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# Sleep, BMI, and Work-Family Conflict: A Gender Comparison of U.S. Workers

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Sleep, Body Mass Index, and Work-Family Conflict:

A Gender Comparison of U.S. Workers

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A dissertation submitted to the faculty of  
Brigham Young University  
in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

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## ABSTRACT

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This study used structural equation modeling (SEM) to examine how sleep problems, Body Mass Index (BMI), and poverty were related to several work, personal, and family variables in a sample of married male and female workers in the United States. The data for this study came from the National Study of the Changing Workforce (NSCW) 2008. This large, nationally representative dataset provided a resource for examining potential gender differences in variables that have been linked to sleep problems and increases in BMI, as well as how each of these variables relate to several work, personal, and family life outcomes, including marital satisfaction, work-to-family conflict, family-to-work conflict, self-reported health (SRH), and life satisfaction. Poverty, work hours, family meals, and workplace flexibility were analyzed in the model to assess their connections to sleep problems and BMI, as well as the five outcome variables. The SEM analysis utilized a multi-group gender comparison by analyzing differences between two group models consisting of married male employees ( $n = 1105$ ) and married female employees ( $n = 1019$ ) in the U.S. The model was significantly different for married males than married females. Several of the individual pathways in the model also differed significantly by gender. Family dinners and workplace flexibility seem to provide a positive influence on health and satisfaction outcomes, and relate negatively to sleep problems and BMI, as well as both types of work and family conflict. Sleep problems also were related to increased work-family conflict, and decreased health and satisfaction outcomes. Also, BMI scores were negatively related to self-reported health and life satisfaction. Overall, this study showed that several work and family demands and resources are related to sleep problems and BMI. It also demonstrated that sleep problems and BMI were generally related to negative outcomes in work, personal, and family life.

Key words: sleep problems, body mass index, self-report health, work-family conflict, family meals, workplace flexibility

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## Contents

Introduction.....	1
Review of Literature .....	4
Theoretical Perspective .....	4
Sleep .....	6
Obesity and Poverty .....	10
Workplace Flexibility.....	12
Family Meals.....	13
Outcome Variables .....	14
Hypotheses .....	20
Method .....	22
Sample.....	22
Procedure.....	23
Measures.....	23
Predictors of Sleep Problems, BMI, Personal and Family Outcomes.....	24
Measures of Work-Family Conflict, Satisfaction, and Health Outcomes.....	26
Analyses and Results .....	28
Preliminary Analyses .....	28
Structural Equation Model .....	29
Examination of Specific Hypotheses .....	30
Discussion.....	33
Strengths, Limitations, and Future Directions .....	40
Conclusion.....	42
References.....	44
Tables and Figures.....	58

## Sleep, Body Mass Index, and Work-Family Conflict:

### A Gender Comparison of U.S. Workers

#### **Introduction**

In an ever-increasing global economy, many working parents are being stretched thin. The demands of longer work hours, nonstandard work schedules, increases in dual-earner families, and other factors that are often considered to be work-related stressors have generally been connected to increased work-family conflict and negative work, personal, and family outcomes (e.g., Aryee, 1992; Aryee, Luk, Leung, & Lo, 1999; Hill, 2005; Reynolds & Aletraris, 2007). Given the stress of meeting so many demands simultaneously, and maybe even relating to the stress itself, some people are not removing responsibilities from their already overcrowded plates. Rather, they are giving up what has almost become a luxury in an era of ‘too much to do in too little time.’ They are sacrificing their sleep, either in amount or in quality, and perhaps their personal health (Jean-Louis, Kripke, Ancoli-Israel, Klauber, & Sepulveda, 2000).

With these expanding role demands in mind, it is no wonder that over the past 40 years adults’ average sleep duration has decreased by 1-2 hours per day (Jean-Louis et al., 2000; NSF, 2008), and the number of adults getting less than seven hours of sleep per day has increased from 15% to 39% (NSF, 2008). This is especially concerning because sleep has been shown to be an essential component of health and optimal development (Healthy Sleep, 2010). Within the past decade, clinicians and researchers have shown greater interest in screening for sleep difficulties, especially because sleep problems can affect health and well-being. Recent research has shown that sleep problems, including short duration of sleep and restlessness during sleep, are associated with numerous serious health problems that are considered to be very serious, including an elevated risk of obesity (Patel, Malhotra, White, Gottlieb, & Hu, 2006), heart

disease (King et al., 2008), hypertension (Gangwisch et al., 2006), type-2 diabetes (Ayas et al., 2003), mood disorders (Healthy Sleep, 2010), and an increased mortality hazard (Kripke, Garfinkel, Wingard, Klauber, & Marler, 2002).

Parental work arrangements and characteristics, which are sometimes viewed as more distal factors in family life, have recently been shown to affect personal and family outcomes. For example, working nonstandard work hours has been linked to increases in working parents' stress (Davis, Goodmand, Pirretti, & Almeida, 2008). Work demands, such as those relating to nonstandard work schedules, can also impact parental sleep, fatigue, and family schedules (Bouvin, Tremblay, & James, 2007). Part of the reason for these findings is that nonstandard work schedules and working too many hours can affect the body's internal biological clock, resulting in insufficient sleep and other sleep problems (Healthy Sleep, 2010). Such schedules also make it more difficult to establish nighttime sleep routines for workers and their families. Consistent nightly bedtime routines have been linked to better sleep, as well as more positive maternal mood (Mindell, Telofski, Wiegand, & Kurtz, 2009b). Parents who are unable to establish consistent nighttime routines are more likely to experience potential sleep problems that affect both the working parents and their families.

Difficulties related to inconsistent nighttime routines and childcare demands are particularly challenging for working mothers (Rotenberg et al., 2000). Mothers tend to be more involved than fathers in nighttime interactions with awakening children (Sadeh, Flint-Ofir, Tirosh, & Tikotzky, 2007), resulting in greater frustration and fatigue. For working mothers, this frustration can be compounded by additional fatigue from the role demands of being a fulltime worker and getting up at night to tend to their awakening children (Rotenberg et al., 2000). Poverty, and its associated stress, is likely to further exacerbate these problems for working

parents, and especially for working mothers (Gyamfi, Brooks-Gunn, & Jackson, 2001). It is plausible that these stressful influences would then continue to affect one another, leading to a downward cycle of perpetuating sleep and health problems.

Past research has shown that there are significant gender differences in sleep, including differences in the amount of sleep problems, amount of sleep disruption, and average hours of sleep per night. A large, national study conducted in Finland showed that several factors were connected with adults having problems getting too much or too little sleep, including gender, marital status, level of education, atypical work schedules, and having young children in the home (Kronholm, Harma, Hublin, Aro, & Partonen, 2006). The same study specifically noted that women averaged more hours of sleep per night than men. Another large study, conducted in the U.S., also found that women averaged about 30 minutes more sleep per night than men (Jean-Louis et al., 2000). Researchers have suggested that women may have a greater need for more hours of sleep than men, and that this difference in need for more sleep may explain why sleep problems have been reported more for women in some studies (e.g., Maume, et al., 2009; Ursin, Bjorvatn, & Holsten, 2005). The increase of problems with sleeping that have been reported by women could also suggest that these problems are more disruptive in the lives of women, particularly working mothers who are trying to fulfill fulltime obligations at home and in the workplace.

It seems to be clear from the current literature that the focus of most sleep research in the context of work and family has been directed toward child outcomes. A few limited studies have shown that work factors (such as work stress, overtime work, and shift work) are related to adult outcomes such as increased sleep problems, especially in working women (e.g., Akerstedt, Fredlund, Gillberg, & Jansson, 2002). However, there is a need for further research to explore



the impact that sleep problems have on adult health and other adult work, personal, and family outcomes (Knudsen, Ducharme, & Roman, 2007). Specifically, there is a gap in research that is directed at explaining sleep problems and their associated outcomes in relation to work-family factors (Linton, 2004), especially in large samples (Maume, Sebastian, & Bardo, 2009; Rotenberg, Moreno, Portela, Benedito-Silva, & Menna-Barreto, 2000). Also, given the differences in how men and women struggle to meet the demands of work and family life (Sadeh et al., 2007), there is a need for a more thorough examination of gender differences in how work and family relate to sleep problems. With these gaps and needs in mind, the current study examined a conceptual model that assessed how several work and family factors were related to sleep problems and other outcomes, and how those connections differed between employed males and employed females.

## **Review of Literature**

### **Theoretical Perspective**

The model for this study was based on the Work/Family Role Strain Model, developed by Kelly and Voydanoff (1985). This role strain model suggests that work-related, individual, and family-related sources of demands and coping resources constantly interact to produce an overall feeling of work/family role strain. This is especially true for working parents who try to juggle demands from work with those of home life with a spouse and/or children. Kelly and Voydanoff's model relates well to concepts stemming from Bronfenbrenner's Ecological Systems Model (1979, 1986). The systems model suggests that one's life is constantly being influenced by a variety of interacting systems with semi-permeable membranes that surround the individual, including personal systems at the micro level, family and work systems that

encompass the individual on a regular basis, and eventually macro systems such as culture and society that interact with the individual.

These competing systems are related to the Work/Family Role Strain Model because each of these interacting systems contains inherent demands as well as resources. Role strain is felt when the resources are unable to meet the demands of a given role or multiple roles. For example, nonstandard work schedules create stress and role strain for working parents (Davis et al., 2008) and can lead to increased sleep problems (Akerstedt et al., 2002). In this case, working parents found the alternative schedule of working nights or weekends stressful in trying to meet simultaneous family role demands, such as dinnertimes or bedtimes. Employees who worked atypical schedules also reported more marital instability as the strain from their work schedules influenced relationships within the family (Davis et al., 2008). Working mothers have also reported wanting to work fewer hours if they were experiencing work-family conflict, especially if they had a young child at home (Reynolds & Aletraris, 2007). Having a young child at home can increase sleep problems and fatigue for working parents, especially working mothers (Rotenberg et al., 2000). These findings have demonstrated the complexity of balancing multiple roles when the demands outweigh the time or resources to accomplish different role demands.

In the work-family research arena, many of studies use models that focus on variables such as work-family balance, work-family fit, work-to-family conflict, or family-to-work conflict (e.g., Aryee, 1992; Frone, Russell, & Cooper, 1997; Hill, 2005; Jones et al., 2008; Lu, Kao, Chang, Wu, & Cooper, 2008). Other research has used these variables as both predictors and outcomes. This study included work-to-family conflict and family-to-work conflict as outcome variables in the model. The model also focused on several other work and family variables that could be considered as resources or demands, and how those variables related to

sleep problems and Body Mass Index (BMI), as well as both types of work-family conflict, marital satisfaction, life satisfaction, and self-reported health in working parents. For example, the model controlled for the amount of hours worked per week (usually considered a demand) influences the likelihood that a working parent will experience sleep problems. This connection suggests that the amount one works may influence one's ability to meet the demands required to care for one's personal needs such as sleeping, and may be connected to how one manages family roles as well. Such a connection would be based on a scarcity hypothesis, which implies that individuals who maintain multiple roles will eventually experience strain and conflict associated with trying to meet the demands of each role, resulting in a taxing effect on the individual's quality of life (Greenhaus & Powell, 2006). This inevitable conflict stems from the likely need to devote time to different roles at different times, which requires taking attention away from another role and increases the odds that the ignored role will begin to become more difficult because its demands are not being met (Greenhaus & Beutell, 1985).

