

ORIGINAL ARTICLE



Time-based conflict and trade-offs: Work-family-school conflict and health behaviors

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Abstract

Individuals face many barriers to healthy behaviors, including a lack of time. Some research finds that individuals “borrow” from time that could be spent on health to “pay” for demands in other domains of their lives. This study aims to further explore these trade-offs as they are motivated by a broader set of life domains (assessing conflict across work, family, and school domains) and as they relate to participation in multiple health behaviors (examining sleep, diet, and exercise behaviors). This study also aims to provide insights that could reduce trade-offs, identifying individual and organizational characteristics that moderate the work-family-school conflict and health behavior relationship. Finally, we aim to better understand the decisional and motivational processes influencing trade-offs by examining the value placed on each health behavior. Seventy-three employed students completed a daily diary study assessing daily levels of work-family-school conflict and behaviors related to sleep, diet, and exercise. Multi-level modeling revealed a curvilinear relationship between work-family-school conflict and exercise and a negative linear relationship between work-family-school conflict and sleep. Proactive personality and time management moderated the work-family-school conflict and exercise relationship. Coping

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moderated the relationship between work-school-family conflict and daily time spent sleeping. Family supportive supervisor behaviors and workplace health climate moderated the relationship between work-family-school conflict and exercise. A latent profile analysis revealed differences in value placed on various health behaviors, and these value profiles moderated the relationship between work-family-school conflict and exercise. These results shed light on the trade-offs that may take place for busy individuals when time is scarce and provide insights that could be useful in promoting valuable health behaviors.

KEYWORDS

exercise, health behaviors, nutrition, sleep, work-family-school conflict

INTRODUCTION

There are many benefits associated with participation in health behaviors, such as obtaining ideal sleep (Chaput et al., 2020), consuming a nutritious diet (Wirt & Collins, 2009), and participating in appropriate types and quantities of physical activity (Rhodes et al., 2017). However, decades of research and public health surveillance document low levels of participation in these valuable health behaviors (Centers for Disease Control and Prevention [CDC], 2022a; Elgaddal et al., 2022; United States Department of Agriculture [USDA], 2022), including among subgroups of working adults (Goetzel et al., 2020), college students (Lederer & Hoban, 2022), and individuals with family responsibilities (e.g. parents of young children, Berge et al., 2011; caregivers for those with chronic illness, Acton, 2002).

Although there are many factors that motivate or discourage participation in health behaviors, time plays an important role; individuals often cite lack of time as a key barrier to promoting health behaviors in their daily lives (Lappalainen et al., 1997; Salmon et al., 2003), or having dedicated time as a facilitator to health behaviors (Mazzola et al., 2017). This is not surprising, given that individuals have a limited amount of time to address daily demands across the many domains of their lives, such as work, family, or school responsibilities.

Conflict across life domains occurs when an individual perceives inter-role conflict between roles in their life, such as when a domain requires time, energy, or behaviors that are not compatible to fulfill the demands of another role, or vice versa (Kossek & Lee, 2017). A common example of conflict among life domains, *work-life conflict*, is well-documented in the organizational sciences literature. Employees who report higher levels of work-life conflict are more likely to report poor health and lower levels of participation in health behaviors (Gisler et al., 2018). High levels of demands and conflict between life domains create time constraints (Gisler et al., 2018), and individuals may feel they have to choose between completing a life role demand or a health behavior, rather than being able to complete both, such as “borrowing” from time that could be used for healthy sleep to “pay” for demands in work and family domains (Barnes et al., 2012; p. 789).

While existing investigations of the relationship between work-life conflict and participation in health behaviors are important, they can be extended in several ways. First, most existing research operationalizes work-life conflict at the intersection of two life domains: work and family. This may not adequately represent the complete picture of responsibilities across multiple domains that demand an individual's time (Kossek & Lee, 2017). The reality is that many individuals must balance work, school, and family. The Center for Education and the Workforce at Georgetown University labeled “learning while earning” the new normal, as over 70% of college students work while enrolled, with one in five working learners reporting having children (Carnevale et al., 2015) and close to one-third reporting caregiving responsibilities (Rothwell, 2021). Second, previous research has operationalized participation in health behaviors in a somewhat narrow way, most often examining a single health behavior. For example, among studies examining the relationships between work–family conflict and behavioral health in the review performed by Gisler et al. (2018), 69% examined the relationship between work–family conflict and a single health behavior. There is value in examining a comprehensive set of health behaviors, as participation in multiple health behaviors is important to promote health, yet very uncommon (Reeves & Rafferty, 2005).

Next, there is an opportunity to assess moderators of the relationship between conflict among life domains and participation in health behaviors. The identification of moderators, including individual or environmental factors, could provide valuable insight for future interventions aiming to promote participation in health behaviors. Finally, examining multiple health behaviors creates an opportunity to assess the value that individuals place on each health behavior. It is possible that individuals vary in the value they place on each health behavior, and a greater understanding of these motivational processes could shed light on how individuals make decisions when they perceive that a trade-off, or a coping strategy that can divert time and energy to other domains (Blake et al., 2009), is necessary.

In keeping with these opportunities, the aims of the present study are to explore the relationship between perceptions of work-family-school conflict and participation in multiple health behaviors (sleep, physical activity, and diet quality) among employed students using a daily diary study. This aim acknowledges the breadth of health behavior participation and life domains. We also aim to test individual and environmental characteristics as moderators of these relationships to identify factors that promote more participation in health behaviors even at higher levels of perceived conflict. Doing so could lay the groundwork for future interventions. Finally, we aim to examine the value that individuals assign to the behaviors of obtaining adequate sleep, consuming a high-quality diet, and performing exercise through a person-centered approach. Examining meaningful classes of value placed on health behavior, as well as differences in health behaviors that emerge as a function of these classes, could shed light on factors that influence decisional processes when individuals perceive time-based conflict and conclude that it is not possible to perform all health behaviors.

Time dedicated to work, family, school, or health as a rational choice

We ground our aims and hypotheses in the theory of Ecological Rationality (Todd & Gigerenzer, 2012). This theory explores how individuals make decisions in real-world circumstances. Individuals make decisions within a bounded rationality, constrained by their own limitations in “information, cognition, memory, and time” (Todd & Brighton, 2016; pg. 11). Individuals also make decisions within an ecological rationality, which accounts for constraints

or enabling factors in their environment (Todd & Brighton, 2016). Such a theory can explain why individuals choose to dedicate time to work, school, family, or their health (or to forgo one of those activities in favor of another); it is a decision suited to the reality of a particular environment (Gigerenzer & Selten, 2002).

PARTICIPATION IN HEALTH BEHAVIORS

Lack of participation in health behaviors is considered a modifiable risk factor due to the influence of health behavior participation on morbidity and mortality related to noncommunicable diseases (Prochaska et al., 2008). Health behaviors are defined as behaviors that are performed that improve, maintain, or restore health (Gochman, 1988), and are frequently operationalized as sleep behaviors, physical activity or exercise behaviors, and behaviors related to nutrition and diet quality in health-promoting disciplines (Wickham et al., 2020). Experts recommend that adults should attend to the quantity of their sleep by getting at least seven hours of sleep each night (Watson et al., 2015). Dietary guidelines recommend the consumption of nutrient-dense foods, such as fruits and vegetables, whole grains, protein foods, and foods that contain healthy fats, while limiting consumption of foods high in added sugars, saturated fat, sodium, and alcoholic beverages (USDA, 2020). Recommendations for physical activity and exercise emphasize that adults should participate in 150 minutes per week of moderate-intensity aerobic activity and at least two days of muscle-strengthening activities (U.S. Department of Health and Human Services, 2018).

Despite the importance of regular participation in these health behaviors, surveillance studies suggest that many individuals do not meet recommendations. Recent estimates suggest that about one-third of the population achieves an insufficient quantity of sleep (Grandner, 2019), that the average Healthy Eating Index Score ranges from 53 to 61 on a scale of 100 for U.S. adults (USDA, 2022), with average servings falling short for nutrient-dense foods and the majority of adults exceeding recommended limits for added sugars, saturated fat, and sodium (USDA, 2020), and that about one-quarter of the U.S. adults meet recommendations for exercise and physical activity (Elgaddal et al., 2022).

Although each health behavior contributes uniquely to morbidity and mortality, research also shows that it is important to consider an individual's participation in health behaviors comprehensively (Geller et al., 2017). Participating in multiple health behaviors is associated with additive benefits related to decreasing morbidity and mortality (Spring et al., 2012). Research demonstrates that participation in multiple unhealthy behaviors or lack of participation in healthy behaviors tends to cluster together (Geller et al., 2017). As previously described, levels of participation in a single health behavior are low; levels of participation in a comprehensive set of health behaviors are even lower. Only 3% of adults in the United States meet expert recommendations for all modifiable risk factors, including sleep, exercise, and physical activity (Reeves & Rafferty, 2005).

