

Mechanisms Underlying the Relationship between Work-Life Conflict and Health Behaviors:  
The Role of Resource Depletion

by

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## Abstract

While there is an abundance of research linking work-family conflict (WFC) and work-life conflict (WLC) to a host of negative outcomes, including compromised health, there has been a dearth of research dedicated to understanding how the work-life interface influences these health outcomes. Identifying the mechanisms that underlie the relationships between work and life factors and health and well-being is essential in the development of effective organizational interventions and programs designed to support employee health and well-being. Using Conservation of Resources (COR) Theory and Self-Regulation Theory as a framework, the present study aims to identify potential mechanisms underlying the relationship between work-life conflict and health behaviors. Specifically, this study investigates the mediating effects of depleted physical, cognitive, emotional, and temporal resources on the relationship between work-life conflict and the health-related behaviors of diet and physical activity. Using Amazon's Mechanical Turk (MTurk), a two-time multi-wave sample of 346 participants was collected using a 30 day time lag. The present findings provide partial support for the mediating role of energy-related resources in the relationship between WLC and dietary choices and exercise frequency.

## Table of Contents

Abstract .....	ii
Introduction.....	1
Work-Family Conflict and Work-Life Conflict .....	3
Work-Family Conflict and Gender .....	11
Conservation of Resources Theory.....	13
The Work Domain and Work-Family Conflict .....	18
Work-Family/Life Conflict and Health Outcomes .....	20
Present Study .....	23
Hypotheses.....	25
Methods.....	26
Sample and Procedure .....	26
Measures .....	29
Analyses.....	31
Results .....	32
Model Fit .....	32
Resulting Pathways.....	34
Discussion .....	37
Limitations.....	42
References .....	45

## List of Tables

Table 1. Descriptive Statistics, Correlations, and Reliabilities.....	61
Table 2. Summary of Regression Equations for Direct Effects.....	62
Table 3. Summary of Regression Equations for Indirect Effects .....	63

List of Figures

Figure 1. Pathways predicting health outcomes from WLC through resource depletion.....60

## Mechanisms Underlying the Relationship between Work-Life Conflict and Health Behaviors: The Role of Resource Depletion

The current health status of the American workforce is at an all-time low and continues to decline as obesity, diabetes, and cardiovascular disease rates steadily increase (Mattke, Schnyer, & Van Busum, 2013). Cardiovascular disease has risen among the ranks to become the number one cause of death in developed countries across the globe, followed by a number of additional preventable and reversible health deteriorating conditions that can be attributed to habitually engaging in poor health behaviors (Carnethon, Gulati, & Greenland, 2005; Yoon, Bastian, Anderson, Collins, & Jaffe, 2014). There are several contextual factors that contribute to the escalating prominence of poor health worldwide, a problem that has gained rapid global attention following the drastic rise in health behavior-related disease rates. While there are several thoroughly researched domains regarding the considerable spikes in obesity, cardiovascular disease, and diabetes, such as changing food systems, sedentary life-styles, transportation development, and increased urbanization (Ng & Popkin, 2012), a host of potentially influential factors remain under-investigated. Engaging in poor health behaviors as a response to occupational factors is a grossly under researched area of study that holds profound implications. Identifying and addressing job-related influences that steer individuals toward making unhealthy lifestyle choices opens the door for organizational interventions and programs that support and encourage positive health behaviors in employees.

The benefits of improving the overall health of the workforce span far beyond the obvious physical, mental, and quality of life benefits reaped at the individual level. The current healthcare system is in a state of calamity as the prominence of chronic disease continues to skyrocket, surpassing healthcare systems' abilities to keep up with the volume of affected individuals and the associated costs (Herzlinger, 2006). Organizations are hemorrhaging money

to cover the costs of employees' medical bills regarding a plethora of conditions spurred by poor health behaviors. By investing in employees' health and wellbeing through health promoting programs, services, and initiatives, substantial benefits will also be observed at the organizational level. In addition to the healthcare-related financial benefits of having healthy employees, poor employee health has also been associated with a host of negative job-related outcomes including turnover, absenteeism, and reduced satisfaction, all of which are linked to overall job performance and are costly to organizations (e.g., Wilson, Dejoy, Vandenberg, Richardson, & McGrath, 2004). In order to maximize organizational efficiency, it is vital to have a foundation of healthy employees.

As national and global health continues to decline, federal agencies are taking notice and are determined to turn these trends around. The recent Total Worker Health (TWH) movement, officially initiated in 2011 by the National Institute for Occupational Safety and Health (NIOSH), strives to promote worker health, safety, and well-being through the use of policies, programs, and practices that endorse a holistic approach to employee health and well-being and the avoidance of job-related safety and health hazards and injuries (Sorensen & Barbeau, 2012). This 360-degree approach to employee health and safety is paving the way for organizational interventions that protect employee safety and promote health and productivity by expanding the traditional view of occupational safety and health (OSH) to include well-being. A recent review of literature investigating the effectiveness of Total Worker Health interventions found that, of all 17 OHS and health promotion interventions conducted through 2014, 16 programs improved risk factors for injuries and/or chronic illnesses (Anger, Elliot, Bodner, Olson, Rohlman, Truxillo, & Montgomery, 2015). The findings of this study suggest that TWH interventions successfully address occupational injuries and chronic illnesses, thus effectively improving workforce health more efficiently than the traditional method of employing more narrowly

focused programs that only target smaller facets of the larger issue (Anger et al., 2015). Programs like TWH will be key in protecting and resorting the health of America's workforce; however, in order to maximize the utility of such programs, it is essential to understand the processes by which occupational and lifestyle factors influence health and well-being related outcomes. Thus, the present study aims to broaden the understanding of how employee participation in poor health behaviors is influenced by organizational and individual factors, specifically work-life conflict and resource depletion.

### **Work-Family Conflict and Work-Life Conflict**

Following recent societal changes over the last few decades, there has been a sizable increase in the quantity of research regarding the work-family interface. Traditionally, there has been a heavy focus on the adverse consequences of engaging in both work and family roles (ten Brummelhuis & Bakker, 2012). Among the most investigated constructs are time pressure, work-family conflict (WFC), burnout, reduced satisfaction, and compromised health, all of which are negative outcomes associated with engaging in multiple roles (Eby, Casper, Lockwood, Bordeaux, & Brinley, 2005). Work-family conflict has long been identified as a form of inter-role conflict in which role pressures from the work and family domains are mutually incompatible so that participation in one role is made more difficult by participation in the other role (Greenhaus & Beutell, 1985). Based on Greenhaus and Beutell's (1985) definition, researchers have more recently broadened the conceptualization of inter-domain conflict to include all aspects of an individual's nonwork life, such as friends, hobbies, and additional obligations, establishing work-life conflict (WLC) as difficulty participating in work or nonwork domains as a result of participation in the other domain (e.g., Boswell & Olson-Buchanan, 2007; Hill et al., 2010; Keeney, Boyd, Sinha, Westring, & Ryan, 2013). Unfortunately, research exploring work-life conflict, as opposed to work-family conflict, is comparatively sparse,



especially in relation to health and wellbeing; however, because the constructs are highly similar by nature, as WLC is a broadened form of WFC, it is not uncommon for researchers to use the terms interchangeably (e.g., Hill, Erickson, Holmes, & Ferris, 2010; Knecht, Bauer, Gutzwiller, & Hämmig, 2011). Due to the conceptually similar nature of these two constructs, researchers also often use theory and research relating to WFC to make predictions about WLC (e.g., Boswell & Olson-Buchanan, 2007; Hill et al., 2010). Similarly, this section of the paper uses the terms WFC and WLC interchangeably for the purposes of developing hypothesis and establishing theoretical background. The proposed study focuses on the role of WLC in the prediction of involvement in poor health-related behaviors, given the construct's direct association with a host of negative outcomes.

Theory holds that WFC develops when the discordance between competing roles, such as the role of a father paired with the role of a retail store manager, influences an individual's performance in one or more domains (Greenhaus & Beutell, 1985). One way in which this may occur is through the depletion of resources, as resources are finite and must be allocated between the multiple roles an individual holds (Greenhaus & Beutell, 1985). There are a few ways in which resource depletion, as a result of role incompatibility, can occur. A popular approach in explaining this phenomenon is the event of negative spillover across domains, conceptualized as the extent to which participation in one domain negatively affects that of another (Pleck, 1995). Negative spillover across domains can occur in a variety of ways, including simultaneous stressors in multiple domains (Bolger, DeLongis, Kessler, & Wethington, 1989), carrying over negative emotions and attributes from one domain into another (Repetti, 1994), and discrepancies between behaviors that are acceptable in one domain but not in another (Greenhaus & Beutell, 1985). Additionally, the nature of inter-role conflict is bidirectional. That is, family and life demands can spillover and interfere with one's work role, referred to as family/life

interference with work (FIW; LIW), while work demands can similarly interfere with one's family and life roles, referred to as work interference with family/life (WIF; WIL) (Frone et al., 2003; Greenhaus & Beutell, 1985). For example, there is evidence suggesting that spillover from an individual's work domain influences their health-related behaviors (Devine, Connors, Sobal, & Bisogni, 2003). Devine and his coauthors (2003) found that, in general, individuals whom reported higher job demands had a more difficult time making healthy dietary choices, especially when their knowledge of healthful eating habits was limited and they did not have social support for these behaviors; however, this study was based exclusively on qualitative data and provides no estimates of how significant these influences truly are. Nonetheless, this research highlights the necessity for viewing workers within the broader social and personal context when identifying how health-related behaviors are influenced and identifies relevant factors that may contribute to making health sustaining versus health degrading choices. It is vital to differentiate between work interference with life and life interference with work when examining the work-life interface, as the two directions of interference tend to exhibit some differing relationships with antecedents and outcomes across domains of life (e.g. Allen & Armstrong, 2006; Frone, Russell, & Cooper, 1997).

