BORROWING FROM SLEEP TO PAY WORK AND FAMILY: EXPANDING TIME-BASED CONFLICT TO THE BROADER NONWORK DOMAIN

CHRISTOPHER M. BARNES
Virginia Tech

DAVID T. WAGNER
Singapore Management University

SONIA GHUMMAN
University of Hawai'i at Manoa

We extend cross-domain research by examining sleep, a domain within the larger nonwork domain that competes for time with work and family domains. We draw from scarcity theory and research on slack resources to contend that, because people cannot increase the amount of time they have, they borrow time from sleep in order to spend more time working and with family. Utilizing a Bureau of Labor Statistics survey of 10,741 participants, we find nonlinear and interactive effects of time spent working and time spent with family on sleep time, suggesting that the negative effects of work and family on sleep time are especially strong when demands for work and family are high. In an experience sampling field study of 122 working adults, we similarly find a nonlinear effect of work time on sleep time as well as an interaction between work time and family time in predicting time spent sleeping. Both studies indicate that as slack time resources become increasingly scarce, time spent working and time spent with family have increasingly powerful negative effects on time spent sleeping. Contrary to our expectations, we found no support for gender as a moderator of these effects.

Employees are responsible for fulfilling a range of activities at work, yet most employees also have a range of activities that happen outside of work, especially in the family domain (for reviews, see Allen, Herst, Bruck, & Sutton, 2000; Eby, Casper, Lockwood, Bordeaux, & Brinley, 2005; Eby, Maher, & Butts, 2010; Kossek & Ozeki, 1998). This research indicates that work and nonwork domains often come into conflict, with most of the work-life literature focused on conflict between work and family. An especially important form of work–family conflict is time-based conflict, in which work and family domains are incompatible due

to competing demands for employees' finite time resources (Greenhaus & Beutell, 1985).

To date, the time-based conflict literature has typically ignored domains other than work or family. However, literature examining the interface between work and nonwork domains is beginning to acknowledge that the lives of employees outside of the workplace entail more than just family (Hecht & McCarthy, 2010; Sonnentag, 2003). Thus, there are activities other than work and family that also compete for the same finite time resources. This is an important point, given that research suggests that employees tend to have a higher quality of life when time spent working and time spent with family are managed such that there is sufficient time to accomplish work goals and to participate in desired family activities (Greenhaus, Collins, & Shaw, 2003). However, exclusively focusing on work and family ignores an entire nonwork domain that is critical to employee effectiveness, health, and well-being: sleep. Alarmingly, sleep is particularly susceptible to being undercut by those who spend large amounts of time in both work and family activities, given that time is a finite resource. Thus, despite the benefits of effectively managing work and family domains, there are further domains that call for employees' time and energies, yet these domains have largely been ignored by the work-life literature. This shortcoming may promote the implicit assumption that other time demands are relatively constant, that they are not important, or that other domains are not meaningfully related to time spent with work and family.

Notwithstanding these assumptions, many people sleep for more hours than they spend working or with family. For example, the American Time Use Survey (ATUS) conducted by the Bureau of Labor Statistics indicates that working Americans spend on average 430 minutes per day working and 467 minutes per day sleeping (Barnes & Wagner, 2009). Thus, it is clear that sleep constitutes a large portion of people's day-to-day lives that ought to be considered by organizational researchers. Moreover, within limits, people have control over the amount of time they spend sleeping. Yet despite the pervasive and powerful effects of sleep—and the lack thereof (Barnes, 2012; Harrison & Horne, 2000; Lim & Dinges, 2010)— the work-life literature has almost entirely ignored the implications that spending time on work and family pursuits will have on this crucial domain. This is important because as it currently stands, the work-life literature could be construed to suggest that someone who spends both a very large amount of time working (e.g., 10 hours per day) and a very large amount of time with family (e.g., 10 hours per day) would conceivably satisfy important goals in work and family domains, thus experiencing positive outcomes from day to day (Greenhaus et al., 2003). However, spending time in this manner would leave very little time for sleeping

(e.g., 4 hours per day), which research indicates would result in a broad variety of negative effects that arise from insufficient sleep (Harrison & Horne, 2000; Lim & Dinges, 2010). Thus, leaving sleep out of work-life theories can lead to tenuous assumptions and misleading conclusions and predictions regarding the benefits of very high levels of both time spent working and time spent with family.

When addressing this omission to past work-life theories, it is also worth considering the large body of research indicating that women face especially difficult challenges with regard to balancing multiple demands on their time (Bianchi, Milkie, Sayer, & Robinson, 2000; Coltrane, 2000; Duncan, Edwards, Reynolds, & Alldred, 2003). Several studies have found gender to be relevant to the relationship between work and family (Gutek, Searle, & Klepa, 1991; Rothbard & Edwards, 2003), with women more likely to experience work–family conflict than men (Behson, 2002; Frone, Russell, & Cooper, 1992; Loerch, Russell, & Rush, 1989; Wallace, 1999). Thus, it is reasonable to expect that gender plays a role in making decisions about allocations of time, including decisions about work, family, and sleep.

Therefore, the purpose of this paper is to extend work-life theory by integrating sleep as a meaningful nonwork domain. We draw from scarcity theory (Edwards & Rothbard, 2000) and research on slack resources (Bromiley, 1991; Cyert & March, 1963; George, 2005) to contend that because people cannot increase the amount of time they have, they borrow time from sleep to spend time with work and family. We expect this to be especially true for women. Moreover, given the array of other activities classified as neither work, family, nor sleep, we propose that the effects of work and family time on sleep time are increasingly strong when demands for time are high, resulting in nonlinear relationships between time devoted to work and family and time spent sleeping. As time becomes scarce, people start by eliminating less important activities (such as leisure) but eventually run out of these and must then trade more directly between sleep time and work/family time. For example, if someone spends an extra hour working on a given day, that person might compensate by watching 1 less hour of television that evening. Thus, the extra hour of work may not come at the expense of sleep. But if the person works an extra 4 hours, cutting out television may not make up for the full 4 hours. Some of those 4 hours may need to come out of sleep time (with the last hour competing most directly with sleep). In this sense, we expect that every moment spent engaged in work or family domains will have nonlinear and increasingly influential negative effects on sleep time, with gender moderating this effect.

This extension to the work-life literature will provide greater understanding of how employees with scarce time resources manage competing

demands and will present additional theoretical considerations that should be included as scholars seek to articulate effective models for managing multiple domains. As an additional contribution, we build upon previous work-life research to examine how the time squeeze among work, family, and sleep differs by gender (Rothbard & Edwards, 2003).

Time-Based Conflict

Time-based conflict arises when time allotted to one (e.g., work) domain expends time necessary for another domain (e.g., family; Edwards & Rothbard, 2000). As might be expected, research has shown that time-based conflict is associated with a variety of work-related constructs. For example, time-based conflict has been connected to the number of hours spent working and/or commuting per week (Bohen & Viveros-Long, 1981; Keith & Schafer, 1980), irregular and inflexible work schedules (Pleck, Staines, & Lang, 1980), and the amount of time spent working overtime (Pleck et al., 1980). Thus, it is clear that work is an important factor to consider when examining time-based conflict.

Likewise, the family domain is one that has received considerable research attention (cf. Allen et al., 2000; Eby et al., 2005, 2010; Kossek & Ozeki, 1998). The family domain encompasses time spent with family members, caring for family members, and engaging in activities intended to benefit family members. We define family broadly to include spouses and children but also long-term relationships with significant others whom a person considers to be family (e.g., same sex partnerships or long-term cohabitation), as well as extended family members with whom the individual often interacts. Research has indicated that several family-related variables are also linked to time-based conflict. For instance, marital status (Herman & Gyllstrom, 1977), presence of younger children in the home (Bohen & Viveros-Long, 1981), large families (Cartwright, 1978), and spousal work involvement and work schedules (Beutell & Greenhaus, 1982; Hall & Gordon, 1973) have all been shown to relate to time-based conflict.

Although work and family are the domains that have dominated the research on time-based conflict, a few studies have addressed other types of conflict, such as work and self (Holahan & Gilbert, 1979), and work and leisure (Staines & O'Connor, 1980). It is important to consider such relationships between work and family in conjunction with other domains, as employees cannot be described purely in terms of work and family (Edwards & Rothbard, 2000). An important subdomain that has been almost entirely ignored in the time-based conflict literature is sleep (see Edwards & Rothbard, 2000 for an exception). Given the importance of sleep, we argue that a holistic assessment of work-life research should

extend to this important component of the nonwork domain, which is the focal contribution of this paper.