Barriers to comprehensive participation in health behaviors

Considerable research has been dedicated to understanding factors that contribute to low levels of participation in health behaviors (e.g., Brug, 2008; Sherwood & Jeffery, 2000). One line of research focuses on barriers, or perceived obstacles that prohibit or limit participation

in a health behavior (Fitzgerald & Spaccarotella, 2009). Although many reasons could be cited as barriers to participation in health behaviors (such as environmental light and noise for sleep, Mantua et al., 2019; cost of healthy food for diet quality, Lappalainen et al., 1997; fear of injury for exercise, CDC, 2022b), lack of time is often reported as a barrier for participation in many health behaviors (Welch et al., 2009). The influence of perceived or actual lack of time is intuitive, as participation in many health behaviors requires that individuals dedicate time for their completion, such as the dedication of seven to nine hours for sleep, daily or weekly time for exercise, and time spent preparing nutritious meals and snacks. The barriers of lack of time and high workload (which is inherently related to time, as reports of high workload could reflect the feeling of having too much to do in a given timeframe) are particularly salient for working adults (Mazzola et al., 2017), for those with family responsibilities (e.g., caregiving; Secinti et al., 2022), and for college students (Silliman et al., 2004).

Some studies have found that individuals “borrow” time that could be dedicated toward health behaviors, to “pay” for duties in other life domains, such as in Barnes et al. (2012) examination of work–family conflict and sleep. This logic could easily be applied to other health behaviors and other life domains. For example, an individual dedicating a high amount of time to work may have to borrow from time that they would have otherwise dedicated to the preparation of healthy meals, opting for less nutritious convenience options. An individual dedicating a high amount of time to family or school responsibilities may also borrow from time that could have been spent exercising.

EXAMINING TRADE-OFFS: BORROWING FROM HEALTH BEHAVIORS TO PAY FOR DEMANDS IN WORK, FAMILY, AND SCHOOL DOMAINS

Research examining participation in health behaviors documents the potentially detrimental effect of conflict among life domains. Much of this research documents a negative relationship, meaning that individuals who perceive greater conflict among life domains are less likely to exercise, consume fruits and vegetables, and achieve enough sleep (Gisler et al., 2018). This finding is well-documented within the literature on working adults, but we also expect to observe similar effects in employed students. For example, Suh et al. (2022) state that as first-year college students add a new domain of responsibilities into their lives they likely perceive time as more limited and experience more work–family–school conflict.

Due to immediate and severe nature of consequences of not meeting demands in the work, family, or school domain (such as being reprimanded at work or failing a test), it is likely that when time is scarce, participation in health behaviors, which can be viewed as having effects that take longer to accumulate (Pozolotina & Olsen, 2019), will be sacrificed. Interpreting these behaviors from a lens of Ecological Rationality, an individual's decision to sacrifice sleep, diet quality, and exercise is rational based on the constraint of lack of time.

Hypothesis 1a-c. There will be a negative relationship between perceived work–family–school conflict and (a) time spent sleeping, (b) diet quality, and (c) exercise.

REDUCING TRADE-OFFS: MODERATORS OF THE WORK-FAMILY-SCHOOL CONFLICT AND HEALTH BEHAVIOR RELATIONSHIP

It would be useful to test salient variables as moderators of the relationship between life domain conflict and health behavior participation because this could provide insight into the ways that individuals or organizations can promote more positive outcomes even in the face of time-based conflict (Valcour, 2007). Variables that are trainable or malleable could be targeted in future intervention studies. Although interventions could take place in many environments, such as schools for students or the workplace for employees, in this study, we focus on occupational settings.

Occupational interventions performed to improve a stressor like work-family conflict or to improve participation in health behaviors can focus on modifying features of the individual or their organizational environment (e.g., Richardson & Rothstein, 2008). In keeping with Ecological Rationality Theory (Todd & Gigerenzer, 2012), we acknowledge that individual and environmental factors can create constraints or affordances on health behaviors. In the following sections, we describe several individual and environmental variables that have been explored as moderators of the stressor-strain relationship, citing research that has linked the moderator to the effective management of a stressor (such as work-life conflict) or a mitigated strain response (such as the absence of reduction of a behavioral strain like reduced health behavior participation).

Individual characteristics

The relationship between life domain conflict and health behavior participation can be generally framed within the stressor-strain framework (French & Allen, 2020), given that work-life conflict is categorized as a stressor and lack of participation in health behaviors could be viewed as a negative behavioral outcome, or a behavioral strain. Research that has examined individual-level moderators in the stressor-strain relationship tends to focus on individual difference variables that could influence the adaptive or maladaptive responses initiated in response to a stressor (Semmer & Meier, 2009).

An example of one such variable is *core self-evaluations*, which refer to a self-appraisal that an individual makes about their competence and worth (Judge et al., 1997). It is a high-order construct that includes generalized self-efficacy (an estimate of competence in a range of situations; Chen et al., 2001), self-esteem (an overall evaluation of self-worth; Rosenberg, 1965), locus of control (a belief that life circumstances are influenced by oneself rather than external causes; Rotter 1966), and emotional stability (a tendency to remain calm and emotionally balanced; Eysenck, 1990). Previous research has connected more positive core self-evaluations to effective management of stressors as they promote more positive appraisals of potentially stressful stimuli (Chang et al., 2012) and increased participation in health behaviors (Köppe & Schütz, 2019). Similarly, *proactive personality* is defined as a tendency to change one's environment (Bateman & Crant, 1993). Previous research has shown that those who report a more proactive personality experience less strain in the face of stressors (Cunningham & De La Rosa, 2008; Park & DeFrank, 2018), and proactivity is positively related to participation in health behaviors (Aspinwall, 2011). Those who possess higher levels of these individual difference variables will be more likely to utilize adaptive responses in the face of stressors

(Semmer & Meier, 2009), such as continuing to make time for health behaviors even in response to work-life conflict.

In addition to individual differences in self-appraisals and personality that could assist in the management of stress and participation in goal-directed behavior, certain behavioral patterns may aid in effectively managing work-family-school conflict or participating in health behaviors. *Time management* is defined as “behaviours that aim at achieving an effective use of time while performing certain goal-directed activities” (Claessens et al., 2007, p. 262). Effective time management involves behaviors that help one assess and become aware of their time, plan and prioritize tasks, and monitor their use of time (Claessens et al., 2007). Previous research has shown that effective time management habits promote positive coping with stress (Michie, 2002) and reduce strain in the presence of stressors (Jex & Elacqua, 1999; Peng et al., 2023). Effective time management is also positively related to participation in health behaviors (Grubbs & Carter, 2002; Pelletier & Laska, 2012). Finally, *coping* is defined as cognitions and behaviors used to manage demands (Dewe et al., 2010). Coping can buffer against the negative effects of a work-life conflict in job-related or family-related well-being (Rantanen et al., 2011). Applied to this study, those who utilize more coping strategies would be more likely to perform health behaviors when experiencing work-family-school conflict by applying cognitions and behaviors that minimize strain in response to the stressor.

When viewing these individual differences and behavioral patterns within an Ecological Rationality lens, core self-evaluations, proactive personality, time management, and coping would encourage participation in health behaviors as an individual develops decision-making heuristics that state that participation in the health behavior is a rational decision in their environment. Following this decision, they may organize their limited time in the most effective way or initiate coping strategies to minimize conflict (Semmer & Meier, 2009). Thus, the relationship between work-family-school conflict and participation in health behaviors will likely be weaker for individuals who report higher levels of these traits and behavioral patterns.

Hypothesis 2a-d. Individual-level characteristics, including (a) core-self evaluations, (b) proactive personality, (c) time management, and (d) coping will moderate the relationship between work-family-school conflict and participation in health behaviors, such that the relationship between work-family-school conflict and participation in health behaviors will be weaker for those who report high levels of these variables.

Environmental characteristics

Research that has examined environmental moderators in the stressor-strain relationship tends to focus on variables that are indicative of a supportive environment (e.g., Stetz et al., 2006). A supportive environment can be operationalized in several ways, being perceived from various sources (i.e., from the organization or from a supervisor) and being offered in various types (i.e., emotional or practical; Lingard & Francis, 2006). For example, *perceived organizational support* is defined as an employee's perception that their organization values their contributions and cares about their well-being (Rhoades & Eisenberger, 2002). Similarly, *family supportive supervisor behaviors* are defined as supervisory behaviors that are supportive of family; these supervisory behaviors include providing emotional and instrumental support, role-modeling behaviors that promote work-life balance, and creatively initiating work-family management

practices (Hammer et al., 2009). Finally, *organizational health climate* is defined as an employee's perceptions about the level of support for employee well-being; this support applies to both physical and psychological health and is given from multiple levels, including co-worker, supervisory, and upper management levels (Zweber et al., 2016).

