



Enrichment and Conflict Between Work and Health Behaviors: New Scales for Assessing How Work Relates to Physical Exercise and Healthy Eating

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Abstract

Studies suggest a mutual influence between work and health behaviors (physical exercise, healthy eating). To advance research on this phenomenon, we developed and validated short scales that capture enrichment and conflict experiences between work and health behaviors. Building on the work-family literature, we developed items assessing enrichment and conflict between (1) work and physical exercise and (2) work and healthy eating. In Study 1, we examined construct validity of the new scales, using confirmatory factor analysis. In Study 2, we refined the items, relying on expert ratings. In Study 3, we tested construct validity of the revised measures and examined their nomological net. We replicated the factor structure across Study 1 and Study 3. Analysis of the nomological net showed that enrichment experiences mainly correlate with job rewards, organizational health behavior climate, high exercise identity, high healthy-eater identity, physical exercise behavior, consumption of fruits and vegetables, and low body mass index (BMI). Conflict experiences mainly correlate with a high amount of effort invested into work, low exercise identity, low healthy-eater identity, no or limited physical exercise behavior, and the consumption of less fruits and vegetables.

Keywords Physical exercise · Eating · Enrichment · Conflict · Scale development · Scale validity

Regularly engaging in health behaviors such as physical exercise and healthy eating has clear benefits for physical health and psychological well-being (Calderwood

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et al., 2021; Rhodes et al., 2017; Wang et al., 2014). Although, engagement in physical exercise and healthy eating depends on many factors (Heikkilä et al., 2013; McDermott et al., 2016), work as a core life domain is particularly influential in fostering versus hindering health behaviors. For instance, a recent study showed that positive experiences at work such as work engagement are associated with better performance patterns in recreational runners (Postema et al., 2021). At the same time, work experiences – particularly when they are negative and stressful – can hinder physical exercise (Sonntag & Jelden, 2009) and healthy eating (Liu et al., 2017).

Importantly, there is not only the potential impact of work on health behaviors. Health behaviors may influence work as well, both in a positive and a negative way. For instance, physical exercise (Reed & Ones, 2006) and consuming healthy foods (Wahl et al., 2017) improve positive affect – a state that is particularly beneficial at work (Davis, 2009). Obsessive engagement in physical exercise, however, may increase negative affect (Ekkekakis et al., 2011) and may undermine positive self-evaluations (Stenseng et al., 2011) that in turn impair job performance (Judge & Bono, 2001). Similarly, when focusing on healthy eating, one might become too preoccupied with it (Strahler et al., 2021), what in turn might harm engagement at work.

Taken together, first empirical evidence suggests mutual influences of work and health behaviors that can be characterized as enrichment versus conflict: Work can both foster and undermine physical exercise and healthy eating; physical exercise and healthy eating can both facilitate and hinder work behaviors and experiences. Despite these observations, little is known about potential antecedents and outcomes of enrichment versus conflict between work and health behaviors. A major barrier to studying such antecedents and outcomes is the absence of valid measures that directly capture the experience that work enriches versus interferes with health behaviors and that health behaviors enrich versus interfere with work. Thus, the goal of this paper is to develop and validate short scales that assess enrichment and conflict between work on the one hand and physical exercise and healthy eating on the other hand. To establish construct validity, we use confirmatory factor analyses, expert ratings, and nomological-net analysis.

We focus on physical exercise and healthy eating as two highly important health behaviors that are associated with reduced risks of major illnesses such as cardiovascular diseases and diabetes (Koloverou et al., 2014; Rosato et al., 2019; Wahid et al., 2016). Physical exercise can be defined as “a subset of physical activity that is planned, structured, and repetitive” (Caspersen et al., 1985, p. 126) that usually aims at maintaining or increasing fitness. In our research, we focus on leisure-time physical exercise and, accordingly, exclude physical activity performed as part of one’s work role or as a mean of transportation. Healthy eating is a complex construct and knowledge about what constitutes a healthy diet differs between persons (Wardle et al., 2000). However, on average, people have a reasonable understanding of healthy versus unhealthy foods (Lappalainen et al., 1998), with fruits, vegetables, whole grains, and nuts being considered as more healthy than high-fat and high-sugar foods (Stevenson, 2017).

Our paper extends past research in several ways. First, we suggest to directly measure enrichment and conflict between work and health behaviors. In the past,

researchers based conclusions about enrichment and conflict mainly on empirical associations (e.g., correlations and regression weights) observed between work factors and health behaviors (Liu et al., 2017; Postema et al., 2021) but not on direct assessments of enrichment and conflict. While detecting empirical associations between work and health behaviors was important in uncovering this interesting phenomenon, researchers now need more direct assessments of enrichment and conflict to move the field forward. For instance, directly assessing enrichment and conflicts enables researchers to systematically examine how enrichment and conflict relate to other variables, how enrichment and conflict develop over time, and how they can be influenced by interventions.

Second, to enable systematic research on enrichment and conflict, we present short, reliable, and construct-valid measures that capture the essence of enrichment and conflict between work and health behaviors. These measures can be used in future research to better understand how work benefits versus harms health behaviors as well as how health behaviors benefit versus harm processes at work. In the nomological-net analysis we make a first step into this direction and show how enrichment and conflict between work and health behaviors are related to potential antecedents and outcomes. Some of these potential antecedents (e.g., work environment, self-perceptions) have been described as facilitators versus barriers in previous research (Mazzola et al., 2017; Power et al., 2017; Zorbas et al., 2018). We extend this previous research that conceptualized facilitators versus barriers as predictors of physical exercise and healthy eating by investigating how facilitators and barriers (i.e., potential antecedents) relate to the experience of enrichment versus conflict. Thus, facilitators and barriers must not be equated with enrichment and conflict experiences, respectively, but rather potentially contribute to enrichment and conflict experiences.

Third, our research contributes to the broader literature on how work and non-work life are intertwined. Whereas past research has mainly focused on the interface between work and family life (Allen & Martin, 2017), examining enrichment and conflict between work and health behaviors will help gain a deeper understanding of how employees can reconcile various life domains. These insights also help identify circumstances where action is needed to overcome potential conflict between work and other life domains. Moreover, our research suggests that theoretical approaches and practical interventions that target health behavior in an isolated way – without taking work into account – may be limited. Adding work to the equation will help to better understand health behavior and design interventions that are effective in improving health behavior.

Core Concepts

We build our research on enrichment and conflict between work and health behaviors on conceptualizations of enrichment and conflict developed in work-family research (Greenhaus & Beutell, 1985; Greenhaus & Powell, 2006). This research focused on “family” as a specific non-work role, but the basic concepts of enrichment versus conflict apply to a broader set of non-work roles (Greenhaus & Kossek,

2014; Staines, 1980). Accordingly, both (1) enrichment and conflict between work and family and (2) enrichment and conflict between work and health behaviors can be seen as specific instantiations of enrichment and conflict between work and broadly defined non-work roles.

Although we ground our research on the enrichment and conflict concepts developed in work-family research, we do not claim that family and health behavior are similar in all possible respects. For instance, a long-term commitment to other family members differs largely from a commitment to deliberately chosen health behaviors. However, the basic principles of mutual enrichment and conflict between work and family as well as between work and health behaviors are similar: Positive work experiences can stimulate desirable states and behaviors in the respective other role (and vice versa), and negative work experiences may hinder desirable states and behaviors in the other role (and vice versa).

Enrichment Concept

Greenhaus and Powell (2006, p. 73) defined work-family enrichment as “the extent to which experiences in one role improve the quality of life in the other role”. Enrichment means that experiences in distinct life roles mutually influence each other in a positive way. Enrichment processes – as well as conflict processes – can occur in two directions: from role A to role B and vice versa.

Building on this enrichment conceptualization, we define work-to-exercise enrichment as the extent to which experiences at work improve physical exercise. For instance, experiencing work as fulfilling comes along with positive affect (Allan et al., 2021) that helps to initiate and maintain exercise behavior (Emerson et al., 2018). Looking at the other direction of the enrichment process, exercise-to-work enrichment is the extent to which physical-exercise experiences improve the quality of experiences at work. For instance, reaching an exercise goal (e.g., running for 45 min) elicits positive affect and increases one’s confidence in achieving goals (Bagozzi et al., 1998; LeBeau et al., 2018). This positive affect and increase in confidence are transferred to work via spillover processes (Edwards & Rothbard, 2000) and increase similar experiences at work.

We define work-to-eating enrichment as the extent to which experiences at work improve healthy eating. For instance, receiving positive performance feedback at work increases one’s confidence in being able to address new challenges (Shea & Howell, 1999). This confidence may generalize (Luszczynska et al., 2005) and can be relied on when trying out new ways of preparing healthy food. Eating-to-work enrichment is the extent to which healthy eating improves the quality of the experiences at work. For instance, consuming a healthy meal provides nutrients that may help to be more persistent and vigorous at work (Kearney & Pot, 2017).