## **Sleep**

Many health disparities stem from variations in health-related behaviors associated with what have been described as the three pillars of health; namely, nutrition, exercise, and sleep. The majority of past research connected to these pillars of health has focused on nutrition and exercise, leaving the impact of sleep under-researched (Healthy Sleep, 2010), even though people spend an average of about one-third of their lives in sleep. Sleep problems and sleep deprivation have recently become matters of broad concern. The National Sleep Foundation (NSF, 2004) reported that many individuals are getting insufficient amounts of sleep, and that this sleep is often of poor quality. Researchers have suggested that sleep is a much larger problem than most people realize, with sleep problems affecting a potential range of between

20% and 41% of individuals (e.g., Archbold, Pituch, Panahi, & Chervin, 2002; Mindell, Owens, & Carskadon, 1999). The Centers for Disease Control reported that chronic sleep insufficiency was a major public health problem that was widely under-recognized, even though it has been associated with numerous health problems (both physical and mental), injury, and even increased mortality (CDCP, 2009).

Recent research has linked sleep problems with a variety of predictors and outcomes relating to family life. For example, sleep problems have been associated with differences in parental behavior (Sadeh, Mindell, Juedtke, & Wiegand, 2009) and sleep hygiene habits (Mindell, Meltzer, Carskadon, & Chervin, 2009a), as well as differences in race and family income (Hale, Berger, LeBourgeois, & Brooks-Gunn, 2009). Lower income families tend to be less likely to establish consistent bedtime routines, creating likely disparities in the quality of sleep, as well as the duration and timing of sleep, which are known factors that relate to negative health outcomes (Hale et al., 2009).

Although some functions of sleep are still unknown, research has confirmed the belief that sleep plays a critical role in healthy brain development, and that an adequate amount of good-quality sleep is essential for optimal human functioning (Dahl, 1996). For example, poor sleep has been related to slower processing speeds and decreases in cognitive functioning (Buckhalt, El-Sheikh, & Keller, 2007). These deficiencies are particularly concerning for workers with dangerous jobs that could experience harm or an accident due to decreased attention or functioning from fatigue. A large, national study conducted in Finland reported that people who did not get at least six hours of sleep had inferior cognitive functioning (measured with both self-report and objective cognitive tasks) compared to those who got 7-8 hours of sleep per night, even after controlling for health and socioeconomic factors (Kronholm et al., 2009).

The same study also noted a connection between daytime sleepiness and cognitive impairment, such as poorer performance in subjective memory function tasks.

Insufficient sleep has also been implicated in other physical health threats, including obesity (Taveras, Rifas-Shiman, Oken, Gunderson, & Gillman, 2008), and evidence suggests that sleep problems, even beginning in childhood, often become chronic with many people not overcoming the problem (Kataria, Swanson, & Trevathan, 1987). Sleep problems such as insufficient sleep have also been found to be risk factors for obesity and metabolic dysfunction (Chaput, Brunet, & Tremblay, 2006; Gupta, Mueller, Chan, & Meininger, 2002; Snell, Adam, & Duncan, 2007). Poor sleep is also concerning because sleep problems often persist over time, creating long term patterns of sleep problems that can remain or even worsen (Kataria et al., 1987). Consistent with this argument, researchers have found significant connections between sleep problems and cognitive functioning across time (Dahl, 1996).

Although technological advances have allowed researchers to explore more of the benefits and functions of sleep, there is still a need for much more work to be done, particularly using large, population-based samples. One of the reasons for the lack of methodologically advanced, broad sleep findings is that collecting robust and reliable sleep data is often associated with extensive time and money. For example, although polysomnography (PSG) is considered the “gold standard” in sleep research, it is rarely used. There are several drawbacks to using PSG in research, including being labor intensive and expensive as it generally requires being monitored in a sleep lab while hooked up to wires and sensors. This unnaturalistic setting can also artificially affect sleep, and some participants experience a ‘first night effect’ as they have to get used to sleeping in this setting (Tilmanne, Urbain, Kothare, VanDewouwer, & Kothare, 2009). These complications can be even more cumbersome when trying to study sleep problems

in a normal, healthy population of married workers because of the difficulties in setting up repeated measurements for working parents who are already feeling a time crunch in meeting current demands. For these and other reasons, most sleep data has been collected via self-report surveys. This is especially the case for any sleep research that has used large populations.

A few studies have found connections between work-related stress and poor sleep quality, as well as problems in duration or consistency of sleep. In a large, representative sample of American full-time workers, work overload and role conflict (conflict between meeting job and family/personal demands) were associated with three indicators of poor sleep quality; trouble falling asleep, trouble staying asleep, and trouble waking up in the morning (Knudsen et al., 2007). A central feature of the current study was the notion that distinct differences in work and family variables within the daily lives of working parents play a key role in health and family outcomes. This notion is reinforced by evidence indicating that certain parental employment factors, such as nonstandard schedules, have been associated with poorer health and developmental outcomes among children (Strazdins Korda, Lim, Broom, & D'Souza, 2004), as well as marital instability and increased stress from role strain for adults (Davis et al., 2008). Such atypical work schedules have also been shown to affect parents' sleep (Bouvin et al., 2007; Rotenberg et al., 2000).

Just as the Work/Family Role Strain model (Kelly & Voydanoff, 1985) and the Systems model (Bronfenbrenner, 1979; 1986) suggest, working parents' sleep and other health outcomes are likely to be impacted by multiple factors related to the workplace and the family. This influence could make regular sleep schedules and other elements of sleep hygiene (i.e., routines, times, etc.) more difficult, thereby undermining parents' sleep and eventually their health. This additional strain from getting inadequate amounts of sleep or poor quality of sleep may then

impact a parent's ongoing ability to effectively fulfill multiple roles. For these reasons, it was important for the current study to examine how sleep problems relate to the work family context in a large sample and to explore potential gender differences.

### **Obesity and Poverty**

Not only have numerous health problems have been connected with sleep (e.g., Healthy Sleep, 2010), but also with obesity (e.g., Bruffaerts et al., 2008). The prevalence of overweight and obesity has been increasing throughout many areas of the world (e.g., Frye & Heinrich, 2003; Kaufman & Karpati, 2007). Obesity has been connected with multiple negative physical health outcomes, and obesity in early age has been shown to predict serious health problems later on in life (Frye & Heinrich, 2003). Obesity has also been related to negative mental health outcomes. In a large cross-national comparison of over 21,000 Europeans, it was determined that obese individuals were more likely than people at a healthy weight to have mental health problems (Bruffaerts et al., 2008). The connections between obesity and health often seem to be cyclical, and for this reason it is sometimes difficult for some studies of obesity to demonstrate causality. However, regardless of whether it is obesity or specific health outcomes that drive the other, the current research has shown that a clear association exists between these factors.

As mentioned previously, researchers have reported connections between obesity and sleep, particularly related to short sleep duration and trouble staying asleep (e.g., Snell et al., 2007). On its website, the National Heart, Lung, and Blood Institute reported that a lack of quality sleep was related to obesity (National Heart, Lung, and Blood Institute, 2010). This research attributed the increase in weight to the hormonal changes which occurred when individuals did not get enough sleep or enough quality sleep. Because sleep provides the body with valuable hormone regulation, those people who were deprived of quality sleep were more

likely to have increases in a hormone called ghrelin (which is the body's hormonal signal for hunger), and decreases of the hormone leptin (which signals the body that it is full). For such reasons, it has often been suggested that even though the definitive causal connections between sleep and weight are not fully known, it is likely that sleep problems will lead to weight gain for many people over time (e.g., Gangwisch, Malaspina, Boden-Albala, & Heymsfield, 2005; Hasler et al., 2004; Taveras et al., 2008). The other side of the argument would suggest that obesity makes bodily functions such as breathing and circulation more difficult, which in turn relate to sleep apnea or other sleep problems.

In conducting research on obesity, researchers found that there was a statistical difference between self-reported BMI and objective measurements of BMI (Nawaz, Chan, Abdulrahman, Larson, & Katz, 2001). Nawaz et al. noted that participants often under-report their weight, and then over-report their height. A comparison of group differences in this same study found that obese women who were unemployed, retired, or on disability, were more likely to under-report their BMI than employed women (2001). Such a phenomenon would obviously raise concerns about the accuracy of self-report data in many studies. For this reason, such studies have recommended that researchers use measured variables of height and weight to calculate BMI when possible instead of relying on self-report. However, because this study used only employed persons who self-report anonymously over the phone, it was anticipated that this common under-reporting of BMI phenomenon found among some groups of women was less likely to significantly impact the BMI scores used in the current study.

Poverty has also been connected to numerous negative developmental and health outcomes, particularly for families in extreme poverty (e.g., Brooks-Gunn & Duncan, 1997). Although intuitively obesity may seem to be a greater problem for wealthy families (who are



likely to be viewed as having more resources for acquiring food and comforts of life), research has shown that families living in poverty often have some of the highest incidences of obesity. Kaufman and Karpati (2007) reported that many impoverished minority families in the United States are experiencing epidemic health concerns relating to elevated levels of obesity. They also reported that many of the factors connected to rising levels of obesity may be related to the neighborhood food environment, food choice (choosing unhealthy or low quality food), and factors other than food availability or food quantity. An ecological study of 21 developed countries showed that impoverished men and women in those countries had higher rates of obesity, and that poverty was significantly correlated with consuming more calories as well as the diabetes mortality rate (Pickett, Kelly, Brunner, Lobstein, & Wilkinson, 2005).

In general, poor health is an endemic problem among impoverished families. For example, family members in poor households are more likely to experience serious health problems such as obesity (Frye & Heinrich, 2003) and developmental problems (Brooks-Gunn & Duncan, 1997). Sleep may also play a significant role in explaining poorer health and development among impoverished families. For these reasons, the current study examined how poverty influences sleeping problems and obesity in married workers. Prior research has shown connections between poverty and stress in working mothers (Gyamfi et al., 2001). Therefore, the current model also examined the potential gender differences in the relationships between poverty and all five of the outcomes in the model (marital satisfaction, work-to-family conflict, family-to-work conflict, self-reported health, and life satisfaction).

### **Workplace Flexibility**

Flexibility in when and where one works, as well as the ability to control or manage one's work and family demands, is generally associated with positive outcomes (Frone &

Yardley, 1996; Glass & Finley, 2002; Jones et al., 2008). With many work-family policies recognizing the demonstrated benefits of work, personal, and family life outcomes, this family-friendly policy has received increased attention. For example, one recent study reported that workplace flexibility can mediate the relationship between long work hours and negative outcomes (Hill, 2007). In a separate study, Hill and colleagues found that IBM workers who reported having more flexibility in the workplace were able to work eight more hours per week before they reported having work-family conflict, in comparison to workers who reported little flexibility (Hill, Hawkins, Ferris, & Weitzman, 2001).