Sleep: The Victim of Balancing Work and Family

Researchers in the fields of physiology, ergonomics, and experimental psychology have spent decades investigating the effects of sleep quantity on human behavior and performance (for reviews, see Harrison & Horne, 2000; Lim & Dinges, 2010; Pilcher & Huffcutt, 1996). Scholars in management and applied psychology have recently taken an interest in the influence of sleep on members of organizations (cf. Barnes & Hollenbeck, 2009; Barnes, Schaubroeck, Huth, & Ghumman, 2011; Barnes & Van Dyne, 2009; Barnes & Wagner, 2009; Christian & Ellis, 2011; Scott & Judge, 2006; Sonnentag, Binnewies, & Mojza, 2008; Wagner, Barnes, Lim, & Ferris, in press). Their studies indicate that low levels of sleep lead to negative effects on self-regulation, decision making, team performance, and job satisfaction, as well as increases in unethical behavior and injuries. Thus, sleep is not only important to humans in general but also has important implications for employees at work.

Despite the predictions permitted by past research, nearly all of the prior studies have completely ignored sleep as a competitor for employees' time. The exception is Edwards and Rothbard (2000), who briefly addressed sleep as a nonwork and nonfamily activity. They noted that in response to increased time demands at work a person may spend less time sleeping or pursuing hobbies. This suggests that time spent sleeping would be negatively correlated with time spent working and with family, or would cut into nonsleep or nonfamily "buffer" activities.

Although they did not directly examine the relationship between time spent working and time spent with family, nor did they directly examine the relationship between time spent with family and time spent sleeping, Basner et al. (2007) found a correlation of –.36 between time spent working and time spent sleeping. Their finding is consistent with the argument put forth by Edwards and Rothbard (2000) that time spent on different activities can be reshuffled. In other words, Basner and colleagues provide initial support for the resource drain model proposed by Edwards and Rothbard.

Scarcity theory and the resource drain model indicate that to the degree that different activities compete for the same time resources (Edwards & Rothbard, 2000) they will be negatively related. Relevant to the topic of scarcity is the idea of slack resources. Slack is the difference between resources that are available and resources that are being utilized (Bromiley, 1991; Cyert & March, 1963). Slack resources can be diverted toward a specific aim (George, 2005). Thus, slack resources can serve as a

buffer between changes in demands and specific behaviors (George, 2005; Wiseman & Bromily, 1996), as the slack is allocated to meet the demand. Slack resources are dynamic (George, 2005) and are essentially used up as they are utilized. In other words, as slack resources are consumed, there is less of a buffer to soak up further increases in demands. Once slack resources are totally gone, any increase in demands will come at the expense of current activities.

Although most research on slack resources is conducted at the firm or unit level and focuses on money, research indicates that time is also an important resource (Zauberman & Lynch, 2005). People spend, save, and utilize time in a similar manner as money, with slack time resources serving a parallel role to slack money resources (Zauberman & Lynch, 2005). Thus, when people have low levels of demands on their time, they have high levels of slack time. Although there are many different types of demands on people's time, three especially prevalent and important demands are time spent working, time spent with family, and time spent sleeping. Other uses of time (such as watching television) are more likely to be considered slack time than are work, family, and sleep. Indeed, some activities, such as watching videos on Youtube, are considered to be loafing behavior (Wagner et al., in press).

Slack time can serve as a buffer against the time demands of work or family activities. For example, if an employee is suddenly given a time critical assignment that necessitates extending work hours, the employee can reallocate slack time (e.g., less time watching television) and stay late at work, without taking time away from family demands or sleep. However, the greater the time demands from work and family, the lower the amount of slack time available to the employee. As slack time is depleted, increases in time demands of work or family cannot be buffered by slack time; an increase in time spent on one activity such as working must come at the expense of another. For example, an employee with very high demands may work 12 hours per day, spend 6 hours with family, and sleep the other 6 hours. If this employee needed to work an extra hour, it would come directly at the expense of time spent with family or time spent sleeping because there is no other activity from which to reallocate time.

Building upon the notion of scarcity and slack time resources, we contend that the influence of time spent working and time spent with family will have stronger relationships with time spent sleeping under some conditions than others. Specifically, we contend that these relationships will be strongest when time is most scarce (i.e., when slack time resources are absent). This reasoning is in line with that of Edwards and Rothbard (2000), suggesting that time can be reallocated from other (nonwork and nonfamily) activities and toward work activities.

Empirical research provides indirect support for this contention. For instance, Rothbard and Edwards (2003) found that the relationship between time spent working and time spent with family was stronger for women than for men. Their explanation for this difference was that, compared to men, women dedicated an average of 7 more hours per week to family. The authors suggested that, with family time investment already at high mean levels, further increases may have left women with little recourse other than drawing time from work. For men, however, lower family time investment may have left slack time resources in other domains (e.g., community involvement, exercise, etc.) such that increases in family time could be addressed by stealing time from other activities rather than from work. Valcour (2007) similarly found that higher amounts of time spent working had stronger effects on work–family conflict for people with low levels of control over their schedules than for people with high levels of control, presumably because they had fewer options for substituting time allocated to other activities.

However, employees who do not have time allocated to nonwork and nonfamily activities will lack the ability to reallocate their time because all time has already been committed to work and family domains. In such examples, every additional hour spent working or with family leaves fewer activities from which to pillage time, making time increasingly scarce. At high levels of time working or with family, an employee will likely have already consumed the majority of his or her slack time resources. With no slack time resources to be reallocated, time spent working, with family, or sleeping will be most directly in conflict with one another.

Therefore, we hypothesize a nonlinear relationship between time spent working and time spent sleeping, such that the greater the amount of time spent working the stronger the negative effect of time spent working on time spent sleeping. In other words, each additional hour of work will be more likely to detract from time spent sleeping than the previous one. Furthermore, we hypothesize a similar nonlinear relationship between time spent with family and time spent sleeping, such that the greater the amount of time spent with family, the stronger the negative effect of time spent with family on time spent sleeping. Finally, our arguments also suggest an interaction between time spent working and time spent with family in predicting time spent sleeping, with these effects concurrently predicting time spent sleeping. Hypotheses 1–3 reflect these expectations.

Hypothesis 1: There will be a nonlinear relationship between time spent working and time spent sleeping, such that the relationship is more strongly negative at high levels of time spent working than at low levels of time spent working.

Hypothesis 2: There will be a nonlinear relationship between time
spent with family and time spent sleeping, such that
the relationship is more strongly negative at high levels
of time spent with family than at low levels of time
spent with family.

Hypothesis 3: Time spent with family will interact with time spent
working to predict time spent sleeping, such that time
spent sleeping will be especially low when time spent
working and time spent with family are both high.

The Moderating Effect of Gender

Although women's participation in the workforce has increased and is
comparable to that of their male counterparts (Bureau of Labor Statistics,
2011; Hakim, 2002), research within the last decade suggests that work
and family roles still continue to be gendered with men pursuing traditional
work roles and women pursuing more traditional family roles (Fletcher
& Bailyn, 2005). Even as the division of household labor becomes more
equal for men and women and men's contributions to domestic chores
increase (Rogers & Amato, 2000), Bianchi et al., (2000) and Coltrane
(2000) estimate that women continue to conduct between 65 and 85% of
domestic chores in the household. Moreover, as work demands increase,
many women still subscribe to the notion that being a good wife and
mother take priority over work pursuits (Buttrose & Adams, 2005; Douglas
& Michaels, 2004). As such, the division between work and house labor
continues to be delineated by gender (Duncan et al., 2003).

Social role theory (Eagly & Koenig, 2006; Eagly, Wood, & Deikman,
2000) suggests that the differentiation of labor across gender in the work
and family domains is shaped by traditional gender belief systems, which
include attitudes toward the appropriate roles of men and women. Cognitive theories of gender development also endorse the idea that individuals acquire gender belief systems through their surrounding environment
and consequently become socialized into gender roles and stereotypes
(Martin, 2000; Martin & Ruble, 2004; Martin, Ruble, & Szkrybalo, 2002).
As such, Cinamon and Rich (2002) found that more women than men fit
a family profile in which they attribute greater importance to family roles
and lower importance to work roles, whereas more men than women fit a
work profile attributing more significance to work roles and less to family
roles.

Women's career goals also seem to reflect traditional gender attitudes
or gender-specific career interests (Diekman & Eagly, 2008; Evans &
Diekman, 2009). For example, Fortin (2005) found gender differences
in career preferences with men being more likely to endorse good pay

than women, whereas women gave more significance to a job with good hours. In the case of self-employment, there are also differences in motives and preferences across gender, with women being more focused on balancing work and family demands whereas men are focused on wealth creation via business ownership (De Martino & Barbato, 2003). Moreover, Judge and Livingston (2008) found that traditional gender role orientations were positively related to the earnings of men and negatively predicted the earning of women. Corrigall and Konrad (2007) suggest that these differences in women's career outcomes can be explained by their gender attitudes and preferences early on in their lives. Specifically, Corrigall and Konrad found women's early preference for flexibility of hours in working later influenced women's hours of household labor and their earnings, suggesting that women's gender attitudes guide both their work and family roles. Given that women engage in more family labor than men (Bianchi et al., 2000; Coltrane, 2000), this implies that women's gender attitudes still might reflect family roles over work roles.