When describing the enrichment concept, Greenhaus and Powell (2006) differentiated between an instrumental path and an affective path through which experiences in one role impact the quality of experiences in another role. The instrumental path refers to the process by which resources (e.g., positive self-evaluations, optimism, hope, and confidence) generated in one role are directly transferred to

and benefit performance in the other role. Carlson et al. (2006) and Kacmar et al. (2014) described this process of generating and transferring psychological resources from one role to the other as the capital aspect of enrichment (capital-based enrichment). The affective path refers to the spillover of positive affect from one role to the other, with positive affect generated in one role facilitating behaviors required in the other, increasing positive affect in that other role (Edwards & Rothbard, 2000). With respect to work-family enrichment, Kacmar et al. (2014, p. 34) characterized this affect-based enrichment as the process “when involvement in work results in a positive emotional state that helps the individual be a better family member”.¹

We propose that capital-based enrichment and affect-based enrichment also occur between work and health behaviors. Capital-based enrichment from work to health behavior means that work generates psychological resources such as confidence or self-esteem that help to pursue physical exercise and healthy eating, respectively. Capital-based enrichment from health behavior to work occurs when physical exercise or healthy eating result in psychological resources that in turn benefit experiences at work. Affect-based enrichment from work to health behavior means that experiences at work foster positive affect that in turn helps to engage in physical exercise and healthy eating, respectively. Affect-based enrichment from health behavior to work means that physical exercise or healthy eating lead to positive affect that in turn facilitates beneficial experiences at work.

Conflict Concept

Greenhaus and Beutell (1985, p. 77) defined work-family conflict as “a form of inter-role conflict in which the role pressures from the work and family domains are mutually incompatible in some respect”. Conflict means that participating in one role makes it more difficult to participate and show required behaviors in the other role. Building on this conceptualization of work-family conflict, we define work-to-exercise conflict as the extent to which participation in the work role impedes engagement in physical exercise. For instance, spending long hours at work and leaving work exhausted makes it more difficult to engage in physical exercise after work (D. M. Y. Brown & Bray, 2019). Exercise-to-work conflict is the extent to which participation in physical exercise makes it more difficult to fully participate and to function well at work. For instance, spending several hours per day on exercise activities (e.g., when training for a marathon) may make it hard to fully participate in all work activities with a lot of energy.

We define work-to-eating conflict as the extent to which features of the work situation make healthy eating more difficult. For instance, when working long hours, it is harder to spend time on cooking a healthy meal at home (Devine et al., 2009). In

¹ In addition to capital-based and affect-based enrichment, a developmental aspect of work-family enrichment has been discussed (Carlson et al., 2006). We focus on capital-based and affect-based enrichment because these enrichment processes can operate on a day-to-day basis, whereas developmental processes refer to longer time frames.

addition, intense healthy-eating efforts may make it more difficult to fully participate at work (eating-to-work conflict). For instance, when spending a lot of time on learning about different philosophies behind healthy diets, less time and energy is left for fully engaging at work.

The work-family literature differentiated between time-based conflict and strain-based conflict as two major types of work-family conflict (Greenhaus & Beutell, 1985; Netemeyer et al., 1996).² Time-based conflict refers to a situation when the amount of time spent in one role makes it difficult to perform desired behaviors in the other role. Strain-based conflict refers to situations when strain (e.g., negative affect, exhaustion) originating in one role makes it difficult to perform desired behaviors in the other role.

We propose that time-based conflict and strain-based conflict also occur between work and health behaviors. Time-based conflict from work to health behavior means that time spent on work makes it difficult to engage in physical exercise or healthy eating. Time-based conflict between health behavior and work occurs when physical exercise or healthy eating require a lot of time so that work processes are impaired. Strain-based conflict between work and health behaviors occurs when work increases strain that hinders the pursuit of physical exercise or healthy eating. A person experiences strain-based conflict between health behavior and work when physical exercise and healthy eating result in strain symptoms (e.g., exhaustion) that in turn impede effective functioning at work.

Nomological Net of Enrichment and Conflict between Work and Health Behaviors

To gain insight into the construct validity of the work-exercise and work-eating scales to be developed, we examine the nomological net of these scales by testing their correlations with other supposedly related constructs. In line with other models addressing the relationship between work and non-work constructs (Crain & Hammer, 2013; Frone et al., 1992), we address antecedents and outcomes of enrichment and conflict between work and health behaviors. As situational antecedents, we examine (1) job factors that should hinder versus facilitate health behaviors, namely effort (i.e., high demands) and rewards (Siegrist, 1996), (2) work hours, and (3) organizational health behavior climate (Sonnentag & Pundt, 2016). As individual antecedents, we focus on identity constructs (i.e., exercise and healthy-eater identity; Anderson & Cychosz, 1994; Strachan & Brawley, 2008). As outcomes, we examine physical exercise and healthy-eating behaviors as proximal outcomes and Body Mass Index as a distal outcome. Figure S1 in the Online Supplement shows our conceptual model.

² Greenhaus and Beutell (1985) describe behavior-based conflict as a third type of work-family conflict. We focus on time-based and strain-based conflict, which is in line with Netemeyer et al. (1996). Specifically, the authors argue that in addition to the general demands of a role, “the time devoted to a given role, and the strain produced by a given role” are core elements of inter-role conflict (p. 401).

Situational Antecedents: Job Factors

We propose that job factors are related to enrichment versus conflict between work and health behaviors. Specifically, we examine key aspects of the effort-reward imbalance model – an influential framework in occupational health research that specifies high effort and low rewards as crucial factors characterizing a workplace that is risky from a health perspective (Siegrist & Li, 2016).

Conceptually, effort within the effort-reward imbalance model originates from high job demands and individual tendencies to mobilize energy in demanding situations (Siegrist, 1996). Empirically, the effort measure captures typical indicators of high demands such as time pressure and frequent interruptions (Siegrist et al., 2009). Accordingly, high effort within the effort-reward imbalance model corresponds to high job demands and obligations (Van Vegchel et al., 2005). We propose that high job demands (i.e., high effort in terms of the effort-reward imbalance model) are positively related to high levels of work-to-exercise conflict and work-to-eating conflict. High job demands require high effort investment and result in psychological strain symptoms such as affective distress and fatigue (Ilies et al., 2010; Nixon et al., 2011). Strain experiences, in turn, make it difficult to engage in health behaviors (Padilla et al., 2021; Schultchen et al., 2019). Moreover, when facing high job demands, people may respond by devoting more time to work (Ng & Feldman, 2008). As a consequence, time lacks for engaging in health behaviors (Mazzola et al., 2017).

Hypothesis 1: Job demands are positively related to (a) work-to-exercise conflict and (b) work-to-eating conflict.

We propose that job-related rewards are positively related to work-to-exercise enrichment and work-to-eating enrichment. Rewards within the effort-reward imbalance model refer to money, esteem, and career opportunities (i.e., job security). These rewards can function as resources that help attaining goals at work and in other life areas (Halbesleben et al., 2014). For instance, these rewards provide the necessary financial resources to engage in physical exercise (cf., purchasing equipment) and healthy eating (cf., purchasing high-quality food). Moreover, rewarding job experiences imply a close link to positive affective states (Allan et al., 2021) that in turn facilitate engagement in physical exercise (Emerson et al., 2018) and the choice of more healthy, nutritious food items (Gardner et al., 2014).

Hypothesis 2: Job-related rewards are positively related to (a) work-to-exercise enrichment and (b) work-to-eating enrichment.

Situational Antecedents: Work Hours

We propose that long work hours are positively related to work-to-exercise conflict and work-to-eating conflict. Long work hours imply that less time is available for participation in other life domains (Xu et al., 2019). When lacking time, people may

sacrifice activities that seem to be dispensable, such as physical exercise and healthy meals. Moreover, after having worked for long hours, strain symptoms such as fatigue (Xu et al., 2019) and negative affect (Rau & Triemer, 2004) increase. Fatigue and negative affect make it more difficult to initiate and maintain physical exercise (D. M. Y. Brown & Bray, 2019; Schultchen et al., 2019). Similarly, negative affective states make it more likely to engage in unhealthy eating (Liu et al., 2017). Consequently, long work hours contribute to the experience that work interferes with physical exercise and healthy eating.

Hypothesis 3: Long work hours are positively related to (a) work-to-exercise conflict and (b) work-to-eating conflict.

Situational Antecedents: Organizational Health Behavior Climate

Organizational health behavior climate is “defined as employee perceptions of organisational efforts to promote health behavior” (Sonnentag & Pundt, 2016, p. 260). An organization’s health behavior climate comprises perceptions of organizational policies, practices, and procedures (Schneider et al., 2013) targeting physical exercise and healthy eating. We propose that an organizational health behavior climate that endorses physical exercise relates positively to work-to-exercise enrichment and negatively to work-to-exercise conflict. Organizations with a well-developed health behavior climate targeting physical exercise emphasize the importance of exercising, have practices in place (e.g., lunch-time running groups), and encourage communication about exercise-related topics (Sonnentag & Pundt, 2016). These features signal that exercising is a desirable activity and that the organization supports physical exercise. Thus, employees receive the message that organizational life is compatible with exercising and perceive that the organization facilitates exercise behavior. Accordingly, employees experience work-to-exercise enrichment. In addition, a high health behavior climate expresses the view that employees are able to exercise even when facing a busy and demanding work life. Consequently, employees understand that work does not interfere with physical exercise. Accordingly, they experience low work-to-exercise conflict.