These organizational characteristics that are indicative of a supportive work environment have been linked to effective management of work stressors (Michie, 2002) and participation in health behaviors (Payne et al., 2012). Applying them to an Ecological Rationality framework, we anticipate that supportive environments would either tangibly or perceptually minimize environmental constraints, resulting in a decision to participate in a health behavior being deemed as rational for an individual given their current environment. Supportive environments can afford resources that promote the effective management of role conflict and greater participation in health behaviors, such as through formal work-life benefits; supportive environments can also encourage social norms legitimizing the actual use of these resources (Lingard & Francis, 2005). Thus, we expect that the relationship between work-family-school conflict and participation in health behaviors will be weaker for individuals reporting more supportive environments.

Hypothesis 3a-c. Organizational-level characteristics, including (a) perceived organizational support, (b) family supportive supervisor behaviors, and (c) organizational health climate will moderate the relationship between work-family-school conflict and participation in health behaviors, such that the relationship between work-family-school conflict and participation in health behaviors will be weaker for those who report high levels of these variables.

UNDERSTANDING TRADE-OFFS: VALUATION OF HEALTH BEHAVIORS

Examining multiple health behaviors affords the opportunity to further examine the nature of trade-offs between health behaviors. When time is scarce, it could be possible that an individual not only borrows from a health behavior to pay for work, family, or school, but that they also borrow from one health behavior to pay for another health behavior. For example, an individual who perceives limited available time due to high work, family, or school demands may wake up extra early to work out due to the value they place on exercise, sacrificing an adequate amount of sleep. An individual who stays up late to complete a school or work assignment may sleep in a little late due to valuing an adequate amount of sleep, leaving no time to consume a nutritious breakfast or pack a healthy lunch and snack for their day.

As health behaviors are not often examined together, little research has explored how participation in health behaviors is valued in relation to one another and how individuals may prioritize health behaviors above one another when time is limited. In many cases, the performance of a health behavior is mutually exclusive and requires that an individual complete a single health behavior at a time. For example, an individual cannot sleep and cook a nutritious meal at the same time. This is in contrast with the behavior of performing work, which for many workers is not mutually exclusive and can be combined with other behaviors. For example, an individual could read a work report while walking on the treadmill during their non-work hours or eat lunch at their desk while continuing to work through their lunch break (Blake et al., 2009). Given the mutually exclusive nature of health behaviors, in which it

can be difficult or impossible to complete multiple health behaviors at the same time, individuals may have to choose between health behaviors in their limited free time.

Research on the coping strategies of employed parents illustrates that individuals make trade-offs, such as microwaving a convenient meal rather than preparing the healthy meal they had planned, to meet demands (Blake et al., 2009; Devine et al., 2006). Examinations of employed parents also suggest that some do view health behaviors as competing against each other when time is limited, such as when preparing a healthy meal means forgoing time exercising (Gisler et al., 2018).

Together, this research suggests that it is important to consider decisional and motivational processes that could explain which health behaviors are prioritized and which are sacrificed. The concept of Ecological Rationality could shed light on these processes. When individuals must make decisions under constraints, they consider anticipated outcomes based on their environmental conditions. Their heuristics likely take into account the value that they place on each possible outcome. It is reasonable to expect individuals may differ in the values that they place on sleep, nutrition, and exercise, and that these differences will be associated with levels of daily participation in each health behavior, although we take an exploratory approach due to the limited amount of research examining multiple health behaviors and competing valuation of health behaviors.

Research Question 1: Will meaningful profiles of value placed on health behaviors emerge?

Hypothesis 4. Health value profiles will moderate the relationship between work-family-school conflict and participation in health behaviors.

METHODS

Participants and study design

All research activities were approved by the relevant university's Institutional Review Board. Data were collected during the Spring and Summer semesters in 2019. Participants were 73¹ employed students over the age of 18, who were recruited at a university in the southeastern US. The sample was 72.6% female, and their average age was 22.4 (SD age = 5.5). 76.5% were employed with part-time job(s), and the remaining were employed full-time. When asked how many hours they typically worked per week, responses ranged from 4 to 80 hours, with the average being 26 hours per week. When asked where they were employed, 31% of participants worked on campus, 58% worked off campus, and 10% reported working both on- and off-campus. A review of job titles provided by participants revealed that the most common jobs were in food service (20.5%), professional and technical services (17.8%), and retail (9.6%). Based on the reported credit hours of enrollment at the time of data collection, 52% of participants were enrolled as full-time students and 48% were enrolled as part-time students. It is worth noting that most participants who were enrolled part-time participated in this study during the summer semester (90%) and could typically be enrolled full-time during the Fall and Spring semesters.

Participants completed an in-person orientation session in which the study activities were explained, informed consent was obtained, and a baseline survey was completed. The baseline

¹Power analyses confirmed that all analyses were adequately powered (>0.92).

survey contained demographic questions as well as perceptions of individual and organizational characteristics. During the daily-diary portion of the study, participants completed two short surveys each day on their computer or mobile device. The morning survey was completed upon waking, and assessed variables related to the previous night's sleep. The evening survey was completed before the participant's bedtime and assessed their experiences regarding work-family-school conflict and their participation in health behaviors during that day. Participants completed surveys for at least seven days and eight nights; after that, participants were asked if they would like to remain in the study for a longer period for measurement validation. Twenty-five individuals were randomly selected to participate for up to 35 days as volunteers in the measurement validation subsample.² We treated late responses completed one or more days after being sent as missing, and did not send reminders. There were 1,210 observations nested within 73 individuals (response rate of approximately 84%). No systemic patterns were found in the missing data. Participants received a \$20 electronic Amazon gift card for a week's participation and a \$100 electronic Amazon gift card if they were a part of the measurement validation subsample.

Measures

Daily survey measures

Work-family-school conflict and health behaviors were measured in daily surveys. Time spent sleeping during the previous night was measured in morning surveys, and work-family-school conflict, diet-related behaviors, and physical activities were measured in evening surveys. The measures of health behaviors were guided by recommendations from the field of workplace health promotion evaluation (O'Donnell, 2017), which aims to capture health behavior patterns that are most connected to morbidity, mortality, and organizational costs, while balancing participant burden.

Work-family-school conflict

Daily levels of work-family-school conflict were measured with a six-item scale ($\alpha = 0.84$). We selected an item from Markel and Frone's (1998) work-school conflict scale, which has been used in diary designs (Park & Sprung, 2015):

"My demands and responsibilities related to (my) _____ interfered with (my) _____." It was worded in six different ways to assess all domains and all possible directions of interference: family-school; family-job; school-family; school-job; job-school; job-family. Participants were asked to rate the frequency of interference on a five-point Likert scale

(1 = "Never" to 5 = "Very Frequently").

Time spent sleeping

The previous night's time spent sleeping was measured with the item of sleep duration from the Pittsburgh Sleep Quality Index (Buysse et al., 1989) in the morning survey. Participants were

²The measurement validation component is related to another project on sleep measurement validation that is not discussed in this manuscript.

asked to answer the question “*Last night, how many hours of actual sleep did you get (this may be different than the number of hours you spent in bed)?*”

Dietary quality

Daily dietary quality was measured with multiple self-report indicators of servings of fruits and vegetables, frequency of fast food consumption, and the frequency of skipped meals for the day. Although habits related to nutrition can be operationalized in a number of ways, we chose consumption of fruits and vegetables and frequency of fast food consumption as measures of daily dietary quality because low consumption of fruits and vegetables and high consumption of fast food are considered risk factors that can be used to indicate poor nutrition in applied research aiming to minimize the response burden of employed participants (Connor et al., 2014). Frequency of skipped meals was included as an indicator of dietary quality because skipping meals has been identified as a coping strategy of employed parents (Devine et al., 2006), and skipping meals is associated with reduced daily diet quality and can have negative long-term health implications (Zeballos & Todd, 2020). Each indicator was analyzed separately.

