ASSOCIATIONS BETWEEN SLEEP QUALITY, THERAPEUTIC ALLIANCE, AND
INEFFECTIVE ARGUING AMONG COUPLES IN THERAPY

by

Lindsey Robinson

A thesis submitted to the Graduate Faculty of
Auburn University
in partial fulfillment of the
requirements for the Degree of
Master of Science

Auburn, Alabama
August 7, 2021

Keywords: sleep, couples therapy, therapeutic alliance, dyadic data

Approved by

Joshua Novak, Chair, Assistant Professor, Human Development and Family Science
Mona El-Sheikh, Professor, Human Development and Family Science
Ben Hinnant, Associate Professor, Human Development and Family Science

Abstract

Considering the far-reaching effects of short or poor-quality sleep on biopsychosocial functioning, little to no research has investigated the associations among sleep quality, therapeutic alliance and couple outcomes in couples in therapy. The purpose of this study was to carry out the first quantitative exploratory investigation into the associations between partner's sleep and ineffective arguing using a sample of 56 couples in therapy. Analyses addressed three research questions: (1) Is one's own relationship between sleep and ineffective arguing moderated by one's own therapy alliance (actor-actor-actor; e.g., husband's sleep → husband's ineffective arguing, conditional upon his level of alliance; wife's sleep → wife's ineffective arguing, conditional upon her level of alliance)? (2) Is one's own relationship between one's sleep and ineffective arguing moderated by one's partner's therapy alliance (actor-partner-actor; e.g., husband's sleep → husband's ineffective arguing, conditional upon wife's level of alliance; wife's sleep → wife's ineffective arguing, conditional upon husband's level of alliance)? (3) Is the relationship between one's sleep and one's partner's ineffective arguing moderated by one's own therapy alliance (actor-actor-partner; e.g., husband's sleep → wife's ineffective arguing, conditional upon husband's level of alliance; wife's sleep → husband's ineffective arguing, conditional upon wife's level of alliance)? Results from six hierarchical multiple regressions indicated one significant model: Higher quality Wife Sleep on Lower Husband Ineffective Arguing at low levels of Wife Therapeutic Alliance. This paper includes a discussion of these results, along with recommendations and implications for therapy.

Acknowledgements

What a journey developing this thesis has been! I am overwhelmed when I think about the beauty of the process of getting here—professionally and personally. This document represents an accumulation of learning, growth, challenge, inspiration, perspective, commitment, time, and love over my last two years at Auburn, and I am humbled to find myself at the conclusion of it all.

First and foremost, I thank Josh for his ever-responsive, attentive, patient, nurturing, and specially catered mentorship. I believed working with him would be a natural, rewarding process, but I could not have anticipated just how perfect of a fit he would be for my development as a researcher, therapist, and person. He has been unwaveringly supportive and understanding throughout my entire experience at Auburn, and I could not measure the extent of all I have learned from his guidance, direction, and care. I'll never be able to thank him enough for all the doors he has and continues to open for me; I truly will be forever grateful he decided to take a chance on me as his graduate student.

I sincerely doubt I could have made it through to this day without my cohort family: Matt, Rui, Maya, Dylan, and Takoma. I always feel a sense of relief when I get to be with them—the ones who love, understand, and believe in me like no others can. All our pep talks, tears, and belly laughs have encouraged and filled me up and given me juice to keep going. I feel lucky we fell into each other's laps so serendipitously here in Auburn and that I get to know and love them so intimately.

The steadfast support of my family has also sustained me. Mom and Dad, with their encouraging and consistent verbal and non-verbal messages of love. My siblings, Summer, JD,

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Chapter 1: Introduction

In 1977, George Engel called for a reform in healthcare disease conceptualization, championing what is known as the *biopsychosocial* (BPS) framework, which accounts for all the biological, psychological, and social components that shape patient dysfunction. This new framework expanded healthcare professionals' understanding of the widespread contributors to illness and sparked discussion within mental and physical health communities on how to best consider, assess, and treat patients' presenting problems. In line with the BPS model (now referred to the *biopsychosocial-spiritual* [BPSS] model; Watson, Bell, & Wright, 1992), marriage and family therapists (MFTs) take a "holistic perspective to health care" and are "concerned with the overall, long-term well-being of individuals and their families" (Commission on Accreditation for Marriage and Family Therapy Education, n.d.). Importantly, this means not only assessing what occurs in the therapy room to effect positive change in clients, but also understanding clients' *full contexts outside of therapy* that contribute to problem formation, maintenance, and resolution. A significant part of context (the *biological* aspect of the BPSS model) includes foundational lifestyle choices—namely, sleep, exercise, and diet—which are foundational to an individual's thoughts, emotions, and behavior. Adequate bioregulation— the regulation of those essential biological processes—is essential to prepare the body and brain to best learn and apply healthy skills and behaviors (e.g., effective communication, problem-solving, emotional coping), such as those learned in therapy, that lead to desired cognitive, emotional, and relational health outcomes.

Despite marriage and family therapy's emphasis on and value of "holistic health care," very little research has been done within the field to determine how factors within the therapy room interact with the foundational lifestyle behaviors of clients in couples' therapy to influence

therapy outcomes (though some pioneers, such as Brown et al. (2019) and Troxel et al. (2017), have started to explore connections like how improving marital quality, often a core goal of couples' therapy, is facilitated through improving sleep). Further, to my knowledge, little to no research has examined how the dyadic nature of those lifestyle factors may influence partners' therapy experiences (such as how readily they build a therapeutic alliance, or a connecting and collaborative relationship, with their therapist) and ultimately sway therapy outcomes. At such an early stage of studying the impact of lifestyle on client outcomes in couples' therapy, the proposed study narrows down the subject to examine the one behavior most people spend roughly one-third of their life doing: sleeping (Blask, 2009).

Sleep in the context of couples is a unique lifestyle factor because it most often occurs in tandem with a partner and is heavily influenced by the shared environmental and relational context of the partnership (whereas factors like diet and exercise can be more individually driven in a relationship). It also strongly influences the cognitive (Harrison & Horne, 2000) and emotional (Guadagni et al., 2014; Killgore et al., 2008) functioning foundational to working productively towards common couples' therapy goals, such as improving marital quality, developing effective communication skills, and building emotional intimacy. Additionally, good sleep promotes relationship building behaviors, such as connecting emotionally (Gauadagni et al., 2014), accurately reading emotional cues (van der Helm et al., 2009), collaborating (Kahn-Greene et al., 2006) and accepting responsibility (Kahn Greene et al., 2006), necessary to establish a strong alliance with one's therapist, which has consistently shown to be the best predictor of outcome in therapy (Fluckiger et al., 2018; Horvath & Symonds, 1991; Hubble et al., 2010; Martin et al., 2000).

The lifestyle factor of sleep can be a significant common thread woven throughout the process of couples' therapy, and the ways it interacts with other factors (e.g., dyadic influence and therapy alliance) in the therapy process is important to examine. For example, getting a good night's rest (*lifestyle factor*)—which, for couples who share a bed, is inextricably influenced by partner sleep behaviors and patterns (*dyadic influence*)—can help each partner have a more receptive and regulated frame of mind (Kahn-Greene et al., 2006; Killgore et al., 2008). This can buoy their capacity to join or build a working relationship (*therapy alliance*) with their therapist, resulting in more efficient and beneficial time spent in the therapy room moving towards their goals. In this way, the interaction between sleep and therapy alliance is such that both factors can reinforce each other to accomplish therapeutic ends. There may be scenarios, however, in which partners in couples' therapy do *not* get good sleep, which can contribute to more conflict both in and out of the therapy room, undermining progress towards their therapy goals. A good therapeutic alliance, however, may *attenuate* the negative impact of poor sleep on couples' relationship outcomes, as the therapist can help clients navigate their frustrations and disagreements (exacerbated and sometimes initiated by poor sleep) more readily through teaching negotiation, emotional expression, and cognitive reappraisal skills. Interestingly, such skills can not only move clients towards their relationship goals but can also improve their sleep (El-Sheikh et al., 2015; Wilson et al., 2017).

The purpose of this thesis is to assess some of the most important, nuanced factors of couples' therapy—sleep, dyadic influence, and therapeutic alliance—to understand their interaction in facilitating therapeutic and relationship goals. As clinicians work to understand the mechanisms by which these factors may work together to produce change, they can more fully acknowledge the *biological*, *psychological*, and *social* aspects of clients' lives and better know

where and how to effectively intervene in the therapy process. As such, using data from couples

in therapy from across three time points (i.e., their first, fourth, and eighth sessions), I will

examine the moderating effect of each partner's therapy alliance on the dyadic relationship

between each partners' sleep and communication outcomes (namely, the degree to which they

feel they can argue effectively).

Chapter 2: Literature Review

Sleep and Individual Functioning

Sleep has long been understood as a necessary function of daily living. General experience quickly teaches that sleep, to one degree or another, is fundamental to survival, needed to feel well, perform optimally, and interact rationally and empathically with others. Only in recent decades, however, has research dug deeper into the mechanisms and underlying processes that better explain *why* humans need sleep—and what happens when it is lacking (Walker, 2017). Sleep is considered adequate when one gets enough of it (between seven and nine hours for adults aged 18 to 64 and seven to eight hours for adults aged 65 and over (National Sleep Foundation, 2020)), and leaves one feeling rested and energized the following day. *Inadequate* sleep constitutes non-restorative sleep facilitated by disturbances in sleep quality (difficulty falling or staying asleep) and/or quantity—with most research suggesting less than five to six hours of sleep is associated with poorer physical and mental health outcomes (Patel et al., 2006; Vgontzas et al., 2012; Zee & Turek, 2006)

Physical Health

At its most basic level, sleep functions to restore and heal the body and mind. One of its primary benefits is its effect on the immune system; it is a foundational building block to strong, active immunity. For example, without quality sleep, an individual can be left three to five times more susceptible to the common cold (Cohen et al., 2009). Dysregulated (getting too much, too little, and/or nonrestorative) sleep is also a risk factor for almost every major chronic disease, including cardiovascular disease (Ayas et al., 2003), type II diabetes (Okamoto et al., 2017), Alzheimer's (Winer et al., 2019), fibromyalgia (Keskindag & Karaaziz, 2017), kidney disease (Jaussent et al., 2015), and cancer (Blask, 2009; Lu et al., 2017; Thompson et al., 2010) and also

amplifies somatic symptoms of pain (Haack & Mullington, 2005), making already painful conditions feel worse. Additionally, sleep regulates hunger and satiety hormones, essential for weight management. In sleep deprivation, the levels of the hormone that signals hunger in the body (ghrelin) increase, while the levels of the hormone that signals satiety (leptin) decrease, leaving one hungrier and more prone to overeat (Walker, 2017). Activity in the areas of the brain that regulate and evaluate food choices are also impaired when sleep is lacking, leading to increased cravings for high-calorie foods (Greer et al., 2013).