Research also suggests that gender roles change over time with family involvement being related to more traditional gendered attitudes. Specifically, having children is negatively related to gender egalitarianism for both men and women (Corrigall & Konrad, 2007; Cunningham, Beutel, Barber, & Thornton, 2005; Davis, 2007; Davis & Greenstein, 2009; Fan & Marini, 2000). For example, Katz-Wise, Priess, and Hyde (2010) found that women endorsed more traditional gender-role attitudes and behaviors after giving birth compared to men. Moreover, married men and women become less supportive of egalitarian family responsibilities and endorse traditional family roles (Bolzendahl & Myers, 2004; Gubernskaya, 2010). In addition, Moors (2003) found that women become more traditional in their gender attitudes as they marry. Overall, these findings suggest that changes in gender attitudes may occur over time trending toward more traditional gender attitudes, perhaps as an adjustment to situational constraints (Corrigall & Konrad, 2007).

Further implication of these findings is that men might more easily trade off work and family obligations compared to women (Tenbrunsel, Brett, Maoz, Stroh, & Reilly, 1995), suggesting that women might have a minimum level of time that they must dedicate to family. This may explain why women report higher work interference with family than men, even when the number of hours worked between men and women are the same (Gutek et al., 1991). In addition, Keith and Schafer (1980) found that women's level of work–family conflict is positively related to the number of hours her husband works per week, whereas men are less susceptible to work–family conflict as a result of their spouse's employment (Greenhaus & Kopelman, 1981).

Although there has been mixed support for the effects of gender on work–family conflict (Eby et al., 2005), several studies have found gender to moderate the relationship between the two domains (Gutek et al., 1991; Rothbard & Edwards, 2003), with women more likely to experience either overall work–family conflict or certain forms of work–family conflict than men (Behson, 2002; Frone et al., 1992; Loerch et al., 1989; Wallace, 1999). Building upon these studies, as well as the research showing that, compared to men, women more strongly identify with the family role and find it difficult to trade off work and family obligations, we expect a similar moderating role of gender in the relationship between work time and time spent sleeping. Given that family time investment is already at higher mean levels for women than for men, increases in work time may leave women with little recourse other than drawing time from sleep. For men, however, their lower family time investment may leave slack in other life roles (e.g., leisure) such that increases in work do not require them to draw time from sleep. Thus, we hypothesize the following:

> *Hypothesis 4a*: Gender will moderate the negative relationship be-
> tween time spent working and time spent sleeping,
> such that this relationship will be stronger for women
> than men.

Considering that work time can typically be fixed into one's schedule as a certain number of hours required per week, Gutek et al. (1991) described family time as generally being more controllable and flexible than work time. However, as we described already, sleep may also be perceived as being very elastic in comparison to work and family time. Particularly, individuals may limit their sleep time in favor of work time. Given that women spend more hours than men in combined work and family time and report more work–family interference than men (Gutek et al., 1991), it is possible that women may be more likely than men to borrow time from sleep in order to meet both work and family demands, which for them are generally perceived as more static (Tenbrunsel et al., 1995). In contrast, men are more likely to employ a compensatory approach to family responsibilities, in which they are more willing to trade off family time to work time, suggesting that increases in one or the other domain might have less negative impact on men's sleep. Accordingly, we predict the following:

> *Hypothesis 4b*: Gender, time spent working, and time spent with
> family will interact to predict time spent sleeping,
> such that the interaction between work and family in
> predicting sleep is stronger for women than men.

Study 1: Method

ATUS

The ATUS is a survey conducted by the Bureau of Labor Statistics. This survey measures the amount of time Americans spend doing various activities, such as paid work, child care, volunteering, socializing, and sleeping (Bureau of Labor Statistics, 2008). Bureau of Labor Statistics employees conducted phone interviews with participants and asked participants to describe their activity from 4:00 a.m. the day before the interview to 4:00 a.m. the day of the interview. Interviewers coded these activities into specified categories as outlined by the Bureau of Labor Statistics (2008). Interviews were conducted nearly every day of the year. We utilized data from 2004 to 2006.

Participants

These data were collected from a nationally representative sample of American civilian noninstitutionalized persons aged 15 years and older. This representative sample was obtained via a stratified random sampling approach. The years 2004–2006 included 820,737 call attempts; 103,148 of these attempts were met with refusals to participate; 41,204 attempts resulted in interviews in which data were collected. The remaining attempts did not result in contact with potential participants. Of the 144,352 successful call attempts to potential participants, 41,204 participated for a participation rate of 28.5%. In order to focus on employees in organizations, we include data only from individuals who worked greater than 0 minutes during the period surveyed. Moreover, to focus on individuals who are likely to experience tension between work and family demands, we focused on people with at least one person living at home with them. Complete data were available for 10,741 such interviews. The mean age of respondents was 42.3 years and 50.8% of the participants were female.

Measures

Time spent working. A category of activity in the ATUS was the amount of time spent working. This category was labeled "work and work-related activities" and was composed of time spent working at their primary job, working at any secondary job, and going through security procedures associated with work. Further detail about each of these components is provided by the Bureau of Labor Statistics (2008).

Time spent on family demands. Two categories in the ATUS were relevant to family demands. One was "caring for and helping household members" and was composed of time spent caring for and helping household children, activities related to household children's education, activities related to household, children's health, caring for household adults, and helping household adults. Another was "household activities," including housework, food preparation and cleanup, and household management. We summed time spent in these categories to create an overall measure of time spent on family demands.

Gender. Participant gender was coded as 0 = *male* and 1 = *female*.

Time spent sleeping. A category of activity in the ATUS was the amount of time spent sleeping. This category was separate from the amount of time spent lying in bed awake or tossing and turning.

Control variables. Previous research indicates that age is negatively related to sleep (Basner et al., 2007). Previous research also indicates that parents often have low levels of sleep (Plessow, Keisel, Petzold, & Kirschbaum, 2011) and that having more than one child can be especially disruptive to sleep (Damato & Burant, 2008). Additional previous research indicates that people sleep less on weekdays than on weekends (Groeger, Zijlstra, & Dijk, 2004). Therefore, we included age, number of children, and weekend as controls.

Study 1: Analysis and Results

To test our hypotheses, we conducted ordinary least-squares regressions. Means, standard deviations, and zero-order correlations between each of the study's variables are provided in Table 1. Table 2 shows the results from the regression analyses that were conducted to test all the study's hypotheses, with standardized coefficients reported. In Step 1, we entered the control variables. In Step 2, we entered the main effects for work time and family time. In Step 3, we entered the squared terms to test curvilinear effects (Cohen, Cohen, West, & Aiken, 2003) proposed in Hypotheses 1 and 2, as well as the interaction term to test Hypothesis 3. We centered predictors prior to calculating interaction and squared terms. In Step 4, we entered the interaction terms including gender as well as the three-way interaction term (gender, work time, family time) in order to test Hypotheses 4(a) and (b). All potential two-way interaction terms including gender, work time, and family time were included to separate the effects of the three-way interaction from the effects of any of the two-way interactions (Cohen et al., 2003).

Hypothesis 1 predicted that there would be a nonlinear relationship between time spent working and time spent sleeping, such that the relationship would be stronger at high levels of time spent working than

TABLE 1

Study 1: Means, Standard Deviations, and Zero-Order Correlations Among Variables

	Mean	SD	1	2	3	4	5	6
1. Age	42.28	12.81						
2. Gender	−.01	.50	−.01					
3. Number of children	.98	1.14	−.31**	−.03**				
4. Weekend	.28	.45	−.05**	−.03**	.02*			
5. Work time (in minutes)	432.46	197.87	−.02*	−.12**	−.02*	−.34**		
6. Family time (in minutes)	102.75	117.89	.03**	.19**	.24**	.11**	−.42**	
7. Time spent sleeping (in minutes)	465.65	110.63	−.07**	.04**	−.02	.16**	−.34**	−.05**

Note. $n = 10{,}741$. *$p < .05$; **$p < .01$ (two-tailed). Gender coded as follows: $0 = male$, $1 = female$.