There are a host of antecedents and negative outcomes associated with work-family conflict that can fall into one of three domains: work-related, family-related, and domain-unspecific (Bellavia & Frone, 2005). Domain-unspecific outcomes refer to individual outcomes as opposed to role outcomes, such as life satisfaction, health, and wellbeing. It has been observed that the relationships between antecedents and outcomes within the work, family, and personal domains differ across the three domains, such that work-related antecedents (e.g., job stress, hours worked) are more strongly related to WIF, while family-related antecedents (e.g., number of kids, family support) are more strongly related to FIW; however, stressors experienced in one

domain also yield consequences across domains (Hargis, Kotrba, Zhdanova, & Baltes, 2011). For example, several studies have observed that higher levels of WIF are related to higher levels psychological burnout and reduced job satisfaction (e.g., Bacharach, Bamberger, & Conley, 1991; Burke, 1988). Regarding the consequences of WFC, a recent meta-analysis conducted by Amstad and colleagues (2011) indicated that WIF is more strongly correlated with work-related outcomes (e.g., burnout, job satisfaction) and FIW is more strongly associated with family-related outcomes (e.g., marital satisfaction, family-related performance) (Amstad, Meier, Fasel, Elfering, & Semmer, 2011). The authors also observed that both WIF and FIW were more strongly related to personal domain outcomes (e.g., health, substance use, depression) than to outcomes within the work and family domains. These finding highlight the importance of studying the work-life interface in relation to personal domain outcomes, as health and well-being are strongly influenced by WFC. Similarly, research also suggests that FIW is more strongly related to health and well-being outcomes such as depression and general health than is WIF (e.g., Allen & Armstrong, 2006; Frone, Russell, & Cooper, 1992). Given the findings and implications of previous research on the influences of WFC on health and well-being, the proposed study focuses specifically on domain-unspecific outcomes related to an individual's health-related behaviors while differentiating between the effects of WIL and LIW.

As described by Beutell and Greenhaus (1983), there are three domains of conflict in which WFC can manifest: time-based, strain-based, and behavior-based. Broadly, time-based conflict arises when temporal demands from one role interfere with time remaining to invest in additional roles, strain-based conflict exists when strain from one role affects performance in another role, and behavior-based conflict occurs when one is unable to appropriately adjust behaviors between domain roles. It has been observed throughout the work-life literature that both time-based and strain-based WFC have been especially associated with a plethora of

negative outcomes such as job and family dissatisfaction, tension across domains, depression, and general life stress (Frone, et al., 1992; Greenhaus, Collins, Singh, & Parasuraman, 1997).

The following sections describe the mechanics of these three forms of conflict and ties them to the present research.

**Time-based conflict.** When an individual holds multiple roles, demands from the various roles may compete for one's time, as the time dedicated to meeting demands in one domain subsequently reduces the time remaining to allot between additional domains (Pleck, Staines, and Lang, 1980). Given that time is a finite resource, it is susceptible to depletion when multiple roles are held. There are two ways in which time-based conflict manifests. The first manifestation is physical, where time pressures make it physically impossible meet demands across all roles, while the second manifestation is cognitive, where time pressures result in fixation on one role when physically working to meet the demands of another role (Bartolome & Evans, 1979).

Sources of time-based conflict can originate from both work and family domains. Regarding the work domain, time-based conflict can develop as a result of excessive work time, scheduling conflicts and role overload (Kahn, Wolfe, Quinn, Snoek, & Rosenthal, 1964; Pleck et al., 1980). Both the number of hours worked per week along with the presence of irregular/inflexible work schedules are consistently positively related to the development of WFC (Pleck et al., 1980). These effects can vary based on a host of circumstances, including marital status, age of children, etc. A recent meta-analytic review on the antecedents of WFC found that non-married individuals experience higher levels of WFC as a result of work time demands than do married individuals (Michel, Kotrba, Mitchelson, Clark, & Baltes, 2011). One potential explanation for this phenomenon is that non-married individuals do not have the support of a spouse to help them meet demands outside of the work domain. Stemming from the

family domain, time-based conflict that results in WFC can be attributed to family role characteristics that require an individual to devote substantial time to family obligations, leaving less time to devote to work-related tasks and activities.

There are a variety of marital and parental combinations that have differing outcomes related to WFC, such as being single without children, being a single parent, being married without children, being married with children, etc. Meta-analytic evidence suggests that single parents experience more WFC than other parental and spousal combinations (Byron, 2005). In general, having children in the household, especially under the age of five, results in higher levels of WFC, given the increase in family related demands children place on parents (Hargis et al., 2011). Following this trend of additional family members relating to higher rates of WFC, Beutell and Greenhaus (1982) observed that large families are associated with higher levels of conflict, especially so regarding women whose husbands are highly involved in their jobs. This trend is consistent with the propositions of Hobfoll's (1989, 2002) Conservation of Resources Theory (COR), as each family member that an individual is closely involved with requires the devotion of energy-related resources, resulting in resource depletion if an individual does not have the resources to meet every family members' demands along with the demands of additional roles held.

Time based-conflict, as a result of work-family/life interference, has been shown to negatively impact health related behaviors, such as meal preparation and exercise frequency (e.g. Bellows-Riecken & Rhodes, 2008; Mailey, Huberty, Dinkel, & McAuley, 2014; Persson & Mårtensson, 2006). Mailey and coauthors (2014) found that the most prominent barriers to exercising for individuals with competing work and family demands include family responsibilities, guilt, scheduling constraints that minimize available time for leisure activities, and work demands. These findings suggest the individuals with competing work and family/life

demands tend to have few remaining temporal resources to dedicate to personal activities, depending on the extent to which work and life domains are interfering. In a similar vein, Persson and Mårtensson (2006) observed that individuals who work long shifts or odd hours tend to prepare healthy meals less frequently and exercise less often, as there is not often much time remaining to dedicate to cooking or engaging in physical activity. Additionally, with the spare time remaining, individuals reported preferring to spend that time socializing or sleeping. These studies suggest that healthy dietary and exercise habits are often not a priority for individuals experience heavy work and life demands that leave them with little spare time. The present study aims to gain a deeper understanding of how time-based conflict influences health behaviors compared to other personal resources.

**Strain-based conflict.** Strain-based conflict has been shown to be related to WFC through the psychological spillover process, where the strain that occurs as a result of participation in one domain is carried over into another domain, thus inducing strain and hindering role performance in the second domain (Greenhaus & Beutell, 1985). One way in which strain-based conflict can arise is through the development of fatigue, or resource depletion, as a result of this spillover process (Evans & Bartolome, 1980). The current study focuses on three types of fatigue; cognitive, physical, and emotional, as defined by Melamed, Shirome, Toker, Berliner, and Shapira (2006). Cognitive fatigue refers to feelings of mental exhaustion and experiencing difficulty thinking quickly. Physical fatigue is conceptualized as feelings of bodily fatigue, such as being tired or having low levels of energy to carry out daily tasks. Emotional fatigue is defined as experiencing feelings of emotional exhaustion where the individual is unable to emotionally invest in tasks or interpersonal relationships. The depletion of these resources, especially emotional exhaustion, has been linked to a variety of negative outcomes (e.g., Ilies, Huth, Ryan, & Dimotakis, 2015).

The proposed study uses emotional exhaustion to characterize the depletion of emotional resources. Conceptualized as a prolonged state of physical and emotional diminution resulting from excessive job and/or personal demands that deplete one's time and energies (Maslach & Jackson, 1981), emotional exhaustion has been regarded as both an antecedent and outcome of WFC (Rubio, Osca, Recio, Urien, & Peiró, 2015). Rubio and coauthors propose that WFC and emotional exhaustion develop a reciprocal influence with each other over time, resulting in a spiraling relationship, where WFC predicts emotional exhaustion while emotional exhaustion simultaneously increases levels of WFC. That is, as emotional exhaustion increases, WFC increases as a result, leading to the further development of emotional exhaustion and vice versa. The findings of this study, among others, suggest that WFC can be viewed as both an antecedent and an outcome of resource depletion across different situations. The present study explores WLC as an antecedent of energy related resource depletion in the prediction of health-related behaviors. Additionally, several studies have identified role stressors across domains as antecedents to the development of emotional exhaustion (e.g., Etzion 1984; Hagen, 1989; Hall, Dollard, Tuckey, & Winefield, 2010). Hall et al. (2010) observed that job demands increase conflict in both the work and family domains, resulting in higher levels of emotional exhaustion. These finding suggest that the presence of WLC leads to the experience of emotional exhaustion. These effects are support by COR Theory's notion that extensive demands deplete personal resources and yield increased levels resource exhaustion (Hobfoll, 2002).

**Behavior-based conflict.** Every role that an individual holds requires unique, and often incompatible, patterns of behavior regarding the requirements, expectations, and obligations accompanying the role at hand (Netemeyer, Boles, & McMurrian, 1996). Behaviors that are incompatible between roles can result in behavior-based conflict when conduct that is necessary or appropriate in one role interferes with one's performance in another role. Spillover theory

holds that the interference of behaviors across roles develops when behaviors learned in one domain inadvertently influences behaviors in other domains (Edwards & Rothbard, 2000). This itself is not necessarily problematic, however, when transferred behaviors are not acceptable across domains and hinder performance, behavior-based conflict emerges. For example, it may be appropriate for an NFL football coach to shout at and criticize athletes on the job; however, this behavior might not be acceptable when interacting with family. One way in which behavior-based conflict can negatively influence performance is through the depletion of psychological and physiological resources, as these behavioral disparities often result in failure to meet the expectations of the role that is being interfered with (Aryee, Srinivas, & Tan, 2005; Zedeck & Mosier, 1990). Thus, holding multiple roles that result in incompatible behaviors or habits acts as a stressor, subsequently draining personal resources (Aryee et al., 2005).