Though less noticeable in the short-term, the long-term impact of inadequate sleep on one's physical health is undeniable. Its most basic benefit could be narrowed down to the simple fact that appropriate amounts of sleep, compared to too little (less than seven hours) or too much (greater than nine hours), is associated with a decreased risk of premature death and thus a longer lifespan (Cappuccio et al., 2010).

Emotional Health

The restorative power of sleep has just as powerful an impact on the mind and brain as it does the body. Sleep disturbances, including both insomnia and excessive sleepiness, are strongly associated with most—if not all—mental illnesses, particularly bipolar, depressive, post-traumatic stress and anxiety disorders (American Psychiatric Association, 2013), and even suicidal ideation and behaviors (Krause et al., 2017; Bernert & Joiner, 2007). The mechanisms by which sleep affects mental health, and vice versa, are vast and important for understanding the significance of a good night's rest in maintaining overall mental and emotional wellbeing.

In conditions of sleep deprivation, the amygdala (area of the brain responsible for the fight-or-flight response) becomes especially reactive, triggering heightened responses to negative stimuli (Krause et al., 2017; Motomura et al., 2013; Yoo et al., 2007). This can manifest as a host

of characteristics, including emotional instability (Krause et al., 2017), irritability, anxiety, aggression (Krizan & Herlache, 2016), and increased anger and hostility (Kahn-Greene et al., 2007), especially when a sleep-deprived individual faces an adversarial situation. These prolonged conditions often culminate in an overall negative mood (Tempesta et al., 2010), which contributes significantly to the development of mental disorders and is itself a defining feature of major depressive disorder (American Psychiatric Association, 2013).

Sleep deprivation is not only a contributing factor to the *development* of mental illness, it is a *maintaining force* for its course. For example, restful rapid eye movement (REM) sleep (the sleep of the latter part of a sleep cycle, characterized by vivid, complex dreaming) helps resolve the distress of emotional experiences (Gujar et al., 2011); when it is fragmented or disrupted, as seen in insomnia, individuals may experience chronic hyperarousal from unresolved overnight distress (Wassing et al., 2016). This can exacerbate symptoms of depression, posttraumatic stress disorder, and other mental health conditions. Lack of sleep also aggravates addictive disorders and is predictive of relapse (Brower et al., 2001; Krause et al., 2017; Walker, 2017). Without adequate sleep, the brain's reward system and impulse control becomes dysregulated, decreasing one's ability to accurately determine reward value and often skewing decision-making towards riskier ends (Krause et al., 2017; Mullin, 2013; Venkatraman et al., 2007)—undermining the addiction recovery process.

Cognitive Health

Though sleep disturbance may not always lead to the development of mental illness, it nevertheless markedly interrupts cognitive functioning. Sleep deprivation is linked to functional decline of the brain's prefrontal cortex, the area responsible for executive decision-making. Such decline manifests as impaired communication skills, less creative problem-solving, heightened

distraction, inflexible thinking, erroneous chronological memory, and stunted ability to respond to surprise (Harrison & Horne, 2000). Sleep's influence on basic attention, as well as working (Drummond et al., 2012; Turner et al., 2007) and long-term memory (Krause et al., 2017; Walker, 2017) skills has profound implications for how it plays into productivity and performance in daily responsibilities and tasks.

Sleep and Relationships

General Relationships

Sleep deprivation's deleterious impact is not just individual in nature—it has ripple effects into the interpersonal interactions and relationships of the sleep deprived persons, in mostly indirect ways. For example, physical pain exacerbated by poor sleep can prevent engagement in certain activities with others; heightened distractibility and blunted creativity at work after some sleepless nights can rupture professional relationships; and impaired memory can inhibit retention of important details about others' lives, diminishing connection between friends and acquaintances. Yet with so many ways sleep deprivation can interfere in relationships, one of the leading avenues may be through the disruption of emotional regulation, processing, and intelligence needed for building stable social ties.

As previously discussed, sleep problems are associated with aggravated anxiety, anger, irritability, and overall emotional stability, which facilitates significant mood disturbance and dominoes into relationship functioning (Haack & Mullington, 2005). For example, adverse moods (such as sadness), often fed by sleep deprivation, encourage more negative daily appraisals than when one's mood is favorable (Tempesta et al., 2010; Forgas, 2003). This can taint day-to-day interactions with others and lead to undue misunderstanding and conflict in relationships, as sleep-deprived and moody individuals interpret words, facial expressions, or

actions from others as more emotionally negative than intended (Krause et al., 2017; Tempesta et al., 2010; van der Helm et al., 2009). Similarly, sleep loss skews emotional reactivity, enhancing the negative emotion (i.e., frustration) of goal-deterring events, while attenuating the positive emotion of goal-enhancing events (Zohar et al., 2005). In other words, for one whose sleep is lacking, desired outcomes in everyday life will be downplayed and undesired outcomes will seem worse than if one had slept well. This can bring a disproportional focus on the negative, which may leave one less pleasant to be around and interfere with relationship building as the affective bond between two people is damaged, and seemingly neutral responses to one another are received unfavorably (Hawkins et al., 2004). When facing daily frustrations and setbacks, sleep deprived individuals also tend to place more blame on others than accepting it themselves, and their ability to inhibit aggression and work cooperatively with others is diminished—further weakening interpersonal relationships (Kahn-Greene et al., 2006).

Another way sleep deprivation blights social connection is through its effect on empathy—or the "ability of an individual to understand another person's mental state [by their] emotions, feelings, and thoughts", a skill "important for…effective interpersonal interaction[s]" (Guadagni et al., 2014, p. 658; Shamay-Tsoory, 2011). With poorer or less sleep comes decreased empathic understanding (Guadagni et al., 2014; Harrison & Horne, 2000; Peretti et al., 2019) and thus less of a capacity to emotionally connect with others. In addition, other components of emotional intelligence—or the ability to regulate emotions constructively, use emotion to inform judgements and decision-making, identify the emotional needs of other people, and utilize emotional information from self and others pro-socially—are sapped by sleep deprivation and fatigue (Brown & Schutte, 2006; Killgore et al., 2008). This can manifest in a myriad of ways: including diminished sense of independence and self-regard, poorer relationship

quality, reduced impulse-control and gratification delay, and less initiative and positive thinking (Killgore et al., 2008). Taken together, these effects can have detrimental consequences for relationships—again underscoring the significance of sleep in sociality.

Importantly, the association between relationships and sleep is bidirectional; sleep impacts relationships, and relationships impact sleep (sometimes, they impact each other simultaneously, creating a self-reinforcing cycle [Garde et al., 2012] that can take a major toll on individual and interpersonal well-being). Interpersonal conflict, disagreement, and distress can induce a physiological stress response, including increased heart rate, blood pressure, and sensory sensitivity that triggers a cognitive and physical alertness and leads to sleep disturbance through a shift in sleep architecture: decreased NREM (or deep, restorative) sleep, increased REM sleep, and more frequent sleep awakenings (Kim & Dimsdale, 2007). Though all relationships can play a role in both influencing and being influenced by individual sleep changes, the most significant may be between intimate partners, where the emotional investment is higher and the potential for miscommunication can have the most damaging repercussions.

Couple Relationships

Impact of Sleep on Relationships. Sleep patterns do not affect partners in isolation; each partner inevitably feels the direct or indirect consequences of the other's sleep outcomes, whether positive or negative. The shared living space between partners creates a mutually-influencing environment that leaves one partner directly vulnerable to the negative effects of the other's sleep disturbances (e.g., a male who has sleep apnea and snores loudly in the night may disrupt his partner's rest; a partner who stays up later on their phone because they struggle to fall asleep may bring detriment to the other's sleep—not to mention that differences in sleep times between partners is linked to greater psychological distress [Chen, 2018], more marital conflict,

and less serious conversation, shared activities, and frequency of sex [Larson et al., 1991]). This could lead to more daytime sleepiness, fatigue, and mood decline for *both* partners, making their relationship more susceptible to conflict—particularly because partner interactions are more negative when both, rather than just one, partners are sleep-deprived (Wilson et al., 2017).

Even if a partner is not directly affected by their companion's sleep problems, indirect effects will exist. Because partners usually have consistent, daily interaction, they bear the greatest brunt of each other's mood, health, and affective changes (Schoebi, 2008; Timmons et al., 2015), that—whether good or ill—are linked with their sleep (Reishtein et al., 2006). The impaired ability to collaborate (Kahn-Greene et al., 2006), take personal blame (Kahn-Greene et al., 2006), regulate emotion (Killgore et al., 2008), have empathy (Gordon & Chen, 2014), communicate effectively (Harrison & Horne, 2000), and accurately read emotional cues (van der Helm et al., 2009) resulting from sleep deprivation may be most painfully felt between companions as they work to run a household and family in unity. This underscores the major role sleep can play in couple interactions, conflict resolution (Gordon & Chen, 2018) and ultimately, marital quality (Yorgason et al., 2018).

No matter the association—direct or indirect—a partner's sleep problems are linked to the others' wellbeing, including poorer physical and mental health, more depressed mood, greater unhappiness, pessimism, dissatisfaction in relationships, and unhappiness in marriage (Jennum et al, 2014; Strawbridge et al., 2004). Partners affected by their significant other's sleep-wake disorders also tend to have diminished work productivity and lower income (Jennum et al., 2014; Russo et al., 2017), which can burden the relationship with additional stress. The longstanding effects of unaddressed sleep problems in one or both partners on their individual and relational health is undeniable.

Impact of Relationships on Sleep. The impact of relationships on sleep outcomes is similarly powerful, and is, again, likely strongest in the context of intimate partner relationships. Married individuals tend to get more sleep than single individuals (Kreuger & Friedman, 2009), happily married women seem to get the best sleep compared to their single counterparts (Troxel, et al., 2009; Troxel et al., 2010), and improvements in marital satisfaction have been associated with decreased risk of insomnia overtime (Troxel et al., 2017). Even so, intimate relationships can also introduce challenges to obtaining adequate sleep. Notably, the marriage or cohabitation relationship yields significant potential influence on partners' sleep experiences, and two of the strongest ways it does so is through shared living space and relationship dynamics and quality.