TABLE 2

Study 1: Regression of Sleep on Work and Family

	Standardized regression coefficient			
Predictors	Model 1	Model 2	Model 3	Model 4
Age	−.09**	−.08**	−.08**	−.08**
Gender	.05**	.05**	.04**	.04**
Number of children	−.07**	−.00	−.00	−.00
Weekend	.16**	.04**	.05**	.05**
Work time		−.44**	−.45**	−.46**
Family time		−.27**	−.29**	−.29**
Work time squared			−.13**	−.13**
Family time squared			−.07**	−.07**
Work × Family			−.15**	−.15**
Work × Gender				.00
Family × Gender				.00
Work × Family × Gender				.01
R^2	.04	.18	.19	.19
ΔR^2		.15	.01	.00

Note. $n = 10{,}741$. *$p < .05$; **$p < .01$ (two-tailed). Gender coded as follows: $0 = male$, $1 = female$.

at low levels of time spent working. Results indicate that the squared term for time spent working is significantly related to time spent sleeping ($\beta = -.13$, $p < .01$; Table 2, Model 3). Figure 1 depicts the form of this relationship. As hypothesized, there is a continual increase in the negative relationship between time spent working and time spent sleeping
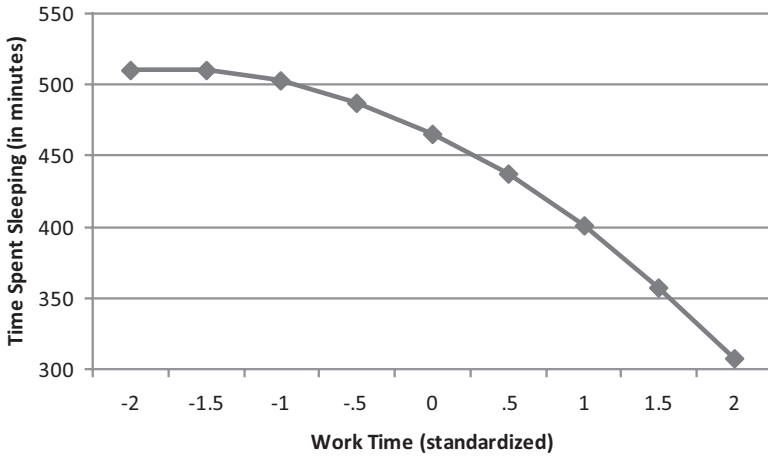
Figure 1: **Study 1: Nonlinear Relationship Between Time Spent Working and Time Spent Sleeping.**

(see Fig. 1).[1] Hypothesis 2 predicted that there would be a nonlinear relationship between family time and time spent sleeping, such that the relationship would be stronger at high levels of time spent with family than at low levels of time spent with family. Results indicate that the squared term for family time was significant ($\beta = -.07, p < .01$; Table 2, Model 3). As hypothesized, at high levels of time spent with family, the effect of family time on sleep time is increasingly negative (Fig. 2).

Hypothesis 3 predicted that there would be an interaction between family time and time spent working, such that the effect of time spent working on sleep would be stronger at high levels of family time than at low levels of family time. The result of the test of this hypothesis was significant ($\beta = -.15, p < .01$; Table 2 Model 3). As hypothesized, Figure 3 shows that at a high (one standard deviation above the mean) level of time spent with family, the negative effect of work on sleep is stronger that it is at a low (one standard deviation below the mean) level of time

---

[1]Based on a reviewer comment, we conducted supplemental analyses to examine the effects of time spent working and time spent with family on time spent in bed but not sleeping. In a full model including the main effects of time spent working, time spent with family, the interaction between work and family time, nonlinear effects, gender effects, and the interaction between gender and the other variables in the model, including the three-way interaction noted above (the same analyses as Model 4 in Table 2 but with the dependent variable of "time spent in bed but not sleeping" instead of time spent sleeping), the R^2 value is only .002. Similarly, controlling for time spent in bed but not sleeping did not significantly change the results in Table 2.
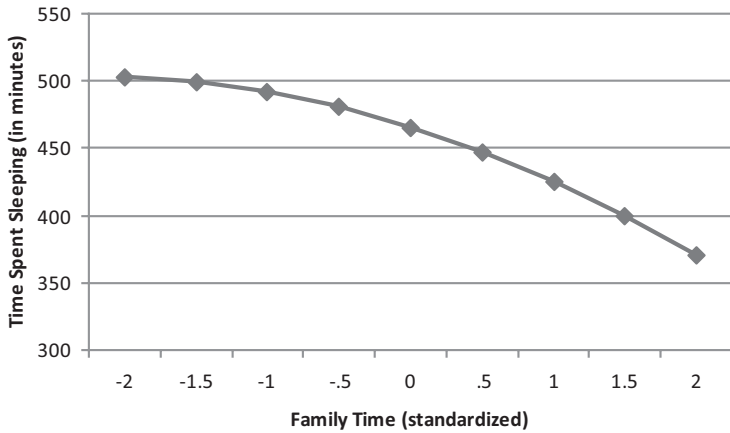
Figure 2: **Study 1: Nonlinear Relationship Between Family Time and Time Spent Sleeping.**
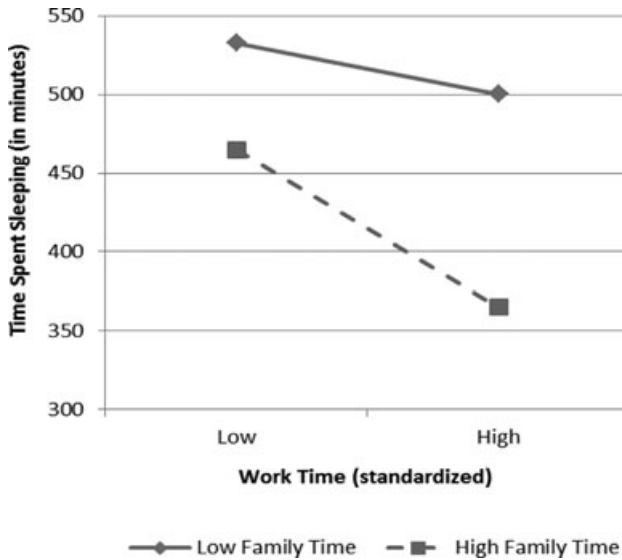

Figure 3: **Study 1: Interactive Effects of Work and Family on Sleep.**

spent with family. The simple slope tests in this interaction revealed a significant negative association between time spent with family and time spent sleeping for both high levels ($b = -.31, p < .001$) and low levels ($b = -.19, p < .001$) of time spent with family.

Hypothesis 4(a) predicted that gender would moderate the negative relationship between time spent working and time spent sleeping. The results of the test of this hypothesis indicate that the interaction term for work and gender was not significant ($\beta < .01$, *ns*; Table 2, Model 4). Hypothesis 4(b) predicted a three-way interaction among gender, time spent working, and family time in predicting sleep. The three-way interaction term was not significant ($\beta = .01$, $P > .10$; Table 2, Model 4). Thus, neither Hypotheses 4(a) nor (b) was supported.

In summary, the results presented earlier offer sound support for the notion that work, family, and sleep time are at odds with one another. The stratified random design of Study 1 allows us to generalize the findings to the population of working Americans. However, all data were given at one point in time in a retrospective fashion, and the study sampled each individual only once, making it impossible to understand fluctuations in behaviors across days or to establish causality among the relationships examined. Therefore, in order to more rigorously test our hypotheses, we conducted our own primary research, which allowed us greater control over measurement of participants' time use and also allowed us to utilize an experience sampling methodology. This approach also allowed us to exclusively study working adults living with a spouse or significant other, therefore ensuring a focus on conflict among work, family, and sleep domains.

Study 2: Method

Sample and Procedures

This sample was composed of working adults who were recruited by university students enrolled in a junior-level organizational behavior course; students received course credit in exchange for the working adults' participation in the study.

Students attended an orientation session during which they received an overview of the study. They also received an invitation letter which was to be given to the working adult (employee). The letter included a summary of the study, which required employees to answer a morning survey (completed just before lunch) and an evening survey (completed just before retiring to bed) each work day for 2 weeks. One hundred twenty-two working adults participated in the 2-week study, providing 1,084 participant-days of responses. The average age of all participants was 46.6 years with an average of 1.7 children living at home (20% had no children living at home); 52% of participants were male, 61.3% had at least a 2-year college degree, and the most prevalent industries in which participants were employed included business and financial operations (14.5%),

sales (9.7%), education (8.9%), management (8.9%), engineering (7.3%), construction (7.3%), transportation (5.6%), government (4.8%), and other fields (33%).

Measures

Time sleeping.   Time spent sleeping the prior evening was measured with the Pittsburgh Sleep Diary (Monk et al., 1994). This measure was presented on the morning survey and asked the employees to report the time they went to bed, how many minutes it took them to fall asleep, how many minutes they spent awake throughout the night after initially falling asleep, and the time they arose from bed in the morning. Time spent sleeping was calculated as the number of minutes between the time an employee went to bed and the time the employee arose the next morning, minus the number of minutes it took the employee to fall asleep and the number of minutes the employee spent awake in bed during the night.

Time working.   Time working was computed in a fashion similar to time spent sleeping, but data were obtained on two different surveys. The morning survey asked the employee to report the time at which he or she arrived at work. The evening survey asked each employee to report the time at which he or she left work. Time at work was calculated as the number of minutes that passed between the employee arriving at and departing from work. Note that this time implicitly included time spent on breaks or at lunch. Including these activities in our analysis is consistent with our conceptual focus that pits work, family, and sleep activities against one another. An employee might not be explicitly working during lunch or during a break, but these activities generally take place at or around the workplace, often with work colleagues. Thus, time spent at the workplace is included as our measure of time working.