Hypothesis 4: Organizational health behavior climate targeting physical exercise is (a) positively related to work-to-exercise enrichment and (b) negatively related to work-to-exercise conflict.

Similarly, we propose that an organizational health behavior climate that endorses healthy eating relates positively to work-to-eating enrichment and negatively to work-to-eating conflict. Organizational values and expectations about healthy eating, respective organizational practices, and communication about healthy eating emphasize the importance of a healthy diet and provide means that facilitate healthy eating (e.g., offering healthy meals in onsite cafeterias; Smith et al., 2020). Accordingly, in organizations with a high health behavior climate, employees notice that work is compatible with healthy eating and experience work-to-eating enrichment.

Moreover, this health behavior climate illustrates how employees can follow a healthy diet even when work life becomes demanding – a signal that should reduce work-to-eating conflict.

Hypothesis 5: Organizational health behavior climate targeting healthy eating is (a) positively related to work-to-eating enrichment and (b) negatively related to work-to-eating conflict.

Individual Antecedents: Exercise Identity and Healthy-Eater Identity

In addition to these situational variables, we include identity-related constructs in our nomological-net analysis. First, exercise identity should be relevant for enrichment and conflict between work and physical exercise. Exercise identity refers to “the salience of a person’s identification with physical exercise as an integral part of the concept of self” (Anderson & Cychosz, 1994, p. 749f.). It captures the person’s experience that engagement in physical exercise is an essential aspect of their self.

We expect a positive relationship between exercise identity and work-to-exercise enrichment. Only when exercise identity is high, a person can experience work-to-exercise enrichment. For a person with a low exercise identity, exercise is irrelevant and, accordingly, they cannot benefit from positive processes happening at work. Moreover, we expect a positive relationship between exercise identity and exercise-to-work enrichment. A high exercise identity implies that one sees exercising in a positive light. Accordingly, one attributes possible positive states and experiences to one’s physical exercise, including a positive impact on work-related processes.

Hypothesis 6: Exercise identity is positively related to (a) work-to-exercise enrichment and (b) exercise-to-work enrichment.

We expect a negative relationship between exercise identity and work-to-exercise conflict. For persons with a high exercise identity, physical exercise is a salient part of their selves. Accordingly, they find it important to protect their exercise intentions and exercise behaviors from any intrusions, including intrusions that have their origin in the work role. Therefore, they are less likely to allow work to interfere with physical exercise, and consequently they experience less work-to-exercise conflict.

We examine the relationship between exercise identity and exercise-to-work conflict in an exploratory way. High exercise identity might be negatively related to exercise-to-work conflict because the positive perspective on exercising makes it unlikely that one regards physical exercise as an activity that harms other life roles. However, it could also be positively related to exercise-to-work conflict because the high salience of physical exercise – along with the assumed high priority of physical exercise over other activities – puts constraints on performing well in other life domains, experienced as exercise-to-work conflict.

Hypothesis 7: Exercise identity is negatively related to work-to-exercise conflict.

Research *Question 1*: How is exercise identity related to exercise-to-work conflict?

Second, we expect healthy-eater identity to be related to enrichment and conflict experiences at the interface between work and healthy eating. Healthy-eater identity refers to the degree to which one perceives healthy eating as an essential aspect of one's self-concept (Strachan & Brawley, 2008). Similar to what we expected for the interface between work and physical exercise, we assume that healthy-eater identity positively relates to work-to-eating enrichment: Only when healthy-eater identity is high, positive work experiences can spill into eating behavior. Further, having a healthy-eater identity implies to see eating healthy in a positive light what in turn should increase eating-to-work enrichment. In addition, a healthy-eater identity entails the wish to protect one's healthy diet from interferences from work, resulting in an effort to keep work-to-eating conflict low. Again, a healthy-eater identity may show both positive and negative associations with eating-to-work conflict.

Hypothesis 8: Healthy-eater identity is positively related to (a) work-to-eating enrichment and (b) eating-to-work enrichment.

Hypothesis 9: Healthy-eater identity is negatively related to work-to-eating conflict.

Research *Question 2*: How is healthy-eater identity related to eating-to-work conflict?

Proximal Outcomes: Health Behaviors

We expect that enrichment and conflict between work and health behaviors are related to the respective health behaviors. More specifically, work-to-exercise enrichment should be positively related to exercise behavior and work-to-exercise conflict should be negatively related to exercise behavior. People may perceive that their experiences at work help them with their physical exercise: For instance, when work increases positive self-evaluations or positive mood, people may use these positive self-evaluations (Williams & French, 2011) and positive mood (Emerson et al., 2018) to initiate and maintain physical exercise. When, however, people perceive that their experiences at work interfere with physical exercise – for instance when work consumes too much of their time or leads to high strain levels – they feel that lack of time prevents them from exercising (Mazzola et al., 2017) and they may be too exhausted to exercise (Padilla et al., 2021).

Hypothesis 10a: Work-to-exercise enrichment is positively related to physical exercise.

Hypothesis 10b: Work-to-exercise conflict is negatively related to physical exercise.

Similarly, work-to-eating enrichment should be positively related to healthy eating and work-to-eating conflict should be negatively related to healthy eating. When people

perceive that their experiences at work support them in their endeavor to eat healthily – for instance when work teaches basic planning skills or puts them into a positive mood – they may use these planning skills (Mazzola et al., 2017) and positive mood (Gardner et al., 2014) choose healthy instead of unhealthy food. When people perceive that work interferes with healthy eating – for instance when work does not leave them enough time to prepare healthy meals and when work increases their strain levels – perceived lack of time (Mazzola et al., 2017) and an elevated strain level (Liu et al., 2017; Padilla et al., 2021) may contribute to the consumption of unhealthy food instead of more healthy food.

Hypothesis 11a: Work-to-eating enrichment is positively related to healthy eating.

Hypothesis 11b: Work-to-eating conflict is negatively related to healthy eating.

Distal Outcome: Body Mass Index

Finally, we expect that enrichment and conflict between work and health behaviors are associated with a person's body mass index (BMI). The BMI is a measure based on height and weight and can be used as an indicator of health risks associated with high body weight (Guh et al., 2009). The BMI has been criticized for several reasons (Nuttall, 2015) and it needs to be acknowledged that extensive physical exercise leading to a high muscle mass can result in a high BMI (Abramowitz et al., 2018). However, because the BMI is an important predictor of all-cause mortality (Di Angelantonio et al., 2016), we use the BMI as a distal outcome of our enrichment and conflict measures.

Work-to-exercise enrichment and work-to-eating enrichment should be negatively related to BMI because the perception that work facilitates physical exercise and healthy eating should be positively related with more physical exercise and healthy eating, respectively (see Hypotheses 10a and 11a), that in turn are related to a lower BMI (Barte et al., 2014; Miller et al., 1997). In contrast, work-to-exercise conflict and work-to-eating conflict should be positively related to BMI because the perception that work interferes with physical exercise and healthy eating should be positively related to less physical exercise and more unhealthy eating, respectively (see Hypotheses 10b and 11b), that in turn are related to a higher BMI (Barte et al., 2014; Miller et al., 1997).

Hypothesis 12a: Work-to-exercise enrichment is negatively related to BMI.

Hypothesis 12b: Work-to-exercise conflict is positively related to BMI.

Hypothesis 13a: Work-to-eating enrichment is negatively related to BMI.

Hypothesis 13b: Work-to-eating conflict is positively related to BMI.

Overview of Research

To examine the construct validity and the nomological net of the enrichment and conflict scales, we conducted three studies. In Study 1, we developed items assessing enrichment and conflict between work on the one side and physical exercise and

healthy eating on the other side. We examined the factor structure using confirmatory factor analysis. Study 2 was an expert study testing content validity of items from Study 1 and additional items, resulting in slightly revised scales. Study 3 examined the factor structure and the nomological net of the revised scales.

Study 1

Method

Sample

We conducted Study 1 with a sample of 267 employees (59.6% female). Participants had to be 18 years or older and work at least 10 h per week. Participants were recruited via posts on social media and direct communication by a group of undergraduate students, partially fulfilling the requirements for their empirical bachelor theses. To ensure a high quality of the recruitment process, we followed recommendations by Wheeler et al. (2014) and Demerouti and Rispens (2014). Participants were invited to take part in a lottery in which they could win vouchers (value of 20 Euro each) from an online retailer.

On average, participants were 38.4 years old ($SD=13.0$) and highly educated with 62.9% holding a university degree. Most participants (84.2%) reported that they had pursued some kind of physical exercise during the past four weeks. Participants' body mass index (BMI) ranged from 17.44 to 40.12 ($M=23.76$, $SD=3.45$), corresponding to a normal weight on average. Table S1 in the Online Supplement provides information about participants' jobs and work hours.