Shared Living Environment. With over 80 percent of adults sleeping with a significant other (National Sleep Foundation, 2013), partners play influential roles in each another's sleep experience through their physical presence and the environment they shape for sleep. Sleeping with a partner, compared to sleeping alone, undoubtedly poses dynamics to sleep hygiene and routines that can either help or hinder one's sleep experience. Supportive partners can help establish consistency in sleep-wake routines that endorse good sleep (Troxel, 2010). The physical presence of a responsive partner can also buffer the stress of threatening situations and daily stressors (Kane et al., 2012; Coan et al., 2006; Kane et al, 2014) that can impair sleep. Even a partner's scent can bring comfort that helps improve sleep efficiency (ratio of time asleep to time spent in bed) and perceived sleep quality (Hofer & Chen, 2020). Though sleeping with a partner can skew sleep architecture (percentage of slow-wave sleep, or the deepest kind of sleep) towards lighter sleep outcomes (Monroe, 1969; Troxel, 2010), couples report sleeping better when together (Diamond et al., 2008; Drews et al., 2020; Monroe, 1969; Troxel, 2010). This suggests that the psychological security that comes from having one's partner close can be more

important than getting the deeper sleep sometimes associated with sleeping alone (Monroe, 1969; Troxel, 2010).

Undoubtedly, if partners do not share sleep environment preferences (e.g., room temperature, lighting, sound, etc.) and sleep-wake times, there is greater likelihood of sleep disturbance and overall poorer sleep quality. However, when partners get on the same page about bedtimes and routines, sleep quality can improve and negative sleep-related side effects diminish (Billows et al., 2009; Russo et al., 2017). In sum, there is a clear connection between a partner's influence on sleep habits/environment and sleep outcomes for couples.

Relationship Dynamics. Relationship quality and functioning are also significant in sleep outcomes between couples. Couples with higher relationship satisfaction report higher sleep quality and quicker sleep onset than those with less satisfying relationships (Brown et al., 2019). Certainly, having a partner whom one trusts and can confide in has a psychologically and physiologically calming effect, promoting down-regulation for a good night's rest (Troxel et al., 2007; Troxel, 2010). On the other hand, marital or relationship distress can be particularly poignant for psychological wellbeing and thus sleep outcomes, as intimate partners are often the primary attachment figure in an individual's life and constitute their most significant relationship capital.

Destructive conflict, such as verbal and psychological aggression, between partners negatively affects each partner's mental health, which in turn diminishes their sleep experience (El-Sheikh et al., 2013), particularly if the disagreement and aggression plays out just before bedtime (Hicks & Diamond, 2011). Conflicts and confrontations that occurred earlier in the day, however, can also intrude on attempts at nighttime decompression through ruminating thoughts and lingering resentments (Troxel, 2010).

Understandably, *physical* aggression within couple relationships also has deleterious

effects on both partner's sleep (El-Sheikh et al., 2015), and perpetration of aggression by one

partner not only negatively affects the other's mental health and sleep, it is injurious to their own

(El-Sheikh et al., 2013). Additionally, the negative consequences of couple conflict on sleep can

have a reciprocal effect, as sleep problems can be predictive of increased relationship conflict

over time (Rauer & El-Sheikh, 2012)—suggesting that couple conflict and poor sleep reinforce

each other cyclically.

Even when interactions between couples do not necessarily escalate to high-conflict or

hyper-arousing situations, they can still have important ripple effects into couples' sleep. Day-to-

day interactions between partners have an amplifying effect on mood states that influence sleep

(Song et al., 2015). Whereas negative mood is associated with poorer quality sleep (an effect

augmented by less supportive actions from one's partner), positive mood is associated with more

refreshing sleep, an outcome strengthened by empathic actions from one's partner (Song et al.,

2015). Attachment style—secure, ambivalent, or anxious—which can be an indicator of

relationship dynamics, may also play a role in how interactions with a partner are perceived,

indirectly affecting how couple dynamics impact sleep (Hicks & Diamond, 2011). While greater

quarreling between couples affects their sleep regardless of attachment style, anxiously attached

individuals experience the greatest sleep disturbance post-conflict (Carmichael & Reis, 2005;

Hicks & Diamond, 2011). This is consistent with research on the precipitating influence of

anxiety and hyper-arousal on sleep disturbance (Goldstein et al., 2013; Palmer & Alfano, 2020).

It is clear that the association between couple relationships and sleep outcomes is

bidirectional. Further, the connection between the two seems to be more prominent than between

sleep and any other social relationship. It is consequently important to continuously consider

how intimate partners and sleep affect one another in the pursuit of health, well-being, and overall quality of life.

Couples, Sleep, and Marriage Therapy

Therapeutic Alliance

Understanding the significance of sleep on physical, mental, and relational wellbeing has important implications for couples in therapy. When accounting for all that may impact therapeutic outcomes—which often includes working towards gains in physical, mental and relational health—considering sleep is imperative. An equally important aspect to consider is what influences the environment of the *therapy room* to promote desired change in clients' lives. Common factors research (Sprenkle & Blow, 2004) points this discussion in a noteworthy direction.

Rather than looking at which therapeutic *techniques or models* are best for creating change, common factors research examines elements of therapy that are efficacious regardless of the theoretical lens. From the literature emerge themes constituting the "common factors" across therapeutic frameworks, which include (but are not limited to): *client and extra-therapeutic factors* (e.g., client motivation, social and economic support, life circumstances, and, notably, lifestyle factors, such as sleep), *therapist and client belief in the treatment approach*, *therapist factors* (e.g., skills, characteristics, personality), and the *strength of the relationship between the client and the therapist* (Hubble et al., 2010). Of these common factors, "clinicians of different orientations [agree]: The therapeutic relationship is the cornerstone" (Norcress, 2010, p. 114). A component of the therapeutic relationship, the therapy *alliance* (or collaborative partnership of client and therapist to achieve therapy goals), is one of the best predictors of outcome in therapy (Fluckiger et al., 2018; Horvath & Symonds, 1991; Hubble et al., 2010; Martin et al., 2000).

Indeed, the degree of change in therapy attributable to the alliance can be as much as five to seven times more than any particular therapy model (Horvath & Symonds, 1991; Hubble et al., 2010; Martin et al., 2000; Wampold, 2001).

Development of the alliance is a two-way relational street and is shaped by the foundational elements of goal consensus, collaboration, positive regard, and affective bond between therapist and client (Martin et al., 2000; Norcress, 2010). Therapists contribute greatly to a strong working alliance through genuine integration of personality, responsiveness to ruptures in the therapeutic relationship, appropriate self-disclosure, and management of countertransference (or reactions of unresolved personal issues within the therapist related to subjects discussed in therapy) (Norcross, 2010). Though therapists' and clients' perceptions of their alliance can (and often do) differ (Bachelor, 2011), clients' perspectives have consistently proven to be better predictors of clinical outcomes than therapists' (Horvath & Bedi, 2002; Fluckiger et al., 2018).

Couples Therapy Alliance

Building an alliance between client and therapist in individual therapy is one thing; developing a strong working alliance between *couple* clients and their therapist is another. The addition of a third party in the therapy room presents a new dynamic, demanding a therapist's ability to balance the needs of *both* partners and get all parties on the same page working towards their goals—no small task, especially if one partner is less motivated to "show up" in therapy than the other. This new dynamic also introduces "complexity into the relation between alliance and outcome" (Quinn et al., 1997, p. 429), which is important to account for when considering how alliance influences the course of couples' therapy. Additionally, the dyadic nature of

couples therapy inevitably means one partner's experience in therapy will influence the other's, whether for better or worse.

Symonds and Horvath (2004) found that when couples agree on the strength of their alliance with the therapist, the correlation between alliance and outcome was markedly stronger, even more so when the strength of both partners' alliances increased across sessions (see also Anker et al., 2010). Interestingly, the correlation was also stronger when male partners had a better alliance with the therapist than the females (Symonds & Horvath, 2004; see also Anker et al., 2010), though Quinn et al. (1997) found the opposite; in their sample, the association between alliance and outcome was stronger for females than males. Regardless of which partner's alliance to the therapist is more correlated with therapy outcome, female partners tend to form a stronger collaborative relationship with the therapist more often than male partners (Werner-Wilson et al., 2003), which tends to lead to more positive therapy outcomes (e.g., couples' therapy goals met and sustained post-treatment; Quinn et al., 1997). Even so, it goes without saying that therapy is most effective when *both* partners' therapeutic alliance is strong, each favoring the therapist and the progress of treatment (Friedlander et al., 2018; Odell et al., 2005).

Highlighting the dyadic influence of partners in therapy, Quinn et al. (1997) found the most successful therapy occurred not only when the females reported stronger alliances than the males, but when the females *perceived* the males worked well (i.e., had a good alliance) with the therapist (even if the male did not report as strong of an alliance as the female perceived). This undergirds the idea that partners care about how the other is responding to and engaging with treatment; the degree of one's partner's responsiveness and benefit from therapy can influence one's own therapeutic experience. Importantly, the nature of the ongoing relationship and

loyalty, or *allegiance*, between partners constitutes a unique aspect of couples' therapy and may influence the correlation between alliance and outcome (Symonds & Horvath, 2004). As Symonds and Horvath (2004) wisely ask: "If one partner forms an alliance with the therapist, does that appear to the other partner as a betrayal of allegiance?" and if so, "what happens to the outcome of therapy?" (p. 453). Irrespective of the complexities and nuances of couples' therapy, alliance plays a major role in its outcomes in clients' lives, and the relationships between all parties in the room influence the progress towards therapeutic ends.

Sleep and Alliance Interaction

As previously discussed, sleep affects physical, mental, and emotional wellbeing in ways that trickle into interpersonal functioning. This means that sleep not only helps explain some of the interactions between partners who come to therapy, it can also influence the building of the alliance in the therapeutic relationship. How clients present in therapy and are emotionally and mentally prepared to do important intra- and interpersonal work, which is naturally impacted by how well-rested they are, will affect their ability to work well with the therapist, accept feedback, and work towards meaningful change.