Time spent with family.   During the evening survey, each employee was asked when he or she had arrived home from work. The employee was then asked to "please fill in the number of hours you have spent with your spouse/significant other tonight (e.g., 2.5, 4, 1.25)." These responses were converted to minutes, representing our final measure of time the employee spent with his or her spouse or significant other.

Controls.   For reasons noted in Study 1, we included age and number of children as controls. We did not include weekend as a control in Study 2 because all participation occurred during the work week.

Analysis

Our research design allowed us to capture snapshots of daily behavior across 2 weeks of an employee's life. Thus, each set of measurements was

TABLE 3
Study 2: Means, Standard Deviations, and Within-Individual Correlations

	Variable	Mean	SD	1	2	3
1	Work time	600.12	77.20	–		
2	Family time	161.41	95.83	−.31**	–	
3	Time spent sleeping	401.10	74.06	−.08	−.04	–

Note. Level-1 $N = 1,084$; Level-2 $N = 122$. **$p < .01$ (two-tailed).

nested within each employee. The appropriate way to analyze such data is to utilize a hierarchical linear model (HLM), which both accounts for the nonindependent nature of the observations and also allows us to directly examine within-person fluctuations in time use behaviors. Accordingly, all of the main effect variables in our analyses were centered at each individual's mean; to create the interaction term we first centered and then squared the main effect term, thus producing a squared variable at Level 1 in our data set. When conducting our analyses, we left the interaction term uncentered as its components had been centered prior to computing the squared term. In sum, these analytical decisions allowed us to illustrate, for example, how a particularly long day at work can influence how much time the employee spends with his or her spouse that evening and how much time the employee is able to sleep that night, all in comparison to the employee's other days during the 2-week study.

Study 2: Results

The results of Study 2 served to validate and extend the findings of Study 1 by showing that results are not merely attributable to between-individual differences but can be attributed to variations in time use from day to day. Means, standard deviations, and within-individual correlations between each of the study's variables are provided in Table 3.

Hypothesis 1 predicted that there will be a nonlinear relationship between time spent working and time spent sleeping. Supporting Hypothesis 1, results from Study 2 indicate that as employees work longer than average, their time spent sleeping falls at an increasing rate ($B = −.002$, $p < .05$; Table 4, Model 3 and Fig. 4).

Hypothesis 2 predicted a nonlinear relationship between time spent with the employee's significant other and the time the employee spent sleeping, such that the relationship would be more strongly negative at high levels of time spent with the significant other than at low levels of time spent with the significant other. Our findings from Study 2 do not support this hypothesis ($B = −.001$, $p > .10$; Table 4, Model 3).

TABLE 4
Study 2: Influence of Family (Time with Spouse/Significant Other) and Work on Sleep

Predictor	Model 1		Model 2		Model 3		Model 4	
	B	T-value	B	T-value	B	T-value	B	T-value
Intercept (B_{00})	401.176	73.24**	400.124	68.48**	407.590	59.75**	408.021	59.81
Level 2 predictors								
Gender (B_{01})	−4.325	−.41	1.472	.13	−2.982	−.24	−3.957	−.30
Number of children at home (B_{02})	−3.960	−.60	.196	.03	−5.480	−.71	−5.507	−.71
Age (B_{03})	.492	.74	−.282	−.40	−.434	−.55	−.447	−.57
Level 1 predictors								
Work time (B_{10})			−.117	−2.19*	−.111	−1.68***	−.114	−1.75
Family time (B_{20})			−.101	−1.70***	−.117	−2.36*	−.115	−2.43
Work time squared (B_{30})					−.002	−2.56*	−.002	−2.56*
Family time squared (B_{40})					−.001	−1.47	−.001	−1.64
Family time × Work time (B_{50})					−.004	−2.73**	−.004	−2.75**
Cross-level predictors								
Work time × Gender (B_{11})							.019	.15
Family time × Gender (B_{21})							−.169	−1.87***
Family time × Work time × Gender (B_{51})							−.000	−.21

Note. Level-1 predictors centered at individuals' means. All Level-2 predictors were grand-mean centered. Gender was coded $0 = male$, $1 = female$. Level-1 $N = 1,084$; Level-2 $N = 122$). $*p < .05$; $**p < .01$; $***p < .10$ (two-tailed).
$B =$ unstandardized regression coefficient obtained in HLM (Level-1 $N = 1,084$; Level-2 $N = 122$).
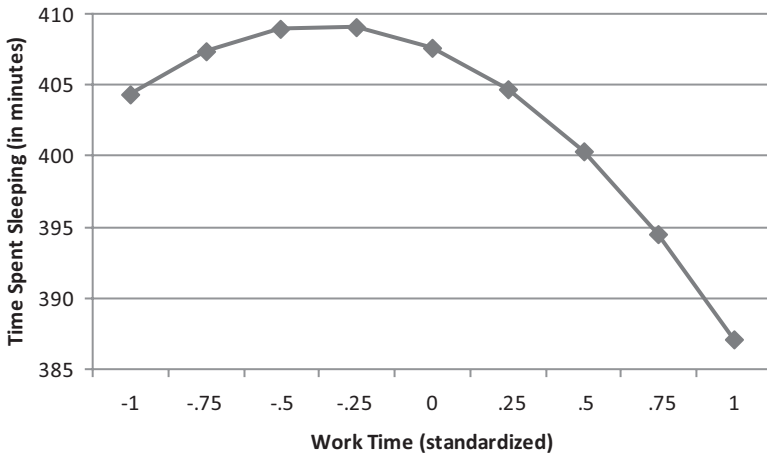
Figure 4: **Study 2: Nonlinear Relationship Between Time Spent Working and Time Spent Sleeping.**

Hypothesis 3 predicted that the interaction between time working and family time would predict time sleeping. Results indicate a significant effect of the interaction term ($B = -.004$, $p < .01$; Table 4, Model 3; Fig. 5). A simple slope analysis indicates that time spent working had a significantly negative effect on time spent sleeping when family time was high ($b = -.47$, $p < .01$), but when time spent with family was low there was not a significant relationship between time spent working and time spent sleeping ($b = .24$, *ns*). These results support Hypothesis 3.

Hypotheses 4(a) argued that the effects of work time on sleep time would be stronger for women than for men. Hypothesis 4(b) argued that the interaction between work and family on sleep would be stronger for women than for men. Results from Study 2 indicate that the moderating effect of gender on the relationship between work and sleep ($B = .019$, $p > .10$; Table 4, Model 4) was not significant, failing to support Hypothesis 4(a). The interaction between family time and work time on sleep was not different based on gender ($B = -.000$, $p > .10$; Table 4, Model 4), failing to support Hypothesis 4(b).[2]

---

[2]At the suggestion of the review team, we conducted a supplementary analysis. We followed the same analysis as indicated in Table 4 but additionally controlled for self-reported perceptions of work–family conflict. Including this control variable did not substantively change our results.
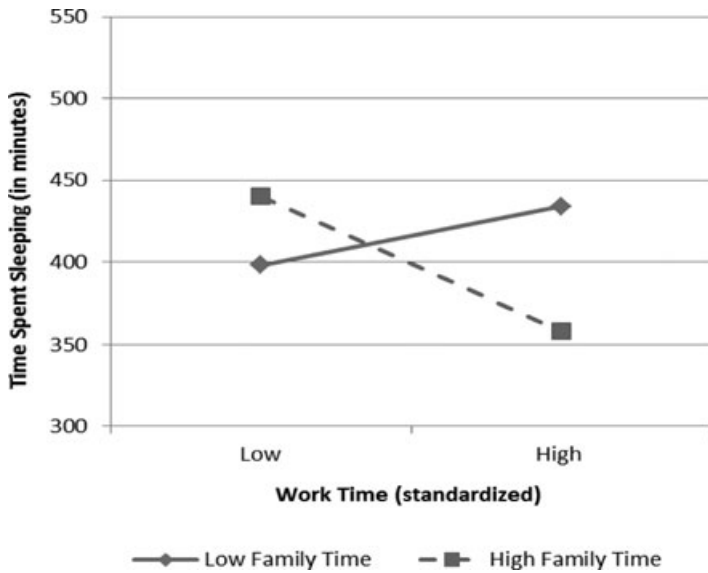
Figure 5: **Study 2: Interactive Effects of Work and Family on Sleep.**

Supplementary Analyses

As described throughout, the focus of this paper is to extend research on the tension between work and nonwork domains, with particular regard for sleep. The primary emphasis has been to show that work and family often take priority, and thus sleep is the domain that suffers when finite time resources become increasingly scarce. However, at the suggestion of a reviewer, we also note that it may be useful to understand how sleep obtained during the night influences time spent working and with family the next day. Thus, we conducted analyses to test the possibility that sleep leads to work and family time as opposed to our hypothesized model in which work and family time conspire to influence subsequent sleep.