Measures

We collected our data with an online survey. All measures were in German. To assess enrichment between work and health behaviors (i.e., physical exercise, healthy eating), we adapted items from Kacmar et al.'s (2014) work-family enrichment measure that focuses on the transfer of psychological resources and used a translation-backtranslation procedure (Brislin, 1970) to arrive at German items. To assess conflict between work and health behaviors (i.e., physical exercise, healthy eating), we adapted items from the German version (Wolff & Höge, 2011) of Carlson et al.'s (2000) work-family conflict measure. For all items, we changed the word *family* into *physical exercise* and *eating healthy food*, respectively, and slightly adjusted the wording, when needed.

We focused on capital-based and affect-based enrichment and on time-based and strain-based conflict. Specifically, we used three items each for assessing eight enrichment constructs (affect-based and capital-based work-to-exercise enrichment, affect-based and capital-based exercise-to-work enrichment, affect-based and capital-based work-to-eating enrichment, affect-based and capital-based eating-to-work enrichment) and eight conflict constructs (time-based and strain-based work-to-exercise conflict, time-based and strain-based exercise-to-work conflict, time-based

and strain-based work-to-eating conflict, time-based and strain-based eating-to-work conflict). Thus, we assessed the interface between work and physical exercise (enrichment and conflict) with a total of 24 items, and the interface between work and healthy eating (enrichment and conflict) with another set of 24 items. We used a Likert response format ranging from 1 (*fully disagree*) to 5 (*fully agree*). Tables 1 and 2 show the wordings for all items used in Studies 1, 2, and 3.³

Statistical Analysis

We tested the construct validity of our measures with confirmatory factor analyses (CFA) in Mplus 7.4, conducting separate analyses for physical exercise and healthy eating. For both types of health behavior, we first tested an eight-factor model and compared these eight-factor models with alternative, less complex models.

Results

Table 3 shows the results from the CFA for the interface between work and physical exercise. An eight-factor model that differentiated between all eight dimensions and with all items loading on the respective dimension showed a very good fit, $\chi^2=384.944$, $df=224$, comparative fit index (CFI)=0.972, Tucker-Lewis index (TLI)=0.966, root-mean-square error of approximation (RMSEA)=0.052, and fit the data better than all alternative models.⁴ Table 1 displays the standardized factor loadings for the eight-factor model.

Table 4 shows the CFA results for the interface between work and healthy eating. Again, the eight-factor model that differentiated between all eight dimensions and with all items loading on the respective dimension showed a very good fit, $\chi^2=333.632$, $df=224$, CFI=0.982, TLI=0.977, RMSEA=0.043, and fit the data better than all alternative models.⁵ Table 2 displays the standardized factor loadings for the eight-factor model.

Tables 5 and 6 show descriptives, zero-order correlations, and Cronbach's Alphas for the eight work-exercise scales and the eight work-eating scales, respectively. Inspection of the means suggests that enrichment and conflict from work to health

³ The final version of the German items are provided in the Online Supplement (Table S4).

⁴ In addition to model comparisons using the Chi²-difference test, we applied further steps to test for discriminant validity between the scales (Shaffer et al., 2016). The differences in CFI of the eight-factor and the four seven-factor models all exceeded .002, speaking against the possibility of construct redundancy. Moreover, all correlations between the eight factor scores were below .85, again not providing evidence for a lack of discriminant validity.

⁵ In additional tests for discriminant validity (Shaffer et al., 2016), we noticed that the CFI difference between the eight-factor model and one of seven-factor models did not exceed .002. Among the 28 correlations between the eight factor scores, three correlations were above .85, suggesting that discriminant validity between the sub-constructs within work-to-eating enrichment, eating-to-work enrichment, and work-to-eating conflict is questionable. When comparing the four-factor model that separates the four main constructs with three-factors models, there was clear evidence for discriminant validity, based on Chi²-difference tests, smallest Chi²=506.362, $df=3$, $p < .001$, CFI differences (Table 4), and correlations between factor scores (with the highest correlation of .38).

Table 1 Item wordings, standardized factor loadings, and findings from expert study for work-exercise measures

Dimensions and items	Study 1		Study 3 Standardized factor loading (SE)	Expert study (Study 2)		
	Standardized factor loading (SE)	Percentage of correct categori- zation		Prototypicality		Comprehen-sibility
				M	SD	
Capital-based work-to-exercise enrichment						
My work helps me feel personally fulfilled and this helps me taking part in physical exercise. ^c	0.928 (0.011)	54.5	4.18	0.98	4.55	0.52
My work provides me with a sense of accomplishment and this helps me taking part in physical exercise.	0.895 (0.014)	72.7	4.00	0.89	4.64	0.50
My work provides me with a sense of success and this helps me taking part in physical exercise.	0.859 (0.018)	72.7	4.18	0.75	4.09	0.83
My work provides me with a sense of confidence that I am able to master challenges and this helps me taking part in physical exercise. ^a	0.890 (0.017)	81.8	4.45	0.52	4.55	0.69
Affect-based work-to-exercise enrichment						
My work puts me in a good mood and this helps me taking part in physical exercise.	0.934 (0.110)	100.0	4.82	0.40	4.82	0.40
My work makes me feel happy and this helps me taking part in physical exercise.	0.922 (0.011)	100.0	4.64	0.67	4.27	1.19
My work often makes me cheerful and this helps me taking part in physical exercise.	0.918 (0.012)	100.0	4.60	0.52	4.60	0.52
Because I have fun at work, it is easier for me taking part in physical exercise. ^b		100.0	4.45	0.82	4.64	0.67
Capital-based exercise-to-work enrichment						
Taking part in physical exercise helps me feel personally fulfilled and this helps me coping better with the demands of my job.	0.938 (0.010)	63.6	4.18	0.60	4.45	0.52
Taking part in physical exercise provides me with a sense of accomplishment and this helps me better fulfilling the demands of my job.	0.892 (0.016)	90.9	4.09	0.54	4.27	0.65
Taking part in physical exercise provides me with a sense of success and this helps me better meeting the demands of my job. ^d	0.874 (0.018)	63.6	4.36	0.50	4.27	0.65
Taking part in physical exercise provides me with a sense of confidence that I am able to master challenges and this helps me better meeting the demands of my job. ^a	0.887 (0.016)	90.9	4.36	0.67	4.18	0.98

Table 1 (continued)

Dimensions and items	Study 1		Study 3		Expert study (Study 2)			
	Standardized factor loading (SE)	Percentage of correct categorization	Standardized factor loading (SE)	Percentage of correct categorization	Prototypicality		Comprehensibility	
					M	SD	M	SD
Affect-based exercise-to-work enrichment								
Taking part in physical exercise puts me in a good mood and this helps me better fulfilling the demands of my job.	0.959 (0.006)	100.0	0.891 (0.016)	100.0	4.64	0.50	4.64	0.50
Taking part in physical exercise makes me feel happy and this helps me better fulfilling the demands of my job.	0.960 (0.006)	90.9	0.898 (0.015)	90.9	4.73	0.65	4.64	0.50
Taking part in physical exercise makes me cheerful and this helps me better fulfilling the demands of my job.	0.949 (0.007)	100.0	0.907 (0.014)	100.0	4.55	0.69	4.73	0.47
Because I have fun in physical exercise, it is easier for me completing tasks at work. ^b		81.8		81.8	4.78	0.44	4.70	0.48
Time-based work-to-exercise conflict								
My job keeps me from taking part in physical exercise more than I would like.	0.853 (0.020)	81.8	0.803 (0.028)	81.8	3.70	0.95	4.30	0.82
The time I must devote to my job keeps me from taking part in physical exercise.	0.922 (0.015)	100.0	0.859 (0.023)	100.0	4.82	0.40	4.64	0.50
Due to the amount of time I must spend on work responsibilities, I miss opportunities to take part in physical exercise.	0.845 (0.021)	100.0	0.862 (0.022)	100.0	5.00	0.00	4.91	0.30
My job does not leave enough time to ensure that I take part in physical exercise. ^b		100.0		100.0	4.73	0.47	4.55	0.69
Strain-based work-to-exercise conflict								
Because my job requires a lot of energy, I am often too exhausted to take part in any physical exercise.	0.922 (0.013)	90.9	0.887 (0.018)	90.9	4.91	0.30	4.91	0.30
Because of my work, my nerves are often frazzled so that I can not take part in any physical exercise.	0.800 (0.024)	100.0	0.828 (0.024)	100.0	4.55	0.69	4.73	0.47
Because of the pressures at work, I am often so drained that I can not take part in any physical exercise.	0.941 (0.012)	90.9	0.914 (0.015)	90.9	4.82	0.40	4.73	0.47
My work requires so much from me that I can not pull myself together putting energy in taking part in physical exercise. ^b		100.0		100.0	4.55	0.69	4.55	0.52

Table 1 (continued)