Psychotherapy as a treatment demands engagement (Wampold, 2007) and collaborative, purposeful work between client and therapist (Hatcher & Barends, 2006) to successfully build a working alliance and achieve therapeutic goals. Sleep deprivation impairs both motivation levels (Engle-Friedman, 2014) and the ability to collaborate effectively (Harrison & Horne, 2000), which can in turn damage how a client responds to and works with their therapist. Additionally, when clients' expectations for how they believe therapy will go are not met, they can be less inclined to engage with and build a strong alliance with their therapist (Odell et al., 2005). Given

that sleep deprivation stunts one's ability to adapt to unexpected circumstances (Harrison & Horne, 2000), poor sleep may deepen the negative effects of unmet expectations on the alliance.

Often, the therapeutic alliance is positively influenced when therapists advise and challenge clients (Werner-Wilson et al., 2003). However, a client who has not been sleeping well may have a compromised capacity for receiving feedback productively, as sleep deprivation leads to more emotional reactivity to potentially negative stimuli (Yoo et al., 2007), worse mood states (Tempesta et al., 2010), and diminished likelihood of accepting responsibility for frustrating circumstances or offering restitution when needed (Kahn-Greene et al., 2006). These responses are, of course, "antithetical to harmonious interpersonal relations" (Kahn-Greene et al., 2006, p. 1440) and would inhibit the development of a strong working relationship with the therapist, ultimately hindering desired outcomes.

Finally, lack of sleep may influence alliance in how it can distort one's ability to accurately perceive emotion and affect in others. A client running on poor or minimal sleep may be more inclined to interpret facials, gestures, and actions made by the therapist as more negative than they actually are (van her Helm et al., 2009), which can create a feeling of mistrust and misunderstanding in the therapy room. Because the affective bond is sometimes considered one of the core components of a good alliance (Martin et al., 2000), the misinterpretations of affect facilitated, at least in part, by sleep loss can take a toll on how well the client and therapist connect to work effectively in therapy.

Alliance as a Moderator Between Sleep and Therapeutic Outcomes

When examining the association between sleep (an extra-therapeutic factor—one of the core "common factors" of therapy) and couple dynamics and outcomes, couples in therapy may have unique benefits compared to those who are not. The added element of help from a therapist

may attenuate the negative impact of inadequate sleep on relationship patterns and interactions, like arguing style and effectiveness. In other words, a strong therapeutic alliance may moderate the relationship between sleep and couple communication—highlighting the power of effective therapy to buffer the impact of poorer lifestyle factors on couple relationships.

The power of couples' therapy comes as partners develop healthy communication and interaction skills that not only improve their relationship quality but also other aspects of their lives, including their sleep (see Troxel et al., 2017). For example, use of *negotiation strategies* (characterized by respect and compromise) within couple conflict, particularly if instigated by husbands, has been shown to lead to better sleep over time—specifically, to better sleep efficiency in husbands and longer sleep duration in both husbands and wives (El-Sheikh et al., 2015). Methods such as *intimacy-building emotional expression* and *cognitive reappraisal* (i.e., reframing, problem-solving, and perspective-taking) utilized between sleep-deprived couples has shown to produce less physiological inflammation within both partners after conflict than those sleep-deprived couples lacking in like emotional regulation capacity (Wilson et al., 2017). *Mindfulness techniques* that bring awareness to thoughts, feelings, sensations, and patterns within and between individuals can attenuate the harmful physiological arousal of couple conflict and stress that interfere with good sleep (Black et al., 2014). All these skills—*negotiation, compromise, emotional expression, cognitive reappraisal, mindfulness*, and more—can be and often are taught and practiced within couples' therapy, facilitated by the therapist, as partners learn to iron out their conflicts and differences. Because therapeutic alliance plays such a salient role in therapy outcomes, the realization of these skills, and ultimately their long-term benefits on body, mind, and relationships, will likely depend on the strength of the alliance between the couple and the therapist.

The Present Study

As MFTs work to carry out the healthiest therapeutic ends for clients (i.e., enduring physical, mental, and relational well-being), couples' therapy can be, as El Sheikh et al. (2013) advocate, one of the "prevention efforts aimed at altering interpersonal conflict tactics" (p. 1064) and "promoting the use of negotiation strategies during conflict" to "optimize sleep" and other health-related outcomes for couples (El-Sheikh et al., 2015, p. 14). Additionally, further exploring how sleep impacts the course and success of therapeutic aims (e.g., effective arguing style between couples) can shed light on how much therapists may need to address sleep habits among clients to augment the lasting effects of skills learned in therapy (see Novak & Gillis, 2021). Examining the dyadic nature of both sleep and therapy alliance also helps account for the nuances of couple relationships in shaping therapy outcomes.

Among the many factors that can play into therapy being an efficacious and beneficial resource for couples' holistic health, clients' sleep and perceptions of therapeutic alliance may be two of the most important to consider. Better understanding how all the client factors and the therapist factors interact to facilitate desired therapeutic change is significant for MFTs to see the full picture of their influence in the therapy room and may have implications for the way they work with clients. For these reasons, the proposed study seeks to examine if and how therapeutic alliance moderates the relationship between each partner's sleep and degree of ineffective arguing through an actor-partner moderation model among couples in couples' therapy.

The theoretical framework for the proposed study accounts for a few of the core factors influencing relationship outcomes for couples in couples' therapy: sleep, therapeutic alliance, and dyadic influence. Sleep can influence couple dynamics (Gordon & Chen, 2018; Troxel et al., 2007; Wilson et al., 2017) and other relationships (Haack & Mullington, 2005; Kahn-Greene et

al., 2006), such as the therapeutic alliance, and can be an extra-therapeutic factor influencing the therapy process (Hubble et al., 2010). The influence of sleep on therapeutic alliance, in addition to the couple relationship in couples' therapy, is important to assess because therapeutic alliance impacts the efficacy of treatment on facilitating desired therapy outcomes (e.g., healthier couple communication; Horvath & Symonds, 1991; Martin et al., 2000). Finally, partners' sleep (Chen, 2018; Troxel, 2010) and therapy experiences (Quinn et al., 1997; Symonds & Horvath, 2004) are dyadic in nature and partners' influences on each other should be accounted for when examining relationship outcomes, like the ways couples argue. Given these understandings, my research questions are three-fold:

1. Is one's own relationship between sleep and ineffective arguing moderated by one's own therapy alliance (actor-actor-actor; e.g., husband's sleep → husband's ineffective arguing, conditional upon his level of alliance; wife's sleep → wife's ineffective arguing, conditional upon her level of alliance)?

2. Is one's own relationship between one's sleep and ineffective arguing moderated by one's partner's therapy alliance (actor-partner-actor; e.g., husband's sleep → husband's ineffective arguing; conditional upon wife's level of alliance, wife's sleep → wife's ineffective arguing, conditional upon husband's level of alliance)?

3. Is the relationship between one's sleep and one's partner's ineffective arguing moderated by one's own therapy alliance (actor-actor-partner; e.g., husband's sleep → wife's ineffective arguing; conditional upon husband's level of alliance, wife's sleep → husband's ineffective arguing, conditional upon wife's level of alliance)?

Chapter 3: Methods

Participants

All participants in the study were couples ($N = 56$) who came in for couples' therapy at the Auburn University Marriage and Family Therapy Clinic between 2016 and 2019. The participants ranged in age from 19 to 65 (husband $M = 34.6$, $SD = 13.2$, $R = 19 – 69$; wife $M = 32.8$, $SD = 11.4$, $R = 19 – 65$), and the couples had been together for anywhere from six months to 28 and a half years (M = 70.8 (months), SD = 71, R = 6 – 343). Among the husbands, 92.9% were White, 5.4% African American, and 1.8% Asian. The wives were 91.1% White, 3.6% African American, 1.8% Hispanic, 1.8% Asian, and 1.7% Other. Regarding education, a little more than a third of the husbands had a bachelor's degree (37.5 %), while the remainder earned a graduate or professional degree (17.9%), GED/high school diploma (26.8%), associate's degree (12.4%), or vocational/technical school certificate (3.6%), with a small portion completing junior high school or less (1.8%). Almost half the wives had a bachelor's degree (45.5%), and the others had a graduate/professional degree (27.3%), associate's degree (12.7%), GED/high school diploma (12.7%), or vocational/technical school certificate (1.8%). About one-fifth of the couples made over $100,000 total income per year (19.6%), with a fairly even spread of income across the other participants: under $5,500 (8.9%), $5,501 to $11,999 (1.8%), $12,000 to $15,999 (1.8%), $16,000 to $19,999 (5.4%), $20,000 to $24,999 (7.1%), $25,000 to $29,999 (10.7%), $30,000 to $34,999 (1.8%), $35,000 to $39,999 (3.6%), $40,000 to $49,999 (7.1%), $60,000 to $69,999 (8.9%), $70,000 to $79,999 (7.1%), $80,000 to $89,999 (8.9%), and $90,000 to $99,999 (7.1%). Most of the couples had no kids at home (71.4%), while 14.3% had one child, 10.7% had two children, and 3.6% had three children at home. See table 1 for full demographic information.

Measures

Medical Outcomes Study Sleep Scale

The Medical Outcomes Sleep Scale (MOS-S) is a health status measure that assesses different dimensions of sleep over the previous four weeks (Smith & Wegener, 2003). The current study used a 6-item Likert-scale short form of the original scale that measures initiation, maintenance, respiratory problems, adequacy, and somnolence. The Likert-scale is five points (1 = *All of the Time*, 5 = *None of the Time*), and example items include, "How often during the past 4 weeks did you get enough sleep to feel rested upon waking in the morning?", "Have trouble falling asleep?", and "Get the amount of sleep you needed?" The 6 items were summed together for a composite score, with higher scores indicating greater severity of sleep disturbance.

Ineffective Arguing Inventory

The Ineffective Arguing Inventory (IAI) was used to assess relationship outcomes in the current study. The IAI measures each partner's perception of how they handle arguments as a couple and is an 8-item self-report measure on a 5-point Likert scale (1 = *Strongly Disagree*, 5 = *Strongly Agree*) (Kurdek, 1994). Example questions include, "By the end of an argument, each of us has been given a fair hearing," "Our arguments are left hanging and unresolved," and "We need to improve the way we settle our differences." Scores are summed together for a composite score, with higher scores indicating more ineffective arguing.