The first analysis indicates that the amount of time sleeping one night does not influence the amount of time spent working the subsequent day ($B = -.039$, $p > .10$). Likewise, we found no evidence that the amount of time sleeping influences the amount of time spent with family the next day ($B = -.003$, $p > .10$). Paired with our formal hypotheses, these results support the notion that work and family time are the domains that steal time from sleep rather than sleep stealing time from work and family domains.

Discussion

The primary purpose of this paper was to extend the work-life literature to include sleep, a large nonwork subdomain that competes with work and family for employee time. We found evidence of a nonlinear effect of time spent working on time spent sleeping, such that this relationship was especially negative at high levels of time spent working. Thus, moving beyond previous theory and empirical research, we found that each additional hour spent working comes at a higher cost to time spent sleeping. On average, a 1-hour increase in time spent working is associated with a decrease in sleep by 14 minutes in the first study and 7 minutes in the second study. On average, a 1-hour increase in time spent with family is associated with a decrease in sleep by 14 minutes in the first study and 6 minutes in the second study. We also found a nonlinear effect of time spent with family on time spent sleeping, such that this relationship was especially negative at high levels of time spent with family. Similarly, we found a nonlinear effect of time spent working on time spent sleeping, with a stronger negative effect at high levels of time spent working. In addition, we found an interaction between work and family in predicting sleep, such that time spent working had an especially strong negative relationship with time spent sleeping when family time was high.

Although this paints a bleak story for the sleep of those who spend large amounts of time working and with family, for those with lower time scarcity sleep is not as much a victim. Indeed, the curvilinear effects we note could be interpreted to indicate that people strive to not steal from sleep for as long as they can, until they run out of other activities from which to steal. Thus, at low levels of time spent working and with family, sleep is robust to time theft.

Despite previous research that suggested a moderating role for gender in the relationship between time spent working and time spent with family (Rothbard & Edwards, 2003), we did not find support for gender as a moderator in either Study 1 or 2. Thus, to the degree that previous research has promoted the assumption that gender serves as a moderator of time-based work–family conflict, our findings indicate that these moderated effects are not as relevant when considering the influence of work and family time allocations on sleep. It may be that although there are gender differences with regard to other forms of work–family conflict (e.g., strain- and behavior-based conflict), time scarcity means that time-based conflict results in similar trade-offs between the genders. Time spent in one activity cannot be allocated to another, regardless of one's gender.

Despite the general consistency in the findings between Studies 1 and 2, there was one inconsistency that should be acknowledged. Although results from Study 1 indicate a nonlinear effect of time spent with family on time spent sleeping, Study 2 did not replicate this effect. It is possible that this difference is due to differences in available slack time in the two samples; in Study 2 there may have been a restriction in range in slack time for a given individual over the course of the 2 weeks. In contrast, Study 1 had a broader range of participants with a broader range of available slack time from which to draw. A second possible explanation is that the measure of family time was much narrower in Study 2 as compared to Study 1. Some of the family activities included in Study 1 (such as cleaning or playing with children) would have been considered "slack" resource time in Study 2. Had Study 2 utilized a broader measure of family time, it is possible that this inconsistency in the results would not have occurred. Our studies had strengths and limitations that were partly offsetting. Study 1 was a large-scale study that utilized nationally representative cross-sectional data of both part-time and full-time employees. This allowed us to test our hypotheses across a broad range of work/life configurations and time scarcity, including those with very low and very high amounts of time spent working. However, although participants were sampled on nearly every day over a 3-year period, any given individual only gave a single day's worth of data. Because temporal precedence cannot be determined in Study 1, inferences regarding causality should be tempered. Study 2 was more longitudinally structured, capturing data over a period of 2 weeks for each participant. Moreover, in Study 2 the data collection was structured such that reports of time spent working preceded time spent with family, which preceded time spent sleeping. This allowed for an examination of how these relationships played out over time, with time spent working and with family influencing sleep later that night. Similarly, the operationalizations of time spent on family demands differed across Study 1 and Study 2. Study 1 utilized a very broad and inclusive operationalization of time spent on family demands, including time spent caring for household family members and time spent on other household activities. This broad measure captures a rich range of activities, ensuring that most activities addressing family demands are examined. However, this operationalization may include activities that are not specific to family demands; for example, meal preparation may include time spent making a meal for one's self. Study 2 utilized a much more narrow operationalization of time spent on family demands, focusing on time spent with one's significant other. This operationalization almost certainly left out many relevant family-based activities (e.g., playing with children); however, it is also certain that time spent with a spouse or significant other is directly

relevant to the family domain, especially given that each research participant was living with his or her spouse or significant other at the time of Study 2.

Theoretical Implications

The most important intended contribution of this paper is to extend the work-life literature to consider a previously ignored nonwork subdomain: sleep. To date theory on this topic has devoted considerable attention to conflict between work and family, including time-based conflict, but has largely ignored other aspects of life. In fact, the extant approach to cross-domain conflict implicitly asserts that work and family are the two most critical domains for employees, yet this approach ignores sleep, which is a large domain that is essential for employee productivity (Wagner et al., in press), health (Faubel et al., 2009), and happiness (Scott & Judge, 2006).

This indicates that sleep is an additional and meaningful piece of the nonwork domain that must be considered when weighing the implications of work and family demands on employee well-being and effectiveness. In sum, our findings extend the work-life literature, showing that sleep is an important human activity that competes with time spent working and time spent with family. This indicates that, much like the analogy of borrowing from Peter to pay Paul, people may steal from sleep time to devote more time to work and family. An observation worth noting is that, as shown in our supplementary analyses, it is work and family that steal from sleep rather than sleep stealing from work and family. Perhaps this is because that work and family typically include interaction with other people, whereas sleep is an individual activity. Thus, one reason why sleep might fall victim to other domains is that an individual only has to steal from a domain in which he or she is affected in favor of giving time to a domain in which other people rely upon the individual. Regardless of the reasons for stealing from sleep time, the work–family conflict literature would have previously indicated that someone satisfying work and family demands by spending large amounts of time in each domain would have positive outcomes (e.g., low work–family conflict), yet our research indicates that such an arrangement would come at a great cost to sleep. By extension, this pattern of time use would lead to considerable decrements to cognitive performance (Lim & Dinges, 2010), affect (Pilcher & Huffcutt, 1996), and attitudes about work (Scott & Judge, 2006) and home (Ravan, Bengtsson, Lissner, Lapidus, & Bjorkelund, 2010). Because of these negative outcomes that most certainly would arise, even when family and work demands are satisfied, the theoretical advancements offered by our findings can add substantial clarity and understanding to observed relationships in cross-domain research.

Practical Implications

Our findings indicate that employees who engage in high levels of time spent working and with family will suffer decrements in the amount of time they spend sleeping. This makes salient the effects of high levels of employee demands on the employees themselves. Although our study did not examine the effects of low levels of sleep on affect, behaviors, and attitudes at work, previous research has documented a multitude of negative effects of low levels of sleep on such phenomena (Harrison & Horne, 2000; Pilcher & Huffcutt, 1996). Perhaps most salient among these effects are cognitive and performance decrements due to low levels of sleep. This indicates that employees who work especially long hours will undercut their own effectiveness, and managers who drive their employees to work especially long hours will drive their sleepy employees to perform poorly.

As the nonlinear effect of work time on sleep time suggests, it is those that work the hardest who will experience the most dramatic sleep decrements. Assuming that managers often drive their best employees to work the most hours, this suggests that managers may be undermining the sleep and cognitive performance of their best employees. Similarly, to the degree that employees push themselves to work the longest hours when working on the most important projects, they will be sleepiest when their actions matter most.

Fortunately, there is a large literature devoted to mitigating the effects of low levels of sleep (Barnes, 2011; Caldwell, Caldwell, & Schmidt, 2008). Such countermeasures include scheduled naps, pharmaceutical aids such as caffeine, targeted work scheduling, and regulations regarding time devoted to specific tasks. This research suggests that managers who work their employees for long hours should allow strategic naps, keep coffee easily available, and monitor the activities of their employees. Another countermeasure suggested by the management and applied psychology literature would be to pair sleepy coworkers with other team members who can back them up (Barnes & Hollenbeck, 2009; Barnes et al., 2008) when employee performance really matters.

Future Research

This study serves to extend the work-life literature with regard to how employees use their time. Future research could also extend strain-based and behavior-based aspects of work–family conflict theory (Greenhaus & Beutell, 1985) by considering the role of sleep in cross-domains relationships. For instance, Zeitlin (1995) noted that some jobs promote high levels of confidence to the point of bravado. Although such behaviors

may be commonplace in many work settings, they may lead to behavior-based conflict when the same individuals display their bravado by making it a point to function on low levels of sleep. Likewise, sleep could be integrated into stress-based models of conflict, as research has connected sleep and stress (Akerstedt et al., 2002; Kalimo, Tenkanen, Harma, Poppius, & Heinsalmi, 2000; Sonnentag & Zijlstra, 2006), suggesting that as employees experience stress at work they may have difficulties sleeping.