### **Work-Family Conflict and Gender**

Spurred by the differences between traditional gender roles for men and women, there has been abundant speculation and research regarding gender differences in the experience of WFC, resulting in the frequent separation of males and females in the analysis of data. To the surprise of many, it has consistently been observed that men and women experience WFC to the same extent (Byron, 2005; Peters, 2009). This trend is contrary to the common prediction that women would experience higher levels of WFC compared to men as a result of women's traditional role as the predominant homemaker leading to additional interference between the work and family domains. The observed trends concerning the experience of WFC have been slightly more mixed than those regarding WLC, given the comparative novelty of the study of WLC. Some findings indicate that men and women experience WLC to the same extent (Bonebright, Clay, & Ankenmann, 2000) while others suggest that women might experience slightly more WLC than men (Hämmig, Gutzwiller, & Bauer, 2009), much like the history of



inconsistent findings within WFC research up unit recently. However, given the lack of a meta-analytic review exploring gender differences in relation to WLC, the true nature of gendered experiences of WLC remains ambiguous.

There are two continuing trends that require consideration when studying the work-family and work-life interfaces. First, women have an increasingly growing presence in the workforce, deviating from the traditional role of the “stay at home mom” (Williams & Boushey, 2010). Second, there has been a sharp rise in men’s participation in the family domain over the last few decades, leaving men with additional family demands than the traditional view holds (Bianchi, Milkie, Sayer, & Robinson, 2000). This societal transition has resulted in higher levels of both work and family demands for both men and women. Unfortunately, organizations have not kept up with this trend toward the equalization of male and females’ roles between the work and family domains, making it more difficult for working parents to evade work-life conflict (Williams, Berdahl, & Vandello, 2016).

While there are no significant gender differences regarding the extent to which males and females experience WFC, there are differences concerning the antecedents associated with the development of WFC across genders. A study by Peters, Den Dulk, and van der Lippe (2009) found that, regarding flexibility scheduling, working overtime enhances men’s levels of work-family conflict; however, working overtime is unrelated to females’ experience of WFC. The same study also demonstrated that flextime affected the amount of overtime women worked; however, there was no relationship between flextime and overtime for men. These findings suggest that job designs that facilitate work-life balance are not the same for men and women and should be taken into consideration when striving to minimize WLC. Given that that present study is interested in the consequences and experience of WLC as opposed to its development,

the current study does not differentiate between genders in its analyses on the basis that males and females have consistently been shown to experience WFC to similar degrees.

### **Conservation of Resources Theory**

A popular framework in work-life research is Hobfoll's (1989, 2002) Conservation of Resources (COR) Theory, which describes how individuals respond to the environmental stressors they encounter and how those encounters influence their well-being. Broadly, COR Theory holds that stress and strain result from the loss, or threatened loss, of resources and that individuals are motivated to protect the resources they have as well as build upon existing resources (Hobfoll, 1989). Traditionally, resources have very broadly been defined as things that people value that fall under the categories of objects (e.g., house, car, phone), energies (e.g., mental, emotional, physical) personal characteristics (e.g., self-efficacy, optimism, resilience), and conditions (e.g., marriage, having children) (Hobfoll, 1988). As this definition is highly open to interpretation and has resulted in essentially anything being identified as a resource, Halbesleben and colleagues (2014) have modified the traditional conceptualization of a resource to include factors perceived by the individual to help attain his or her goals. This goal-oriented approach to conceptualizing resources connects COR Theory to an array of theories of motivation that aid in the explanation of the role of resources (Halbesleben, Neveu, Paustian-Underdahl, & Westman, 2014). Existing research on the role of resources lacks the application of multiple theoretical backgrounds that support and build on each other, limiting the conclusions that can be drawn from existing findings. The present study combines the frameworks of COR Theory and Self-Regulation Theory (see Baumeister & Heatherton, 1996; Vohs & Baumeister, 2016), which is discussed in the following section, to develop a more complete understanding of how health behaviors are influenced by an individual's personal and contextual resources and motivations.

Resources can be further broken down into personal and contextual domains (Hobfoll, 2002). Contextual resources include those that are not identified with the self and exist in the surrounding social contexts, such as money or housing. On the other hand, personal resources are directly related to the self and include personal characteristics, such as energies or self-efficacy. There are unique antecedents that predict the depletion of personal versus contextual resources, yielding differing consequences (Hobfoll, 2002). Once initial resources are depleted, there are fewer resources remaining to dedicate to additional demands in an individual's life, whether that be related to family, work, or the self.

The result of resource depletion is psychological strain, defined as a reaction to an environment in which there is a threatened loss of resources, actual loss of resources, or a lack of resource gain following the investment of resources (Hobfoll, 1989). If no behavior is carried out to reduce the depletion of resources and subsequent strain, the ultimate result is burnout (Hobfoll & Shirom, 1993). According to Maslach (1982), burnout is comprised of three dimensions; emotional exhaustion, depersonalization, and diminished personal accomplishment. There are a variety of resources that uniquely contribute to the development of burnout in each of the three dimensions, with job demands and resource depletion being the primary causes of stress and strain that initiate the burnout process (Leiter & Maslach, 1988). A meta-analysis conducted by Alarcon (2011) observed that higher job demands and fewer resources, specifically emotional resources, are associated with higher levels of burnout; however, additional research is needed investigating additional resources that influence the burnout process along with the mechanisms underlying these relationships. Additionally, previous research has investigated behavioral and attitudinal job-related outcomes as a result of resource loss, such as increased turnover intentions and decreased organizational commitment, job involvement, and job satisfaction (Burke & Richardson, 1993; Kahili, 1988). These findings should be expanded from the job-domain to

include how resource depletion, as a result of work-life interference, influences individuals' behaviors and attitudes in both the work and non-work domains. Hence, the current study aims to identify which resources are most related to negative behavioral outcomes regarding health-related behaviors as a result of WLC.

In addition, COR Theory poses that existing resources can generate new resources in a cyclical sort of manner, referred to as a gain spiral. That is, in the absence of stressors, individuals can use current resources to obtain even more resources (Hobfoll, 2002). In a similar manner, loss spirals can also occur. Upon the loss of initial resources, the lack of remaining resources leads to further loss of resources when demands cannot be met. There are several assumptions under COR Theory that support these phenomena (Hobfoll, 1989). Primarily, COR Theory assumes that those who have more resources are more likely to avoid stressful/ taxing situations that would deplete existing resources, allowing those with a surplus of resources to invest in gaining additional resources. Additionally, individuals who already have a resource reserve are better prepared to handle stressors, should they arise. Similarly, individuals with larger resource reserves are less negatively affected by the event of resource depletion, as they have a stronger resource buffer to begin with. It has also been observed that the severity of spiraling effects varies across individuals. According to COR Theory, select individual differences, such as self-esteem, act as personal resources, potentially buffering the effects of stressors that could deplete one's resources (Hobfoll, 1989).

COR theory also holds that it is psychologically more harmful for individuals to lose resources than it is beneficial for them to gain the resources that were previously lost (Hobfoll, 1989). This tendency suggests that losses across domains are more influential than gains of similar weight. In the case of work-life conflict, a loss spiral can arise when an individual is faced with demands at work (or in their personal life) that deplete resources and induce stress,

leaving them with fewer resources to invest in the nonwork (or work) domain. Thus, any investment of resources in one's personal life, unaccompanied by gains, continues to deplete the individual's resources, leaving them with even fewer resources to invest in work the following day and so on. However, contrary to the classic belief in spiraling effects, more recent research suggests that WFC stays constant over time in the absence of a major life event, minimizing the role of spiraling effects (Matthews, Wayne, & Ford, 2014). In a longitudinal study that implemented various time lags relating WFC to self-perceptions of health, Matthews and colleagues (2014) found that WFC remained relatively stable over time, regardless the time lag interval used and the degree of WFC reported. Additionally, it was observed that WFC has an immediate negative impact on subjective wellbeing as opposed to diminishing wellbeing over time. Together, these findings suggest that it is not necessary to study WFC longitudinally, contrary to the traditional approach for conducting research on the work-life interface. These findings do not negate the assumptions made under COR Theory but rather suggest that they are more applicable in an immediate context as opposed to emerging over time. Considering these findings, the present study investigates whether WLC immediately impacts engagement in health-related behaviors, as it does subjective wellbeing, through the depletion of various energy resources.

Research regarding the role of resource depletion in the context of the work-family interface suggests that energies play a role in the development of WFC. In assessing the relationships between daily workload, fatigue, and work-family conflict in teachers, Ilies et al. (2005) tested a model exploring the mediating effects of cognitive, emotional, and physical fatigue on the relationship between workplace experience (workload and affective distress) and work-family conflict. Their results demonstrate that, while each of the three energies are related to the experience of work-family conflict, only emotional exhaustion serves as a significant

mediator in this relationship. These findings suggesting that, in the case of teachers, job demands and resulting work-to-family conflict are primarily linked through emotional exhaustion. While Ilies et al. (2005) were interested in how work factors predict WIF through the experience of cognitive, physical, and emotional fatigue, the present study poses that the depletion of energy resources arises as a result of WLC. Given the aforementioned utility of WFC as both a predictor and an outcome (e.g., Rubio et al., 2015), it is suspected that the resource depletion that results from incompatible work and nonwork roles influence individuals' health-related behaviors.