The Couples Therapy Alliance Scale

The Couples Therapy Alliance Scale (CTAS) measures two theoretical dimensions of the therapeutic alliance—*Content* and *Interpersonal System* (Pinsof & Catherall, 1986). The *Content* dimension assesses the "what" of the alliance and includes the categories of *Tasks*, *Bonds* and *Goals*, taken from Bordin's (1979) conceptualization of the working alliance. The *Interpersonal*

System dimension accounts for the "who" of the alliance and is organized into three categories, including *Self-Therapist*, *Other-Therapist*, and *Group-Therapist*. This allows each partner to measure their personal alliance with the therapist, their perception of the partner's alliance with the therapist, and their perception of their couple alliance with the therapist. In the current study, a revised and shortened 13-item version of the CTAS was used. Items were measured on a 7-point Likert-scale (1 = *Completely Disagree*, 4 = *Neutral*, 7 = *Completely Agree*) and included questions such as, "The therapist understands my goals in this therapy" (*Goals*), "The therapist cares about the relationship between my partner and me" (*Bonds*), and "My partner and the therapist agree about the way the therapy is being conducted" (*Tasks*). The 13 items were summed to get a composite score, and higher scores indicated more favorable perceptions of the therapeutic alliance (Heatherington & Friedlander, 1990).

Covariates

The covariates added to the model will include couple satisfaction (16-item Couple Satisfaction Index [Funk & Rogge, 2007]) and anxiety (Generalized Anxiety Disorder-7 [Spitzer et al., 2006])—which have both been shown to relate to couple conflict (Brassard et al., 2009). Depression affects emotion regulation and thus the way partners relate to and interact with one another (Holley et al., 2017) in conflict, and power between partners affects the dynamics between them and how much room there is the in the relationship to mutually influence each other (Loving et al., 2004). For these reasons, depression (Major Depression Inventory [MDI; Olsen et al., 2003]) and power (Relationship Power Scale [RPS; Miller et al., 2019]) will be included as covariates as well. Additionally, number of children, level of education, age, relationship length and household income will be accounted for, as they can also influence conflict and arguing in marriage (Britt & Huston, 2012; Glass & Wright, 1997).

Procedure

Quantitative data for this study was collected via self-report paper assessments given to the clients when they came in for therapy at the Auburn University Marriage and Family Therapy clinic. Participants were asked to fill out an initial intake survey, which gathered data on the MOS-S and IAI measures for both partners. These measures were then collected again every four sessions (i.e., at the fourth, eighth, and twelfth sessions) in a follow-up assessment completed before session. Therapeutic alliance data was collected immediately after each session through another self-report assessment clients were asked to fill out before leaving therapy. The paperwork of the data collected in the clinic was then given to undergraduate interns who input it into an SPSS database.

Data used for the current study was filtered down to the target population of only heterosexual couple cases whose paperwork were thoroughly completed across all sessions, including the intake paperwork and the follow-up and intersession before and after paperwork for sessions one, four, and eight. Starting with the couple intake cases from 2016 to 2020, I deleted all the same-sex couple cases (because there were so few), cases that did not include intake data for both partners, were duplicates, and were missing large chunks of data and/or were not in the follow-up data. Similarly, in the follow-up data I deleted all the cases that were not in the intake data, did not include data for both partners, were missing data past session four, included same-sex partners and/or were duplicates. I also only kept the follow-up data through session eight. I reviewed both the filtered intake and follow-up data sets to ensure they had all the same cases, then filtered the intersession before and after datasets, keeping all the same cases as in the intake and follow-up data sets and all the data up through session eight. The final sample included 56 couples left for analysis.

Analytic Strategy

Once all the data was filtered, I combined it into one dataset and created composite scores of all the main variables (i.e., MOS-S, CTAS, and IAI) and covariates (i.e., CSI, GAD, MDI, and RPS) for both husband and wife at each time point for the analysis. I then took each variable and averaged all three scores (from times one, four, and eight) for a combined composite score of each variable across the whole period studied (see Table 2 for means and Cronbach reliabilities at each time point).

Next, I ran the descriptive statistics for the main variables and all covariates. I assessed for data normality. I mean-centered the predictor (i.e., MOS-S) and moderator (i.e., CTAS) variables for both husband and wife. I then conducted a Missing Values Analysis to determine if the data were missing at random.

I ran a 3-stage hierarchical multiple regression for both partners to answer the study's research questions. In Model 1 of the hierarchical regression, I regressed MOS-S onto IAI score. In Model 2, I added covariates to the regression equation. In Model 3, I created an interaction term between MOS-S and CTAS scores and then added it to the model to test for a moderation effect. To test for actor-partner effects between the variables, I ran six different regressions. In the first regression, I used all the wife's predictor, moderator, and outcome variables. In the second, I did the same with all the husband's variables. For the third regression, I used the wife's MOS-S (predictor), husband's CTAS (moderator), and wife's IAI (outcome). For the fourth, I used the husband's MOS-S (predictor), wife's CTAS (moderator), and wife's IAI (outcome). For the fifth, I used the wife's MOS-S (predictor), wife's CTAS (moderator), and husband's IAI (outcome). For the sixth, I used the husband's MOS-S (predictor), husband's CTAS (moderator),

and wife's IAI (outcome). For each regression, I used all the covariate variables for husband and wife.

Chapter 4: Results

Preliminary Analyses

Utilizing the SPSS program's (version 21.0) Missing Value Analysis 7.5, an expectation maximization (EM) technique was used with inferences based on the likelihood under the normal distribution (Hill, 1997). Little's MCAR test yielded a non-significant chi-square, indicating that the data were missing completely at random (MCAR) [$\chi2(33) = 29.479$, p = .643]. A total of 0.510% of all values were missing, with a range of 0.00% to 3.6% (husband's therapy alliance).

Preliminary analysis using bivariate correlations were examined (see Table 3). The correlation revealed several notable findings. First, neither the husband's nor wife's sleep scores were significantly correlated with their ineffective arguing scores. However, husband sleep was significantly positively correlated with his alliance ($r = .275$, $p < .05$), and his alliance was significantly positively correlated with wife alliance ($r = .604$, $p < .01$) and significantly negatively correlated with his ineffective arguing (r = -.447, p < .01) and wife ineffective arguing ($r = -.299$, $p < .05$). While wife alliance and sleep were not correlated, wife alliance and ineffective arguing were, with a significant negative correlation for both actor ($r = -.346$, $p < .05$) and partner ($r = -.450$, $p < .01$). Husband and wife ineffective arguing were also significantly positively correlated ($r = .713$, $p < .01$).

The data met all assumptions of multiple regression. There was independence of residuals as evidenced by a Durbin-Watson statistic of 2.277. The dependent and independent variables displayed an approximately linear relationship when plotted as studentized residuals versus unstandardized predicted values. Data were checked for multicollinearity, with no independent variables displaying strong correlations and tolerance statistics ranging from .537-.978. Visual inspection of the residual scatterplot also revealed that the assumption of homoscedasticity has

been met. The studentized residuals were normally distributed, as assessed by Shapiro-Wilk's test ($p > .05$). Nonetheless, the predictor (i.e., Sleep) and moderator (i.e., Therapy alliance) variables were centered for the regression analyses.

Hypothesis Testing using Hierarchical Multiple Regression

A 3-stage hierarchical multiple regression with ineffective arguing score as the dependent variable was used to test the research questions. See Table 4 for a summary of the results. Actor-actor-actor effects were tested first, then actor-partner-actor, and finally actor-actor-partner. For models 1 and 2, sleep and alliance were regressed onto ineffective arguing (model 1) while controlling for couple satisfaction, anxiety, depression, relationship power, relationship length, household income, number of children, education level, and age (model 2). In model 3, an interaction term between sleep and alliance was created to test for a moderation effect.

For research question 1 (actor-actor-actor models), results from the husband models revealed significant models (model 1: $F(2, 51) = 6.181$, $p = .004$, $R^2 = .195$; model 2: $F(17, 36) = 8.568$, $p < .001$, $R^2 = .802$; model 3: $F(18, 35) = 7.957$, $p <.001$, $R^2 = .804$), however the interaction term was not significant ($\beta = -.051$, $p = .576$). The wife models revealed that the first model was not significant but subsequent models were (model 1: $F(2, 51) = .212$, $p = .810$, $R^2 = .008$; model 2: $F(17, 36) = 6.185$, $p < .001$, $R^2 = .745$; model 3: $F(18, 35) = 6.234$, $p <.001$, $R^2 = .762$), along with a nonsignificant interaction term ($\beta = .205$, $p =.120$).

For research question 2 (actor-partner-actor models), results from the husband models revealed that the first model was not significant but subsequent models were (model 1: $F(2, 51) = 1.829$, $p = .171$, $R^2 = .067$; model 2: $F(17, 36) = 8.257$, $p < .001$, $R^2 = .809$; model 3: $F(18, 35) = 8.999$, $p <.001$, $R^2 = .834$). There was a significant interaction term ($\beta = .190$, $p =.031$), but simple slopes analyses revealed that the slopes were not statistically different from zero, and this

was confirmed with the Johnson-Neyman technique revealing no regions of significance, meaning that regions crossed the zero threshold. The wife models revealed that the first model was not significant but subsequent models were (model 1: $F(2, 51) = 1.868$, $p = .165$, $R^2 = .070$; model 2: $F(17, 36) = 7.340$, $p < .001$, $R^2 = .795$; model 3: $F(18, 35) = 6.811$, $p < .001$, $R^2 = .797$), along with a nonsignificant interaction term ($\beta = .045$, $p = .625$).

For research question 3 (actor-actor-partner models), results from the husband models revealed that the first model was not significant but subsequent models were (model 1: $F(2, 51) = 1.889$, $p = .162$, $R^2 = .070$; model 2: $F(17, 36) = 7.199$, $p < .001$, $R^2 = .792$; model 3: $F(18, 35) = 6.785$, $p < .001$, $R^2 = .796$), along with a nonsignificant interaction term ($\beta = -.077$, $p = .425$). Results from wife models were all significant. In Model 1, the regression of wife sleep onto husband ineffective arguing was not statistically significant [$F(2, 51) = .445$, $p = .643$, $R^2 = .017$]. In Model 2, the covariates were added, leading to a statistically significant R-square change of $\Delta R^2 = .787$, suggesting that addition of the covariates accounted for 78.7% of the variation in husband ineffective arguing. The regression equation was also statistically significant for Model 2 [$F(16, 35) = 7.979$, $p = .000$, $R^2 = .804$]. An interaction term of wife sleep and wife alliance was added to Model 3, which yielded a statistically significant equation [$F(1, 34) = 8.927$, $p = .000$, $R^2 = .833$] and an R-square change of $\Delta R^2 = .029$. Thus, 2.9% of the variation in husband ineffective arguing can be attributed to the addition of the interaction term. The interaction between wife sleep and wife alliance on husband alliance was statistically significant ($\beta = .271$, $p < .05$).