Dimensions and items	Study 1		Study 3		Expert study (Study 2)			
	Standardized factor loading (SE)	Percentage of correct categorization	Standardized factor loading (SE)	Percentage of correct categorization	Prototypicality		Comprehensibility	
					M	SD	M	SD
Time-based exercise-to-work conflict								
The time I spend on physical exercise keeps me from my job-related tasks.	0.560 (0.055)	90.9	0.793 (0.028)	90.9	4.82	0.40	4.82	0.40
Spending time on physical exercise often causes me to forgo opportunities that could be helpful to my career.	0.708 (0.050)	100.0	0.893 (0.019)	100.0	4.45	0.69	4.18	0.75
Because of taking part in physical exercise, I miss job-related events and activities.	0.458 (0.060)	100.0	0.814 (0.026)	100.0	4.55	0.69	4.55	0.52
Taking part in physical exercise asks for my time that I then can not invest into my work. ^b		100.0		100.0	4.82	0.40	4.82	0.40
Strain-based exercise-to-work conflict								
Because I have to pay attention to many things when taking part in physical exercise, I am often preoccupied with sports matters at work. ^c	0.649 (0.049)	27.3		27.3	3.86	0.90	4.14	0.69
Because I am often stressed from taking part in physical exercise, I have a hard time concentrating on my work.	0.744 (0.047)	81.8	0.759 (0.032)	81.8	3.90	0.99	4.10	0.99
Pressures from taking part in physical exercise weaken my ability to do my job.	0.504 (0.058)	81.8	0.679 (0.042)	81.8	4.50	1.27	4.27	1.19
Physical exercise requires a lot of energy that I can not put into my job. ^a		90.9	0.718 (0.036)	90.9	4.45	0.82	4.55	0.69

SE = Standard error

^aNewly developed item after Study 1, retained for Study 3 because of high percentage of correct expert categorization in Study 2^bNewly developed item after Study 1, omitted in Study 3 because percentage of correct expert categorization for original items higher than 72% in Study 2^cItem used in Study 1, omitted in Study 3 because of low percentage of correct expert categorization in Study 2^dItem used in Study 1, omitted in Study 3 because of low percentage of correct expert categorization in Study 2 and narrow scope

Table 2 Item wordings, standardized factor loadings, and findings from expert study for work-eating measures

Dimensions and items	Study 1		Study 3		Expert study (Study 2)				
	Standardized factor loading (SE)	Percentage of correct categorization	Standardized factor loading (SE)	Percentage of correct categorization	Prototypicality		Comprehensibility		
					M	SD	M	SD	
Capital-based work-to-eating enrichment									
My work helps me feel personally fulfilled and this helps me eating healthy food. ^c	0.946 (0.008)	36.4	0.921 (0.011)	72.7	3.91	0.54	4.27	0.65	
My work provides me with a sense of accomplishment and this helps me eating healthy food.	0.939 (0.009)	81.8	0.811 (0.026)	90.9	4.18	0.75	3.91	0.70	
My work provides me with a sense of confidence that I am able to master challenges and this helps me eating healthy food. ^a	0.846 (0.023)	90.9	0.846 (0.023)	90.9	4.18	0.60	4.45	0.69	
Affect-based work-to-eating enrichment									
My work puts me in a good mood and this helps me eating healthy food.	0.930 (0.010)	100.0	0.887 (0.017)	100.0	4.64	0.50	4.82	0.40	
My work makes me feel happy and this helps me eating healthy food.	0.906 (0.012)	90.9	0.885 (0.017)	90.9	4.70	0.67	4.45	0.82	
My work often makes me cheerful and this helps me eating healthy food.	0.938 (0.009)	100.0	0.913 (0.014)	100.0	4.91	0.30	4.73	0.47	
Because I have fun at work, it is easier for me eating healthy food. ^b		90.9		90.9	4.70	0.48	4.64	0.50	
Capital-based eating-to-work enrichment									
Eating healthy helps me feel personally fulfilled and this helps me coping better with the demands of my job. ^b	0.907 (0.014)	72.7	0.808 (0.026)	72.7	3.91	0.83	4.27	0.79	
Eating healthy provides me with a sense of accomplishment and this helps me better fulfilling the demands at my job.	0.823 (0.023)	81.8	0.801 (0.027)	81.8	3.50	0.71	3.70	0.82	
Eating healthy provides me with a sense of success and this helps me better meeting the demands of my job.	0.828 (0.022)	72.7	0.767 (0.031)	72.7	4.09	0.83	4.18	0.75	
Eating healthy provides me with a sense of confidence that I can master challenges and this helps me better meeting the demands of my job. ^b		90.9		90.9	4.09	0.83	4.18	0.87	

Table 2 (continued)

Dimensions and items	Study 1		Study 3		Expert study (Study 2)			
	Standardized factor loading (SE)	Percentage of correct categorization	Standardized factor loading (SE)	Percentage of correct categorization	Prototypicality		Comprehensibility	
					M	SD	M	SD
Affect-based eating-to-work enrichment								
Eating healthy puts me in a good mood and this helps me better fulfilling the demands of my job.	0.914 (0.012)	100.0	0.857 (0.022)	100.0	4.91	0.30	4.64	0.50
Eating healthy makes me feel happy and this helps me better fulfilling the demands of my job.	0.926 (0.011)	90.9	0.782 (0.030)	90.9	4.73	0.47	4.64	0.50
Eating healthy makes me cheerful and this helps me better fulfilling the demands of my job.	0.943 (0.009)	100.0	0.808 (0.028)	100.0	4.82	0.40	4.64	0.50
Because I have fun dedicating myself to healthy eating, it is easier for me completing tasks at work. ^b		63.6		63.6	4.22	0.83	4.30	0.82
Time-based work-to-eating conflict								
My job keeps me from eating healthy food more than I would like. ^c	0.861 (0.019)	63.6		63.6	4.10	0.88	4.20	0.92
The time I must devote to my job keeps me from eating healthy food.	0.899 (0.015)	100.0	0.846 (0.023)	100.0	4.91	0.30	4.91	0.30
Due to the amount of time I must spend on work responsibilities, I cannot eat so healthily as I would like.	0.901 (0.015)	100.0	0.851 (0.022)	100.0	4.91	0.30	4.82	0.40
My job does not leave sufficient time to ensure healthy eating. ^a		100.0	0.776 (0.030)	100.0	4.82	0.40	4.91	0.30
Strain-based work-to-eating conflict								
Because my job requires a lot of energy, I am often too exhausted to take care of eating healthy food.	0.926 (0.013)	100.0	0.953 (0.011)	100.0	4.73	0.47	4.73	0.47
Because of my work, my nerves are often frazzled so that I neglect eating healthy food.	0.766 (0.028)	100.0	0.844 (0.021)	100.0	4.73	0.47	4.82	0.40
Because of the pressures at work, I am often so drained that I do not have any energy left for eating healthy food.	0.914 (0.014)	100.0	0.882 (0.017)	100.0	4.82	0.40	4.82	0.40

Table 2 (continued)

Dimensions and items	Study 1		Study 3		Expert study (Study 2)		Comprehensibility	
	Standardized factor loading (SE)	Percentage of correct categorization	Standardized factor loading (SE)	Percentage of correct categorization	Prototypicality		Comprehensibility	
					M	SD	M	SD
My work requires so much from me that I can not pull myself together putting more energy into eating healthy food. ^b		100.0		4.27	0.79	4.64	0.67	
Time-based eating-to-work conflict								
The time I spend on eating healthy food keeps me from my job-related tasks.	0.520 (0.048)	100.0	0.774 (0.033)	4.73	0.47	4.82	0.40	
Spending time on eating healthy food often causes me to forgo opportunities that could be helpful to my career.	0.963 (0.024)	81.8	0.788 (0.032)	4.22	0.67	3.70	1.16	
Because of matters related to eating healthy food, I miss job-related events and activities.	0.777 (0.031)	72.7	0.662 (0.043)	4.33	0.71	4.11	0.60	
Eating healthy food asks for my time that I then can not invest into my work. ^b		100.0		4.91	0.30	4.82	0.40	
Strain-based eating-to-work conflict								
Because I have to pay attention to many things around healthy eating, I am often preoccupied with eating-related matters at work. ^c	0.642 (0.048)	27.3		4.00	0.87	3.80	1.40	
Because I am often stressed from matters related to eating healthy food, I have a hard time concentrating on my work.	0.699 (0.045)	81.8	0.776 (0.033)	4.20	0.63	4.00	0.82	
Pressures from matters related to eating healthy food weaken my ability to do my job.	0.710 (0.043)	100.0	0.746 (0.035)	4.10	0.99	4.09	0.70	
Eating healthy food costs a lot of energy that I can not put into my job. ^a		90.9	0.738 (0.035)	4.73	0.47	4.64	0.50	

SE = Standard error

^aNewly developed item after Study 1, retained for Study 3 because of high percentage of correct expert categorization in Study 2^bNewly developed item after Study 1, omitted in Study 3 because percentage of correct expert categorization for original items higher than 72% in Study 2^cItem used in Study 1, omitted in Study 3 because of low percentage of correct expert categorization in Study 2