Along with being related to beneficial work outcomes, research has suggested that workplace flexibility is also related to positive family functioning (Stevens, Kiger, & Riley, 2006), as well as mental health and a sense of fit between the demands associated with work and family roles (Jones et al., 2008). Much of the benefit of workplace flexibility seems to stem from the cognitive perception that one has the ability to manage work and family demands flexibly when needed, and the flexibility does not even have to be used to receive many of the benefits found in previous studies (Jones et al., 2008). Workplace flexibility has also been connected to better physical health outcomes and fewer sleep problems (Costa, Sartori, & Akerstedt, 2006). Based on the findings of previous research with workplace flexibility, it was anticipated that in this study workplace flexibility would also be positively associated with satisfaction and health outcomes (Kossek, Lautsch, & Eaton, 2006), and negatively associated with sleep problems, BMI, and both types of work and family conflict.

### **Family Meals**

Many studies have shown that spending time doing things together with family members is a key dimension of effective family functioning (McCreary & Dancy, 2004), and is related to

greater family cohesion and life satisfaction (Eggebeen & Knoester, 2001). One such family activity is the family mealtime. Family mealtimes have been associated with greater levels of unity and communication among family members (Fulkerson, Neumark-Stzainer, & Story, 2006). Although the average family mealtime lasts only about 18-19 minutes (Mitchell, Piazza, Waggoner, Modi, & Janicke, 2009), this important time together has been shown to provide beneficial shared family events that have been linked to better physical and mental health outcomes, and even family stability (Flores, Tomany-Korman, & Olson, 2005; Munoz, Israel, & Anderson, 2007).

An important finding in recent work and family research showed that family mealtimes also provide a buffering effect by reducing some of the negative work and family outcomes that are often associated with work-family conflicts and long working hours (Jacob, Allen, Hill, Mead, & Ferris, 2008). Also, in relation to health and obesity research, studies have suggested that regular family mealtimes are often indicative of structure and routine within the family that are likely to influence outcomes such as sleep quality and quantity (Mindell et al., 2009a), as well as lower levels of obesity (Taveras et al., 2005). In the current study, it was anticipated that family dinners would play a positive role in both providing a buffer effect for balancing role demands as well as establishing structure for family routines that aid working parents in establishing consistent sleep habits that are related to decreased sleep problems.

### **Outcome Variables**

**Marital satisfaction.** This study examined only married workers. One of the common findings in work and family literature is the connection between marriage and parenting roles, and demands and frustrations from the workplace. For example, employees who work evening shifts and irregular work schedules have been shown to have higher divorce rates (Perry-Jenkins,

Repetti, & Crouter, 2001). Work-family imbalances and conflict have also been associated with lower marital satisfaction and time spent with a partner (Stevens et al., 2006). Part of the reasoning for these connections is likely due to the job stressors from the work environment spilling over into the home environment and affecting relationships, behaviors, and tensions in the home (Schulz, Cowan, Cowan, & Brennan, 2004). These conflicts fall in line with the Work/Family Role Strain theory mentioned previously.

Factors from work tend to influence one's actions and attitudes at home and vice versa. This is one reason why it has been suggested that positive factors in work and the home can spill over in positive ways. For instance, one study showed that although working mothers reported that many family and work characteristics depleted their resources, creating more role strain, the study showed that having more flexibility at work actually reduced role strain and related to benefits at home such as better marital communication or increased family cohesion (e.g., Morris & Coley, 2004). Marital satisfaction is also likely to be influenced by health factors such as obesity and sleep. For example, overweight women reported low relationship satisfaction (Ball, Crawford, & Kenardy, 2004). Anecdotal evidence commonly refers to the challenges of a spouse whose partner tosses and turns during the night or snores due to sleep apnea or other sleep or breathing problems. When one's poor quality of sleep affects their spouse, it is not likely to be beneficial on the marital relationship. Family role demands, such as having a young child in the home, have also been related to sleep problems and sleep disruptions, which then in turn have been related to decreased marital satisfaction (Medina, Lederhos, & Lillis, 2009). Through the lens of work and family role demands impacting personal outcomes, this study therefore examined how sleep and obesity impacted marital relationship satisfaction. The conceptual

model also examined the specific influence of family dinners and workplace flexibility on marital satisfaction.

**Work-to-family conflict and family-to-work conflict.** Due to the almost inevitable tension that stems from meeting work and family role demands, many workers experience work-family conflict. Work-family conflict has been defined as, “a form of inter-role conflict in which the role pressures from the work and family domains are mutually noncompatible in some respect. That is, participation in the work (family) role is made more difficult by virtue of participation in the family (work) role” (Greenhaus & Beutell, 1985, p. 77).

Past research has generally found that work-family conflict is related to negative work, family, and personal outcomes (e.g., Aryee, 1992; Hill, 2005). It is important when discussing work-family conflict to distinguish between the two main forms, which are work-to-family conflict and family-to-work conflict. Work-to-family conflict arises when stressors at work carry over into the home, or interfere with personal and family life (Repetti, Wang, & Saxbe, 2009). Family-to-work conflict is related to stressors from family life carrying over into the workplace and causing conflict with work responsibilities or outcomes. Previous research that has distinguished the two types of work-family conflict have generally shown that work-to-family conflict is related to stressors and demands from work, and that family-to-work conflict is associated with stressors and demands from within the family or home (e.g., Frone & Yardley, 1996; Galovan et al., in press; Voydanoff, 2007). Demands from work and family life are related to self expectations and social expectations (Greenhaus & Beutell, 1985). For example, working mothers who have a young child at home have been shown to experience certain social pressures or expectations relating to their domestic tasks and childcare duties (Rotenberg et al., 2000).

Work-family conflict has also been connected to sleep problems and sleep duration. In a study of nearly 500 soldiers, shorter sleep duration was related to increased work-family conflict (Britt & Dawson, 2005). The same study reported a connection between work-family conflict and self-reported physical health, such that soldiers who reported more negative physical health symptoms were more likely to report higher work-family conflict. Each of these findings were stronger for soldiers who were married or had a child at home (Britt & Dawson, 2005).

Based on the Work/Family Role Strain Model and the Ecological Systems Theory, it was expected that work, personal, and family demands and resources would influence both work-to-family conflict and family-to-work conflict. Therefore, in addition to examining the connections between sleep and BMI with both types of work-family conflict, this study also included several other demands and resources that would be expected to be predictors of work-family conflict. The demands in the model included work hours per week, and having a young child in the home. These demands have been connected to increased work-family conflict in prior research (e.g., Aryee et al., 1999; Galovan et al., in press). For example, having a young child in the home requires more attention from a working parent, and can lead to more frustration and conflict in balancing work and parenting demands. Parents with young children in the home have placed more importance on the availability of family supportive programs in the workplace because of the conflict problems associated with this role demand (Frone & Yardley, 1996).

The conceptual model also included two resource variables and two control variables in relation to both types of work-family conflict. The resources in the model included workplace flexibility and the frequency of family dinners. These variables have been related to decreased work-family conflict. For example, workplace flexibility has been shown to have a negative association with work-family conflict, perhaps because it is seen as a valuable psychological

resource that allows workers to manage role demands with a feeling of more autonomy and control, thereby lessening the feeling of conflict between competing work and family demands (e.g., Galovan et al., in press; Jones et al., 2008). The two control variables in the model were education level and poverty status. These exogenous variables were added to the model to account for any variance explained in the model due to major differences in income or education. In this study, the model examined both work-to-family conflict and family-to-work conflict so that it could compare how work and family variables, as well as sleep and BMI, uniquely related to each form of work-family conflict.

**Self-reported health (SRH).** Self-perception of health can impact many areas of life. Self-reported health is often measured using a single item that asks participants to rate their overall health as ‘poor,’ ‘fair,’ ‘good,’ or ‘excellent.’ The use of one-item self-reported health has been recognized as a reliable measurement of individuals’ health (e.g., DeSalvo et al., 2006; Furnée, Groot, & van den Brink, 2008; Page et al., 2009), and has been noted as a dimension that is irreplaceable in health-related research (Idler & Benyamini, 1997). Self-reported health is not only relatively easy to obtain, it has been shown to be a reliable predictor of numerous behaviors and outcomes. For example, in a survey given to over 2500 participants, those who reported being in poor health were more likely to be overweight, less physically active, get less sleep, and reported feeling more shy, lonely, and hopeless, and less happy (Page & Suwanteerangkul, 2009). In a four-year longitudinal study conducted in Norway, it was shown that self-reported health remained very stable over time (Breidablik, Meland, & Lydersen, 2009). Although there are limitations to the single-item self-reported health variable, studies have demonstrated that it can still be a reliable measure of health. The robust ability of self-reported health to predict a wide variety of health outcomes suggests that it has predictive validity. Also, self-reported health

has been shown to demonstrate test-retest reliability (Lundberg & Manderback, 1996), as well as construct validity through its correlation with a variety of more complex health-related factors (Cousins, 1996).

Similar findings have been shown repeatedly in other studies. For example, self-reported health has been shown to be a valid measure of physical health status and predicted risk behaviors such as physical inactivity, smoking, alcohol consumption, lack of sleep, and overweight status (Segovia, Bartlett, & Edwards, 1989). A recent meta-analysis by Furnée et al. (2008) reported that self-reported health was a reliable variable that was significantly related to education. In another meta-analysis of 46 studies that used self-reported health, it was determined that 40 of 46 studies showed that adults who reported that they were in “poor” health had a higher mortality rate (Benyamini & Idler, 1999). Another study showed that even after controlling for morbidity, access to health services, and health-related behaviors, self-reported health was still a significant predictor of both short-term and long-term mortality (Rakowski, Mor, & Hiris, 1991).

Self-reported health has been connected to sleep as well. In a large, nationally representative study of almost 10,000 adults in Finland, it was shown that sleep problems (sleeping too much or too little) were associated with negative self-reports of health (Kronholm et al., 2006). Based on previous research, this study examined the influence of sleep and BMI on self-reported health. It also examined the unique connections between several work and family demands and resources with self-perceived health, and how each of these connections differed for working males versus working females.

**Life satisfaction.** Life satisfaction is generally viewed as the overall attitude one has toward how their life is fitting in with where they want it to be. One study found that life



satisfaction seems to have a reciprocal relationship with health, risk-taking, and other outcomes and behaviors. It was suggested that perhaps when individuals are more satisfied with how their life is going, they are more committed to taking care of themselves and avoiding risky and/or unhealthy behavior (Strine, Chapman, Balluz, Moriarty, & Mokdad, 2008). Along with being related to negative physical health outcomes, decreased life satisfaction has also been connected to negative mental health outcomes such as higher levels of anxiety and stress (Chang, 2000).