Probing Significant Interaction Effects

In order to probe for significant interaction effects, I conducted post hoc regressions to test the simple slopes of the conditional effects of wife sleep on husband ineffective arguing at

relatively low (−1 SD below the mean), moderate (mean), and high (+1 SD above the mean) levels of wife therapeutic alliance (Holmbeck, 2002). Results are plotted in Figure 1. Wife sleep was negatively associated with husband ineffective arguing for participants reporting comparatively low levels of wife therapeutic alliance as evidenced by a significant slope (b = -.41, p = .030). In contrast, there were non-significant slopes for a negative association between wife sleep and husband ineffective arguing for women reporting relatively moderate wife therapeutic alliance (b = -.13, p = .281), and a positive association between wife sleep and husband ineffective arguing for women reporting relatively high therapeutic alliance (b = .14, p = .365).

The Johnson-Neyman (JN) technique (Bauer & Curran, 2005; Johnson & Neyman, 1936) was used to further probe the interaction and to identify regions of significance for the simple slopes of wife sleep on husband ineffective arguing across the range of wife therapeutic alliance. Table 5 presents the results from the JN analysis. As depicted in Figure 1, the effect of wife sleep on husband ineffective arguing was statistically significant at p < .05 when the raw mean score of wife therapeutic alliance was -.324 or below. The JN technique identified nine regions of significance, meaning that the effect of wife sleep on husband ineffective arguing was not significant when the raw mean score of wife therapeutic alliance was above -5.18. This finding suggests that within this sample, wife sleep had no significant effect on husband ineffective arguing except when mean wife therapeutic alliance was lesser than or equal to -.324. In the context of low wife therapeutic alliance scores (≤ -5.18), higher wife sleep scores are associated with lower husband ineffective arguing. Overall, the moderating effect was significant for 31.48% and insignificant for the remaining 68.519% of study participants.

Chapter 5: Discussion

The present thesis explored the dyadic associations between husband and wife sleep on husband and wife ineffective arguing with each partner's therapeutic alliance as a moderator in the associations within a sample of 56 couples in therapy. Six different regression models were performed to test the associations, including an actor-actor-actor, actor-partner-actor, and actor-actor-partner for both husband and wife. I also accounted for several important covariates—relationship satisfaction, relational power, depression and anxiety, and relevant demographics in the models. Of the six different models, one was significant: wife sleep on husband ineffective arguing, conditional on wife's therapeutic alliance. After probing for significant interaction effects, the significant associations in the model suggested that when wives get good sleep but have a low therapy alliance, husbands report less ineffective arguing, or better communication outcomes.

The connection between better wife sleep and less ineffective arguing perceived by husbands first underscores the role of sleep in intimate partner dynamics, validating the extensive research on the dyadic nature of sleep and its effects on relationship outcomes (Krause et al., 2017; Wilson et al., 2017; Yorgason et al., 2018). This finding also substantiates the fact that women's sleep may have more of an impact on relationship outcomes than men's, due to women's tendency to be more affected by the burden of sleep disturbance and its associated symptoms than men (Boccabella & Malouf, 2017). With the relationship between better wife sleep and less husband ineffective arguing conditional on poorer wife therapy alliance, particular nuance is added to the story. When wives experience better alliances in couples therapy than husbands (which is often the case; see Werner-Wilson et al., 2003), husbands may feel more emotionally threatened because they experience an imbalance in the therapeutic system and a

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greater struggle to get their needs met and heard in therapy. Men are typically the partners who resist going to therapy (Wendt & Shafer, 2016) and find it more difficult to articulate and express emotion anyways (Fischer & LaFrance, 2014), and the dynamic of wives forming a stronger bond with the therapist may further deepen their (the husband's) frustration. This tension might then bubble over into couple conflict outside of session, resulting in increased ineffective arguing and gridlock between partners. This is aligned with Quin et al.'s (2017) findings that poorer outcomes are associated with husbands who perceived a stronger alliance between the wife and therapist than the wife did between the husband and therapist.

Importantly, the couple therapy alliance measure assesses different dimensions of each partner's perception of the alliance (the *content* dimension, including tasks, bonds, and goals, and the *interpersonal* dimension, exploring self-therapist, other-therapist, and group-therapist relationships). In the current findings, it is unclear which dimensions of the couple therapy alliance the wife scores lowest on (i.e., if the overall score is brought lower because of specific qualms in the therapy dynamic related to content or interpersonal ties, or if all dimensions are scored low across the board). However, if the stance that husbands experience poorer alliances in therapy more often than wives holds true (Werner-Wilson et al., 2003), the link between low wife alliance scores and less ineffective arguing in husbands in the current study may be because wives who get good sleep can more accurately read emotional and affective cues (van der Helm et al., 2009), like their husband's poorer connections with the therapist, and then correctly rate that in the interpersonal dimension of the measure—bringing down the overall score. Wives may recognize and address the husband's poorer therapy experience outside of session, helping the husbands feel validated and understood, and ultimately improving the husband's ineffective arguing scores.

Interestingly, the five other regression models tested were not significant. Of note, the husband actor-partner-actor model had a significant interaction term, but the simple slopes were not significantly different from zero. Consequently, this finding could not be interpreted, but perhaps could have been with a greater sample size. As for the other models, there are several possible reasons why significant interactions were not found.

First, there were no significant correlations found between sleep and therapy alliance, other than for the husband's sleep and alliance, which may be because the relationship between the two variables occurs through other variables, such as mood (e.g., anxiety and depression). Bivariate correlations in the current study indicated a significant association ($p < .01$) between sleep and anxiety and depression for both husbands and wives (see table 3), further underscoring the relevance of these variables in the analysis. Because of sleep's powerful effect on mood (Haack & Mullington, 2005) and mood's salient role in relationship building, leaving mood out as a mediator between sleep and alliance may help explain the non-significance of the other regression models tested.

Another explanation for the non-significance of the models could be the lack of accounting for variables such as lifestyle factors that can provide energy and buffer against the negative impacts of poor sleep on individual and relational well-being, such as exercise (Huang et al., 2021), or caffeine. Timing of therapy could also provide more context to the relationships between sleep, therapy alliance, and arguing outcomes; the ripple effects of sleep on one's energy and stamina levels to "show up" in therapy may be felt more poignantly at certain times of the day than others. For example, if one comes to therapy in the morning, when strongly caffeinated and fresh for the day, the loss of energy from a bad night's sleep may not affect therapy outcomes as negatively as it could if sessions are held after work in the evening, when

one starts to "tank" from the day's exhaustion. Future research should assess and account for these factors, as they can have important bearing on these associations.

Perhaps the relationship between sleep and alliance on ineffective arguing was not significant in the remaining statistical models because the study did not account for more in-session factors, such as the therapy model used, the content discussed, and the direction taken by the therapist to effect change within the couple. Therapy sessions may not have been as helpful as husbands and wives would have liked, and couples may have then left sessions agreeing on the futility of their therapy experience or their dislike for the therapists' approach, thus feeling more aligned with one another—leading to a decrease in ineffective arguing (even when reporting poor sleep and poor therapy alliance, which are typically understood to *worsen* dyadic communication outcomes). The results of the study corroborate this, in part, in reflecting a decrease in therapy alliance, as well as ineffective arguing, across time for both partners (see table 2). Future research could test this hypothesis by including these in-session factors in analyses, gathering a more well-rounded picture of what occurs in therapy to influence couple relationship outcomes.

Implications for Therapy

The present paper has implications for couple's therapy. First, given the minimal moderating significance of therapeutic alliance on the relationship between sleep and ineffective arguing both individually and dyadically among the statistical models tested, therapeutic alliance may not have as positive of a buffering effect on that relationship as predicted. However, therapeutic alliance *was* significantly negatively correlated with ineffective arguing in *all* six regression models, confirming prior research on the undeniable influence of therapeutic alliance on therapy outcomes and, more specifically, *dyadic* outcomes in couples therapy (Anker et al.,

2010; Friedlander et al., 2018; Norcress, 2010). This points to the ever-present need for therapists to attend to the collaborative relationship between them and their clients.

With the one significant regression model connecting better wife sleep with less husband ineffective arguing, conditional on lower wife therapy alliance, in the current study, there are more specific takeaways for therapists to consider. Given the moderating effect of lower wife therapy alliance, it appears important to note how the wife's relationship with the therapist affects the husband throughout the course of therapy. As previously suggested, one interpretation of the findings that husbands report better couple arguing outcomes when wives sleep well and have lower alliances is because (1) women feel the negative impact of sleep on daily functioning more than men (Boccabella & Malouf, 2017), so when the wife in particular feels well-rested, there is less strain on the couple dynamic, and (2) husbands tend to report poorer therapy alliances more often than women (Werner-Wilson et al., 2003), so when the wife reports a lower alliance as well, he may feel less threatened by the bond between wife and therapist and thus perceive less contentious arguing with his partner outside of session. In other words, the husband may feel less of a "betrayal of allegiance" to the couple relationship from his wife in therapy when she reports a weaker therapy alliance, leading to his report of better arguing outcomes (Symonds & Horvath, 2004, p. 453).

The significance of these results should not necessarily be taken to mean that improved husband report of couple communication will come only on conditions of good wife sleep and lower wife therapy alliance. Rather, they may suggest the value of therapists providing psychoeducation about sleep and accounting for its impact on therapy outcomes (Novak & Gillis, 2021), particularly when it comes to the wife's sleep, as well as the importance of monitoring both verbal and written reports of alliance from each partner—but especially the man—in

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couples therapy, ensuring both wife's *and* husband's needs are acknowledged and addressed. In addition to assessing for and promoting healthy lifestyle patterns, such as good sleep, with clients, therapists should facilitate open dialogue about how to build and maintain a strong join with both partners throughout treatment so that any imbalances in the couple alliance system do not disrupt couple therapeutic outcomes.

Limitations and Directions for Future Research

There were a few limitations to the current study. First, the sample was non-diverse, gathering participants from the same rural Alabama, geographic area, with over 90% of both husbands and wives identifying as White. The couples represented only heterosexual couples as well, limiting how generalizable the results are for implications in couples' therapy among non-straight couples. Additionally, the number of participants who qualified for the study was minimal, resulting in a small sample size—further limiting the generalizability of the results.