Exercise

A self-report scale was used to measure the daily time spent on exercise. Participants were first asked if they engaged in exercise during that day, and those who answered “yes” were asked to report the type of exercise (e.g., cardiovascular or muscle-strengthening) they have performed during the day, duration of each exercise, and the intensity of the exercise (light, moderate, strenuous). Participants were permitted to specify more than one activity in the event that they had engaged in multiple exercise activities in a single day. A composite score of exercise was then calculated using the formula: $(9 \times \text{strenuous activity}) + (5 \times \text{moderate activity}) + (3 \times \text{light activity})$ (Barber et al., 2017; Godin, 2011).

Baseline survey measures

The following were hypothesized to be individual or environmental variables that moderated the relationship between work-family-school conflict and health behaviors. These variables were assessed as trait-like variables on the baseline survey completed at the participant orientation, as opposed to the state-like variables assessed on the daily survey.

Core self-evaluations

Core self-evaluations, a higher-order personality trait comprised of locus of control, neuroticism, self-esteem, and self-efficacy, were measured using the Core Self-Evaluations Scale (Judge et al., 2003; $\alpha = 0.81$). Participants were asked to report the degree to which they agreed with 12 items, such as “*I determine what will happen in my life*” (locus of control facet) on a five-point Likert scale (1 = “Strongly Disagree” to 5 = “Strongly Agree”).

Proactive personality

Proactive personality was measured using the Proactive Personality Scale (Li et al., 2014; $\alpha = 0.79$). Participants were asked to rate the extent to which they agreed with four items, such as “*I am particularly good at realizing ideas*” on a five-point Likert scale (1 = “Strongly Disagree” to 5 = “Strongly Agree”).

Time management

Effective time management habits were measured using the Time Management Behavior Scale (Macan et al., 1990; $\alpha = 0.86$). Participants were presented with a list of 31 behaviors such as “make lists of things to do”, “avoiding interruptions”, and “set short term goals”. Participants were instructed to rate the extent to which they use each behavior on a five-point Likert scale (1 = “Never” to 5 = “Very Frequently”).

Coping

Coping strategies were measured using the 16-item Problem and Emotion Focused Coping Scale (Carver et al., 1989; $\alpha = 0.68$). Participants were asked to think about events or situations that have been stressful or troubling and to report how often they tend to use various strategies to deal with the situation. An example item is “I make a plan of action and follow it.” Participants rated on a five-point Likert scale (1 = “Never” to 5 = “Very Frequently”).

Perceived organizational support

Perceived organizational support was measured using three items from the Perceived Organizational Support Scale (Eisenberger et al., 2002; $\alpha = 0.86$). An example item is “My organization shows a lot of concern for me.” Participants rated their extent of agreement on a five-point Likert scale (1 = “Strongly Disagree” to 5 = “Strongly Agree”).

Family supportive supervisor behaviors

Supervisor behaviors that are supportive of work-family balance were measured with the 14-item Family Supportive Supervisor Behaviors Scale (Hammer et al., 2009; $\alpha = 0.96$). An example item is “My supervisor is willing to listen to my problems in juggling work and nonwork life.” Participants rated their extent of agreement on a five-point Likert scale (1 = “Strongly Disagree” to 5 = “Strongly Agree”).

Organizational health climate

Perceptions of workplace climate support for health were measured with the Multi-faceted Organizational Health Climate Assessment (Zweber et al., 2016; $\alpha = 0.88$). Participants were presented with nine items, such as “My organization encourages me to speak up about issues and priorities regarding employee health and well-being” and rated their extent of agreement on a five-point Likert scale (1 = “Strongly Disagree” to 5 = “Strongly Agree”).

Health behavior value

Health behavior value was measured using three items that asked how much participants valued a particular activity in their life. Using a sliding scale ranging from 0 to 100 (with anchors ranging from “not at all” to “a great deal”), participants specified the value they placed on “consuming a healthy diet,” “getting a healthy amount of physical activity,” and “getting a healthy amount of sleep.” Continuous and interactive scales, such as sliding scales, are useful in capturing more variance and robust responses for predictive analyses (Fryer & Nakao, 2020) and could be particularly useful in capturing meaningful variation in this case, as some individuals could place a high value on all health behaviors.

Analytic approach

Given the nested nature of the data, to test Hypothesis 1, focusing on main effects, and Hypotheses 2 and 3, focusing on moderating relationships, we utilized a multi-level modeling

approach. For Hypotheses 1a-1c, we tested for both linear and curvilinear relationships. Although the life conflict and health behavior literature has largely considered linear relationships (e.g. Gisler et al., 2018), some research has found evidence of a curvilinear relationship (Barnes et al., 2012) in which each increasing unit indicative of conflict (such as time spent with work or family) has an increasingly negative influence on participation in health behaviors. Therefore, we included both linear and quadratic terms of work-family-school conflict to capture potential curvilinear relationships. The models included random effects to account for between-person variability and within-person fluctuations across days of the week. Moderators were included to assess whether the linear or curvilinear relationships varied at different levels of the moderators (Hypotheses 2 and 3).

To explore the research question and Hypothesis 4, we conducted a person-centered approach, latent profile analysis, through an iterative process. To determine the optimal number of health value profiles, we considered both interpretability and statistical fit indices. We evaluated multiple statistical criteria for model comparison, including (a) the Akaike information criterion (AIC; Akaike, 1987), (b) the Bayesian information criterion (BIC; Schwarz, 1978), (c) the sample-size adjusted BIC (sBIC; Sclove, 1987), (d) the consistent Akaike information criterion (CAIC), (e) the bootstrap likelihood ratio test (BLRT; McLachlan & Peel, 2000), and (f) the Lo-Mendell-Rubin Adjusted Likelihood Ratio Test (LMRT; Lo et al., 2001). A lower AIC, BIC, SABIC, or CAIC indicates better model fit, and a model with lower values on at least two of these indices is preferred (Morin et al., 2016). A significant BLRT or LMRT suggests that the current model fits better than a model with one fewer profile, making it a preferred model; conversely, a nonsignificant result suggests that adding an additional profile does not meaningfully enhance model fit. Also, we reported entropy, which reflects the overall classification accuracy; a higher entropy indicates higher classification accuracy and better profile separation, with values above .80 considered good (Tein et al., 2013). Beyond statistical fit indices, we also evaluated the interpretability of the model to ensure that the identified profiles represented distinct and meaningful patterns (Merz & Roesch, 2011; Min & Su, 2020).

RESULTS

Table 1 shows the descriptives, including means, standard deviations, and within-person and between-person correlations of the studied variables.

Multilevel modeling

We first examined the intraclass correlations (ICCs) for the multilevel models. The ICCs were 31.2% for sleep and 85.0% for exercise, highlighting the need for multilevel modeling to account for the nested structure of the data. Hypotheses 1a-c focused on the relationship between work-life-school conflict and sleep, diet quality, and exercise. The multilevel modeling results are reported in Table 2.

A negative linear relationship was observed between daily work-family-school conflict and daily time spent sleeping ($\beta = -0.06$, $p < .05$), such that higher levels of work-family-school conflict were associated with less time spent sleeping, supporting Hypothesis 1a. There was a significant curvilinear relationship (Figure 1) between daily work-family-school conflict and daily time spent on exercise ($\beta = 1.61$, $p < .01$), supporting Hypothesis 1c. The form of the

TABLE 1 Means, standard deviations, and within-person and between-person correlations.

	1	2	3	4	5	6	7
1. WFS conflict	1.96 (0.81)	−0.08	0.11*	−0.02	−0.06	−0.03	0.06
2. Time spent sleeping	−0.13**	7.08 (1.79)	0.00	−0.03	0.07	−0.02	0.00
3. Exercise	−0.01	0.03	0.98 (3.20)	−0.03	0.03	0.04	−0.06
4. Fast food	0.01	−0.03	−0.05	1.54 (0.70)	−0.08*	0.03	−0.02
5. Fruit	0.10*	0.01	0.04	−0.09**	1.80 (0.94)	0.11**	−0.09**
6. Vegetable	0.00	−0.01	0.06	−0.01	0.34**	2.05 (1.00)	−0.08*
7. Skipped meals	0.08	0.01	−0.06	0.00	−0.12**	−0.10**	1.09 (0.30)

Note: WFS conflict = work-family-school conflict; Correlations above the diagonal are within-person. Correlations below the diagonal are between-person; Values on the diagonal are means (standard deviations).

* $p < .05$, ** $p < .01$.

TABLE 2 Multilevel regression results for fixed effects estimates of work-family-school conflict on sleep and exercise, and moderation effects.