Table 3 Results of confirmatory factor analyses for work-exercise enrichment and work-exercise conflict (Study 1, $N=267$)

	χ^2	df	CFI	TLI	RMSEA	$\Delta \chi^2$	Δ df	p
Model 1: Eight-factor model	384.944	224	0.972	0.966	0.052			
Model 2a: Seven-factor model	423.153	231	0.967	0.961	0.056	38.209	7	<.001
Model 2b: Seven-factor model	426.386	231	0.966	0.960	0.056	41.442	7	<.001
Model 2c: Seven-factor model	608.476	231	0.935	0.923	0.078	223.532	7	<.001
Model 2d: Seven-factor model	437.057	231	0.965	0.958	0.058	52.113	7	<.001
Model 3: Four-factor model	701.166	246	0.922	0.912	0.083	316.222	22	<.001
Model 4a: Three-factor model	2,413.234	249	0.628	0.588	0.180	2028.29	25	<.001
Model 4b: Three-factor model	951.196	249	0.879	0.866	0.103	566.252	25	<.001
Model 4c: Three-factor model	2,607.552	249	0.595	0.551	0.188	2,222.608	25	<.001
Model 4d: Three-factor model	963.444	249	0.877	0.864	0.104	578.500	25	<.001
Model 5a: Two-factor model	2,662.094	251	0.586	0.545	0.190	2,277.150	27	<.001
Model 5b: Two-factor model	2,855.481	251	0.553	0.508	0.197	2,470.537	27	<.001
Model 6: One-factor model	4,771.571	252	0.224	0.150	0.259	4,386.627	28	<.001

CFI comparative fit index; *TLI* Tucker-Lewis Index; *RMSEA* root-mean-square error of approximation

Model 1: All eight constructs loading on distinct factors. Model 2a: Affect-based and capital-based work-to-exercise enrichment loading on one common factor. Model 2b: Affect-based and capital-based exercise-to-work enrichment loading on one common factor. Model 2c: Time-based and strain-based work-to-exercise conflict loading on one common factor. Model 2d: Time-based and strain-based exercise-to-work conflict loading on one common factor. Model 3: Work-to-exercise enrichment, exercise-to-work enrichment, work-to-exercise conflict, and exercise-to-work conflict as four distinct factors. Model 4a: Exercise-to-work enrichment and exercise-to-work conflict as two distinct factors, work-to-exercise enrichment and work-to-exercise conflict loading on one common factor. Model 4b: Work-to-exercise enrichment and work-to-exercise conflict as two distinct factors, exercise-to-work enrichment and exercise-to-work conflict loading on one common factor. Model 4c: Work-to-exercise conflict and exercise-to-work conflict as two distinct factors, work-to-exercise enrichment and exercise-to-work enrichment loading on one common factor. Model 4d: Work-to-exercise enrichment and exercise-to-work enrichment as two distinct factors, work-to-exercise conflict and exercise-to-work conflict loading on one common factor. Model 5a: All work-to-exercise items loading on one factor, all exercise-to-work items loading on another factor. Model 5b: All enrichment items loading on one factor and all conflict items loading on another factor

behaviors occurred at a medium level. With respect to the scales capturing the direction from health behavior to work, enrichment scores were relatively high, whereas conflict scores were quite low. Most of the scales turned out to be highly reliable. The two work-to-exercise conflict scales (and to a lesser degree the work-to-eating conflict scales) had low internal consistencies – a finding that we addressed in the next step of our research (Study 2).

Overall, intercorrelations between most scales within the different work-exercise and work-eating constructs were low to moderate. Within the two work-to-exercise enrichment scales, the two exercise-to-work enrichment scales, the two work-to-exercise conflict scales, the two work-to-eating enrichment scales, the two eating-to-work enrichment scales, and the two work-to-eating conflict scales, the intercorrelations were very high, suggesting a rather low differentiation between the various subscales.

Table 4 Results of confirmatory factor analyses for work-eating enrichment and work-eating conflict (Study 1, $N=267$)

	χ^2	df	CFI	TLI	RMSEA	$\Delta \chi^2$	Δdf	p
Model 1: Eight-factor model	333.632	224	0.982	0.977	0.043			
Model 2a: Seven-factor model	349.490	231	0.980	0.976	0.044	15.858	7	.026
Model 2b: Seven-factor model	378.848	231	0.975	0.970	0.049	45.216	7	<.001
Model 2c: Seven-factor model	418.704	231	0.968	0.962	0.055	85.072	7	<.001
Model 2d: Seven-factor model	388.170	231	0.974	0.968	0.059	54.538	7	<.001
Model 3: Four-factor model	524.882	246	0.953	0.947	0.065	191.250	22	<.001
Model 4a: Three-factor model	2,571.327	249	0.610	0.567	0.187	2,237.695	25	<.001
Model 4b: Three-factor model	1,041.903	249	0.867	0.852	0.109	708.271	25	<.001
Model 4c: Three-factor model	1,920.131	249	0.719	0.689	0.159	1,586.499	25	<.001
Model 4d: Three-factor model	1,031.244	249	0.868	0.854	0.108	697.612	25	<.001
Model 5a: Two-factor model	3,087.875	251	0.523	0.476	0.206	2,754.243	27	<.001
Model 5b: Two-factor model	2,423.073	251	0.635	0.598	0.180	2,089.441	27	<.001
Model 6: One-factor model	4,657.638	252	0.259	0.189	0.256	4,324.006	28	<.001

CFI comparative fit index; *TLI* Tucker-Lewis Index; *RMSEA* root-mean-square error of approximation

Model 1: All eight constructs loading on distinct factors. Model 2a: Affect-based and capital-based work-to-eating enrichment loading on one common factor. Model 2b: Affect-based and capital-based eating-to-work enrichment loading on one common factor. Model 2c: Time-based and strain-based work-to-eating conflict loading on one common factor. Model 2d: Time-based and strain-based eating-to-work conflict loading on one common factor. Model 3: Work-to-eating enrichment, eating-to-work enrichment, work-to-eating conflict, and eating-to-work conflict as four distinct factors. Model 4a: Eating-to-work enrichment and eating-to-work conflict as two distinct factors, work-to-eating enrichment and work-to-eating conflict loading on one common factor. Model 4b: Work-to-eating enrichment and work-to-eating conflict as two distinct factors, eating-to-work enrichment and eating-to-work conflict loading on one common factor. Model 4c: Work-to-eating conflict and eating-to-work conflict as two distinct factors, work-to-eating enrichment and eating-to-work enrichment loading on one common factor. Model 4d: Work-to-eating enrichment and exercise-to-work enrichment as two distinct factors, work-to-eating conflict and eating-to-work conflict loading on one common factor. Model 5a: All work-to-eating items loading on one factor, all eating-to-work items loading on another factor. Model 5b: All enrichment items loading on one factor and all conflict items loading on another factor

Study 2

The CFAs conducted in Study 1 showed a good model fit for the eight-factor models. However, internal consistencies for some of the scales were low, suggesting that some items might not capture the underlying constructs sufficiently well and/or that the items capture diverse aspects of the respective construct. To evaluate the content of all items at a deeper level, we conducted an additional study in which experts classified all items and rated them with respect to their prototypicality and comprehensibility.

Table 5 Means, standard deviations, Cronbach's Alphas, and zero-order correlations between work-exercise measures (Study 1)

Variable	<i>M</i>	<i>SD</i>	Min	Max	Alpha	1	2	3	4	5	6	7
1 Capital-based work-to-exercise enrichment	2.64	1.02	1.00	5.00	.92							
2 Affect-based work-to-exercise enrichment	2.61	0.99	1.00	5.00	.95	.90						
3 Capital-based exercise-to-work enrichment	3.49	1.16	1.00	5.00	.94	.41	.35					
4 Affect-based exercise-to-work enrichment	3.73	1.15	1.00	5.00	.97	.37	.34	.90				
5 Time-based work-to-exercise conflict	2.56	1.20	1.00	5.00	.90	-.19	-.18	.02	.06			
6 Strain-based work-to-exercise conflict	2.41	1.15	1.00	5.00	.92	-.26	-.28	-.07	-.06	.73		
7 Time-based exercise-to-work conflict	1.30	0.51	1.00	3.67	.59	.02	-.04	.12	.14	.24	.14	
8 Strain-based exercise-to-work conflict	1.32	0.51	1.00	3.67	.61	-.01	-.04	.23	.23	.00	.08	.50

N=267. Correlations $\geq .12$ are significant with $p < .05$. Correlations $\geq .16$ are significant with $p < .01$. Correlations $\geq .20$ are significant with $p < .001$

Table 6 Means, standard deviations, Cronbach's Alphas, and zero-order correlations between work-eating measures (Study 1)

Variable	<i>M</i>	<i>SD</i>	Min	Max	Alpha	1	2	3	4	5	6	7
1 Capital-based work-to-eating enrichment	2.51	0.99	1.00	5.00	.95							
2 Affect-based work-to-eating enrichment	2.51	1.01	1.00	5.00	.95	.94						
3 Capital-based eating-to-work enrichment	3.20	1.09	1.00	5.00	.89	.38	.42					
4 Affect-based eating-to-work enrichment	3.50	1.07	1.00	5.00	.95	.33	.35	.86				
5 Time-based work-to-eating conflict	2.18	1.05	1.00	5.00	.92	-.27	-.27	.00	.03			
6 Strain-based work-to-eating conflict	2.24	0.97	1.00	5.00	.90	-.26	-.26	.03	.03	.72		
7 Time-based eating-to-work conflict	1.34	0.63	1.00	5.00	.74	.04	-.01	.18	.17	.10	.17	
8 Strain-based eating-to-work conflict	1.19	0.42	1.00	4.00	.70	.09	.07	.16	.12	.19	.17	.51

N = 267. Correlations $\geq .12$ are significant with $p < .05$. Correlations $\geq .16$ are significant with $p < .01$. Correlations $\geq .20$ are significant with $p < .001$

Method

Six women and five men (mean age = 33.36, $SD = 10.27$) served as raters in the expert study. All had specialized in work and organizational psychology, with seven (63.6%) pursuing a PhD, and four working in a post-doc or professorial position.