Another recommendation for future research is to use a broader and more encompassing approach to measuring time with family. Some forms of family demands were not captured by our studies, such as time spent caring for a parent living outside of one's own home, time spent caring for a partner from a same sex partnership, or time spent caring for a long-time unmarried significant other. Because some of these activities were missing, and our findings indicate that conflict is especially high when time is scarce, it is likely that our results are a conservative estimate of these effects. Future research taking a broader perspective on family demands may more accurately estimate these effects.

Finally, future research would do well to utilize longitudinal designs. Future researchers may find that employees manage conflict among work, family, and sleep differently at different points in time. Employees may be more willing to sacrifice family and sleep for work time at the end of a financial reporting period, when job demands are high, when promotions are imminent, or when at higher levels in the organization. Moreover, previous research indicates that the negative effects of low levels of sleep are cumulative (Dinges et al., 1997; Hursh et al., 2004), suggesting that sleep decrements due to high levels of time spent working may carry over for multiple days. All of this suggests that employees who "borrow from sleep" to meet the demands of other domains will eventually have to "pay the piper."

REFERENCES

Akerstedt T, Knutsson A, Westerholm P, Theorell T, Alfredsson L, Kecklund G. (2002). Sleep disturbances, work stress and work hours—A cross-sectional study. *Journal of Psychosomatic Research*, *53*, 741–748.

Allen TD, Herst DEL, Bruck CS, Sutton M. (2000). Consequences associated with work-to-family conflict: A review and agenda for future research. *Journal of Occupational Health Psychology*, *5*, 278–308.

Barnes CM. (2011). "I'll sleep when I'm dead": Managing those too busy to sleep. *Organizational Dynamics*, *40*, 18–26. doi:10.1016/j.orgdyn.2010.10.001.

Barnes CM. (2012). Working in our sleep: Sleep and self-regulation in organizations. *Organizational Psychology Review, 2*, 234–257. DOI: 10.1177/2041386612450181.

Barnes CM, Hollenbeck JR. (2009). Sleep deprivation and decision-making teams: Burning the midnight oil or playing with fire? *Academy of Management Review*, *34*, 56–66.

Barnes CM, Hollenbeck JR, Wagner DT, DeRue DS, Nahrgang JD, Schwind KM. (2008). Harmful help: The costs of backing-up behavior in teams. *Journal of Applied Psychology*, *93*, 529–539.

Barnes CM, Schaubroeck JM, Huth M, Ghumman S. (2011). Lack of sleep and unethical behavior. *Organizational Behavior and Human Decision Processes*, *115*, 169–180. doi:10.1016/j.obhdp.2011.01.009.

Barnes CM, Van Dyne, L. (2009). "I'm tired": Differential effects of physical and emotional fatigue on workload management strategies. *Human Relations*, *62*, 57–90.

Barnes CM, Wagner DT. (2009). Changing to daylight saving time cuts into sleep and increases workplace injuries. *Journal of Applied Psychology*, *94*, 1305–1317.

Basner M, Fomberstein KM, Razavi FM, Banks S, William JH, Rosa RR, Dinges DF. (2007). American time use survey: Sleep time and its relationship to waking activities. *Sleep*, *30*, 1085–1095.

Behson SJ. (2002). Coping with family-to-work conflict: The role of informal work accommodations to family. *Journal of Occupational Health Psychology*, *7*, 324–341.

Beutell NJ, Greenhaus JH. (1982). Interrole conflict among married women: The influence of husband and wife characteristics on conflict and coping behavior. *Journal of Vocational Behavior*, *21*, 99–110.

Bianchi SM, Milkie MA, Sayer LC, Robinson JP. (2000). Is anyone doing the housework? Trends in the gender division of household labor. *Social Forces*, *79*, 191–228.

Bohen HH, Viveros-Long A. (1981). *Balancing jobs and family life: Do flexible work schedules help?* Philadelphia, PA: Temple University Press.

Bolzendahl CI, Myers DJ. (2004). Feminist attitudes and support for gender equality: opinion change in women and men, 1974–1998. *Social Forces*, *83*, 759–789.

Bromiley P. (1991). Testing a causal model of corporate risk taking and performance. *Academy of Management Journal*, *34*, 37–59.

Bureau of Labor Statistics. (2008). *American Time Use Survey*. Retrieved from http://www.bls.gov/tus/.

Bureau of Labor Statistics. (2011). *Women in the labor force: A databook*. Washington, DC: U.S. Department of Labor. Retrieved from http://www.bls.gov/cps/wlf-databook2011.htm.

Buttrose I, Adams P. (2005) *Motherguilt: Australian women reveal their true feelings about motherhood*. Camberwell, Australia: Penguin.

Caldwell JA, Caldwell JL, Schmidt RM. (2008). Alertness management strategies for operational contexts. *Sleep Medicine Reviews*, *12*, 257–273.

Cartwright LK. (1978). Career satisfaction and role harmony in a sample of young women physicians. *Journal of Vocational Behavior*, *12*, 184–196.

Christian MS, Ellis APJ. (2011). Examining the effects of sleep deprivation on workplace deviance: A self-regulatory perspective. *Academy of Management Journal*, *54*, 913–934.

Cinamon RG, Rich Y. (2002). Gender differences in attribution of importance to life roles: Implications for the work-family conflict. *Sex Roles*, *47*, 531–541.

Cohen J, Cohen P, West SG, Aiken LS. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences*. Mahwah, NJ: Erlbaum.

Coltrane S. (2000). Research on household labor: Modeling and measuring the social embeddedness of routine family work. *Journal of Marriage and the Family*, *62*, 1208–1233.

Corrigall EA, Konrad AM. (2007). Gender role attitudes and careers: A longitudinal study. *Sex Roles*, *56*, 847–855.

Cunningham M, Beutel AM, Barber JS, Thornton A. (2005). Reciprocal relationships between attitudes about gender and social contexts during young adulthood. *Social Science Research*, *34*, 862–892.

Cyert R, March J. (1963). *A behavioral theory of the firm*. Englewood Cliffs, NJ: Prentice-Hall.

Damato EG, Burant C. (2008). Sleep patterns and fatigue in parents of twins. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, *37*, 738–749.

Davis SN. (2007). Gender ideology construction from adolescence to young adulthood. *Social Science Research*, *36*, 1021–1041.

Davis SN, Greenstein TN. (2009). Gender ideology: Components, predictors, and consequences. *Annual Review of Sociology*, *35*, 88–105.

De Martino, R, Barbato R. (2003). Differences between women and men MBA entrepreneurs: Exploring family flexibility and wealth creation as career motivators. *Journal of Business Venturing*, *18*, 815–833.

Diekman AB, Eagly AH. (2008). Of men, women, and motivation: A role congruity account. In Shah JY, Gardner WL (Eds.), *Handbook of motivation science* (pp. 434–447). New York, NY: Guilford.

Dinges DF, Pack F, Williams K, Gillen KA, Powell JW, Ott GE, . . . Pack AI. (1997). Cumulative sleepiness, mood disturbance, and psychomotor vigilance performance decrements during a week of sleep restricted to 4–5 hours per night. *Sleep*, *20*, 267–277.

Douglas S, Michaels M. (2004). *The mommy myth: The idealization of motherhood and how it has undermined women*. New York, NY: Simon & Schuster.

Duncan S, Edwards R, Reynolds T, Alldred P. (2003). Motherhood, paid work and partnering: Values and theories. *Work, Employment and Society*, *17*, 309–330.

Eagly AH, Koenig AM. (2006). Social role theory of sex differences and similarities: Implication for prosocial behavior. In Dindia K, Canary DJ (Eds.), *Sex differences and similarities in communication* (2nd ed., pp. 161–177). Mahwah, NJ: Erlbaum.

Eagly AH, Wood W, Diekman AB. (2000). Social role theory of sex differences and similarities: A current appraisal. In Eckes T, Trautner HM (Eds.), *The developmental social psychology of gender* (pp. 23–174). Mahwah, NJ: Erlbaum.

Eby LT, Casper W, Lockwood A, Bordeaux C, Brinley A. (2005). Work and family research in IO/OB: Content analysis and review of the literature (1980–2002). *Journal of Vocational Behavior*, *66*, 124–197.

Eby LT, Maher CP, Butts MM. (2010). The intersection of work and family life: The role of affect. *Annual Review of Psychology*, *61*, 599–622.

Edwards JR, Rothbard NP. (2000). Mechanisms linking work and family: Clarifying the relationship between work and family constructs. *Academy of Management Review*, *25*, 178–199.