### **Self-Regulation Theory**

Originally developed by Bandura (1991), Self-Regulation Theory helps explain why individuals often struggle to engage in healthful behaviors, especially when one's goal is to participate in health sustaining behaviors, such as eating well or exercising frequently. This theory refers to self-regulation as the process of using self-regulatory processes to refrain from engaging in undesirable impulses, such as snacking or nail biting; however, individuals possess a finite amount self-regulatory ability. It has been proposed and supported that self-control itself acts as a resource, referred to as self-control strength, that, when depleted, can result in failed attempts to self-regulate and give into immediate desires (Muraven & Baumeister, 2000). This perspective has frequently been used in studying the health-related behaviors of individuals (e.g. Beal, Weiss, Barros, & MacDermid, 2005; Muraven & Baumeister, 2000), suggesting that the depletion of self-regulatory resources leaves individuals susceptible to indulging in behaviors that do not line up with their goals (e.g., eating an entire pint of ice cream when one's goal is to lose ten pounds). It has also been observed that the act of coping with stress and strain can deplete self-regulatory resources (Muraven & Baumeister, 2000), indicating that attempts to cope with the strain that results from the depletion of energy-related resources as a result of work-family conflict can inhibit self-regulatory process and fuel engagement in poor health behaviors.

Additionally, it has been observed that engagement in poor health behaviors, such as eating sugary and fatty foods, is, itself, a coping mechanism that aids in reducing stress (Ng & Jeffery, 2003). This notion lines up with the implications of Self-Regulation Theory, in that one's impulse is to cope with stress in a way that relieves it, and the depletion of self-regulatory resources eventually leads to engaging in these coping behaviors, regardless of their impact on goal achievement. Given the intertwining of these two theoretical perspectives, the current study combines Self-Regulation Theory with COR Theory to better explain the role of resource depletion and self-regulatory processes in the tendency for employees to engage in poor health behaviors. Combined, these theories develop the prediction that, through the depletion of energies as a result of WLC, an individual's self-regulatory alibies are consequently hindered by the resulting strain, thus driving the individual toward behaviors that are related to coping.

### **The Work Domain and Work-Family Conflict**

Work organization, defined as how work processes, such as job design, scheduling, management, organizational characteristics, and policies and procedures, are structured and managed (NIOSH, 1996), has been shown to influence employee health and wellbeing through various means, including work setting, individual differences, and, most pertinent to the proposed study, the development of stress and strain (Danna & Griffin, 1999). Occupational stressors can arise as a result of job demands, organizational climate and culture, and various facets of one's job design. These notions suggest that organizational and job characteristics can have a significant impact on the health and well-being of employees and, ultimately, the productivity and effectiveness of the organization as a whole (Wilson et al., 2004). A developing area of focus within the work domain is the availability and encouragement of organizational family-friendly policies for employees. In a study investigating how job environments and characteristics relate to employee health, Wilson and colleagues (2004) observed that the

presence of work-life balance policies, flexible work schedules, child-care services, parental leave, etc., within an organization correlated negatively with high workload, demanding schedules, turnover intentions, poor working conditions, and somatic symptoms. The presence of these policies was also related to lower levels of stress as well as positively associated with satisfaction, content, and overall health. These findings suggest that providing employees with resources to help balance their work and family lives generates positive outcomes in the work, life, and personal domains.

Additional investigation of these policies indicates that the mere presence of family-supportive policies is not enough to create an impact on employee participation in flexibility opportunities. It has been observed that employee perceptions of an organization's family supportiveness, regardless the number of family-friendly benefits provided and degree of supervisor support, is associated with WFC, job satisfaction, organizational commitment, and turnover intentions (Allen, 2001). These findings highlight the importance of having an organizational culture that disseminates family supportiveness that rather than simply including work-life balance policies in employee contracts. Going beyond simply providing work-family adaptive options is vital in the success of these programs, as participation may be hindered by the prevalent stigma associated with engaging in these options. Various studies suggest that individuals who take advantage of family conducive work opportunities often face negative judgments from coworkers and supervisors regarding a lack of commitment to the organization (Allen & Russell, 1999; Williams, Blair- Loy, & Berdahl, 2013). This stigmatization deeply flaws existing flexibility programs that are not backed by a family-supportive culture. It has also been observed that the bridge between the presence of family-supportive policies and employee perceptions of family support by the organization is employee perceptions of family-supportive supervisors (Thomas & Ganster, 1995). This research highlights the importance of the presence



of family-supportive policies paired with organizational support for participation in these opportunities, as this combination develops a family-supportive culture that encourages employees to effectively balance their work and family domains.

### **Work-Family/Life Conflict and Health Outcomes**

An abundance of research has linked WFC to a variety of negative outcomes within the work, life, and personal domains, including reduced job satisfaction in the work domain, less marital satisfaction in the family domain, and, more recently, compromised health in the domain-unspecific, or personal, domain. (Adams & Jex, 1999; Allen, Herst, Bruck, & Sutton, 2000; Kossek & Ozeki, 1998). Previous research using COR Theory as a framework has observed that the amount of time devoted to work and/or family roles is associated with the development of WFC through the depletion of time itself as well as its associated energies (Gutek, Searle, & Klepa, 1991). Additionally, higher levels of WFC have been related to the development of strain, which is associated with a plethora of adverse outcomes across domains (e.g., Burke, 1988; Greenhaus & Beutell, 1985). Regarding the personal domain, it has been observed that both directions of work-family conflict are related to negative outcomes regarding personal health and well-being (Gutek, et al., 1991). As previously mentioned, WIF and FIW tend to produce unique outcomes from each other across domains, including health-related behaviors and outcomes. FIW has consistently shown to be more strongly related to physical and mental health outcomes compared to WIF, including anxiety, depression, hypertension, and general overall health (Frone et al., 1997). An exception to this trend is the consistent finding that WIF is more strongly related to heavy alcohol use (Russell, Cooper, & Frone, 1991). Although FIW appears to be more directly related to health behaviors and outcomes, the effects of WIF are still present and should not be overlooked.

While several connections have been established between WFC and health outcomes, little investigation has focused on identifying the underlying mechanisms of these associations. Evidence strongly suggests that the relationship between WFC and health outcomes is mediated, rather than direct (Frone et al., 1992; O’Driscoll, Ilgen, & Hildreth, 1991). In response to this indication, researchers began theorizing mediators for this relationship. It has been proposed that engaging in poor health behaviors, such as indulging in comfort foods and physical inactivity, produces pleasure and subsequently alleviates stress (Ng & Jeffery, 2003). In testing this hypothesis, Ng and Jeffery (2003) observed that individuals high in perceived stress were more likely to have a higher fat diet and exercise infrequently. In relation to the work-family interface, the stress produced by incompatible work and family demands can help explain why WFC undermines positive health behaviors. Additionally, previous research suggests that work-family roles restrict exercise in females particularly, especially so if children under the age of five are present in the household (Brown & Trost, 2003; Nomaguchi & Bianchi, 2004).

Building on these findings, Allen and Armstrong (2006) observed that the poor health-related behaviors of reduced physical activity and unhealthy food choices are related to WFC, specifically FIW; however, the identification of factors that mediate the relationship between WFC and the observed poor health-related behaviors requires further exploration. It has been proposed that repetitive thought, as a result of stress, is a mechanism of how WFC affects health, suggesting that repeatedly thinking about the experienced conflict prolongs one’s exposure to the stressor, furthering the depletion of mental resources and the generation of strain (Davis, Gere, & Sliwinski, 2016). Uncovering the mechanisms that underlie the relationship between stress and strain and the associated health and wellbeing outcomes sets the stage for the development of organizational approaches that minimize the development of strain and promote employee health and wellbeing. The current study aims to identify mediators of the WLC and health behavior

relationship with the long-term goal of contributing to the development of organizational practices aimed to facilitate engagement in positive health behaviors.

Across research linking aspects of the work-family interface to health outcomes, there are several widespread limitations that hinder the magnitude of existing findings. First, health outcomes tend to be lumped into a single construct, often captured with the use of a single item, as opposed to breaking health outcomes down into their individual components, such as cardiovascular health, mental health, sleep quality, etc. Additionally, the majority of research in this area is cross-sectional self-report. Health outcomes are dynamic and should be measured across multiple waves to gain the deepest understanding of how proposed factors influence long-term health. Obesity and cardiovascular disease do not develop overnight. However, given Matthews and colleagues' (2014) recent findings that WFC is stable over time and impacts subjective wellbeing and behaviors immediately, health behaviors as a consequence of WLC can reasonably be measured in close proximity to measuring WLC, as these behaviors do not necessarily develop over time the way physical health outcomes do (Matthews et al., 2014). Additionally, the use of cross-sectional self-report methods introduces common method bias into the data, which is discussed further in the methods section (Podsakoff, MacKenzie, & Podsakoff, 2003).

Another prominent limitation within the existing literature is that health outcomes are often obtained primarily through a single item. While previous work-family and health research has shown that a single-item, self-report measurement of subjective health has shown to be a viable predictor of mortality, hospitalization, and physical health (Allen & Armstrong, 2006; Frone et al., 1997), there is a plethora of objective measures of health, such as blood pressure, existence of health conditions, etc. that provide stronger support for the observed relationships and more insight into the process of how occupation and lifestyle factors are related to health

outcomes. Regarding health behaviors, a host of validated, multidimensional scales exist that can be used to capture a variety health behaviors that provide information beyond what a single item can capture. The present study considers all of these limitations in order to maximize the implications of the observed findings.

### **Present Study**

Building on the framework that Conservation of Resources Theory and Self-Regulation Theory provide, the present study investigates four proposed mechanisms that mediate the relationship between WLC and negative health behaviors: depleted physical, cognitive, emotional, and temporal resources. These resources were selected given their close ties to the experience of WLC and established relationships with a host of negative outcomes in the personal domain. The present model (*Figure 1*) suggests that work-life conflict, through the depletion of various personal resources, influences individuals' involvement in negative health behaviors.