There were also limitations in the measures and methodology involved in the data collection. The MOS-S is an older measure that the AU MFT Clinic has used to assess for sleep for a few years; however, had measures been selected for the sole purpose of data collection with the current study, a stronger and newer measure, such as the PROMIS-sleep disturbance-short form (Yu et al., 2012) could have been used instead. Importantly, all measures involved were subjective, collected via self-report, which can compromise data validity. Utilizing more objective measures, such as polysomnography for sleep, would help increase the accuracy of the variables and strengthen the analyses. Because the data used for the study was pre-collected, the measures used to test the research questions were limited.

The way the data was collected and input into the SPSS system also left room for error in the accuracy of each client's scores. All data in this study was gathered via paper assessments

and then input into SPSS files by undergraduate intern students. This process was time-consuming and taxing, creating potential for erroneous data input due to intern fatigue.

Regarding methodology, collapsing the three time points (sessions one, four, and eight) into one score across time for all the variables used was also a weakness of the study. This was done for simplicity in the analysis, but it simultaneously limited the full picture of the relationship between the variables overtime. Similarly, couples' scores were aggregated and not nested. Future research could account for time and couple-level scores using multi-level modeling to test the research questions and assess for the moderating effect of therapeutic alliance on the relationship between sleep and ineffective arguing in couples.

Conclusion

The purpose of this study was to further explore how different individual, dyadic, and therapy factors work together to effect therapeutic change for partners in couples' therapy. With the hope of parsing out more of the nuance in these biopsychosocial-spiritual interactions, I narrowed down the factors to specifically assess how couple therapy alliance may moderate the relationship between sleep and ineffective arguing in couples in therapy. In doing so, I sought to clarify the connections between these factors and ultimately enhance therapists' understanding of how and where to effectively intervene in couples' treatment.

The results of the study suggest that therapy alliance may not attenuate the relationship between sleep and couple arguing outcomes as much as predicted, but it does clearly still have significant bearing on arguing outcomes for both husbands and wives. Sleep also may not have as significant of a direct influence on the therapeutic relationship or therapy outcomes as previously thought but may indirectly affect them through its impact on anxiety and depression (i.e., mood). With the significance of the wife actor-actor-partner model, it can also be concluded

that better wife sleep influences husband arguing outcomes when her alliance is lower—pointing to the need to pay particular attention to the wife's sleep and the balance in therapeutic alliance between husband and wife in couples' therapy.

Taken together, it is clear there are more variables, both within and without session, to account for when examining the biopsychosocial-spiritual variables that influence outcomes in couples' therapy. Future research can build off the current study by expanding and diversifying the sample size, as well as strengthening variable assessment through looking at other individual, couple, and session factors across time. Continuing to explore these associations will strengthen the field of marriage and family therapy and better equip MFTs to assess for and influence the most salient variables influencing their clients' desired therapy outcomes.

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Table 1

Demographic Information for the Sample (N= 56 couples)

Individual Variables	Husbands (*N*= 56)	Wives (*N*= 56)
Race		
White	92.9%	91.1%
African American	5.4%	3.6%
Hispanic	0.0%	1.8%
Asian	1.8%	1.8%
Other	0.0%	1.8%
Age (*M*)		
19 – 25	32.1%	34.5%
26 – 32	19.8%	25.4%
33 – 39	17.9%	14.4%
40 – 46	10.8%	10.8%
47 – 53	9%	5.4%
54 – 60	5.4%	5.4%
61 +	5.4%	3.6%
Education		
Junior High School or less	1.8%	0.0%
GED/High School	26.8%	12.7%
Vocational/Technical School	3.6%	1.8%
Associate Degree/2 years	12.4%	12.7%

Bachelor Degree	37.5%	45.5%
Graduate/Professional Degree	17.9%	27.3%

Couple Level Variables

 # Children

0	71.4%
1	14.3%
2	10.7%
3	3.6%

Income

Under $5,500	8.9%
$5,501 to $11,999	1.8%
$12,000 to $15,999	1.8%
$16,000 to $19,999	5.4%
$20,000 to $24,999	7.1%
$25,000 to $29,999	10.7%
$30,000 to $34,999	1.8%
$35,000 to $39,999	3.6%
$40,000 to $49,999	7.1%
$60,000 to $69,999	8.9%
$70,000 to $79,999	7.1%
$80,000 to $89,999	8.9%
$90,000 to $99,999	7.1%
$100,000 or more	19.6%

Relationship Length

6-12 months	10.8%
13-24 months	12.6%
25-36 months	16.3%
37-48 months	12.6%
49-60 months	9%
61+ months	37.9%

Note: [a]Relationship Length calculated in months. [b]Education (1 = Junior High School or less, 2 = GED/High School, 3 = Vocational/Technical School, 4 = Associate Degree/2 years, 5 = Bachelor Degree, 6 = Graduate/Professional Degree) [c]Income (1 = Under $5,500, 2 = $5,501 to $11,999, 3 = $12,000 to $15,999, 4 = $16,000 to $19,999, 5 = $20,000 to $24,999, 6 = $25,000 to $29,999, 7 = $30,000 to $34,999, 8 = $35,000 to $39,999, 9 = $40,000 to $49,999, 10 = $50,000 to $59,999, 11 = $60,000 to $69,999, 12 = $70,000 to $79,999, 13 = $80,000 to $89,000, 14 = $90,000 to $99,999, 15 = $100,000 or more)

Table 2

Main Study Variables Means, SDs, and Reliabilities across time (N = 56)

Construct	Mean	SD	α
Husband Sleep T1	19.63	5.08	.821
Husband Sleep T4	19.73	4.92	.770
Husband Sleep T8	20.59	4.96	.818
Husband Therapeutic Alliance T1	23.31	7.21	.893
Husband Therapeutic Alliance T4	22.86	8.28	.973
Husband Therapeutic Alliance T8	20.57	7.94	.955
Husband IAI T1	23.31	7.21	.810
Husband IAI T4	22.86	8.29	.935
Husband IAI T8	20.57	7.94	.940
Wife Sleep T1	19.05	5.56	.811
Wife Sleep T4	19.73	5.38	.856
Wife Sleep T8	20.14	5.26	.777
Wife Therapeutic Alliance T1	25.61	8.88	.892
Wife Therapeutic Alliance T4	24.63	8.52	.910
Wife Therapeutic Alliance T8	22.11	7.89	.918
Wife IAI T1	25.61	8.88	.947
Wife IAI T4	24.63	8.52	.934
Wife IAI T8	22.11	7.89	.946

Table 3

Husband and Wife Reports of Sleep, Therapy Alliance, Ineffective Arguing, Covariate and Demographic Variables:

Correlations and Descriptives (N = 56)

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1. Husband sleep	--																				
2. Wife sleep	.253	--																			
3. Husband alliance	.275*	.043	--																		
4. Wife alliance	.039	-.134	.604**	--																	
5. Husband ineffective arguing	-.209	-.015	-.447**	-.450**	--																
6. Wife ineffective arguing	-.024	-.005	-.299*	-.346*	.713**	--															
7. Husband Relationship Satis.	.069	-.064	.441**	.527**	-.826**	-.619**	--														
8. Wife Relationship Satis.	.054	.095	.308*	.429**	-.722**	-.759**	.733**	--													

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#	Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
9.	Husband Anxiety	-.615**	-.076	-.471**	-.288*	.291*	.056	-.292*	-.204	--										
10.	Wife Anxiety	-.214	-.568**	-.005	.137	-.033	.019	.026	.990	.002	--									
11.	Husband depression	-.664**	-.057	-.406**	-.164	.392**	.042	-.377**	-.242	.833**	.015	--								
12.	Wife depression	-.286*	-.617**	-.129	-.063	.166	.144	-.170	-.162	.198	.788**	.146	--							
13.	Husband Rel. Power	-.263	-.069	-.487**	-.406**	.790**	.602**	-.731**	-.644**	.280*	.026	.402**	.160	--						
14.	Wife Rel. Power	-.078	-.158	-.400**	-.381**	.544**	.608**	-.464**	-.478**	.124	.170	.126	.227	.689**	--					
15.	Husband age	.011	-.021	-.447**	-.318*	.457**	.353*	-.437**	-.396**	.260	-.195	.195	-.091	.376**	.364**	--				
16.	Wife age	-.001	-.001	-.301*	-.269	.437**	.343*	-.421**	-.412**	.230	-.212	.166	-.054	.338*	.269*	.937**	--			
17.	Relationship Length[a]	.101	.074	.001	-.216	.312*	.197	-.398**	-.273*	.130	-.197	.059	-.001	.238	.186	.339*	.472**	--		
18.	Number of children	.119	-.083	.086	-.185	.141	.185	-.226	-.344**	-.085	-.033	-.145	.011	.109	.079	.255	.262	.221	--	
19.	Husband education[b]	.085	.101	-.128	-.142	.132	.027	-.147	-.058	.041	.030	.021	-.130	.124	-.049	.116	.072	.040	.017	--

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
20. Wife education	.208	.163	-.121	-.204	.194	.139	-.154	-.141	-.207	-.364**	-.109	-.306*	.111	.019	.174	.139	-.074	.055	.308*	--	
21. Combined income[c]	.070	.009	-.330*	-.448**	.547**	.391*	-.507**	-.492**	.122	-.127	.113	-.101	.425**	.399**	.669**	.649**	.394*	.323*	.198	.343*	--
_M_	19.9	19.6	79.9	81.7	22.3	24.1	50.6	46.8	8.1	9.5	17.3	17.1	38.6	37.1	34.6	32.8	70.8	.46	4.1	4.7	9.4
_SD_	4.3	4.4	9.1	15.3	6.8	5.1	16.2	16.2	5.1	4.7	9.8	8.6	12.8	14.4	13.2	11.4	71	.83	1.5	1.3	4.7
Range	11-29	9.7-29.3	53.5-91	63-91	9.7-36.7	10.7-38.7	18.7-78.3	12-77.3	0-19.7	1.7-22.3	2-37	3-41	12.3-78.7	16.3-115	19-69	19-65	6-343	0-3	1-6	2-6	1-15

p < .05. **p* < .01.

