room, or at least a twin bed, to overcome the "bed of thorns" created by gendered expectations, snoring, and other aberrant partner behaviours. Yet paradoxically, [...] only 7% of couples under 55 currently sleep in separate

beds, despite almost half complaining of being awakened up to six times a night. [...] Sleeping apart for couples represents a break in the routines of sleep and a departure from the frame of reference so crucial to sleep patterning. Rather than promoting a good night's sleep, sleeping alone can actually hinder sleep, with partner absence and the emptiness of the bed disturbing the "ambience and the ritual" associated with sleeping together [...] This suggests a strong cultural association between being a couple and sharing a bed. Despite the possibility of better sleep elsewhere, couples in general show a willingness to go along with the possible disruption associated with sharing a bed to preserve the well-being of the relationship and to meet social expectations of appropriate couple behavior. (Hislop, 2007)

For research:

Literature on couple sleep in nonclinical settings is scarce. Based on the existing research, it can be assumed that there are gender-specific differences in the reaction to the presence of a bed partner. This may have an influence on the quality of the relationship.

Future studies should extend the knowledge about the link between bed sharing and the quality of both relationship and sleep, e.g. regarding chronotypes and the phase of the woman's menstrual cycle.

Because characteristics of sleep and those of romantic relationships influence each other, it will be important to identify biological markers in couples, such as the concordance of melatonin and oxytocin secretion.

Also, as proposed by Randler and Kretz (2011) further studies should use other forms of sampling such as random sampling of couples and sampling in households instead of during events in order to sample partners spending less time together or preferring less similar activities. Furthermore, research intending to study gender differences in morningness should provide a low variance in age and ideally provide the same mean age for both genders. Additionally, future work should further investigate different age classes and explore the genetic basis of sleep-related traits (Randler, 2007). Finally, referring to Spiegelhalder et al. (2015) future studies should contain larger sample sizes.

Moreover, to our knowledge, all studies were conducted with heterosexual couples. Sleep

quality, relationship satisfaction and chronotype similarity in homosexual or transgender couples would be an interesting future research topic.

For practice:

Some marital problems might be associated with nocturnal disruptions. The aspect that conflicts are caused by disturbed sleep or diverging preferences due to mismatched chronotypes should be taken into consideration by physicians, therapists, and marriage counselors.

For patients with sleep disorders where relationship problems are suspected to play a role in the etiology or course of the sleep disorder, couples' sleep therapy may prove helpful in addition to standard treatment. The assessment of sleep patterns and habits and possible sources of stress may be relevant for the treatment of sleep disorders (Troxel, 2010).

Partners should be included when treating sleep disturbances such as sleep apnea or snoring in order to improve not only the patients' health but to enhance relationship satisfaction and quality of life of the partner.

As mentioned by Spiegelhalder et al. (2015), sleeping in pairs can be a protective factor for the development and maintenance of insomnia, thus the dyadic nature of sleep should be considered when treating sleeping disorders. Also the partner's mental health has an influence on one's sleep and should be kept in mind during treatment.

Sleeping apart is not necessarily an indicator of an unhappy or unhealthy relationship and may be taken into consideration. At least couples should be encouraged to have an open dialogue about sleeping habits in order to sleep better and to have a happier relationship (Troxel et al., 2007). The shared goal should be finding a balance between the role of sleeper and that of partner (Hislop, 2007).

### Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this article.

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