The influence of two covariates will be considered in the present study: rumination and income. Repetitive thought, or rumination, has been shown to impact both short and long-term mental and physical reactions to stressors, including increased depression, anxiety, somatic illnesses, and blood pressure (Brosschot, Gerin, & Thayer, 2006; Watkins, 2008). A recent study observed that repetitive thought serves as mechanism underlying the relationship between work-family conflict and a variety and physical and mental health outcomes (Davis et al., 2016); therefore, it is expected that repetitive thought plays a role in the proposed relationships. In order to regulate the influence of rumination, the present study will control for rumination in the investigation of the mediating role of resource depletion on the relationship between WLC and health related-behaviors if rumination is related to the depletion of the proposed resources or health behaviors and has a significant effect on the resulting pathways.

Additionally, existing research suggests that there is a relationship between income and diet, such that individuals with lower income tend to eat more unhealthy foods and fewer healthy foods as a result of less access to healthy food items, less education regarding health sustaining practices, and a host of other factors that may serve as a barrier to engaging in healthy dietary behaviors (e.g., Darmon, Ferguson, & Briand, 2002; Hiza, Casavale, & Guenther, 2013). Similar effects have been shown regarding physical activity, in that individuals with lower income tend to engage in less physical activity (e.g., Frank, Andresen, & Schmid, 2004; Parks, Housemann, & Brownson, 2003). However, according to a meta-analysis by Yarcheski, Mahon, Yarcheski, and Cannella (2004), these effects tend to be small in magnitude and may not be an influential factor in the prediction of health-related practices. Upon exploring the relationship between income and health behaviors, the present study will control for income in the investigation of the mediating role of resource depletion on the relationship between WLC and health related-behaviors if income is related to health behaviors and has a significant effect on the resulting pathways.

The health-related behaviors of interest in the present study include dietary and exercise habits. These health behaviors were chosen given their direct relationship with a plethora of negative health-related outcomes such as obesity, diabetes, and cardiovascular disease. An extensive review of literature conducted by Baum and Posluszny (1999) suggests that psychological stress is related to the development of cardiovascular disease, obesity, cancer and a host of other ailments as a result of the tendency to engage in poor health behaviors as a response to stress. Such behaviors include, but are not limited to, tobacco and alcohol use, poor diet, a lack of exercise, and poor sleep habits. There is extensive research regarding tobacco and alcohol use as a coping response to stress (e.g., Conway & Vickers, 1981; Crum & Muntaner, 1995; Ng & Jeffery, 2003); however, far less is known about the ways in which dietary and

exercise behaviors are influenced by stressors in different domains and how organizations can promote successful engagement in healthy behaviors. A variety of work related factors that induce stress are associated with higher levels of smoking, a higher fat diet, and less exercise (Ng & Jeffrey, 2003). Given that existing research has identified consistent links between work, personal life, and WLC-related stressors and compromised health and health-related behaviors, the next step is to identify the underlying mechanisms of these relationships to gain a greater understanding of the processes that lead individuals to develop poor health habits. The purpose of the current research is to contribute to the development of theory investigating the process by which WLC results in poor health outcomes by identifying mediating factors that steer individuals experiencing WLC toward engaging in unhealthy behaviors or away from engaging in healthy behaviors. Given existing evidence suggesting that the relationship between WLC and health outcomes is indirect (e.g., Frone et al., 1992; O'Driscoll et al., 1991) and the scarcity of research investigating such mediating effects, the current study answers Frone and coauthors' (1992) and Allen and Armstrong's (2006) call for additional investigation of pathways by which health is compromised as a result of domain conflict through the examination of various energy related resources.

**Hypotheses.** Based on the proposed model, it is hypothesized that as WLC decreases, the abundance of physical, cognitive, emotional, and temporal resources will increase, resulting in reduced engagement in negative health-related behaviors. Conversely, as WLC increases, these energy related resources will decrease, resulting in increased engagement in negative health-related behaviors. Given that there is no existing research examining the indirect role of these resources on dietary and exercise behaviors, the present study is the first to explore these phenomena and, thus, hypothesizes significant effects for all pathways being investigated. Once a better understanding of these relationships is developed, more specific and parsimonious

models and hypotheses can be established. There are four specific hypotheses being tested by this model:

*Hypothesis 1:* WLC (both WIL and LIW) is negatively associated with the availability of physical, cognitive, emotional, and temporal resources.

*Hypothesis 2:* The depletion of resources is negatively related to health behaviors.

- a. Physical, cognitive, emotional, and temporal resource depletion are negatively associated with diet.
- b. Physical, cognitive, emotional, and temporal resource depletion are negatively associated with physical activity.

*Hypothesis 3:* The relationship between WLC (both WIL and LIW) and health behaviors is mediated by the depletion of physical, cognitive, emotional, and temporal resources.

- a. Physical, cognitive, emotional, and temporal resources mediate the relationship between WIL/LIW and diet.
- b. Physical, cognitive, emotional, and temporal resources mediate the relationship between WIL/LIW and exercise.

*Hypothesis 4:* The indirect effects from LIW to health behaviors are greater in magnitude than indirect effects from WIL to health behaviors.

## **Methods**

### **Sample and Procedure**

Participants were recruited from Amazon's Mechanical Turk (MTurk) via a listing for an organizational research study. The initial sample size of 500 participants was set higher than the sample size required to make meaningful conclusions from the data, after taking into consideration that individuals who provide inattentive or biased responses are dropped from the sample. A primary threat for introducing systematic bias into web-based survey data is careless

responding (Mead & Craig, 2012); therefore, to identify careless responding in participants, three items designed to detect insufficient effort responding were inserted throughout the survey (e.g., “Please select strongly disagree for this item”). Participants who answered one or more of these items incorrectly were removed from the dataset. At time one, 501 individuals completed the survey. Of the completed surveys, 483 individuals met the qualifications of missing no more than 1 insufficient effort item, working 35 or more hours a week, and having a valid MTurk ID that can be used to invite them to take the time 2 survey. Of the individuals that were emailed a time 2 link, 357 completed the survey and 346 missed 1 or fewer insufficient effort items, worked 35 or more hours a week, and had a valid an Mturk ID that could be matched to the initial survey. The final sample consisted of two time points of data from 346 individuals, resulting in a retention rate of 72%.

The average participant was 38 years old ( $SD = 10.05$ ), male (57.0%), and worked 42 hours a week ( $SD = 4.87$ ). The median income of the sample was between \$60,000 and \$70,000. The majority of the sample was either married or living with a partner (60.9). The racial composition of the sample was 81.7% Caucasian, 6.1% Asian American, 6.1% Hispanic, 4.6% African American, 0.3% Native American, 0.3% Arabic, and 0.9% other. Given that the present study is interested in eating behaviors, it is noted that 90.4% of the sample did not have any dietary restriction, 3.8% was lactose intolerant, 0.9% was gluten intolerant, 1.7% had seafood allergies, and the remaining 3.6% reported other dietary restrictions.

In response to growing concerns regarding the generalizability, validity, and reliability of organizational survey data using MTurk, Michel, O’Neill, Hartman, and Lorys (2018) conducted a multi-wave study investigating each of these three concerns. Regarding generalizability, they found that MTurk workers are broadly distributed across the labor market, representing a wide variety of occupations and employment types. Concerning validity, the resulting effect sizes for



organizational and health-related variables are comparable to, or even larger than, published benchmarks using traditional methods of survey data collection. Additionally, it was observed that MTurk data yields high test-retest reliability ( $r_{xx}$ ,  $r_{yy}$ ) and stability ( $r_{xy}$ ) over time across all variables observed. Collectively, these findings support the use of MTurk for conducting organizational and occupational health research.

In order to reduce common method variance, the present study collected data over two time points. WLC and demographic information was measured at time one and resource depletion and dietary behaviors at time two. There was exactly one month separating the measurement of the two time points. This separation of the predictor and criterion variables reduces the salience of prior responses, reducing the influence of completed items on subsequent responses (Podsakoff et al., 2003). Qualifying participants' MTurk IDs were used to invite them to complete time two of the survey upon completion of the first phase.

To be eligible for participation in the study, MTurk workers must have worked a minimum of 35 hours per week, be at least 18 years of age, and currently living in the United States. These requirements guarantee that participants have competing work and life demands to meet and are representative of the population of interest (Greenhaus, Collins, & Shaw, 2003). Additionally, participants' MTurk profiles should indicate that the individual has completed at least 100 HITs and have a HIT approval rate of at least 95% (Peer, Vosgerau, & Acquisti, 2014). These restrictions limit participants to only MTurk workers that have shown to consistently provide high quality data. After informing participating MTurk workers of the study information, participants were directed to a secure Qualtrics link where they completed the survey on their own time. Upon completion of the surveys, participants were debriefed on the nature of the research and compensated \$1.00 for their time at the end of each survey. A recent longitudinal study using various time lags to explore the nature of WFC suggests that work-family conflict

has an immediate effect on the subjective well-being of individuals and is a relatively stable construct over time, in the absence of a major life event (Matthews et al., 2014); therefore, the current study entailed a single measurement of each construct, separating the predictor and criterion variables by a one month time lag in order to capture the immediate effects of WLC on health-related behaviors.

## **Measures**

**Work-life conflict.** Because of the scarcity of well-established WLC measures along with the conceptual similarity between WLC and WFC, researchers often use adapted versions of validated WFC measures to capture general work-nonwork domain conflict (e.g., Boswell & Olson-Buchanan, 2007; Hämmig et al., 2009). Both directions of WLC, WIL and LIW, were captured using an adapted version of the WFC measure developed and validated by Carlson, Kacmar, and Williams (2000). Nine items measure WIL (e.g., “My work keeps me from my nonwork activities more than I would like.”) and nine items measure LIW (e.g., “Due to stress outside of work, I am often preoccupied with nonwork matters at work.”). Responses were collected using a 5-point Likert scale ranging from 1 = “strongly disagree” to 5 = “strongly agree”. Higher scores relate to higher levels of WIL and LIW.