Table 4

Summary of Hierarchical Regression Analysis of Wife Actor-Actor-Partner (Research Question 3)

Variable	*B*	*SE*	β	*t*	*p*	R^2	ΔR^2	*F*
Model 1					.643	.017		.445
Constant	22.245	.944		23.566	.000			
Wife sleep	-.151	.975	-.022	-.155	.877			
Wife alliance	-.905	.959	-.133	-.944	.350			
Model 2					.000	.804	.787	7.98
Constant	10.744	12.522		.858	.397			
Wife sleep	.238	.809	.034	.295	.770			
Wife alliance	-1.278	.920	-.187	-1.390	.173			
Husband age	.018	.151	.034	.119	.906			
Wife age	.006	.166	.009	.034	.973			
Relationship length	-.002	.010	-.020	-.186	.853			
Number of children	-.616	.749	-.076	-.822	.417			
Husband education	-.067	.405	-.015	-.167	.869			
Wife education	.140	.556	.026	.252	.803			
Combined income	.156	.178	.109	.876	.387			
Husband power	.198	.086	.375	2.291	.028			
Wife power	.080	.076	.167	1.056	.298			
Husband depression	.018	.112	.026	.163	.872			
Wife depression	.212	.133	.270	1.598	.119			
Husband anxiety	-.047	.208	-.035	-.228	.821			
Wife anxiety	-.260	.219	-.182	-1.191	.242			
Husband Relationship Satis.	-.167	.066	-.393	-2.538	.016			
Wife Relationship Satis.	-.032	.054	-.075	-.594	.556			
Husband alliance	.072	.089	.091	.800	.429			
Model 3					.000	.833	.740	8.93
Constant	17.259	12.031		1.435	.161			
Husband sleep	.576	.771	.083	.747	.460			

Wife alliance	-.356	.941	-.052	-.378	.708
Husband age	.070	.143	.132	.487	.630
Wife age	-.047	.157	-.079	-.300	.766
Relationship length	-.001	.010	-.015	-.142	.888
Number of children	-.904	.711	-.111	-1.271	.213
Husband education	-.135	.380	-.031	-.356	.724
Wife education	.097	.521	.018	.186	.854
Combined income	.114	.167	.080	.679	.502
Husband power	.168	.082	.318	2.047	.048
Wife power	.110	.072	.229	1.526	.136
Husband depression	.018	.112	.026	.163	.872
Wife depression	.212	.133	.270	1.598	.119
Husband anxiety	-.047	.208	-.035	-.228	.821
Wife anxiety	-.260	.219	-.182	-1.191	.242
Husband Relationship Satis.	-.167	.066	-.393	-2.538	.016
Wife Relationship Satis.	-.032	.054	-.075	-.594	.556
Husband alliance	.030	.085	.037	.346	.732
Husband Partner Interaction	2.756	1.135	.271	2.429	.021

Table 5

Conditional Effect of Wife Sleep on Husband Ineffective Arguing at Values of Wife Therapeutic

Alliance Scores (N = 56)

Wife Therapeutic Alliance	Effect	*SE*	*t*	*p*	CILL	CIUL
-16.9414	-0.699	0.2903	-2.4082	0.0198	-1.2824	-0.1157
-15.5414	-0.6522	0.2719	-2.3988	0.0203	-1.1986	-0.1058
-14.1414	-0.6053	0.2538	-2.3851	0.021	-1.1154	-0.0953
-12.7414	-0.5585	0.2361	-2.3657	0.022	-1.0329	-0.0841
-11.3414	-0.5116	0.2188	-2.3384	0.0235	-0.9513	-0.0719
-9.9414	-0.4648	0.2021	-2.2998	0.0258	-0.8709	-0.0587
-8.5414	-0.4179	0.1861	-2.2456	0.0293	-0.7919	-0.0439
-7.1414	-0.3711	0.171	-2.1694	0.0349	-0.7148	-0.0273
-5.7414	-0.3242	0.1572	-2.0628	0.0444	-0.64	-0.0084
-5.1839	-0.3056	0.152	-2.0096	0.05	-0.6111	0
-4.3414	-0.2774	0.1448	-1.9151	0.0613	-0.5684	0.0137
-2.9414	-0.2305	0.1344	-1.7146	0.0927	-0.5007	0.0397
-1.5414	-0.1836	0.1265	-1.452	0.1529	-0.4378	0.0705
-0.1414	-0.1368	0.1214	-1.1264	0.2655	-0.3808	0.1073
1.2586	-0.0899	0.1197	-0.7514	0.456	-0.3305	0.1506
2.6586	-0.0431	0.1214	-0.355	0.7241	-0.287	0.2008
4.0586	0.0038	0.1263	0.0299	0.9763	-0.2501	0.2576
5.4586	0.0506	0.1342	0.3772	0.7076	-0.2191	0.3203
6.8586	0.0975	0.1445	0.6744	0.5032	-0.193	0.388
8.2586	0.1443	0.1568	0.9202	0.362	-0.1709	0.4595
9.6586	0.1912	0.1707	1.1201	0.2681	-0.1518	0.5342
11.0586	0.238	0.1857	1.2817	0.206	-0.1352	0.6113

Note. CILL = 95% confidence interval lower limit; CIUL = 95% confidence interval upper limit.

Figure 1

The Relationship between Wife Sleep and Husband Ineffective Arguing, with Wife Therapeutic Alliance as a Moderator (N = 56)
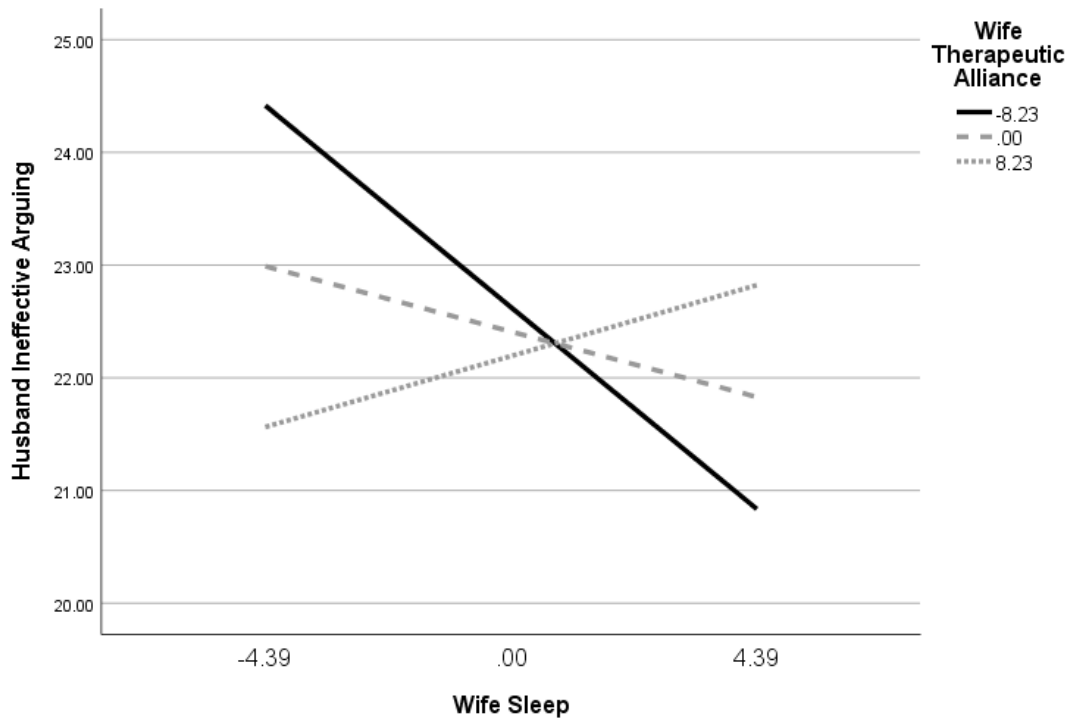
Note. Simple slopes of the conditional effects of Wife Sleep on Husband Ineffective Arguing with relatively low (−1 SD below the mean), moderate (mean), and high (+1 SD above the mean) levels of Wife Therapeutic Alliance. Only the Black solid line was significantly different than zero.

Appendix A

Medical Outcomes Study Sleep Scale

How often during the <u>past 4 weeks</u> did you…	*All of the Time*	*Most of the Time*	*Some of the Time*	*A Little of the Time*	*None of the Time*
Get enough sleep to feel rested upon waking in the morning?	1	2	3	4	5
Awaken short breath or with a headache?	1	2	3	4	5
Have trouble falling asleep?	1	2	3	4	5
Awaken during your sleep time and have trouble falling asleep?	1	2	3	4	5
Have trouble staying awake during the day?	1	2	3	4	5
Get the amount of sleep you needed?	1	2	3	4	5

Appendix B

Ineffective Arguing Inventory

Please indicate how much each argument description fits your relationship.

	Strongly Agree	Disagree	Undecided	Agree	Strongly Agree
By the end of an argument, each of us has been given a fair hearing	1	2	3	4	5
When we begin to fight or argue, I think, "Here we go again."	1	2	3	4	5
Overall, I'd say we're pretty good at solving our problems.	1	2	3	4	5
Our arguments are left hanging and unresolved	1	2	3	4	5
We go for days without settling our differences.	1	2	3	4	5
Our arguments seem to end in frustrating stalemates	1	2	3	4	5
We need to improve the way we settle our differences	1	2	3	4	5
Overall, our arguments are brief and quickly forgotten	1	2	3	4	5

Appendix C

Couples Therapy Alliance Scale

These statements refer to your thoughts about your therapist/therapy right NOW. We are interested in your FIRST impressions.

Completely Disagree............ Neutral............ Completely Agree

The therapist cares about me as a person	1	2	3	4	5	6	7
The therapist understands my goals in this therapy	1	2	3	4	5	6	7
The therapist and I are in agreement about the way the therapy is being conducted	1	2	3	4	5	6	7
The therapist does <u>not</u> understand the relationship between my partner and me	1	2	3	4	5	6	7
The therapist cares about the relationship between my partner and me	1	2	3	4	5	6	7
The therapist does <u>not</u> understand the goals that my partner and I have for ourselves as a couple or co-parents in this therapy	1	2	3	4	5	6	7
My partner feels accepted by the therapist	1	2	3	4	5	6	7
My partner and the therapist agree about the way the therapy is being conducted	1	2	3	4	5	6	7
The therapist understands my partner's goals for this therapy	1	2	3	4	5	6	7
My partner and I do <u>not</u> accept each other in this therapy	1	2	3	4	5	6	7
My partner and I are in agreement about our goals for this therapy	1	2	3	4	5	6	7
My partner and I are <u>not</u> pleased with the things that each of us does in this therapy	1	2	3	4	5	6	7
I am satisfied with this therapy	1	2	3	4	5	6	7