	Sleep			Exercise		
	Coef.	SE	Std. Coef.	Coef.	SE	Std. Coef.
Main effects model						
WFS conflict	−0.06*	0.03	−0.10	0.24	0.23	0.03
WFS conflict ²	−0.06	0.04	−0.08	1.61**	0.36	0.14
Moderated model						
Core self-evaluation	0.00	0.04	0.00	0.09	1.16	0.02
WFS conflict X Core self-evaluation	−0.07	0.04	−0.07	0.10	0.39	0.01
WFS conflict ² X Core self-evaluation				0.27	0.58	0.01
Proactive personality	−0.01	0.03	−0.03	0.61	0.95	0.04
WFS conflict X proactive personality	0.01	0.04	0.01	−0.18	0.38	−0.01
WFS conflict ² X proactive personality				−1.55*	0.67	−0.08
Time management	−0.03	0.04	−0.05	1.42	0.99	0.10
WFS conflict X time management	0.01	0.05	0.01	−0.70	0.48	−0.04
WFS conflict ² X time management				−2.65**	0.97	−0.11
Coping	0.00	0.03	0.01	0.17	0.99	0.01
WFS conflict X coping	0.09*	0.04	0.11	0.05	0.36	0.00
WFS conflict ² X coping				−0.95	0.55	−0.05
Perceived organizational support	0.00	0.02	0.02	0.40	0.65	0.11
WFS conflict X perceived organizational support	−0.03	0.02	−0.05	0.30	0.21	0.03
WFS conflict ² X perceived organizational support				0.22	0.30	0.02
Family supportive supervisor behavior	0.02	0.02	0.07	−0.55	0.65	−0.18
WFS conflict X family supportive supervisor behavior	−0.01	0.02	−0.01	−0.03	0.22	0.00
WFS conflict ² X family supportive supervisor behavior				−0.92**	0.31	−0.07
Organizational health climate	−0.01	0.03	−0.02	1.40	0.73	0.21
WFS conflict X organizational health climate	0.00	0.03	0.00	−0.07	0.24	−0.01
WFS conflict ² X organizational health climate				−1.74**	0.34	−0.12

Note: WFS conflict = daily work-family-school conflict, WFS conflict² = the quadratic term.

* $p < .05$, ** $p < .01$.

relationship can best be described as a U-shape. In the lower range of work-family-school conflict, as conflict increased, time spent exercising decreased. However, in higher ranges of work-family-school conflict, as conflict increased, time spent exercising also increased. No significant relationship was observed between daily work-family-school conflict and each indicator of daily dietary quality with the current sample.

To test Hypothesis 2a-d, we assessed the moderating effects of individual characteristics, including core self-evaluations, proactive personality, time management, and coping, on the relationships between daily work-family-school conflict and health behaviors. The linear

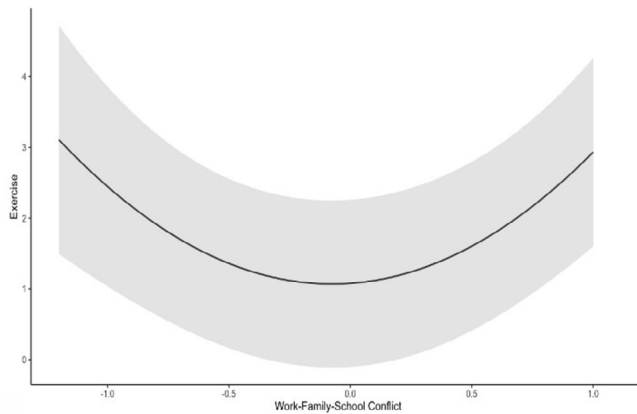


FIGURE 1 This figure illustrates the curvilinear relationship between work-family-school conflict (centered) and exercise (composite scores), the U-shape reveals that exercise initially decreases as work-family-school conflict as work-family-school conflict increases, before increasing again. The grey band represents the confidence intervals.

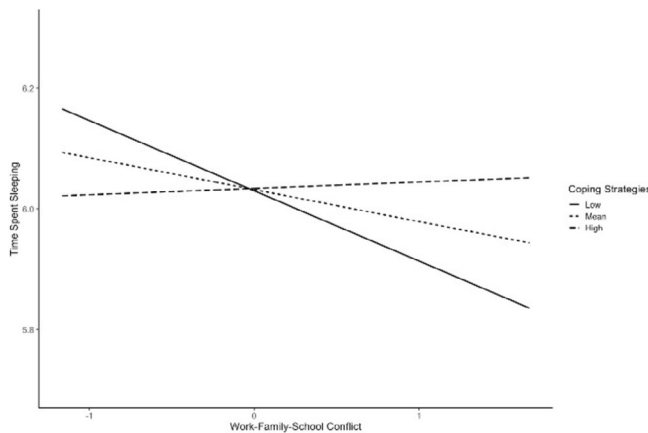


FIGURE 2 This figure illustrates how coping strategies moderate the linear relationship between work-family-school (WFS) conflict (centered) and time spent sleeping (log minutes). The three lines represent individuals low (mean – 1SD), average (mean), and high (mean + 1SD) in levels of coping strategies. Consistent with Hypothesis 2d, those with low coping strategies exhibited a stronger negative linear relationship between WFS conflict and time spent sleeping, while those with average coping strategies exhibited a weaker negative linear relationship. Those with high levels of coping strategies exhibited a positive linear relationship between WFS conflict and time spent sleeping.

relationship between daily work-family-school conflict and daily time spent sleeping was moderated by coping skills ($\beta_{\text{interaction}} = 0.08, p < .05$), such that coping skills buffered the negative association between work-family-school conflict and time spent sleeping, supporting Hypothesis 2d. The curvilinear relationship between daily work-family-school conflict and daily exercise was moderated by both proactive personality ($\beta_{\text{interaction}} = -1.55, p < .05$) and time management skills ($\beta_{\text{interaction}} = -2.65, p < .01$), consistent with Hypotheses 2b and 2c. Significant moderations for the individual characteristics hypotheses are depicted in Figures 2–4.

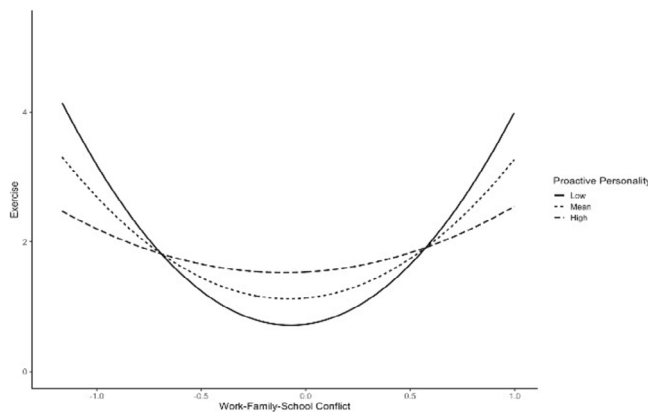


FIGURE 3 This figure illustrates how a proactive personality moderates the curvilinear relationship between work-family-school (WFS) conflict (centered) and exercise (composite scores). The three curves represent individuals with low (mean - 1SD), average (mean), and high (mean + 1SD) levels of proactive personality. At high levels of proactive personality, individuals maintain a more stable exercise routine across varying levels of WFS conflict, consistent with Hypothesis 2b, which posits that the relationship between work-family-school conflict and participation in health behaviors will be weaker for those with high proactive personality. In contrast, at low levels of proactive personality, exercise initially decreases as WFS conflict increases, before increasing again.

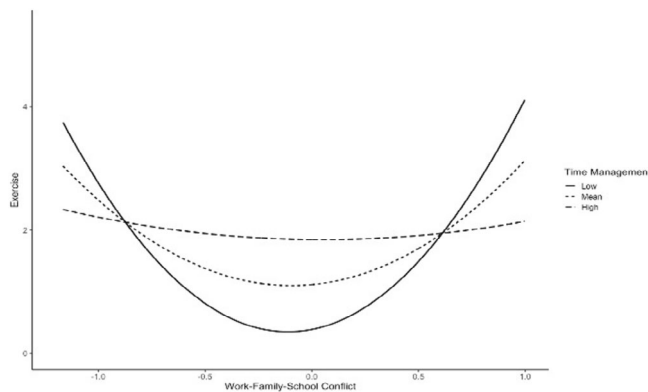


FIGURE 4 This figure illustrates how time management moderates the curvilinear relationship between work-family-school (WFS) conflict (centered) and exercise (composite scores). The three curves represent individuals with low (mean - 1SD), average (mean), and high (mean + 1SD) levels of time management skills. At high levels of time management, individuals maintain a stable exercise routine across varying levels of WFS conflict, consistent with Hypothesis 2c, which posits that the relationship between work-family-school conflict and participation in health behaviors will be weaker for those with high time management skills. In contrast, at low levels of time management, exercise initially decreases as WFS conflict increases, before increasing again.