For both types of health behavior (i.e., physical exercise, healthy eating), we provided the raters with descriptions of all eight constructs (i.e., capital-based work-to-exercise enrichment, affect-based work-to-exercise enrichment, etc.), descriptions of six distraction constructs (referring to knowledge, energy-related, and behavioral processes), and a list of 32 items capturing the eight constructs (24 original items and eight newly formulated items) and 26 distraction items. For all eight scales we developed one new item each that could later replace the most problematic item – if needed. These new items aimed at capturing the core of the respective enrichment and conflict constructs. The items were formulated after thorough discussions between the first two authors of this paper. The distraction items addressed knowledge, energy-related, and behavioral processes, corresponding to the respective construct descriptions.

We asked the experts to classify every item, using a category system comprising the eight target constructs and the six distraction constructs. In addition, experts could opt for a “none of these categories applies” answer. Later, we coded if experts’ classifications were correct. Experts also rated the prototypicality (“How well does this statement reflect the category you have chosen?”) and the comprehensibility (“How easy is it to understand the statement?”) of each item on a five-point scale, ranging from 1 (*very poorly*) to 5 (*very well*).

Results

The right-hand columns of Tables 1 and 2 display the results of the expert ratings. For work-exercise items, correct classifications ranged between 27.3% and 100%, with a mean of 85.6% for the original items and 87.5% for all items, corresponding to a strong content validation outcome (Colquitt et al., 2019, Table 5) when assuming an average correlation between our focal scales and the orbiting scales. For 20 out of 24 original items the percentage of correct classifications was above 72% – the threshold that differentiates “moderate” from “weak” content validation outcomes (Colquitt et al., 2019). Similarly, for work-eating items, correct classifications ranged between 27.3% and 100%, with a mean of 84.5% for the original items and 86.1% for all items, implying a strong content validation outcome. For 21 out of 24 original items the percentage of correct classifications was above 72%.

Based on the expert ratings, we revised some scales. We kept all original items (already used in Study 1) that were correctly classified by at least 72% of the experts (i.e., the percentage of correct classifications required to regard content validities as moderate at least, Colquitt et al., 2019) and replaced items not meeting this criterion by newly developed items. For capital-based exercise-to-work enrichment, two items did not meet the 72% criterion. In this case we kept the item with the broader scope, in an attempt to achieve a better coverage of the underlying construct (“Taking part

in physical exercise helps me feel personally fulfilled and this helps me coping better with the demands of my job”). Eliminating poorly classified items resulted in three revised scales for the work-exercise constructs and three revised scales for the work-eating constructs. Five work-exercise scales and five work-eating scales remained unchanged. For all items used in the final work-exercise and work-eating scales, mean prototypicality ratings were 4.46 ($SD=0.36$) and 4.49 ($SD=0.34$), respectively. Mean comprehensibility ratings were 4.51 ($SD=0.27$) and 4.52 ($SD=0.26$), respectively.

Study 3

In Study 3, we aimed at testing the factor structure and the nomological net of the slightly adapted work-exercise and work-eating scales.

Method

Sample

We collected data for Study 3 in a sample of 226 employees (49.6% female), recruited via an online panel (www.respondi.com) that offers survey participation to interested individuals in exchange for gift vouchers. Persons aged between 18 and 65 years and employed at least 20 h per week were invited for study participation (self-employed persons and freelancers were excluded because they might have more control in designing the interface between their work and health behaviors).

Participants' mean age was 43.40 years ($SD=12.38$) and 25.2% had an university degree. Participants' BMI ranged from 16.65 to 52.07 ($M=26.87$, $SD=6.20$). Most participants (76.1%) reported that they spend at least one hour per week on physical exercise. Table S1 reports information about participants' jobs and work hours.

Measures

Measures included refined measures for the work-exercise and work-eating constructs (see Study 2) as well as measures used for analyzing the nomological net.

Work-Exercise Measures and Work-Eating Measures To test the construct validity of the slightly revised scales, we used 21 of the original items and 3 newly developed items for each of the two types of health behaviors (i.e., a total of 24 items for the physical exercise and 24 items for the healthy eating). As in Study 1, we used a Likert response format ranging from 1 (*fully disagree*) to 5 (*fully agree*).

Job Factors We assessed job demands with three items from the effort measure of the short effort-reward imbalance assessment (Siegrist et al., 2009) in its German version (TNS Infratest Sozialforschung, 2016). A sample item is: “I have constant time pressure due to a heavy workload”. Cronbach's Alpha was 0.73. For assessing rewards, we

used seven items from the same short measure of effort-reward imbalance (Siegrist et al., 2009; TNS Infratest Sozialforschung, 2016). A sample item is: “I receive the respect I deserve from my superiors”. Cronbach’s Alpha was 0.79. We assessed work hours by asking about the actual work hours (including overtime) per week.

Organizational Health Behavior Climate For measuring organizational health behavior climate, we differentiated between physical exercise and healthy eating. We assessed these two components with 12 items each, using items developed by Sonnentag and Pundt (2016). Sample items are “Here, it is expected that you will be physically active on a regular basis” (physical exercise component) and “If you are interested in eating healthier, you will get support from this organization” (healthy eating component). Cronbach’s Alpha was 0.94 for each of the two climate components.

Exercise Identity and Healthy-Eater Identity We measured exercise identity with nine items from Anderson and Cychosz (1994; German version by Sonnentag & Pundt, 2016; sample item: “I need to exercise to feel good about myself”). Cronbach’s Alpha was 0.94. In line with Strachan and Brawley (2009), we adapted these items to assess healthy eater identity (sample item: “I need to eat healthily to feel good about myself”). Cronbach’s Alpha was 0.91.

Physical Exercise We measured physical exercise with items from the EHIS-PAQ (Finger et al., 2015) in its German version (Robert Koch-Institut, 2017). Specifically, we assessed the number of days in a typical week spent for at least ten minutes on low-to-moderate physical exercise (described to participants as “sport, fitness or recreational physical activities that cause at least a small increase in breathing or heart rate”), the amount of time spent on these exercise activities per week, and the number of days in a typical week spent on resistance training or strength exercises. In addition, we asked about the number of days in a typical week spent for at least ten minutes on intense physical exercise that lead to a larger increase in breathing or heart rate (i.e., vigorous physical exercise; Brown et al., 2004) and about the amount of time spent on these exercise activities per week.

Eating Behavior We focused on the consumption of fruits and vegetables as healthy food and the consumption of sugar-intense products as unhealthy food based on the empirical evidence about the health impact of specific food choices (Lloyd-Williams et al., 2008; Wang et al., 2014; Yang et al., 2014), research practice in earlier studies (Conner et al., 2015; Sonnentag et al., 2017), and feasibility issues (i.e., in daily life it is difficult to judge the nutritional quality of entire meals as opposed to single food items; Bucher et al., 2015). Specifically, we used items from the Food Frequency List (Winkler & Döring, 1998) with a 7-point response format ranging from 1 (*never*) to 7 (*several times per day*), asking about how often participants consumed specific food items. We assessed the frequency of eating fruits and vegetables with three items (“fresh fruits”, “salads or raw vegetables”, “cooked vegetables”; Cronbach’s Alpha = 0.74) and the frequency of eating sugar-intense products

with another set of three items (“cakes, pastry, cookies”, “chocolates”, “sweets such as drops and compote”; Cronbach’s Alpha=0.72). In addition, we assessed snacking behavior with single items from Sonnentag et al. (2017) with “fresh fruits” referring to healthy food and “sweets such as sweet drops or chocolate “ referring to unhealthy food. We used an 8-point response format ranging from 1 (*never*) to 8 (*several times per day*).