**Physical, cognitive, and emotional resources.** Reports of resource-based burnout were used to capture the depletion of emotional, cognitive, and physical resources. Resource burnout were measured using the 14-item Shirom-Melamed Burnout Measure (SMBM) (Shirom & Melamed, 2006). The SMBM is broken down to assess physical fatigue, cognitive weariness, and emotional exhaustion (e.g., “I have no energy for going to work in the morning”, “I have difficulty concentrating”, “I feel I am not capable of investing emotionally in coworkers and customers”). Responses were provided using a 7-point Likert scale ranging from 1 = “never or

almost never” to 7 = “always or almost always”. Higher scores within each group are indicative of higher levels of resource depletion for the associated energy.

**Temporal Resources.** The present study characterizes temporal resource depletion as role overload, defined as a time-based form of conflict in which the perceived demands associated with an individual’s multiple roles leave them with insufficient time to adequately fulfill all role requirements (Duxbury, Lyons, & Higgins, 2008). Role overload was measured using Reilly’s (1982) 13-item measure of role overload (“e.g. There are too many demands on my time”). Responses are collected using a 5-point Likert scale ranging from 1 = “strongly agree” to 5= “strongly disagree”. Higher scores indicate higher levels of role overload.

**Dietary choices.** Combining methodologies used by Allen and Armstrong (2006) and Liu, Song, Koopmann, Wang, and Chang (2017), eating behaviors were measured using a list containing various food items. Participants were asked reflect on their dietary choices over the past month and report how often they consumed each item on the list on a weekly basis using a 6-point Likert scale ranging from 0 = “never” to 5 = “5 or more times a week”. The 14 items adapted from Liu et al.’s list, based on the Behavioral Risk Factor Surveillance System State Questionnaire used by the Centers for Disease Control and Prevention (2003), include healthful foods (e.g. fruits, green vegetables, whole grains) and unhealthy foods high in sugar (e.g. soda, candy, pastries) and fat (e.g. fried chicken, hamburgers, bacon) taken from the dietary fat screener developed by Caan, Coates, and Schaffer (1995). Responses were added up within each of the healthy and unhealthy categories, yielding two separate scores. Higher scores indicate higher levels of consumption of the associated category of food.

**Exercise.** A single item was used to capture exercise frequency. Participants reported the number of times they exercise on a weekly basis. This includes cardiovascular exercises (e.g. running, swimming, cycling), weight training, yoga, or engagement in sports.

**Rumination.** Given the previous observation suggesting that rumination mediates the relationship between work-family conflict and health outcomes (Davis et al., 2016), the present study statistically controls for rumination. Rumination was measured using the rumination subscale of the Trapnell and Campbell (1999) Rumination-Reflection Questionnaire. The 13-item measure contains items such as “I spend a great deal of time thinking back over my embarrassing or disappointing moments” and “I always seem to be rehearsing in my mind recent things I’ve said or done”. Responses were collected using a 5-point Likert scale ranging from 1 = “strongly disagree” to 5 = “strongly agree”. Higher scores relate to higher ruminative tendencies.

### **Analyses**

The hypotheses for the present study were tested using path analysis. All analyses were conducted in MPlus (Muthén & Muthén, 2010). Upon examining the distributions of study variables, it was observed that several variables were not normally distributed. This was not unexpected, as many of the constructs explored in the occupational health and work-family literature have a low base rate and are subsequently positively skewed. WIL (SI = 0.242, SE = 0.131), LIW (SI 0.515, SE = 0.131), cognitive resources (SI = 0.511, SE = 0.131), emotional resources (SI = 0.664, SE = 0.131), and physical resources (SI = 0.310, SE = 0.131) were slightly positively skewed. Temporal resources, diet, and exercise habits were approximately normally distributed.

Given that the WLC and resource depletion variables were not normally distributed, Robust Maximum Likelihood (MLR) estimation was used. MLR estimation is the preferred method when the data contains continuous variables that are not normally distributed. This method follows the same framework as Maximum Likelihood estimation but calculates robust standard errors and corrected model test statistics (Kline, 2015, p. 238). Because bootstrapping cannot be used with MLR, indirect effects were calculated and interpreted using RMEDIATION

(Tofighi & MacKinnon, 2011). Indirect effects testing the mediating role of energy-related resource depletion on the relationship between WLC and health-related behaviors were deemed significant if the resulting 95% confidence intervals did not include zero.

## Results

### Model Fit

**Power analysis.** In reference to MacCallum, Browne, and Sugawara's (1996) test of not-close model fit, with 6 degrees of freedom and 346 participants, the resulting probability of rejecting the null hypothesis that the fit is not excellent is 0.181. Because of this low power, there is only an 18.1% chance of correctly identifying that the model fit for the sample is excellent when the model fits the population well, making it difficult to assess the viability of the resulting fit statistics.

**Fit statistics.** In order to assess the fit of the hypothesized model, several model fit indices were examined. Based on Kline's (2005) recommendations for interpreting model fit, the present model was supported by the resulting fit statistics, suggesting rather good model fit to the data.  $\chi^2 = 15.254$  ( $df = 6$ ,  $p = 0.018$ ), suggesting that the model does not fit that data perfectly; however, it is important to note that based on the low power for identifying a model that fits the data well, the resulting fit statistics may underrepresent the true model fit. The CFI (0.990) value was higher than the 0.95 benchmarks and TLI (0.933) is very close to this benchmark (Kline, 2005). SRMR = 0.021, suggesting close model fit to the data, as it is less than the 0.08 benchmark. The RMSEA (0.067,  $p = 0.214$ ) had a 90% confidence interval of [0.025 0.109], suggesting excellent model fit according to Kline's (2005) specifications. The insignificant  $p$ -value at  $\alpha = 0.05$  suggests that the model fit the data very well. The upper bound of the 90% confidence interval is slightly higher than the 0.10 cap for the poor model fit hypothesis; however, the RMSEA for correctly specified models with small degrees of freedom are

especially susceptible to mistakenly suggesting poor model fit (Kenny, Kaniskan, & McCoach, 2015); therefore, the RMSEA statistics for the present model should be interpreted with caution as the model only contained six degrees of freedom. Despite the low power for identifying a truly fitting model and degrees of freedom, the resulting fit statistics ultimately support the fit of the present model to the data.

### **Covariates**

The influence of two covariates was considered in the present study: rumination and income. Rumination has been shown to impact mental and physical reactions to stressors and to mediate the relationship between work-family conflict and a variety of physical and mental health outcomes (Brosschot et al., 2006; Davis et al., 2016; Watkins, 2008); therefore, the effects of rumination on the proposed model were considered. Rumination was significantly related to physical ( $r = 0.581, p < 0.01$ ), cognitive ( $r = 0.544, p < 0.01$ ), emotional ( $r = 0.403, p < 0.01$ ), and temporal resources ( $r = 0.483, p < 0.01$ ). Because rumination was related to all four of the mediators, a model including rumination as a covariate was run. The results of this model differed from those of the model without any covariates; thus, rumination was included as a control variable in the present analyses.

Income was also considered as a potential covariate in the present model, as income has shown to be related to a host of negative health behaviors including poor diet and lack of physical activity (e.g. Darmon et al., 2002; Frank et al., 2004; Hiza et al., 2013; Parks et al., 2003). Partially supporting previous findings, it was observed that income was only significantly related to healthy eating behaviors ( $r = 0.181, p < .01$ ) and had no relationship with unhealthy eating behaviors ( $r = 0.029, p > 0.05$ ) or physical activity ( $r = 0.053, p > 0.05$ ). Because of the significant relationship between income and healthy diet, a model including income as a covariate was run; however, the results from this model did not differ from the model where only

rumination was controlled for. In order to maintain the most parsimonious model, income was not included as a covariate in the present study.

### **Resulting Pathways**

Intercorrelations, means, standard deviations, and reliabilities among all study variables are presented in Table 1. As expected, healthy eating behaviors and unhealthy eating behaviors were negatively correlated. Additionally, exercise frequency was positively associated with healthy dietary choices and negative associated with unhealthy dietary choices. The associations between these health-related behaviors suggest that health behaviors may be linked to each other, in that participating in one health-sustaining behavior is associated with engaging in other health-sustaining behaviors and fewer unhealthy behaviors. The four resources were strongly correlated with each other, suggesting that the depletion of one resource is associated with the depletion of the remaining resources. The strengths of these associations suggests that a slightly collinear relationship exists between the resources, which could lead misleading calculations of direct and indirect effects. Finally, all of the correlations between the predictor variables and outcome variables were nonsignificant; however, recent developments in statistical theory and methodology have determined that model predictors do not have to be significantly related to outcomes in order to appropriately identify a mediating effect (e.g. Cerin & MacKinnon, 2008; Hayes, 2018; Rucker et al., 2011).

A summary of the estimated direct effects can be found in Table 2. In partial support of Hypothesis 1, which predicted that both directions of WLC predict resource depletion, WIL significantly predicted the depletion of physical, cognitive, emotional, and temporal resources, while LIW only predicted the depletion of emotional and cognitive resources. Of the examined resources, only the depletion of physical and emotional resources were significantly predictive of health behaviors. Physical resources predicted unhealthy dietary choices and exercise frequency

while emotional resources predicted unhealthy dietary behaviors. However, the correlation between emotional exhaustion and unhealthy eating behaviors ( $r = -0.057, p > 0.05$ ) was not significant, while the estimated direct relationship was significant ( $B = -0.136, p = 0.001$ ), indicating the presence of suppression effects. None of the proposed resources predicted healthy dietary choices. Additionally, cognitive and temporal resource depletion were not predictive of either dietary behavior or exercise frequency. These findings provide partial support for Hypothesis 2, which predicted that the depletion of all four resources would be predictive of eating fewer healthy foods, more unhealthy foods, and less frequent exercise. Although several of the observed direct effects were nonsignificant, mediating effects were still tested for all hypothesized pathways, as the absence of significant direct effects does not discount the viability of having an indirect effect (Hayes, 2018, p.118; Kenny & Judd, 2014).