To test Hypothesis 3a-c, the moderating effects of organizational characteristics, including perceived organizational support, family supportive supervisor behaviors, and organizational health climate, on the relationships between daily work-family-school conflict and health behaviors were examined. The relationship between daily work-family-school conflict and sleep was not moderated by organizational characteristics with the current sample. The curvilinear

relationship between daily work-family-school conflict and daily exercise was moderated by workplace health climate ($\beta_{\text{interaction}} = -1.74, p < .01$) and family supportive supervisor behaviors ($\beta_{\text{interaction}} = -0.92, p < .01$), consistent with Hypotheses 3b and 3c. Significant moderations for the organizational characteristics hypotheses are depicted in Figures 5 and 6.

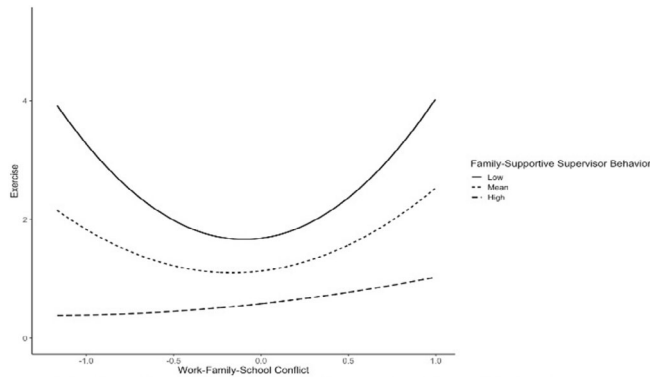


FIGURE 5 This figure illustrates how family supportive supervisor behavior (FSSB) moderates the curvilinear relationship between work-family-school (WFS) conflict (centered) and exercise (composite scores). The three curves represent individuals with low (mean - 1SD), average (mean), and high (mean + 1SD) levels of FSSB. At high levels of FSSB, exercise slightly increases. At low and mean levels of FSSB, exercise initially decreases as WFS conflict increases, before increasing again. This is consistent with Hypothesis 3b, which posits that the relationship between work-family-school conflict and participation in health behaviors will be weaker for those who report higher FSSB.

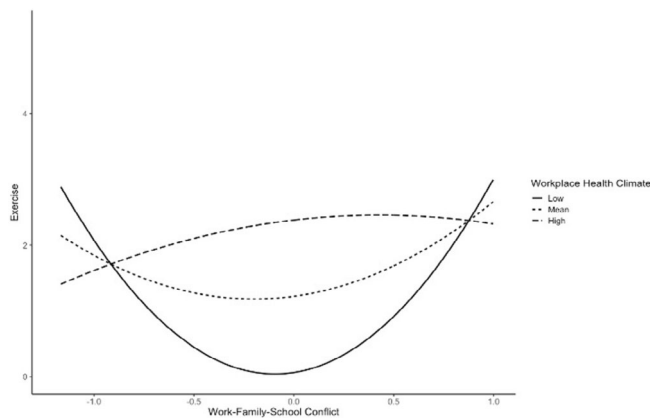


FIGURE 6 This figure illustrates how organizational health climate moderates the curvilinear relationship between work-family-school (WFS) conflict (centered) and exercise (composite scores). The three curves represent individuals with low (mean - 1SD), average (mean), and high (mean + 1SD) levels of organizational health climate. At high levels of health climate, individuals maintain a stable exercise routine across varying levels of WFS conflict in the form of a subtle inverted-U. In contrast, those with low and mean health climate have a more pronounced curvilinear U-shape, where exercise initially decreases as WFS conflict increases, before increasing again. This is consistent with Hypothesis 3c, which posits that the relationship between work-family-school conflict and participation in health behaviors will be weaker for those who report higher health climate.

Latent profile analysis

To explore Research Question 1, a latent profile analysis was conducted to identify the profiles of health value responses from the baseline survey. Results indicated that a four-profile solution provided the best fit to the data (Table 3), as it had the lowest AIC, BIC, and CAIC, highest entropy. The BLRT results also supported the four-profile solution over the three- or five-profile solution.

Figure 7 shows the estimated mean levels of health values for each profile. After examining mean value levels within each profile, we categorized the profiles using the following labels. The first profile (32.4%), labeled “Reasonable Resters,” reported that they valued each health behavior at a moderate level, but valued sleep slightly more than the other behaviors ($M_{\text{Sleep}} = 3.27$, $M_{\text{Diet}} = 3.00$, $M_{\text{Exercise}} = 3.05$). The second profile (23.5%), labeled “Elevated Eaters,” reported that they placed a very high value on all health behaviors but valued diet at a higher level ($M_{\text{Sleep}} = 4.56$, $M_{\text{Diet}} = 5.00$, $M_{\text{Exercise}} = 4.44$). The third profile (16.2%), labeled “Relaxed Resters,” reported placing a low value on diet, a moderately low value on exercise, and a moderate value on sleep ($M_{\text{Sleep}} = 3.00$, $M_{\text{Diet}} = 1.91$, $M_{\text{Exercise}} = 2.46$). Finally, the fourth profile (27.9%), labeled “Balanced Beings,” placed a moderately high value on all health behaviors ($M_{\text{Sleep}} = 3.95$, $M_{\text{Diet}} = 4.00$, $M_{\text{Exercise}} = 4.00$).

To further explore the boundary conditions of the relationships between work-family-school conflict and health behaviors (Hypothesis 4), we included and tested the latent profiles of health values as moderators in multilevel modeling. The health value profiles can be treated as a categorical variable, as the profiles were entirely distinct from one another in our data, given the high entropy. The health value profiles did not show moderation effects on the relationship between work-family-school conflict and sleep. However, these profiles did moderate the relationship between daily work-family-school conflict and exercise. The results (see Figure 8) suggest that “elevated eaters” (profile 2) and “balanced beings” (profile 4), who generally maintained higher health values, exhibited a stronger positive quadratic association between daily work-family-school conflict and exercise (profile 1 as reference, profile 2 quadratic interaction $\beta_{\text{interaction}} = 2.78$, $p < .01$; profile 4 quadratic interaction $\beta_{\text{interaction}} = 2.51$, $p < .01$; profile 3 as reference, profile 2 quadratic interaction $\beta_{\text{interaction}} = 3.22$, $p < .05$; profile 4 quadratic interaction $\beta_{\text{interaction}} = 2.96$, $p < .05$). They tended to engage in more exercise on average, and they might initially reduce exercise when facing work-family-school conflict but were more likely to increase exercise when experiencing very high levels of work-family-school conflict. In contrast, “reasonable resters” (profile 1) and “relaxed resters” (profile 3), who generally had lower health values, tended to engage in minimal exercise, regardless of their levels of work-family-school conflict. Refer to the Supplementary Document, which includes Table S1, for more information on the analytic strategy and detailed results for this hypothesis.

TABLE 3 Model fit statistics of the latent profile analysis.

	AIC	BIC	sBIC	Entropy	LMR	BLRT	Df	CAIC
2-profile	584.174	606.369	574.878	0.858	53.98**	57.178**	10	616.369
3-profile	579.113	610.186	566.099	0.883	12.331	13.061*	14	624.186
4-profile	484.48	524.431	467.748	1	96.892	102.633**	18	542.431
5-profile	486.33	535.159	465.88	0.999	5.949	6.15	22	557.159

Note:

* $p < .05$, ** $p < .01$.