Life satisfaction has also been connected to other variables related to personal and family life. Studies have shown that sleep problems were negatively associated with life satisfaction (Kelly, 2003, 2004; Pilcher, 1998). Life satisfaction has also been connected to weight. Overweight women reported being less satisfied in their current life status, and less satisfied with future life aspirations (Ball et al., 2004). Given these connections between life satisfaction with sleep and obesity, this study examined how sleep problems, obesity, family meals, and workplace flexibility affected life satisfaction for married workers. Similar to self-reported health and many other variables that have demonstrated reliability with a single-item, studies of life satisfaction that have used single-item measurements have also been shown to be reliable (Schimmack & Oishi, 2005). Another study demonstrated that the use of a single-item measure of life satisfaction was significantly related to multi-item measures of life satisfaction, and that the single-item measures were reliable and valid in large samples (Abdel-Khalek, 2006).

## **Hypotheses**

Based on previous work that has shown connections between sleep problems and obesity and their link to health and satisfaction outcomes, this study examined sleep and obesity in the context of several work and family variables. It also explored potential gender differences between working husbands and working wives, expecting that some of the variables in the model

would relate to different types of role strain for husbands and wives because of their often unique roles in family life. With the Work/Family Role Strain Model and Ecological Systems model in mind, and considering the prior research that has shown connections between work and family demands and health outcomes, the study tested the following hypotheses:

*H1: That sleep problems will be positively associated with BMI scores in working adults.*

*H2: Sleep problems will be negatively related to marital satisfaction, self-reported health, and life satisfaction, and positively related to work-to-family conflict and family-to-work conflict.*

*H3: BMI will be negatively related to marital satisfaction, self-reported health, and life satisfaction, and positively related to work-to-family conflict and family-to-work conflict.*

*H4: Workplace flexibility will be negatively related to sleep problems, BMI, work-to-family conflict, and family-to-work conflict, and positively related to marital satisfaction, self-reported health, and life satisfaction.*

*H5: Family dinners will be negatively related to sleep problems, BMI, work-to-family conflict, and family-to-work conflict, and positively related to marital satisfaction, self-reported health, and life satisfaction.*

*H6: Poverty will be positively related to sleep problems, BMI, work-to-family conflict, and family-to-work conflict, and negatively related to marital satisfaction, self-reported health, and life satisfaction.*

*H7: That increased work hours will be positively related to sleep problems, BMI, work-to-family conflict, and family-to-work conflict, and negatively related to marital satisfaction, self-reported health, and life satisfaction.*

*H8: The gender model comparison will be statistically different for married male employees versus married female employees.*

*H8a: Married females will experience more work-to-family conflict and family-to-work conflict than married males when they have a young child at home.*

*H8b: Married females with higher BMI scores will report less marital satisfaction, self-reported health, and life satisfaction than married males.*

## Method

### Sample

This study used a sample that came from the latest survey from the National Study for the Changing Workforce (NSCW 2008) (see Galinsky, Aumann, & Bond, 2009). The NSCW is the largest ongoing study of how the workplace impacts personal and family life for the American workforce. Since 1992, it has been collected about every five years by the Families and Work Institute. The NSCW data were collected to follow up on three national surveys of the workforce that were conducted by the U.S. Department of Labor between 1969 and 1977, known as the Quality of Employment Surveys (QES). The NSCW is well-respected and widely used by researchers, policy makers, and the media because of its in depth snapshot at how the American workplace has changed over the past 40 years (Families and Work Institute, 2010).

The subsample for the current study came from the NSCW 2008, and employed the selection criteria that only married men and women were used. This allowed for the examination of a model that used several variables that are strongly related to marriage, such as family meals presence of young children in the home, and marital satisfaction. With the selection criteria in place, the final sample used in this study consisted of 2,124 employed and married men ( $n = 1105$ ) and women ( $n = 1019$ ) and was representative of married workers in the United States. This subsample was limited to those who were at least 18 years old, reported being currently married and living with spouse, resided in the lower 48 states, were employed in the civilian labor force, and lived in a non-institutionalized household with a telephone.

The original NSCW 2008 sample was weighted to be representative of the U.S. population, based on data from the March 2007 Current Population Survey. This final subsample was representative of married workers in the U.S. Participants ranged in age from 18 to 91 years

old, with a mean age of 48.10 years ( $SD = 11.47$  years). Approximately one-fifth (21%) of the final sample reported having a high school diploma or less education, while the majority of the workers (59%) had obtained at least an associate's degree. The average annual family income for the married participants was \$108,867 ( $SD = \$93,113$ , median \$85,000). The sample ethnicity was composed of 87% Caucasian, 6% African American, 5% Hispanic/Latino, and 2% other. Of the 2,124 workers in the sample, 1,003 reported having at least one child under age 18 in the home, with 400 reporting having a child under age 6 in the home. The number of children in the home ranged from 0 to 8, with workers averaging 1.57 children in the home ( $SD = 1.10$  children).

### **Procedure**

Participants for the NSCW 2008 were selected using a random digit dial method. One-time phone interviews were then conducted with participants, which lasted approximately 50 minutes and were completed with the use of a computer-assisted telephone interviewing (CATI) system. The guided interviews explored some topics in more depth, depending on responses, with approximately 600 potential items in the survey. These items were designed to assess the relationships between work, personal, and family life as well as including extensive questions about background and demographic information. Each NSCW survey collected a nationally representative sample of about 3,500 participants who were waged and salaried employees during data collection, and generally had about a 50% response rate for eligible households.

### **Measures**

The study used several single-item measures, due in part to the use of a nationally representative archival dataset, instead of some preferred multi-item measures. Although some researchers have viewed the use of single-item measures as a limitation, researchers have shown that single-item measures can be effective in yielding reliable results (Wanous, Reichers, &

Hudy, 1997). As previously mentioned, many satisfaction items such as life satisfaction have been shown to be reliable when constructed from a single-item measure (e.g., Abdel-Khalek, 2006; Schimmack & Oishi, 2005), as well as single-items that assess self-reported health (e.g., DeSalvo et al., 2006; Idler & Benyamini, 1997; Page et al., 2009; Rakowski et al., 2001).

The measures for this study included several exogenous variables that were used as either control variables or variables of interest. The control variables consisted of presence of young children in the home and education level. Variables of interest in the model included frequency of family dinners, work hours per week, workplace flexibility, and poverty status (being under 250% of the U.S. poverty line based on family income and individuals within the household). The two main mediating variables in the model were sleep problems and Body Mass Index (BMI). Outcome variables in this study consisted of marital satisfaction, work-to-family conflict, family-to-work conflict, physical health, and life satisfaction.

### **Predictors of Sleep Problems, BMI, Personal and Family Outcomes**

**Control variables.** Several variables in the study were controlled for, including education level (with 6 categories, ranging from less than high school to graduate/professional degree), presence of young children (under age 6) in the home (constructed as a dummy variable with 0 = no, 1 = yes), poverty status, status of current employment, and marital status. Gender, marital status, and employment status were controlled in the SEM model by analyzing differences for two groups that included only married male employees and married female employees. One control variable that was also a variable of interest was work hours per week. The mean number of work hours per week was significantly different for males ( $M = 46.00$  hours,  $SD = 12.76$ ) and females ( $M = 39.57$  hours,  $SD = 13.85$ ).

The exogenous variables in the model also included the frequency of family dinners and workplace flexibility. *Frequency of family meals* was measured by a 1-item question that asked respondents to report on the “Frequency the entire family eats dinner together?” Responses were based on the number of days that participants ate dinner together with their family and ranged from 0 (*never*), to 6.5 (*6 to 7 days per week*). The mean score for the days/week that respondents ate dinner with their family was 4.67 ( $SD = 1.92$ ) for married males, and 4.54 ( $SD = 1.92$ ) for married females. *Workplace flexibility* was measured by a 4-item scale which asked respondents how much freedom they had to decide what to do on their job and how to do their work, as well as if they get to had schedule flexibility to manage work and family responsibilities. Responses were based on a 4-point Likert scale ranging from 1 (*strongly agree*) to 4 (*strongly disagree*). Responses were then reverse-coded to give a positive workplace flexibility score, with ‘4’ demonstrating high workplace flexibility. The mean score for workplace flexibility was 3.25 ( $SD = 0.69$ ) for married males and 3.19 ( $SD = 0.72$ ) for married females, with a Cronbach’s alpha of .77 for the scale.

**Sleep problems.** An index of sleep problems was created using a 3-item scale that asked participants how often sleep interfered with work, the frequency of having trouble falling asleep, and the frequency of problems during sleep. Responses were based on a 5-point Likert scale from 1 (*never*) to 5 (*very often*). The scale was left to be negative, with higher scores (closer to ‘5’) representing more problems associated with sleep, and had a mean score of 2.18 ( $SD = 0.94$ ) for married males, and 2.36 ( $SD = 1.01$ ) for married females. The Cronbach’s alpha for the sleep problems scale was .75.

**Body Mass Index.** Body Mass Index (BMI) was calculated from two items in the survey that asked the participants to report their height in inches and their weight in pounds. The

calculation for BMI was based on the standard BMI calculation,  $BMI = [(weight\ in\ pounds / (height\ in\ inches)^2) * 703]$ . Respondents whose BMI scores were outside of possible scales (for example, a BMI under 10 or over 100) were excluded. It is considered standard practice in health and obesity studies to standardize BMI scores (e.g., Snell et al., 2007), therefore, BMI scores were standardized for use in the current study. The standardized BMI scores ranged from  $z = -2.07$  to  $z = 5.58$ . The mean score for BMI in the study was 28.80 ( $SD = 5.85$ ) for married males, and 27.67 ( $SD = 6.75$ ) for married females.

### **Measures of Work-Family Conflict, Satisfaction, and Health Outcomes**

**Work-to-family conflict.** Work-to-family conflict was measured by a 5-item scale that has been used in the NSCW data collection since 1992. The scale asked participants: (1) How often have you NOT had enough time for YOUR FAMILY or other important people because of your job? (2) How often have you NOT had the ENERGY to do things with your family or other important people in your life because of your job? (3) How often has work kept you from doing as good a job at home as you could? (4) How often have you NOT been in as good a MOOD as you would like to be at home because of your job? (5) How often has your job kept you from concentrating on important things in your personal or family life? Responses were based on a 4-point Likert scale (1 = *very often*, 2 = *often*, 3 = *sometimes*, and 4 = *rarely/never*). Responses were then reverse-coded so that higher scores would indicate more work-to-family conflict. The Cronbach's alpha of the scale was .84. The mean scores for work-to-family conflict were 1.69 ( $SD = 0.68$ ) for married males, and 1.64 ( $SD = 0.65$ ) for married females.