A summary of the estimated indirect effects, calculated using RMEDIATION, can be found in Table 3. It was proposed that physical, cognitive, emotional, and temporal resources would mediate the relationship between both directions of WLC and the consumption of healthy foods, unhealthy foods, and exercise frequency. The present findings provide partial support for this hypothesis and reveal some interesting trends. Physical resource depletion significantly mediated two of the three health behaviors examined in the present study. Physical depletion as a result of WIL was related to the consumption of more unhealthy foods, but did not mediate the relationship between LIW and unhealthy food consumption. Physical resource depletion also mediated the relationship between WIL and physical activity, suggesting that higher rates of physical depletion as a result of WIL result in less frequent exercise. Once again, there was no mediating effect in the LIW direction.

Emotional resource depletion significantly mediated the relationship between both directions of WLC and unhealthy food consumption; however, in the reverse direction of the



proposed hypothesis. The present findings indicate that higher rates of emotional exhaustion as a result of WLC are related to eating fewer unhealthy foods. These results are counter-predictive of Hypothesis 3 by suggesting that physical resource depletion does not result in engaging in poor health behaviors. Suppositions regarding this finding are proposed in the discussion section. Lastly, emotional depletion displayed no mediation effects regarding healthy food consumption or exercise frequency.

None of the proposed resources mediated the relationship between WLC and healthy food consumption, suggesting that resource depletion resulting from WLC may not impact the amount of healthy foods individuals consume. Additionally, cognitive and temporal resource depletion did not mediate any of the proposed pathways, suggesting that the depletion of time and cognitive energy may not influence health-related behaviors. Overall, the present findings provide partial support for Hypothesis 3. As seen in Table 3, it is important to note that several of the observed indirect effects are on the borderline of significance and do not provide overwhelming support for the implication of these effects; however, that is not to say that they are not meaningful.

Finally, Hypothesis 4 predicted that resource depletion stemming from LIW would be more strongly related to negative health-related behaviors than resource depletion stemming from WIL. Because the majority of indirect effects were nonsignificant, only relationships that yielded significant mediating effects in at least one direction were considered in testing this hypothesis. Indirect effects were compared using the Wald chi square test after adding a nonlinear constraint to the model that constrained the strengths of the effects being compared to equality (Preacher & Hayes, 2008). The Wald test compares the chi-square values of the unconstrained and constrained model through a chi-square difference test.

There were three relationships that displayed significant mediating effects between WLC and health behaviors, including the mediating effect of physical depletion on unhealthy diet and exercise as well as the mediating effect of emotional depletion on unhealthy diet. The results of the Wald tests provide partial support for Hypothesis 4. There was not a significant difference between the indirect effect of physical depletion stemming from WIL versus LIW on unhealthy eating behaviors,  $\Delta\chi^2 (1, N = 346) = 0.066, p = 0.084$ . There was also no significant difference between the indirect effect of emotional depletion stemming from WIL versus LIW on unhealthy eating behaviors,  $\Delta\chi^2 (1, N = 346) = 0.024, p = 0.315$ . These findings suggest that both directions of WLC have similar effects on unhealthy eating behaviors through physical and emotional resource depletion. However, there was a significant difference between the indirect effect of physical depletion stemming from WIL versus LIW on exercise behaviors,  $\Delta\chi^2 (1, N = 346) = -0.218, p = 0.004$ , indicating that physical resource depletion as a result of WIL may more strongly mediate exercise behaviors compared to physical resource depletion as a result of LIW. Because the two indirect effects describing this relationship were in opposite directions, their absolute values were used to compare the magnitude of the indirect effects rather than comparing them directly. This observed difference in magnitude was in contrast to Hypothesis 4, which predicted that indirect effects stemming from the LIW direction would be stronger than those stemming from WIL. Speculations regarding these findings are presented in the discussion section.

## **Discussion**

Given the plethora of research suggesting that WFC and WLC are related to poor health outcomes, it is necessary to determine the underlying mechanisms of these relationships. The aim of the present study was to expand the field's understanding of how WLC influences health-related behaviors by testing the mediating roles of various energy-related resources. Only one

other study has answered this call for research by exploring the role of repetitive thought on the WFC – physical health relationship (Davis et al., 2016). Davis and his coauthors (2016) observed that repetitive thought served as a potential mechanism of how WFC can affect physical health. In comparing the significance of the indirect effects obtained by Davis et al. (2016) with those of the present study, it appears that they are similar in magnitude, with confidence intervals very nearly approaching zero. This might suggest that the nature of indirect effects within the personal domain may not be large in magnitude when predicting the relationship between WLC and health behaviors; however, their presence is nonetheless meaningful and influential.

The findings of the present study suggest that physical, cognitive, emotional, and temporal resources, as a result of WLC, have differing and unique relationships with dietary and exercise behaviors. Cognitive and temporal depletion as a result of WLC appear to have insignificant effects on health behaviors, contrary to the frequent findings that time constraints result in poorer dietary and exercise behaviors (e.g. Mailey et al., 2014; Persson & Mårtensson, 2006). There are several speculations as to why these findings did not produce the expected and previously observed results. As mentioned before, there was moderate collinearity between all four resources, resulting in high shared variance among the resources and, thus, smaller amounts of unique variance explained by each individual resource. Specifically, the effects of mediators on dependent variables tend to be mitigated depending on the degree to which the mediators are correlated with each other (Preacher and Hayes, 2008). Additionally, the content of the measure used to capture temporal depletion may not have captured the various sources of temporal depletion that exist. The role overload scale used focuses more heavily on social and work-related expectations and time constraints and less on leisure time activities, which would include meal preparation and exercise. A scale that captures temporal depletion in relation to leisure

activities may be more appropriate for estimating the relationship between time and health behaviors.

Physical depletion appeared to have the strongest and most frequent mediating effects of the four explored resources. Exhausted physical resources as a result of WLC were related to the consumption of more unhealthy food from the WIL direction and less frequent exercise from the WIL direction. A supposition as to why physical depletion demonstrated the strongest indirect effects out of the four resources at hand is that different forms of resource depletion may spur different reactions and outcomes in individuals that may influence subsequent actions. For example, physical depletion may leave individuals feeling more tired and unwilling to expend the energy to prepare a healthy meal, as more quickly prepared, convenient meals tend to be less healthy (Brunner, Van der Horst, & Siegrist, 2010). On the other hand, individuals experiencing other forms of resource depletion may have more remaining energy to put into preparing a meal at the end of the day. This might suggest that dietary behaviors pull more strongly on physical energy than on cognitive and emotional energy; however, additional research needs to explore the resources that contribute to consuming healthy foods versus unhealthy foods. Additionally, consuming unhealthy food items has been shown to serve as a coping mechanism for reducing stress (Ng & Jeffery, 2003). Because WLC generates stress and strain, as does resource depletion, it could be that consuming unhealthy food items serves as a coping mechanism for reducing stress as a consequence of resource depletion. This also falls in line with Self-Regulation Theory, which explains how prolonged exposure to stressors and strain often result in engaging in poor health-related behaviors that act as coping mechanism for stress, such as being sedentary or eating unhealthy foods (Muraven & Baumeister, 2000). More research needs to be done on individual reactions to the depletion of resources in order to better theorize why individual resources have differing effects on dietary and exercise behaviors.

Physical and emotional resources demonstrated some trends that were in contrast to the proposed directionality of the indirect effects. This could be due to the suppression effects present within the data, characterized by a difference in magnitude or directionality between the beta weight of a relationship versus its bivariate correlation (Kline, 2005, p. 36). None of the correlations between physical and emotional resource depletion and health behaviors were significant; however, several of the direct and indirect effects between these variables were significant. Emotional depletion via both directions of WLC was indirectly related to the consumption of fewer unhealthy foods. This finding was especially surprising, considering that emotional exhaustion tends to show more pronounced negative outcomes than other forms of resource depletion throughout the literature (e.g., Alarcon, 2011; Ilies et al., 2005). Suppression occurs when a variable, or set of variables, affect the predictive validity of other variables as a result of their inclusion in the regression equation (Tzelgov & Henik, 1991). In order to determine whether the reversed directionality was due to multicollinearity or a suppressor variable, each resource was run in the model individually. It was observed that the directionality of the relationship between temporal resource depletion and exercise becomes reversed when other resources are included in the model, in that the inclusion of all four resources makes the relationship positive rather than negative. This confirms the presence of suppression effects in the present data.

There are additional reasons as to why several unexpected relationships were observed regarding physical and emotional resources. Specific to the reversed results regarding unhealthy eating behaviors, suspicion as to why this relationship was observed may have to do with the reliability of the measures of health behaviors. The reliabilities for healthy diet ( $\alpha = 0.75$ ) and unhealthy diet ( $\alpha = 0.76$ ) scales were acceptable but not great. These lower reliabilities suggest that these scales might not be exclusively and holistically capturing healthy and unhealthy

dietary behaviors. This is more strongly reflected in estimates that may have weaker effects by nature and can lead to misleading outcomes depending on the degree to which the scale is failing to capture the specific construct. This may also explain why no significant indirect effects were observed between WLC, resource depletion, and healthy food consumption. Several of these indirect effects were extremely close to significance and, thus, their true nature remains blurry. The use of a more reliable scale would more accurately depict the relationships between WLC, resource depletion, and dietary behaviors. Subsequent studies predicting these relationships should use a modified version of the present scale or different, validated, measures of dietary behaviors in order to accurately and uniquely capture healthy and unhealthy dietary behaviors.