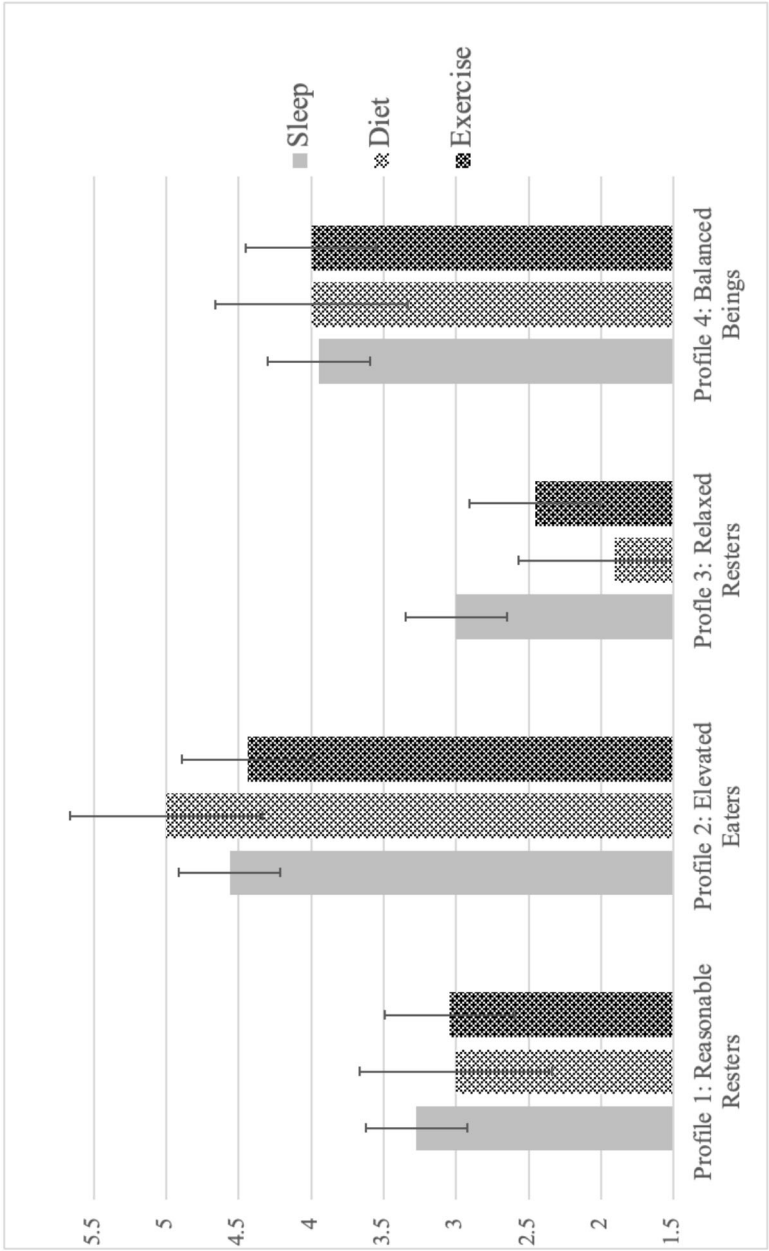


FIGURE 7 This figure shows the estimated means of the four health value profiles. Reasonable Resters place a moderate value on all behaviors, valuing sleep the most. Elevated eaters value all health behaviors highly, with diet being the most important to them. Relaxed Resters valued sleep at a moderate level but placed a low value on diet and exercise. Balanced beings placed a moderately high value on all health behaviors.

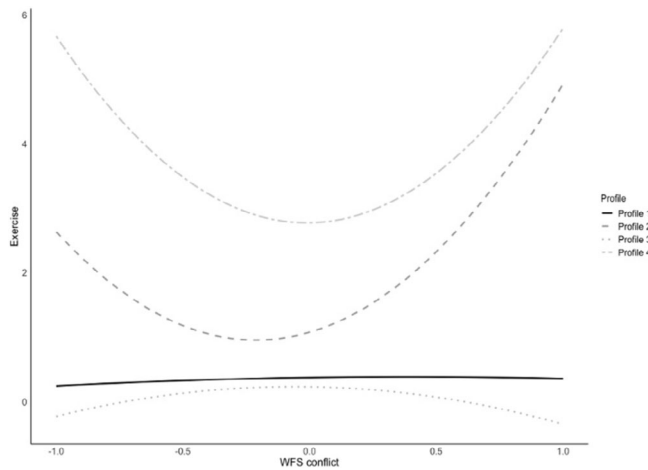


FIGURE 8 This figure illustrates the moderating effects of health value profiles on the curvilinear relationship between work-family-school conflict (centered) and exercise (composite scores). In profile 1 (“reasonable resters”) and profile 3 (“relaxed resters”), there was a stable, weak relationship between WFS conflict and exercise, with both profiles exhibiting low average levels of exercise. In profile 2 (“elevated eaters”) and profile 4 (“balanced beings”), the average levels of exercise are high, and exercise initially decreases as WFS conflict increases, before increasing again.

DISCUSSION

This study sought to replicate previous research regarding the relationship between time-based conflict among various life domains and its implications for health behaviors, while extending this literature by examining multiple health behaviors and testing moderators of the relationship, and incorporating a novel person-centered approach to valuation of health behaviors. We found a negative linear relationship between work-family-school conflict and time spent sleeping and a curvilinear relationship between work-family-school conflict and exercise. The nature of the curvilinear relationship could provide interesting implications. In some ways, the finding was consistent with existing literature in which life conflict has a deleterious effect on participation in health behaviors. That is, for lower ranges of work-family-school conflict, individuals were less likely to exercise as conflict increased. This could be consistent with the constraints-based interpretation; individuals’ time is limited, and they choose to dedicate their limited time to demands in work, family, and school rather than exercise. However, in the higher ranges of work-family-school conflict, individuals actually exercised more as conflict increased. This could be indicative of a coping mechanism in which individuals use exercise to disengage from perceived role conflict.

The findings for the moderating effect of health behavior value profile for the relationship between work-family-school conflict and exercise could point toward this explanation. The U-shape, in which exercise decreased as work-family-school conflict increased, but then increased at a certain point, was observed for profiles that placed a high value on exercise. It is possible that these individuals direct time toward their work, school, and family demands as conflict increases, until they reach a point at which they are too stressed to care, perceive there is no possible way to get it all done, or another similar feeling, and disengage from their demands to participate in a valued behavior (exercise in this case).

There was no significant relationship between work-family-school conflict and diet quality. This could indicate that individuals do not “borrow” from diet or nutrition to “pay” for demands in other domains of their lives. However, this logic is inconsistent with the literature on the food choices of employed parents, which documents some strategies that sacrifice diet and nutrition (e.g., Blake et al., 2009). Alternatively, this finding could be attributed to the differences in operationalizations of health behaviors utilized in this study. That is, both time spent sleeping and exercising were operationalized in time-based quantities, hours spent sleeping and hours spent exercising. This operationalization is similar to the time spent sleeping variable utilized in Barnes et al. (2012), obtained from the American Time Use Surveys. However, diet quality was operationalized using questions that indicate the consumption of nutritious foods (e.g., fruits and vegetables) or the minimized consumption of foods that tend to be higher in sugar, saturated or trans fats, and sodium (e.g., fast food). Had we included a time-based quantity operationalization of diet or nutrition, such as time spent preparing nutritious meals, we might have found a significant relationship indicative of borrowing from nutrition to pay for work, family, or school demands. It is possible that when examining work-life conflict and behavior through the lens of behavioral trade-offs, operationalizations of health behaviors tied to time-based quantity rather than quality are uniquely suited to illustrate this phenomenon.

This study also found that the relationships between work-family-school conflict and health behaviors were moderated by some individual and organizational characteristics. For example, individuals higher in proactive personality and who reported more time management skills had a weaker relationship between work-family-school conflict and exercise. Individuals who utilized coping strategies had a weaker relationship between work-family-school conflict and sleep. Individuals who reported that their supervisor demonstrated more family-supportive supervisor behaviors and individuals who perceived a stronger workplace health climate at their workplace had a weaker relationship between work-family-school conflict and sleep. The nature of these moderation relationships could be described as a buffering effect, such that these variables could promote more positive health behaviors in the presence of perceived work-family-school conflict.

More research is needed to disentangle why variables moderated some relationships, but not others. For example, no organizational characteristics moderated the relationship between work-family-school conflict and time spent sleeping. Gisler et al. (2018) state in their review of work-life conflict and health that the relationship between conflict and exercise can be explained by both depleted time and energy. That is, individuals experiencing high demands in work, family, and school domains may have trouble finding both the time and the energy to exercise, and thus, individuals may be in even greater need of the individual and environmental resources explored in this study. Sleeping requires time but not energy, which could be one potential explanation for the null findings in these moderation analyses.

Additionally, more research is needed to explain why some relationships conformed to a linear relationship while others exhibited a curvilinear relationship. Ferris et al. (2006) point out that the majority of the stressor-strain literature has an implicit assumption of linearity, which has informed theory and methods. Considerations of non-linear relationships are often exploratory in nature, and there tends to be little a priori or theoretical guidance that would allow us to predict when linear relationships might hold for some behaviors but not others. Future research providing guidance on when linear and curvilinear hypotheses are warranted could allow for both nuanced and parsimonious predictions in the future.

Using the person-centered latent profile analysis approach, this study also explored how individuals place value on various health behaviors and how these values could shape behavioral responses to perceived work-family-school conflict. These results indicated that individuals do differ in the value that they place on health behaviors. The profiles identified differed both in how they valued health behaviors generally (such as valuing all health behaviors at a higher or lower level) and in how they value health behaviors in relation to one another (such as valuing diet above other health behaviors even when a high value is placed on all behaviors generally).