**Family-to-work conflict.** Family-to-work conflict was also measured by a 5-item scale that has been used in the NSCW since 1992. The questions asked participants: (1) How often have you NOT had enough time for your job because of your family life? (2) How often has

your family life drained you of the energy you needed to do your job? (3) How often has your family life kept you from doing as good a job at work as you could? (4) How often have you NOT been in as good a mood as you would like to be at work because of your family life? (5) How often has your family life kept you from concentrating on your job? Responses were based on a 4-point Likert scale (1 = *very often*, 2 = *often*, 3 = *sometimes*, 4 = *rarely/never*). Responses were also reverse-coded for family-to-work conflict so that higher scores would mean more conflict. The Cronbach's alpha of the scale was .79. The mean scores for family-to-work conflict were 1.30 ( $SD = 0.44$ ) for married males, and 1.36 ( $SD = 0.50$ ) for married females.

**Marital satisfaction.** Marital satisfaction was assessed using one-item. Respondents were asked to rate the question, "Overall satisfaction with marriage/relationship." Responses were based on a 4-point Likert scale ranging from 1 (*not too satisfied*) to 4 (*extremely satisfied*). The mean scores for marital satisfaction were 3.48 ( $SD = 0.72$ ) for married males, and 3.37 ( $SD = 0.79$ ) for married females.

**Life satisfaction.** Life satisfaction was assessed by a 1-item question. Respondents were asked to rate their "Overall life satisfaction" on a 4-point Likert scale ranging from 1 (*very satisfied*) to 4 (*very dissatisfied*). Responses were then reverse-coded to give a positive score for life satisfaction, with '4' meaning *very satisfied*. The mean life satisfaction score was 3.42 ( $SD = 0.65$ ) for married males, and 3.44 ( $SD = 0.68$ ) for married females.

**Self-reported health.** Self-reported health was assessed using a 1-item question. Participants were asked to rate their "Overall current state of health." Responses were based on a 4-point Likert scale (1 = *excellent*, 2 = *good*, 3 = *fair*, 4 = *poor*). Responses were then reverse-coded to give a positive score for self-reported health, with '4' meaning excellent. The mean score for self-reported health was 3.13 ( $SD = 0.72$ ) for married males, and 3.17 ( $SD = 0.71$ ) for



married females. As previously mentioned, this measure of health status has been shown to be reliable and valid as an overall indication of health status (e.g., Idler & Benyamini, 1997; Page et al., 2009).

## **Analyses and Results**

### **Preliminary Analyses**

The first step in conducting analyses was to examine descriptive statistics for potential gender differences in the main variables in the conceptual model (See Figure 1 for the conceptual model). This was done by conducting independent samples *t*-tests comparing married male employees versus married female employees (See Table 1). I then conducted bivariate correlations between each of the variables in the model to evaluate the variables for any potential problems due to multicollinearity. This was done by examining the correlations of the variables in the model and ensuring that they do not exceed the recommended cutoff of .85 for the SEM variables, as suggested by Kline (2005). After ensuring that there was no multicollinearity between the variables, I constructed a means and correlations table for the variables, separating means, standard deviations, correlations, and statistically significant mean differences between men and women (see Table 1). The highest correlations were between work-to-family conflict and family-to-work conflict in men and women, with  $r = 0.46$  and  $r = 0.51$  respectively. The next highest correlations were between marital satisfaction and life satisfaction ( $r = 0.43$  for males and  $r = 0.39$  for females), and between sleep problems and work-to-family conflict ( $r = 0.36$  for males and  $r = 0.41$  for females). Overall, the preliminary analyses showed that the majority of the hypothesized relationships in the variables seemed to be present in the correlations, and were in the same directions as hypothesized. The independent samples *t*-tests also demonstrated that many of the variables in the study were statistically different between genders (see Table 1).

## Structural Equation Model

After the initial exploration of the descriptive statistics and intercorrelations, I constructed the conceptualized structural equation model (SEM) to examine gender differences and similarities among the predictors and outcomes related to sleep problems, BMI, and work-family variables in the model (Figure 1). I conducted the analyses using the Analysis of Moment Structures (AMOS) software version 17.0 (Arbuckle, 2008). The SEM model controlled for marital status and gender by using a two-group comparative analysis. The use of a multi-group comparison allowed for the examination of how the relationships between sleep problems and BMI, with the other predictor and outcome variables in the model, differed for married male workers versus married female workers.

After constructing the SEM model, I examined the standardized path coefficients in the model to ensure that each path was significant for at least one gender group. Any paths that were not significant at the  $p < .10$  level, for either married male employees or married female employees, were trimmed out of the final model to increase model fit and allow for a more parsimonious analysis of the variables (See Figure 2). The final, trimmed model was then examined for model fit using the chi-square analysis, as well as assessing the standard fit indices (including the CFI, TLI, and RMSEA), as suggested by Arbuckle (2008), Byrne (2001), and Hoyle and Panter (1995). A nonsignificant chi-square analysis, along with a CFI and TLI close to 1.00 and an RMSEA  $< .05$  suggest that the model fits the data well. The final model ( $n = 2124$ ) demonstrated excellent model fit,  $\chi^2(52) = 43.685$ ,  $p = .787$ , CFI = 1.000, TLI = 1.000, RMSEA = .000.

Next, I examined differences in the individual paths between gender groups using pairwise parameter comparisons. These differences were shown by examining which critical

ratios for the path coefficients were statistically different between males and females (significant differences between genders are shown in Table 2). I then examined the overall *R*-squared for each of the outcomes in the model, as well as sleep problems and BMI. This allowed me to report on the explained variance for each of these variables in the model, and compare how this variance differs by gender.

### Examination of Specific Hypotheses

**H1:** Hypothesis 1 was not supported. The index of sleep problems was not correlated with BMI as previous studies have shown (see Table 1), and the SEM model showed that sleep problems were not significantly related to BMI scores for males (standardized path coefficient,  $\beta = -.004^{\text{ns}}$ ) or females ( $\beta = .014^{\text{ns}}$ ) (see Table 2 and Figure 2).

**H2:** Hypothesis 2 was supported. This hypothesis stated that sleep problems would be negatively related to marital satisfaction, self-reported health, and life satisfaction, and positively related to work-to-family conflict and family-to-work conflict. Sleep problems were negatively related to marital satisfaction for both married males ( $\beta = -.106^{**}$ ) and married females ( $\beta = -.145^{**}$ ), to self-reported health for males ( $\beta = -.228^{**}$ ) and females ( $\beta = -.214^{**}$ ), and to life satisfaction for both males ( $\beta = -.269^{**}$ ) and females ( $\beta = -.279^{**}$ ). Also, sleep problems were positively related in increases in work-to-family conflict for males ( $\beta = .368^{**}$ ) and females ( $\beta = .309^{**}$ ), as well as increases in family-to-work conflict in males ( $\beta = .364^{**}$ ) and females ( $\beta = .271^{**}$ ).

**H3:** Hypothesis 3 was partially supported. This hypothesis stated that BMI would be negatively related to marital satisfaction, self-reported health, and life satisfaction, and positively related to work-to-family conflict and family-to-work conflict. Standardized BMI scores were negatively related to self-reported health in both males ( $\beta = -.192^{**}$ ) and females ( $\beta = -.296^{**}$ ).

They were also negatively related to life satisfaction for females ( $\beta = -.078^{**}$ ), but they were not significantly related to life satisfaction for males ( $\beta = -.017^{ns}$ ). However, BMI scores were not significantly related to marital satisfaction, work-to-family conflict, or family-to-work conflict.

**H4:** Hypothesis 4 was partially supported. This hypothesis stated that workplace flexibility would be negatively related to sleep problems, BMI, work-to-family conflict, and family-to-work conflict, and positively related to marital satisfaction, self-reported health, and life satisfaction. Workplace flexibility was negatively related to sleep problems for both males ( $\beta = -.144^{**}$ ) and females ( $\beta = -.147^{**}$ ). It was also negatively related to BMI for females ( $\beta = -.114^{**}$ ), but not for males ( $\beta = .023^{ns}$ ). Workplace flexibility was negatively related to work-to-family conflict for both males ( $\beta = -.224^{**}$ ) and females ( $\beta = -.254^{**}$ ). It was also positively related to marital satisfaction for males ( $\beta = .060^*$ ) and females ( $\beta = .080^{**}$ ), to self-reported health for males ( $\beta = .123^{**}$ ), but only marginally for females ( $\beta = .050^+$ ), and to life satisfaction for males ( $\beta = .162^{**}$ ) and females ( $\beta = .174^{**}$ ). However, workplace flexibility was not significantly related to family-to-work conflict.

**H5:** Hypothesis 5 was partially supported. This hypothesis stated that higher frequency of family dinners would be negatively related to sleep problems, BMI, work-to-family conflict, and family-to-work conflict, and positively related to marital satisfaction, self-reported health, and life satisfaction. Family dinners were negatively related to sleep problems for both males ( $\beta = -.086^*$ ) and females ( $\beta = -.147^{**}$ ). Frequent family dinners were positively related to marital satisfaction for males ( $\beta = .215^{**}$ ) and females ( $\beta = .097^*$ ), as well as increased life satisfaction for males ( $\beta = .130^{**}$ ) and females ( $\beta = .090^*$ ). However, family dinners were not significantly related to BMI scores, work-to-family conflict, family-to-work conflict, or self-reported health.

**H6:** Hypothesis 6 was partially supported. This hypothesis stated that poverty would be positively related to sleep problems, BMI, work-to-family conflict, and family-to-work conflict, and negatively related to marital satisfaction, self-reported health, and life satisfaction. Poverty was positively related to sleep problems for females ( $\beta = .068^{**}$ ), but it was slightly negatively related to sleep for males ( $\beta = -.030^{ns}$ ). It was negatively related to self-reported health for females ( $\beta = -.112^{**}$ ), but not for males ( $\beta = -.003^{ns}$ ). Also, poverty was negatively related to life satisfaction for both males ( $\beta = -.042^{ns}$ ) and females ( $\beta = -.068^*$ ). However, poverty was not a significant predictor of BMI, marital satisfaction, work-to-family conflict, or family-to-work conflict.

**H7:** Hypothesis 7 was partially supported. This hypothesis stated that increased work hours would be positively related to sleep problems, BMI, work-to-family conflict, and family-to-work conflict, and negatively related to marital satisfaction and life satisfaction. Work hours were related to more sleep problems for females ( $\beta = .083^{**}$ ) than for males ( $\beta = .032^{ns}$ ), and to increased work-to-family conflict for both married males ( $\beta = .204^{**}$ ) and married females ( $\beta = .224^{**}$ ), but was not significantly related to the other hypothesized variables.

**H8:** Hypothesis 8 was supported. This hypothesis stated that there would be a statistically significant difference between gender groups in the model. In relation to the group comparison model, a significant chi-square analysis of model comparison would suggest that the models are statistically different for males and females (Arbuckle, 2008). This analysis demonstrated that the married male group was significantly different from the married female group,  $\chi^2(29) = 65.807, p = .000$ .