Evans CD, Diekman AB. (2009). On motivated role selection: Gender beliefs, distant goals, and career preferences. *Psychology of Women Quarterly*, *33*, 235–249.

Fan P, Marini MM. (2000). Influences on gender-role attitudes during the transition to adulthood. *Social Science Research*, *29*, 258–283.

Faubel R, Lopez-Garcia E, Guallar-Castillon P, Balboa-Castillo T, Gutierrez-Fisac JL, Banegas JR, Rodriquez-Artalejo F. (2009). Sleep and health-related quality of life among older adults: A population-based cohort in Spain. *Sleep*, *32*, 1059–1068.

Fletcher JK, Bailyn L. (2005). The equity imperative: Redesigning work for work–family integration. In Kossek EE, Lambert SJ (Eds.), *Work and life integration: Organizational, cultural, and individual perspectives* (pp. 171–190). Mahwah, NJ: Erlbaum.

Fortin NM. (2005). Gender role attitudes and the labour-market outcomes of women across OECD countries. *Oxford Review of Economic Policy*, *21*, 416–438.

Frone MR, Russell M, Cooper ML. (1992). Prevalence of work–family conflict: Are work and family boundaries asymmetrically permeable? *Journal of Organizational Behavior*, *13*, 723–729.

George G. (2005). Slack resources and the performance of privately held firms. *Academy of Management Journal*, *48*, 661–676.

Greenhaus JH, Beutell NJ. (1985). Sources of conflict between work and family roles. *Academy of Management Review*, *10*, 76–88.

Greenhaus JH, Collins KM, Shaw JD. (2003). The relation between work-family balance and quality of life. *Journal of Vocational Behavior*, *63*, 510–531.

Greenhaus JH, Kopelman RE. (1981). Conflict between work and nonwork roles: Implications for the career planning process. *Human Resource Planning*, *4*, 1–10.

Groeger JA, Zijlstra FRH, Dijk DJ. (2004). Sleep quantity, sleep difficulties and their perceived consequences in a representative sample of some 2000 British adults. *Journal of Sleep Research*, *13*, 359–371.

Gubernskaya Z. (2010). Changing attitudes toward marriage and children in six countries. *Sociological Perspectives*, *53*, 179–200.

Gutek BA, Searle S, Klepa L. (1991). Rational versus gender role explanations for work–family conflict. *Journal of Applied Psychology*, *76*, 560–568.

Hakim C. (2002). Lifestyle preferences as determinants of women's differentiated labor market careers. *Work and Occupations*, *29*, 428–459.

Hall DT, Gordon F. (1973). Career choices of married women: Effects on conflict, role behavior, and satisfaction. *Journal of Applied Psychology*, *58*, 42–48.

Harrison Y, Horne JA. (2000). The impact of sleep deprivation on decision making: A review. *Journal of Experimental Psychology-Applied*, *6*, 236–249.

Hecht TD, McCarthy JM. (2010). Coping with employee, family, and student roles: Evidence of dispositional conflict and facilitation tendencies. *Journal of Applied Psychology*, *95*, 631–647.

Herman JB, Gyllstrom KK. (1977). Working men and women: Inter- and intrarole conflict. *Psychology of Women Quarterly*, *1*, 319–333.

Holahan C, Gilbert L. (1979). Interrole conflict for working women: Careers versus jobs. *Journal of Applied Psychology*, *64*, 86–90.

Hursh SR, Redmond DP, Johnson ML, Thorne DR, Belenky G, Balkin TJ, . . . Eddy DR. (2004). Fatigue models for applied research in warfighting. *Aviation Space and Environmental Medicine*, *75*, A44–A53.

Judge TA, Livingston BA. (2008). Is the gap more than gender? A longitudinal analysis of gender, gender role orientation, and income. *Journal of Applied Psychology*, *93*, 994–1012.

Kalimo R, Tenkanen L, Harma M, Poppius E, Heinsalmi P. (2000). Job stress and sleep disorders: Findings from the Helsinki Heart Study. *Stress Medicine*, *16*, 65–75.

Katz-Wise SL, Priess HA, Hyde JS. (2010). Gender-role attitudes and behavior across the transition to parenthood. *Developmental Psychology*, *46*, 18–28.

Keith PM, Schafer RB. (1980). Role strain and depression in two-job families. *Family Relations*, *29*, 483–488.

Kossek EE, Ozeki C. (1998). Work- family conflict, policies, and the job-life satisfaction relationship: A review and directions for organizational behavior/human resources research. *Journal of Applied Psychology*, *83*, 139–149.

Lim J, Dinges DF. (2010). A meta-analysis of the impact of short-term sleep deprivation on cognitive variables. *Psychological Bulletin*, *136*, 375–389.

Loerch KJ, Russell JE, Rush MC. (1989). The relationships among family domain variables and work–family conflict for men and women. *Journal of Vocational Behavior*, *35*, 288–308.

Martin CL. (2000). Cognitive theories of gender development. In Eckes T, Trautner HM (Eds.), *The developmental social psychology of gender* (pp. 91–121). Mahwah, NJ: Erlbaum.

Martin CL, Ruble D. (2004). Children's search for gender cues: Cognitive perspectives on gender development. *Current Directions in Psychological Science*, *13*, 67–70.

Martin CL, Ruble DN, Szkrybalo J. (2002). Cognitive theories of early gender development. *Psychological Bulletin*, *128*, 903–933.

Monk TH, Reynolds CF, Kupfer DJ, Buysse DJ, Coble PA, Hayes AJ, . . . Ritenour AM. (1994). The Pittsburgh Sleep Diary. *Journal of Sleep Research*, *3*, 111–120.

Moors G. (2003). Estimating the reciprocal effect of gender role attitudes and family formation: A log-linear path model with latent variables. *European Journal of Population*, *19*, 199–221.

Pilcher JJ, Huffcutt AI. (1996). Effects of sleep deprivation on performance: A meta-analysis. *Sleep*, *19*, 318–326.

Pleck JH, Staines GL, Lang L. (1980). Conflicts between work and family life. *Monthly Labor Review*, *103*, 29–32.

Plessow F, Kiesel A, Petzold A, Kirschbaum C. (2011). Chronic sleep curtailment impairs the flexible implementation of task goals in new parents. *Journal of Sleep Research*, *20*, 279–287.

Ravan AR, Bengtsson C, Lissner L, Lapidus L, Bjorkelund C. (2010). Thirty-six-year secular trends in sleep duration and sleep satisfaction, and associations with mental stress and socioeconomic factors—Results of the population study of women in Gothenburg, Sweden. *Journal of Sleep Research*, *19*, 496–503.

Rogers S, Amato P. (2000). Have changes in gender relations affected marital quality? *Social Forces*, *79*, 731–753.

Rothbard NP, Edwards JR. (2003). Investment in work and family roles: A test of identity and utilitarian motives. Personnel Psychology, *56*, 699–729.

Scott BA, Judge TA. (2006). Insomnia, emotions, and job satisfaction: A multilevel study. *Journal of Management*, *32*, 622–645.

Sonnentag, S. (2003). Recovery, work engagement, and proactive behavior: A new look at the interface between nonwork and work. *Journal of Applied Psychology*, *88*, 518–528.

Sonnentag S, Binnewies C, Mojza EJ. (2008). "Did you have a nice evening?" A day-level study on recovery experiences, sleep, and affect. *Journal of Applied Psychology*, *93*, 674–684.

Sonnentag S, Zijlstra FRH. (2006). Job characteristics and off-job activities as predictors of need for recovery, well-being, and fatigue. *Journal of Applied Psychology*, *91*, 330–350.

Staines GL, O'Connor P. (1980). Conflicts among work, leisure, and family roles. *Monthly Labor Review*, *103*, 36–39.

Tenbrunsel AE, Brett JM, Maoz E, Stroh LK, Reilly AH. (1995). Dynamic and static work-family relationships. *Organizational Behavior and Human Decision Processes*, *63*, 233–246.

Valcour M. (2007). Work-based resources as moderators of the relationship between work hours and satisfaction with work-family balance. *Journal of Applied Psychology*, *92*, 1512–1523.

Wagner DT, Barnes CM, Lim V, Ferris DL. (in press). Lost sleep and cyberloafing: Evidence from the laboratory and a daylight saving time quasi-experiment. *Journal of Applied Psychology*. doi: 10.1037/a0027557.

Wallace JE. (1999). Work-to-nonwork conflict among married male and female lawyers. *Journal of Organizational Behavior*, 20, 797–816.

Wiseman R, Bromiley P. (1996). Towards a model of risk in declining organizations: An empirical examination of risk, performance and decline. *Organization Science*, 7, 524–543.

Zeitlin LR. (1995). Estimates of driver mental workload: A long-term field trial of two subsidiary tasks. *Human Factors*, 37, 611–621.

Zauberman G, Lynch JG. (2005). Resource slack and propensity to discount delayed investments of time versus money. *Journal of Experimental Psychology: General*, 134, 23–37.