This preliminary look into how individuals place value on health behaviors relative to others recognizes that behaviors related to sleep, nutrition, and exercise do not take place in a vacuum. Especially for a very busy population, such as employed students with family responsibilities, they may feel that they cannot “do it all” and must make choices between certain health behaviors rather than promoting all health behaviors. Understanding the value that individuals place on each health behavior could shed light on processes that influence these decisions and could serve as a springboard for future research that acknowledges the importance of and helps promote participation in comprehensive health behaviors, even among busy individuals.

Strengths, limitations, and future directions

This study is strengthened by the breadth of life domains and health behaviors examined. That is, this study addresses a larger need to examine a comprehensive set of health behaviors, as opposed to a single health behavior. This is due to the clustering of health and risk behaviors (Geller et al., 2017) and the low proportion of individuals who meet recommendations for multiple health behaviors (Reeves & Rafferty, 2005). This study also addresses calls to examine conflict beyond the narrowly defined domains of work and family (Park & Headrick, 2017), given that it may not fully capture the responsibilities the many roles that employed individuals juggle (Kossek & Lee, 2017) and that the proportion of individuals who balance work, school, and family demands are growing (Choo et al., 2021; Riggert et al., 2006).

This study is also strengthened by the use of a daily-diary approach, a useful methodological approach for examining health behaviors in particular. Individuals tend to report sleep, exercise, and dietary choices more accurately when reflecting on a shorter window of time (Te Braak et al., 2023). This design also lends itself to examinations of within- and between-person effects, which we utilized for hypotheses related to both main effects and moderation. Finally, as this study utilized multi-level modeling and latent profile analysis, it integrates the benefits of both variable-centric and person-centric approaches. Researchers have pointed out that many topics of interest to researchers have been traditionally investigated from a variable-centric or person-centric approach, when many valuable research questions could be asked that integrate both types of inquiry (Muthén & Muthén, 2000).

Several limitations should also be noted. The health behaviors studied were operationalized in a way that would limit participant burden, although more comprehensive and nuanced measures do exist (e.g., the Dietary Screener Questionnaire; National Cancer Institute, 2013). In addition to assessing relationships using a time-based quantity measure related to diet and nutrition described above, future research should continue to refine the measurement of health behaviors in a reliable and valid way that minimizes participant burden. Although an individual's perception of an organizational characteristic does yield a valuable perspective, the organizational characteristics assessed in this study do not reflect a shared perception or group-level

phenomenon. In future research, it would be useful to assess these relationships in an organizational setting and aggregate perceptions of appropriate organizational characteristics. Such a design would also allow for the incorporation of other sources of data, such as supervisor-reported levels of support, to address the limitations of designs that rely only on self-report. Additionally, the gender imbalance of the sample (72.6% female) could limit generalizability. A meta-analysis found that, although the relationship between gender and work-life conflict is nuanced, there is more evidence for similarity in rates of perceived conflict among men and women (Shockley et al., 2017). Additionally, a systematic review describes inconsistent findings on gender and health behavior participation (Hiller et al., 2017). Perhaps this complexity and inconsistency are why gender differences in the relationship between work-life conflict and health behaviors have been hypothesized in previous research, but are not always supported (e.g., Barnes et al., 2012). Future studies could pursue more balanced gender ratios to better ensure representativeness and generalizability and to further explore the role of gender in work-life conflict and health behaviors.

Several opportunities for future research could be assessed. As participation in health behaviors is influenced by a host of nuanced factors, the results of this study open many avenues for future research. For example, future studies could examine features of the health behaviors themselves. Research in exercise science, dietetics/nutrition, and health promotion has produced insights about strategies that could be used to maximize the health benefits of a health behavior while minimizing time invested, such as the completion of a shorter high-intensity interval training workout (Gillen & Gibala, 2014) or advance quantity meal preparation on a weekend to minimize time cooking healthy meals on workdays (Mendez et al., 2021). Research could further explore the use of these strategies during periods of work-family conflict. Future research could also examine other individual differences or motivational processes that influence participation in multiple health behaviors. This study did so by exploring the value placed on multiple health behaviors, but future research could examine other attitudes or self-efficacy relevant to multiple health behaviors. Future research could also adopt a cross-cultural lens. This study and most of the cited public health surveillance research on participation in health behaviors were conducted in the United States. Adopting a cross-cultural approach would be interesting given that the experience of work-life conflict can vary in an international landscape (Allen et al., 2020).

Finally, future research could further explore the transactional component of navigating the work-life interface. Previous research has used language such as “trade-offs” and “saving,” (Blake et al., 2009, p. 7) or “borrow” and “pay” (Barnes et al., 2012, p.789). However, their study designs or data sources did not allow for precise definitions, operationalizations, or measurement of these processes. It would be interesting to further explore these transactional concepts and incorporate them into theory, study design, and measurement in studies focusing on the intersection of life domains. Trade-offs are a decision-making heuristic utilized in Ecological Rationality Theory (Gigerenzer & Gaissmaier, 2011), which could provide a precise theoretical basis to explore this concept further.

Implications for research and practice

This study points to the usefulness of Ecological Rationality Theory as a lens to better understand the implications of time-based conflict. Individuals make decisions that are rational based on the circumstances of their environment, including constraints created by lack of time,

affordances created by individual or environmental characteristics, and the value they place on various behaviors or anticipated outcomes. While Ecological Rationality Theory has been applied to health-related decision-making, these studies seemed to have focused on clinical interactions (physician judgement, patient's decision between screening and treatment options; Gigerenzer & Gaissmaier, 2011). This could represent an opportunity to expand the application of Ecological Rationality Theory in non-clinical health-related contexts by exploring decision-making related to sleep, exercise, nutrition, or other health behaviors.

The significant moderation relationships have implications for both practitioners and researchers who contribute to the development of interventions. The buffering effect of some individual and organizational characteristics on the work-family-school conflict health behavior relationship suggests that these could be useful agents of change in multi-level interventions aimed at work-life balance, health behaviors, or both in the workplace. Proactive behaviors can be taught through process-oriented interventions (Aspinwall, 2011), time management skills can be strengthened through behavioral and cognitive strategies (Green & Skinner, 2005), and effective coping can be enhanced through psychoeducational and therapeutic interventions (Stensrud & Stensrud, 1983). Family-supportive behaviors can be trained through supervisory training programs (Crain & Stevens, 2018), and perceptions of workplace health climate can be modified through organizational change and leadership development (e.g., Schwatka et al., 2022). Although programming geared toward developing individual characteristics could be offered in both educational and workplace settings (Lederer & Oswalt, 2017; Shain & Kramer, 2004), creating more supportive supervisory and organizational characteristics necessitates that workplaces be active partners in promoting work-life balance and health behaviors. A combination of individual and organizational approaches, perhaps offered through workplace-university partnerships, would likely be impactful and address a gap in existing programming. For example, there are few prevention and intervention programs in the workplace focusing on the management of work-family-school conflict (Suh et al., 2022) and although health behavior change programming does exist (Mattke et al., 2013), programs often target individuals or organizations (Richardson & Rothstein, 2008) rather than comprehensively addressing individual and organizational factors (Kohler & Munz, 2006).

The results of the LPA revealing profiles of health behavior value will likely have implications for the science and practice of multiple health behaviors change programs, which are being increasingly recognized as preferable to programs focusing on single health behaviors due to the clustering of multiple health and risk behaviors (Prochaska et al., 2010). It could be helpful to understand why individuals may or may not place equal value on all health behaviors, which could influence their perceptions of or experience in programs targeting multiple health behaviors (Prochaska et al., 2010).

CONCLUSION

By replicating previous research on work-life conflict and participation in health behaviors, and by extending this research through a focus on multiple life domains, multiple health behaviors, and moderators of the conflict-health behavior relationship, this study sheds light on factors that influence the health of busy professionals. Lending more support to the idea that individuals “borrow” from time for health behaviors to “pay” for demands in other life domains, this study shows that this phenomenon may not be exclusive to the health behavior of sleep. As individuals rarely consistently and comprehensively address all modifiable risk factors

for health, and place different values on behaviors that promote health, this research further supports that individuals face difficult decisional processes when deciding on trade-offs to make. Individual and organizational characteristics, including proactive personality, time management, coping skills, family-supportive supervisor behaviors, and workplace health climate, could serve as useful points of future intervention to make these trade-offs less likely and promote health behaviors in the presence of perceived conflict.

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CONFLICT OF INTEREST STATEMENT

The authors have no conflicts of interest to report.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ETHICS STATEMENT

This study was approved by the Institutional Review Board at the University of Central Florida.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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