**H8a:** Hypothesis 8a was partially supported. This hypothesis stated that married females would report more work-to-family conflict and family-to-work conflict than married males when

they have a young child at home. Although married males and females reported almost the same amount of work-to-family conflict in relation to the presence of a young child at home ( $\beta = .084^{**}$  for males,  $\beta = .078^{**}$  for females), females did report significantly more family-to-work conflict ( $\beta = .136^{**}$ ) than for males ( $\beta = .070^*$ ) when considering the presence of a young child in the home.

**H8b:** Hypothesis 8b was partially supported. This hypothesis stated that married females with higher BMI scores would report less marital satisfaction, self-reported health, and life satisfaction than married males. Although BMI was not significantly related to marital satisfaction for either gender, higher BMI scores for married females were related to significantly lower self-reported health ( $\beta = -.296^{**}$ ) than males ( $\beta = -.196^{**}$ ), as well as lower life satisfaction for females ( $\beta = -.078^{**}$ ) than for males ( $\beta = -.017^{ns}$ ).

### Discussion

Although past research has shown connections between sleep problems and BMI (Chaput et al., 2006; Gangwisch et al., 2005; Gupta et al., 2002; Hasler et al., 2004; Kataria et al., 1987; NHLBI, 2010; Patel et al., 2006; Snell et al., 2007; Taveras et al., 2008), this study did not find a significant connection using a nationally representative sample of workers in the United States. One possible explanation for this finding is that many of the previous studies used smaller sample sizes and utilized multiple measures of assessment, including objective measures. Another possible explanation is that many of the previous studies used a variable that measured short sleep duration, rather than problems falling asleep or staying asleep. Future research using representative samples would benefit from including more specific questions relating to sleep quality and sleep duration, as well as objective measures of both sleep problems and BMI. It is likely that many of these factors have been unexplored in the past directly because these measures

are more difficult and expensive to obtain, and require increased time in comparison to large sample sizes that utilize only survey and self-report measures.

One of the main purposes of this study was to examine how sleep problems affected work-family conflict, self-reported health, and satisfaction outcomes in a national sample of working men and women. As hypothesized, sleep problems were significantly related to negative overall outcomes for men and women. This finding was expected due to the previous research that has shown that work and family stressors/demands generally relate to sleep problems (Akerstedt et al., 2002; Britt & Dawson, 2005; Groeger et al., 2004; Knudsen et al., 2007; Rotenberg et al., 2000). The current study not only supported these general findings, but expanded the current literature by examining the pathway coefficients for men and women separately in a model assessing the work-family interface. This analysis showed that women did experience more sleep problems than men, similar to previous findings (Jean-Louis et al., 2000; Maume et al., 2009; Ursin et al., 2005). Also, women's sleep problems were related to less marital and life satisfaction than men. However, men's sleep problems were more strongly associated with both types of work-family conflict and lower self-reported health.

Although other studies have found that increased BMI scores were related to marital satisfaction, this connection was not significant in this study for either gender. In this study, BMI was also not significantly related to either type of work-family conflict. Whereas BMI is often considered to be a predictor of health, perhaps it is the health problems themselves that are connected with work-family conflict in other studies and not being overweight alone (e.g., Britt & Dawson, 2005). This study did find that BMI scores were related to self-reported health and life satisfaction, both of which have been outlined previously (e.g., Ball et al., 2004; Page & Suwanteerangkul, 2009; Segovia et al., 1989). This was especially true for women. Similar to

findings from other studies, women tend to view being overweight as a more negative factor in life than men (e.g., Lamb, Jackson, Cassiday, & Priest, 1993; Turner, Hamilton, Jacobs, Angood, & Dwyer, 1997). Perhaps this is due to more social pressure from the media and society, which commonly purport the view that for women 'thin equals attractive and healthy.' Research has shown that images of women in the media have become thinner over time, and that these images are portrayed as the socially desirable characteristics of female beauty (Turner et al., 1997). This adopted self-perception of an overweight woman would then lead her to feel like her weight interferes with her happiness and life satisfaction, and would likely make her more focused on the negative health and life implications that are associated with being overweight. Another finding in this study was that higher education was related to lower BMI scores. This link has also been shown in previous research, especially for women (Daniel et al., 2006).

Workplace flexibility was negatively related to sleep problems. This finding supports previous research (Costa et al., 2006). Workplace flexibility was also negatively related to BMI for women as hypothesized, but not for men. One potential explanation for this finding is that flexibility for women may have a more positive psychological effect in reducing stress associated with balancing work and family role demands. This decreased stress may help mitigate the effects of the increased cortisol that is often associated with weight gain (Daniel et al., 2006), providing a buffer against stress-related weight gain. Workplace flexibility was also positively related to marital satisfaction, life satisfaction, and self-reported health. It was also negatively related to work-family conflict. Each of these results support previous research (e.g., Hill et al., 2001; Jones et al., 2008; Stevens et al., 2006), and suggest that workplace flexibility is an important family-friendly workplace policy for helping workers balance the role demands of



work so that they can meet their personal and family role needs. This study provides additional evidence to support the promotion of workplace flexibility policies by businesses.

Family dinners were positively related to marital and life satisfaction, especially for men. These connections support previous research that demonstrates that having regular mealtimes together with family members provides important opportunities for family communication and relationship development, as well as increased satisfaction in one's overall life (e.g., Eggebeen & Knoester, 2001; Flores et al., 2005; Fulkerson et al., 2006). Although family meals have been shown to provide a buffering effect against long work hours and lead to lower work-family conflict (Jacob et al., 2008), having regular family meals was not significantly related to work-family conflict in this study. Family meals were negatively correlated with both types of work-family conflict for males and females in this study, but did not predict those outcomes in the model. One explanation for this finding is that this relationship in the SEM model may have been confounded through the connection between family meals with sleep problems and satisfaction outcomes. Family meals were negatively related to sleep problems, as hypothesized. This finding supports previous literature (Mindell et al., 2009a, 2009b), which suggests that family meals provide an important role in establishing nighttime routines that make schedules more consistent. This consistency in schedules is likely to assist in creating a more conducive sleep schedule, aiding in the body's ability to rely on a consistent biological clock and circadian rhythm, and thus get better sleep (Healthy Sleep, 2010).

Poverty was only significantly related to three variables in the model; sleep problems, self-reported health, and life satisfaction. Poverty was positively related to sleep problems in women, but only had a small negative relationship with sleep problems for men. This finding may be related to differences in stress experienced by men and women in poverty. For example,

Gyamfi et al. (2001) reported that working mothers in poverty experience increased levels of stress. This stress may be related to the demands of meeting family and work roles, as well as worry over bills and an insufficient income to meet family needs. It may be this increased stress for working mothers in poverty that affects their sleep problems more than it does in men. A similar explanation could be seen in the result that women in poverty had significantly lower self-reported health than men, as well as slightly lower life satisfaction than men in poverty. Perhaps the stress that impoverished women face leads to more frustration in life and a feeling that their health is not as good as it should be because of the increased worry. Other potential connections to that increased stress from poverty that were not found in the model included increased BMI scores and both types of work-family conflict. Although previous researchers have reported connections between poverty and obesity (e.g., Frye & Heinrich, 2003; Kaufman & Karpati, 2007; Pickett et al., 2005), the connection was not significant in this model. It is unclear why this common finding was not significant in this model. It may be related to the study participants who were neither obese nor living in poverty.

Work hours were only significantly related to two variables in the model, sleep problems and work-family conflict. As hypothesized, increased work hours were related to increased sleep problems in men and women. This finding supports other studies which have reported that increased work hours, which decrease personal and family time and increase work-related stress and demands, are likely to interfere with sleep quality, duration, or consistency (e.g., Akerstedt et al., 2002; Bouvin et al., 2007; Healthy Sleep, 2010; Kronholm et al., 2006). In the study by Kronholm et al. (2006), a large sample was broken into groups by sleep duration. Increased work hours had a direct negative relationship to hours of sleep per night, so that as work hours increased in each group, sleep decreased. Working longer hours leads to a decreased availability

of hours left per day to sleep. It is also possible that the increased stress that is often associated with increased work hours (e.g., Britt & Dawson, 2005; Knudsen et al., 2007) decreases sleep quality as well so that even when workers are sleeping they are not getting restful sleep. Work hours were also negatively related to work-to-family conflict. This finding supports previous research (Aryee et al., 1999; Galovan et al., in press; Repetti et al., 2009), and suggests that the additional role demands associated with the long work hours create more stress and conflict that gets in the way of meeting family role demands.

Several gender differences were identified in this study. The first main finding was that the SEM model group comparison between men and women was significant. This suggests that the model fits each gender differently based on the variables and pathways in the model. An examination of the significantly different individual pathways between the gender groups illuminates this finding further. For example, having a young child at home was related to significantly greater family-to-work conflict for women than for men. This supports previous literature, which has reported that women who work still come home to fulfill the majority of household and childcare responsibilities; and the increased family role demands associated with having a young child at home lead to working parents, especially mothers, feeling an increased sense of work-family conflict (e.g., Britt & Dawson, 2005; Galovan, in press; Kronholm et al., 2006; Reynolds & Aletraris, 2007; Rotenberg et al., 2000; Sadeh et al., 2007).

Another significant gender difference in the model was that family dinners were related to significantly greater marital satisfaction for men than for women. One possible explanation for men's relationships with their spouses benefitting more from family mealtimes is that working women tend to be more responsible for family demands (e.g., Rotenberg et al., 2000), such as preparing meals, and may not benefit from the family mealtime as much as men because they are

more tired from preparing the meal. This difference may allow men to perceive the mealtime as more of a relaxing time to communicate with family members and focus on building relationships and enjoying time together, rather than being focused as much on the family demand aspect of the preparing for, or cleaning up after, the meal.

The study also hypothesized that higher BMI scores would be related to significantly lower marital satisfaction, life satisfaction, and self-reported health for women. Although the relationship between BMI and marital satisfaction was not significant in this study, BMI scores were related to lower self-reported health and life satisfaction for women. These findings support previous research (e.g., Ball et al., 2004), and suggest that being overweight does affect women's perception of life quality and health more than it does for overweight men. This is not surprising given the Western society's focus on the connection between thinness and feminine beauty (Lamb et al., 1993; Turner et al., 1997).

One final gender difference was that education level was related to significantly greater self-reported health for men than for women. Increased education level has been connected with lower BMI and increased health in numerous studies (Chen, Chang, & Yang, 2008; Daniel et al., 2006; Kitagawa & Hauser, 1973; Meeks & Murrell, 2001; Paertakul, White, Williamson, Ryan, & Bray, 2002). However, only a few studies have noted that higher education seems to be more significantly related to self-reported health in men than in women (e.g., Giang & Allebeck, 2003). One explanation for the difference in this model could be that education was related to BMI more strongly for women than for men, and that relationship to BMI accounted for some of the variance between education and health for women more than for men.