Only physical resource depletion mediated the relationship between WLC and exercise habits. Stemming from only from the WIL direction, physical depletion was indirectly related to less frequent exercise. It is not a surprise that physical resources were the most strongly related to exercise frequency out of the resources explored in the present study, as physical activity draws primarily on physical resources. These findings suggest that cognitive, emotional, and even temporal resource depletion might not influence individuals' decision or likelihood to engage in exercise.

Overall, while the magnitudes of several of the observed indirect effects are small, the present study suggests that the depletion of energy related resources as a result of WLC may influence individuals' dietary choices and exercise habits. Additionally, these effects may differ based on the type of resource depletion being experienced. This information is vital to the expansion of theory and practice, as understanding what factors cause individuals to engage in health promoting versus deteriorating behaviors and how they do so is necessary in identifying ways to steer individuals toward health sustaining behaviors and away from damaging ones. As the present study was exploratory by nature, given that no other studies have explored the roles

of these specific resources in relation to dietary behaviors and exercise, additional research expanding upon the present findings is necessary to gain a better understanding of these phenomena. Because a large number of pathways were explored in order to gain an initial understanding of these relationships, future studies can begin to hone in on specific resources and relationships to gain a more thorough understanding of the relationships at hand.

### **Limitations**

Given that this was the first study to explore the proposed relationships, there are several limitations that affect the interpretation of the present finding that can be alleviated in future studies. As mentioned before, there was moderate collinearity between the four resources, resulting in high shared variance between the resources and, thus, smaller amounts of unique variance explained by each individual resource. As a result, the true effects of each resource may be misrepresented in the present data, as collinearity affects the estimation and significance tests in multiple regression (Iacobucci, 2008). In order to eliminate the issue of collinearity, future studies could consider treating resource depletion as a single latent variable as opposed to including each type of resource depletion individually within the model. Doing so would also address the suppression issue observed in the current study, as the role of each resource would no longer have an effect on the predictive validity of the remaining resources. The issues of collinearity and suppression effects serve as major barriers in interpreting the results of the present study, as they may distort the relationships being explored.

Additionally, the power estimate (0.181) for the fit of the overall model is markedly lower than the generally accepted baseline of 0.80. The resulting probability of a type II error, rejecting the null hypothesis that the fit is not excellent when it actually is, is very high. Given this low power, it is difficult to determine if some of the fit statistics misidentified the model as having poor fit with the data. Despite this low power, the majority of the fit statistics supported

the overall fit of the model. In order to determine the true fit of the proposed model, additional data should be collected with a sample size that provides sufficient power. According to MacCallum et al.'s (1996) test of not-close model fit, with 7 degrees of freedom, the present model requires at least 1,426 participants to achieve a power of 0.80. Another way to improve the power of the model is to free up additional parameters and increase the degrees of freedom in the model by removing some of the pathways. Given the exploratory nature of the present study, the model was extremely saturated and only had 6 degrees of freedom. Removing variables or pathways that are not meaningful from the model can open up degrees of freedom and improve the power of the model fit.

In addition to having low power for model fit and a small sample size, the present study only contains 2 time-points while testing mediating effects. It is recommended that each stage of a model be collected at a different time-point in order to control for biases such as common method variance and provide stronger causal inference. Because both the mediators and outcome variables were measured at the same time-point, causality between resource depletion and health behaviors cannot be determined. It would be beneficial for future studies to test these relationships with a time separation between each stage of the model in order to control for methodological biases and provide stronger causal inference.

## **Conclusion**

Understanding the ways in which occupational factors affect individual health and wellbeing is vital in the development and implementation of organizational and individual practices that encourage positive health behaviors and promote overall health. The present study is among the first to explore mechanisms underlying the WLC – health behavior relationship and suggests that there may be an indirect effect of energy-related resource depletion on dietary choices as a result of WLC. The present findings demonstrate that each of the energy-related



resource play a unique role in predicting health related behaviors as a result of WLC; however, additional research exploring the role of resources as well as other potentially mediating constructs is vital for a holistic understanding of how work-life conflict leads to poor health behaviors and outcomes.

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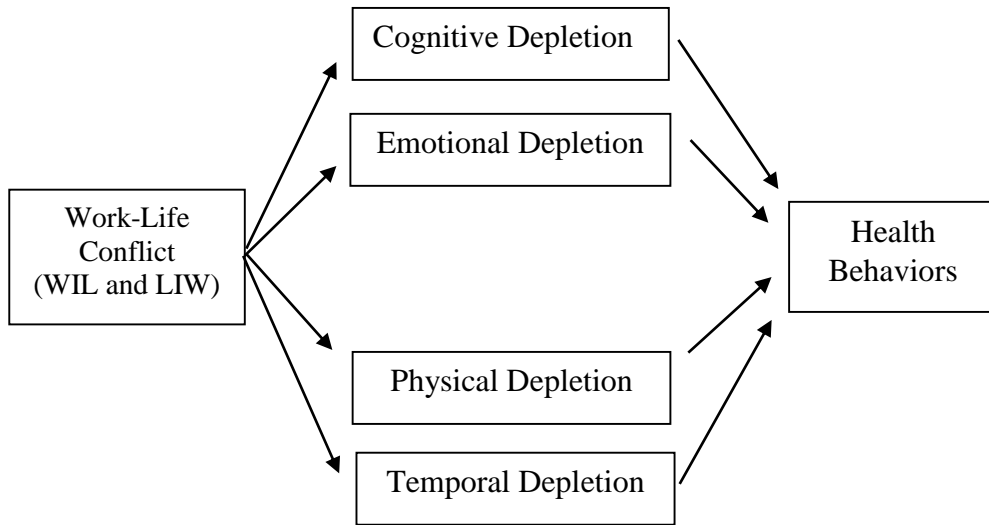
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**Figure 1. Pathways predicting health outcomes from WLC through resource depletion**

Table 1. Descriptive Statistics, Correlations, and Reliabilities

	M	SD	$\alpha$	1	2	3	4	5	6	7	8	9
1. WIL	2.538	1.012	0.930									
2. LIW	2.053	0.831	0.900	0.532**								
3. Physical	3.377	1.436	0.942	0.566**	0.381**							
4. Cognitive	2.658	1.321	0.931	0.428**	0.469**	0.722**						
5. Emotional	2.688	1.460	0.937	0.383**	0.416**	0.616**	0.658**					
6. Temporal	2.762	1.056	0.958	0.691**	0.439**	0.697**	0.551**	0.484**				
7. Healthy	2.461	0.894	0.748	0.057	-.023	-.102*	-.080	-.001	-.040			
8. Unhealthy	1.754	0.920	0.760	0.041	0.088	0.127*	0.043	-.057	0.104	-.211**		
9. Exercise	3.310	2.060	-	0.059	-.008	-.174**	-.114*	-.059	-.062	0.393**	-.183**	
10. Rumination	2.855	1.116	0.964	0.443**	0.443**	0.581**	0.544**	0.403**	0.483**	-.044	0.183**	-.073

Note.  $N = 346$

\* $p < 0.05$ ; \*\* $p < 0.01$

Table 2. Summary of Regression Equations for Direct Effects

Regression	B	<i>p</i>
Physical Depletion		
WIL	0.529	0.000
LIW	-0.004	0.964
Cognitive Depletion		
WIL	0.180	0.023
LIW	0.359	0.00
Emotional Depletion		
WIL	0.229	0.007
LIW	0.403	0.000
Temporal Depletion		
WIL	0.603	0.000
LIW	0.049	0.438
Healthy Diet		
Physical Depletion	-.0105	0.085
Cognitive Depletion	-0.054	0.359
Emotional Depletion	0.074	0.004
Temporal Depletion	0.044	0.562
Unhealthy Diet		
Physical Depletion	0.124	0.048
Cognitive Depletion	-0.027	0.631
Emotional Depletion	-0.136	0.001
Temporal Depletion	0.035	0.613
Exercise		
Physical Depletion	-0.416	0.002
Cognitive Depletion	-0.043	0.774
Emotional Depletion	0.106	0.341
Temporal Depletion	0.204	0.156

Note: WIL = work interference with life; LIW = life interference with work.

Table 3. Summary of Regression Equations for Indirect Effects

Outcome	Mediator	WIL		LIW	
		Indirect Effect	95% CI	Indirect Effect	95% CI
Healthy Diet	Physical Depletion	-0.056	[-0.124, 0.008]	0	[-0.025, 0.026]
	Cognitive Depletion	-0.01	[-0.038, 0.011]	-0.019	[-0.067, 0.022]
	Emotional Depletion	0.017	[-0.004, 0.047]	0.03	[-0.007, 0.077]
	Temporal Depletion	-0.027	[-0.116, 0.062]	-0.002	[-0.018, 0.01]
Unhealthy Diet	Physical Depletion	0.067	[0.001, 0.137]	0	[-0.029, 0.028]
	Cognitive Depletion	-0.005	[-0.029, 0.015]	-0.01	[-0.053, 0.03]
	Emotional Depletion	-0.031	[-0.065, -0.006]	-0.055	[-0.106, -0.016]
	Temporal Depletion	0.021	[-0.061, 0.104]	-0.002	[-0.013, 0.006]
Exercise	Physical Depletion	-0.22	[-0.383, -0.077]	0.002	[-0.086, 0.09]
	Cognitive Depletion	-0.008	[-0.026, 0.007]	-0.015	[-0.117, 0.081]
	Emotional Depletion	0.024	[-0.026, 0.089]	0.043	[-0.045, 0.147]
	Temporal Depletion	0.123	[-0.047, 0.298]	0.01	[-0.006, 0.037]

Note: WIL = work interference with life; LIW = life interference with work.