### **Strengths, Limitations, and Future Directions**

This study has several strengths, such as the use of a large, nationally representative dataset. The NSCW dataset is generally well-respected and well-known in work-family research. It provides a representative picture of how workers in the U.S. experience work and family life, and how sleep problems are related to several work, personal, and family outcomes. The current study used the most up-to-date NSCW survey to get a current view of work and family life for U.S. workers. Another strength that this study had was the use of a gender comparison SEM model. Few studies have examined how work and family life are related to sleep problems and BMI. By using a gender comparison, this study was able to explore unique gender differences between specific paths in the conceptual model. For example, this study assessed the connections between workplace flexibility and family dinners with sleep problems and several work and family outcome variables, and how these connections differed for married male versus married female workers. Both of these variables have been generally under-examined in relation to sleep problems. This study also examined both work-to-family conflict and family-to-work conflict. By separately examining both of these conflict variables, it was able to explore the unique relationships that sleep, BMI, and the exogenous variables had on conflict stemming from family role demands at home versus conflict from work role demands.

The current study also had several limitations. Although the NSCW dataset is widely respected, it uses only self-report data, instead of objective measures. Because this study was focused primarily on how sleep problems and BMI scores affected work and family outcomes, it would have been helpful to have more objective measurements of each of these items. However, because those variables are not the primary focus of the NSCW dataset, the information was more limited on those variables than a study would be that was focused on exploring more

detailed issues associated with sleep and BMI. Another limitation is that this study used several single-item measures. Even though many single-item measures have been shown to be reliable and valid in previous research, as stated previously, future research in this area would benefit by capturing more descriptive data from using multiple-item measures that have demonstrated reliability and validity in the areas of sleep and health research. Many of the variables in this study can also have a potential of positive report bias because people answering the phone interviews, even though this procedure may reduce some of this effect through anonymity, may have a social incentive for saying that they are healthy and happy due to social pressure. To overcome this limitation, future studies would need to employ more objective assessments, especially in relation to family meals, sleep problems, BMI, and health. Future studies would also benefit from employing a longitudinal approach to these variables to see how sleep problems and obesity relate to different outcomes for the same population over time. This study was limited to a cross-sectional approach where causality could not be examined or implied. With this limitation in mind, as well as the use of only self-report data, it is clear that future research could explore the specific connections of these variables in much more depth through the use of objective measurements in a population measured across the lifespan.

This study showed that sleep is an important factor in family life and influences a variety of work and family outcomes. Future research needs to consider sleep, often overlooked in research even though it is considered to be one of the three pillars of health, when examining work and family outcomes. Sleep problems are likely to be connected with additional physical and mental health problems that affect relationships at work and in the home. For this reason, future research would benefit by examining more health-related predictors and outcomes. The role of stress is likely to be an important factor in the relationship between sleep problems and

outcomes such as work-family conflict and health. Researchers also need to examine sleep in connection to work and family variables in different contexts. Population-based studies with specific groups would further explain the relationship of sleep to health in the work-family context. For example, studies examining sleep in the work-family area should focus on groups such as those who work atypical schedules (night work, shift work, long shifts over 10 hours, etc.). They should continue to examine the influence of family meals and workplace flexibility in these studies as well, as they both seem to provide a buffering factor that helps workers set up consistent routines or adapt to needs so that they can meet personal and family role demands.

### **Conclusion**

Using a large, nationally representative dataset this study was able to examine how several work and family demands and resources related directly to sleep and BMI, as well as several outcomes. This study demonstrated that there are some differences between working men and women in relation to sleep problems and BMI. Workplace flexibility continues to represent an important factor in balancing work and family demands. Having regular family dinners also provided an important positive, buffering factor in relation to sleep problems and was related to positive satisfaction outcomes. Sleep problems and higher BMI scores were generally associated with negative outcomes. Overall, this study suggests that sleep problems can play a significant role in multiple areas of life, and that there are some important factors in work and family life that can help lessen the likelihood of sleep problems for married workers.

One of the strongest implications from this study is to support family- and worker-friendly policies from a business standpoint. It seems that workplace flexibility is related to having more consistent family meals. When employers provide flexibility, it is likely that workers are able to better meet the demands of personal and family life. In this case, workers can

adjust their schedules so that they can be present for family dinners. Having this regular family mealtime not only seems to benefit the workers, but, from previous research, also seems to relate to more consistent family routines that are connected to more consistent bedtimes and more quality sleep. These simple consistencies in a worker's routine are likely related to better sleep habits, which then leads to more productive and happier waking hours and less conflict between work and family. In the case of flexibility and family meals, these factors are likely to act as protective factors that are related to health, decreased stress, and greater family, work, and life satisfaction in general. These conditions would then likely relate to happier, better employees. Therefore, it is important for businesses and individual workers to seek to develop these protective factors, which will likely benefit not only the workers, but their productivity and satisfaction in the workplace, as well as their perceived health and relationships in the home.



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**Appendices**

*Table 1* – Descriptive Statistics and Correlations Table.....59  
*Table 2* – Decomposition Table of Results from SEM Analysis.....60  
*Figure 1* – Initial Conceptual SEM Model.....61  
*Figure 2* – Final SEM Model for Sleep, BMI, and Work-Family Conflict.....62

TABLE 1: Descriptive Statistics and Correlations among Study Variables

	$M(SD)_{\text{Males}}$	$M(SD)_{\text{Females}}$	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Work Hours	46.00(12.76) <sup>a</sup>	39.57(13.85)	—	-.06	.11 <sup>**</sup>	.02	-.06 <sup>+</sup>	.06 <sup>+</sup>	.03	.02	.01	.23 <sup>**</sup>	.04	.01	-.01
2. Family Dinners	4.67(1.92)	4.54(1.92)	-.09 <sup>+</sup>	—	.17 <sup>**</sup>	.08 <sup>+</sup>	.02	.07	-.11 <sup>*</sup>	.02	.26 <sup>**</sup>	-.11 <sup>*</sup>	-.09 <sup>*</sup>	.05	.19 <sup>**</sup>
3. Kids < 6 at Home	0.23(.42) <sup>a</sup>	.15(.35)	-.04	.11 <sup>*</sup>	—	-.08 <sup>**</sup>	.14 <sup>**</sup>	.03	.02	-.02	.01	.14 <sup>**</sup>	.08 <sup>**</sup>	.01	-.04
4. Work Flexibility	3.25(.69) <sup>b</sup>	3.19(.72)	-.00	.12 <sup>*</sup>	.01	—	-.13 <sup>**</sup>	.16 <sup>**</sup>	-.16 <sup>**</sup>	.01	.10 <sup>**</sup>	-.29 <sup>**</sup>	-.08 <sup>**</sup>	.18 <sup>**</sup>	.23 <sup>**</sup>
5. Poverty < 250%	.14(.35)	.15(.36)	-.14 <sup>**</sup>	-.05	.13 <sup>**</sup>	-.01	—	-.21 <sup>**</sup>	-.00	-.01	.03	.00	.02	-.04	-.05 <sup>+</sup>
6. Education Level	4.15(1.53) <sup>a</sup>	3.98(1.48)	.06 <sup>+</sup>	.05	.07 <sup>*</sup>	.05	-.28 <sup>**</sup>	—	-.07 <sup>*</sup>	-.08 <sup>*</sup>	.02	-.02	-.00	.21 <sup>**</sup>	.11
7. Sleep Problems	2.18(.94) <sup>a</sup>	2.36(1.01)	.09 <sup>**</sup>	-.18 <sup>**</sup>	-.03	-.17 <sup>**</sup>	.08 <sup>*</sup>	-.09 <sup>**</sup>	—	-.00	-.14 <sup>**</sup>	.41 <sup>**</sup>	.37 <sup>**</sup>	-.26 <sup>**</sup>	-.31 <sup>**</sup>
8. Body Mass Index	28.80(5.85) <sup>a</sup>	27.67(6.75)	-.01	-.05	-.05	-.13 <sup>**</sup>	.08 <sup>*</sup>	-.13 <sup>**</sup>	.05	—	.03	.00	.01	-.20 <sup>**</sup>	-.01
9. Marital Satisfaction	3.48(.72) <sup>a</sup>	3.37(.79)	.01	.18 <sup>**</sup>	.02	.13 <sup>**</sup>	-.06 <sup>+</sup>	.04	-.17 <sup>**</sup>	-.02	—	-.16 <sup>*</sup>	-.22 <sup>**</sup>	.11 <sup>**</sup>	.39 <sup>**</sup>
10. Work-Family Conf.	1.69(.68) <sup>c</sup>	1.64(.65)	.27 <sup>**</sup>	-.17 <sup>**</sup>	.06 <sup>*</sup>	-.32 <sup>**</sup>	.02	.05	.36 <sup>**</sup>	-.01	-.21 <sup>**</sup>	—	.51 <sup>**</sup>	-.24 <sup>**</sup>	-.34 <sup>**</sup>
11. Family-Work Conf.	1.30(.44) <sup>a</sup>	1.36(.50)	.06 <sup>+</sup>	-.12 <sup>*</sup>	.13 <sup>**</sup>	-.08 <sup>**</sup>	.04	.02	.27 <sup>**</sup>	-.01	-.28 <sup>**</sup>	.46 <sup>**</sup>	—	-.18 <sup>**</sup>	-.30 <sup>**</sup>
12. Self-Report Health	3.13(.72)	3.17(.71)	-.01	.16 <sup>*</sup>	.07 <sup>*</sup>	.13 <sup>**</sup>	-.15 <sup>**</sup>	.11 <sup>**</sup>	-.25 <sup>**</sup>	-.32 <sup>**</sup>	.15 <sup>**</sup>	-.17 <sup>**</sup>	-.16 <sup>**</sup>	—	.30 <sup>**</sup>
13. Life Satisfaction	3.42(.65)	3.44(.68)	-.03	.21 <sup>**</sup>	-.01	.25 <sup>**</sup>	-.12 <sup>**</sup>	.06 <sup>*</sup>	-.33 <sup>**</sup>	-.12 <sup>**</sup>	.43 <sup>**</sup>	-.35 <sup>**</sup>	-.33 <sup>**</sup>	.26 <sup>**</sup>	—

Notes: Values above the diagonal are for the Married Males ( $n = 1105$ ); values below the diagonal are for Married Females ( $n = 1019$ ).

Significant mean differences by gender are represented by: <sup>a</sup> ( $p < .01$ ), <sup>b</sup> ( $p < .05$ ), <sup>c</sup> ( $p < .10$ ).

Significant correlations are represented by: <sup>+</sup>  $p < .10$ , <sup>\*</sup>  $p < .05$ , <sup>\*\*</sup>  $p < .01$



TABLE 2: *Decomposition of Effects from SEM on Sleep, BMI, and Work-Family Variables*

	Direct		Indirect		Total	
	Males	Females	Males	Females	Males	Females
<i>Effects on Sleep Problems</i>						
Work Hours	.032	.083**	NA	NA	.032	.083
Family Dinners	-.086*	-.147**	NA	NA	-.086	-.147
Workplace Flexibility	-.144**	-.147**	NA	NA	-.144	-.147
Poverty < 250% †	-.030	.068*	NA	NA	-.030	.068
Education Level	-.050	-.066*	NA	NA	-.050	-.066
<i>Effects on Standardized Body Mass Index (BMI)</i>						
Sleep Problems	-.004	.014	NA	NA	-.004	.014
Workplace Flexibility †	.023	-.114**	NA	NA	.023	-.114
Education Level	-.081**	-.126**	NA	NA	-.081	-.126
<i>Effects on Marital Satisfaction</i>						
Sleep Problems	-.106**	-.145**	NA	NA	-.106	-.145
Family Dinners	.215**	.097*	.009	.021	.224	.118
Workplace Flexibility	.060*	.080**	.015	.021	.075	.101
<i>Effects on Work-to-Family Conflict</i>						
Sleep Problems †	.368**	.309**	NA	NA	.368	.309
Work Hours per Week	.204**	.224**	.012	.026	.216	.250
Kids < Age 6 at Home	.084**	.078**	NA	NA	.084	.078
Workplace Flexibility	-.224**	-.254**	-.053	-.045	-.277	-.299
Education Level	.014	.054*	-.018	-.020	.032	.074
<i>Effects on Family-to-Work Conflict</i>						
Sleep Problems	.364**	.271**	NA	NA	.364	.271
Kids < Age 6 at Home †	.070*	.136**	NA	NA	.070	.136
<i>Effects on Self-Reported Physical Health</i>						
Sleep Problems	-.228**	-.214**	NA	NA	-.228	-.214
Standardized BMI	-.192**	-.296**	NA	NA	-.192	-.296
Family Dinners	.000	.000	.020	.032	.020	.032
Kids < 6 at Home	.024	.064*	NA	NA	.024	.064
Workplace Flexibility	.123**	.050 <sup>+</sup>	.028	.065	.151	.115
Poverty < 250% †	-.003	-.112**	.007	-.015	.010	-.127
Education Level †	.161**	.017	.027	.052	.189	.069
<i>Effects on Life Satisfaction</i>						
Sleep Problems	-.269**	-.279**	NA	NA	-.269	-.279
Standardized BMI	-.017	-.078**	NA	NA	-.017	-.078
Family Dinners	.130**	.090*	.023	.041	.153	.131
Workplace Flexibility	.162**	.174**	.038	.050	.200	.224
Poverty < 250%	-.042	-.068*	.008	-.019	-.050	-.087
Education Level	.051 <sup>+</sup>	-.001	.015	.028	.066	.029

*Notes.* NA = Not applicable (because paths were not in original model or were trimmed out). † Represents significant differences in the pairwise comparisons between direct effects across genders at  $p < .05$ . Significant direct regression coefficients are represented by: <sup>+</sup>  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$ . When a variable had no significant direct, indirect, or total effect for either gender, it was removed from the table.

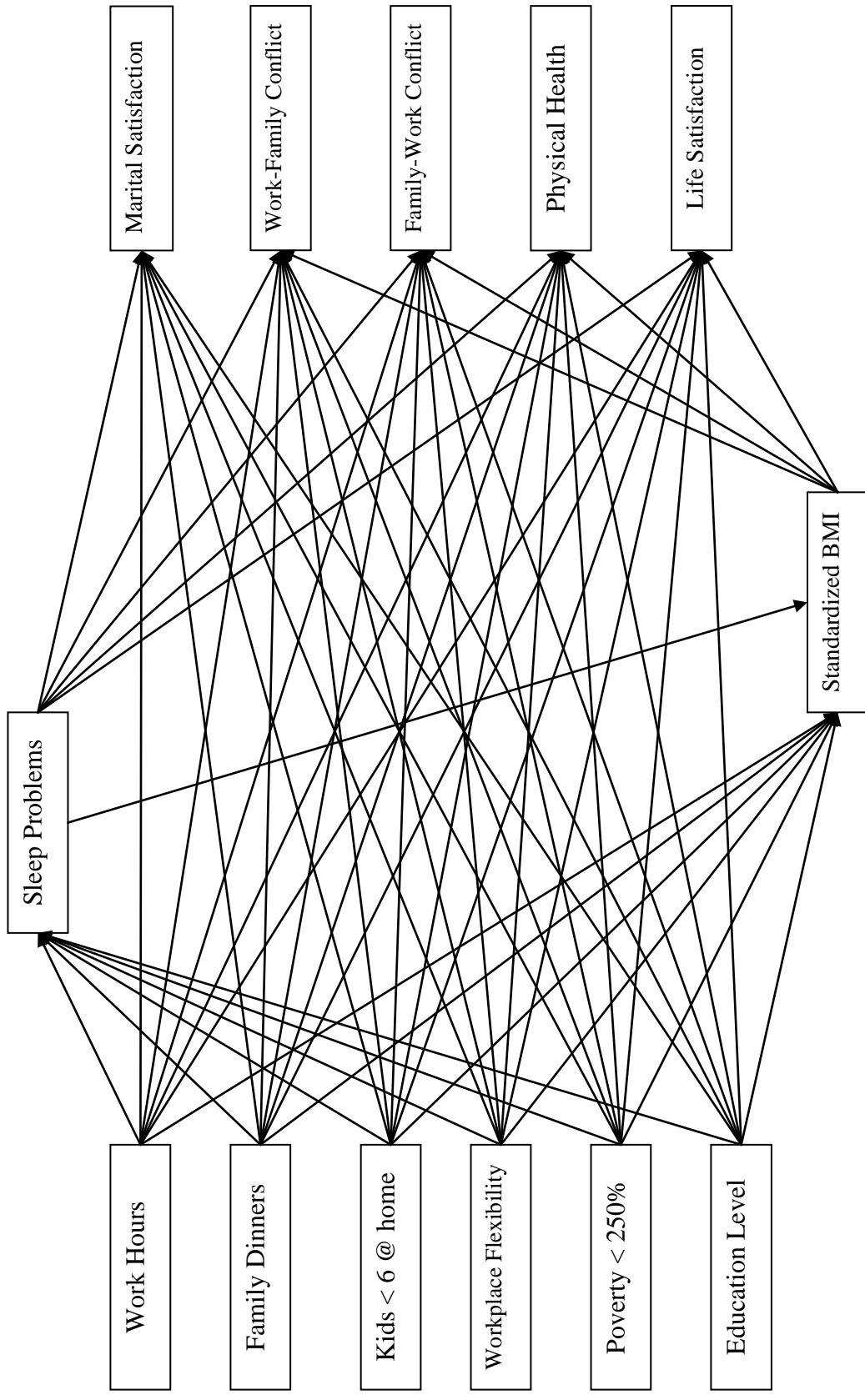
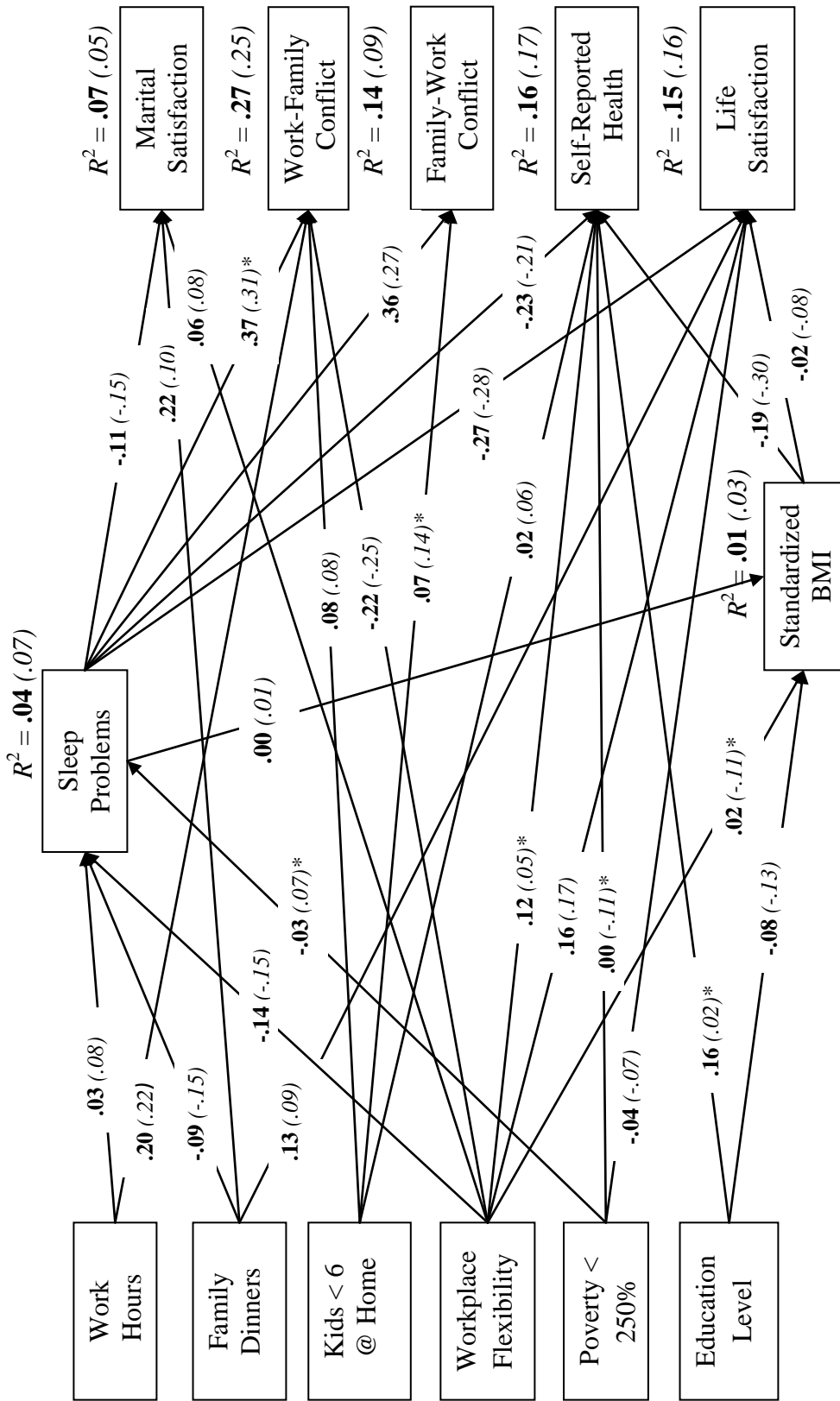


Figure 1. *Initial Conceptual Model*

Figure 2. Final SEM Model for Sleep and BMI in Relation to U.S. Workers' Health, Satisfaction, and Conflict Outcomes



Notes: Numbers for males in the model are shown in bold, and numbers for females are italicized in parentheses. Only pathways that were significant for males, females, or both are shown. Also, for parsimony in reading the model, not all significant path coefficients are shown between the exogenous control variables and the five outcome variables (see TABLE 2 for direct effects). Overall model ( $n = 2124$ ) had an excellent fit to the data,  $\chi^2(52) = 43.895$ ,  $p = .787$ , CFI = 1.000, TLI = 1.000, RMSEA = .000. Regression coefficients that are significantly different between genders are represented by: \*  $p < .05$ .