Statistical Analysis

We examined the construct validity of the revised enrichment and conflict scales with confirmatory factor analyses conducted in Mplus 7.4. As in Study 1, we specified separate eight-factor models for each of the two types of health behavior (physical exercise, healthy eating) and tested these eight-factor models against alternative models.

Results

Confirmatory Factor Analysis and Descriptive Information

Table 7 shows the results from the CFA examining the work-exercise constructs. An eight-factor model that differentiated between all eight dimensions and specified all items loading on the respective dimension showed an excellent fit, $\chi^2=322.697$, $df=224$, CFI=0.980, TLI=0.975, RMSEA=0.044. This eight-factor model fit the data better than all alternative models.⁶ Table 1 displays standardized factor loadings for the eight-factor model.

Table 8 displays the CFA results for the interface between work and healthy eating. Again, an eight-factor model that differentiated between all eight dimensions and specified loadings of all items on their respective factors had a very good fit, $\chi^2=373.695$, $df=224$, CFI=0.965, TLI=0.956, RMSEA=0.054. This eight-factor model had a better fit than most alternative models. Model fit of the eight-factor model was not superior to a seven-factor model (Model 2d) with items assessing time-based and strain-based eating-to-work conflict loading on one common factor, suggesting that time-based and strain-based conflict eating-to-work conflict cannot be differentiated.⁷

⁶ In additional tests for discriminant validity (Shaffer et al., 2016), the CFI difference between the eight-factor model and one of the seven-factor models did not exceed .002. Three correlation coefficients between the eight factor scores exceeded .85, suggesting that differentiation between sub-constructs within work-to-eating enrichment, eating-to-work enrichment, and work-to-eating conflict is problematic. Comparing the four-factor model with three-factors models resulted in evidence for discriminant validity, based on Chi²-difference tests, smallest Chi²=535.393, $df=3$, $p<.001$, CFI differences (Table 7), and correlations between factor scores (with the highest correlation of .76).

⁷ Additional tests for discriminant validity (Shaffer et al., 2016) revealed that the CFI difference between the eight-factor model and one of the seven-factor models did not exceed .002. Five correlation coefficients between the eight factor scores exceeded .85, failing to provide evidence for discriminant validity between some of the eight sub-constructs. When comparing the four-factor that separates the four main constructs, there was clear evidence for discriminant validity, based on Chi²-difference tests, Chi²=207.229, $df=3$, $p<.001$, CFI difference (Table 8), and correlations between factor scores (with the highest correlation of .59).

Table 7 Results of confirmatory factor analyses for work-exercise enrichment and work-exercise conflict (Study 3, $N=226$)

	χ^2	<i>df</i>	CFI	TLI	RMSEA	$\Delta\chi^2$	Δdf	<i>p</i>
Model 1: Eight-factor model	322.697	224	0.980	0.975	0.044			
Model 2a: Seven-factor model	344.218	231	0.977	0.972	0.047	21.521	7	.003
Model 2b: Seven-factor model	338.271	231	0.978	0.974	0.045	15.574	7	.029
Model 2c: Seven-factor model	416.258	231	0.962	0.955	0.060	93.561	7	<.001
Model 2d: Seven-factor model	357.010	231	0.974	0.969	0.049	34.313	7	<.001
Model 3: Four-factor model	481.948	246	0.952	0.946	0.065	159.251	22	<.001
Model 4a: Three-factor model	1,354.213	249	0.773	0.748	0.140	1,031.516	25	<.001
Model 4b: Three-factor model	1,338.831	249	0.776	0.752	0.139	1,016.134	25	<.001
Model 4c: Three-factor model	1,017.341	249	0.842	0.825	0.117	694.644	25	<.001
Model 4d: Three-factor model	1,103.640	249	0.824	0.805	0.123	780.943	25	<.001
Model 5a: Two-factor model	2,128.273	251	0.614	0.576	0.182	1,805.576	27	<.001
Model 5b: Two-factor model	1,609.053	251	0.721	0.693	0.155	1,286.356	27	<.001
Model 6: One-factor model	2,636.932	252	0.510	0.463	0.205	2,314.235	28	<.001

CFI comparative fit index; *TLI* Tucker-Lewis Index; *RMSEA* root-mean-square error of approximation

Model 1: All eight constructs loading on distinct factors. Model 2a: Affect-based and capital-based work-to-exercise enrichment loading on one common factor. Model 2b: Affect-based and capital-based exercise-to-work enrichment loading on one common factor. Model 2c: Time-based and strain-based work-to-exercise conflict loading on one common factor. Model 2d: Time-based and strain-based exercise-to-work conflict loading on one common factor. Model 3: Work-to-exercise enrichment, exercise-to-work enrichment, work-to-exercise conflict, and exercise-to-work conflict as four distinct factors. Model 4a: Exercise-to-work enrichment and exercise-to-work conflict as two distinct factors, work-to-exercise enrichment and work-to-exercise conflict loading on one common factor. Model 4b: Work-to-exercise enrichment and work-to-exercise conflict as two distinct factors, exercise-to-work enrichment and exercise-to-work conflict loading on one common factor. Model 4c: Work-to-exercise conflict and exercise-to-work conflict as two distinct factors, work-to-exercise enrichment and exercise-to-work enrichment loading on one common factor. Model 4d: Work-to-exercise enrichment and exercise-to-work enrichment as two distinct factors, work-to-exercise conflict and exercise-to-work conflict loading on one common factor. Model 5a: All work-to-exercise items loading on one factor, all exercise-to-work items loading on another factor. Model 5b: All enrichment items loading on one factor and all conflict items loading on another factor

Tables 9 and 10 display descriptives, zero-order correlations, and Cronbach's Alphas for the work-exercise scales and work-eating scales, respectively. Generally, participants reported medium levels of enrichment and conflict from work to health behaviors. With respect to the opposite direction from health behavior to work, scores for enrichment were relatively high and scores for conflict were comparably low. All Cronbach's Alphas exceeded 0.75. Similar to the correlational patterns found in Study 1, the intercorrelations between the enrichment scales and the conflict scales were low to moderate. Correlations within work-exercise enrichment scales and within work-eating enrichment scales were relatively high, indicating that the enrichment processes from work to health behaviors and from health behaviors to work covary. Again, correlations among the subscales referring to the same enrichment or conflict construct were particularly high.

Table 8 Results of confirmatory factor analyses for work-eating enrichment and work-eating conflict (Study 3, $N=226$)

	χ^2	<i>df</i>	CFI	TLI	RMSEA	$\Delta \chi^2$	Δdf	<i>p</i>
Model 1: Eight-factor model	373.695	224	0.965	0.956	0.054			
Model 2a: Seven-factor model	397.314	231	0.961	0.953	0.056	23.619	7	.001
Model 2b: Seven-factor model	401.017	231	0.960	0.952	0.057	27.322	7	<.001
Model 2c: Seven-factor model	406.548	231	0.958	0.950	0.058	32.853	7	<.001
Model 2d: Seven-factor model	379.656	231	0.965	0.958	0.053	5.961	7	.544
Model 3: Four-factor model	454.421	246	0.951	0.945	0.061	80.726	22	<.001
Model 4a: Three-factor model	1,503.768	249	0.703	0.671	0.149	1,130.073	22	<.001
Model 4b: Three-factor model	1,215.844	249	0.771	0.746	0.131	842.149	22	<.001
Model 4c: Three-factor model	661.650	249	0.902	0.892	0.086	287.955	22	<.001
Model 4d: Three-factor model	805.606	249	0.868	0.854	0.099	431.911	22	<.001
Model 5a: Two-factor model	2,134.808	251	0.554	0.510	0.182	1,761.113	24	<.001
Model 5b: Two-factor model	1,003.754	251	0.822	0.804	0.115	630.059	24	<.001
Model 6: One-factor model	2,336.583	252	0.507	0.460	0.191	1,962.888	25	<.001

CFI comparative fit index; *TLI* Tucker-Lewis Index; *RMSEA* root-mean-square error of approximation

Model 1: All eight constructs loading on distinct factors. Model 2a: Affect-based and capital-based work-to-eating enrichment loading on one common factor. Model 2b: Affect-based and capital-based eating-to-work enrichment loading on one common factor. Model 2c: Time-based and strain-based work-to-eating conflict loading on one common factor. Model 2d: Time-based and strain-based eating-to-work conflict loading on one common factor. Model 3: Work-to-eating enrichment, eating-to-work enrichment, work-to-eating conflict, and eating-to-work conflict as four distinct factors. Model 4a: Eating-to-work enrichment and eating-to-work conflict as two distinct factors, work-to-eating enrichment and work-to-eating conflict loading on one common factor. Model 4b: Work-to-eating enrichment and work-to-eating conflict as two distinct factors, eating-to-work enrichment and eating-to-work conflict loading on one common factor. Model 4c: Work-to-eating conflict and eating-to-work conflict as two distinct factors, work-to-eating enrichment and eating-to-work enrichment loading on one common factor. Model 4d: Work-to-eating enrichment and exercise-to-work enrichment as two distinct factors, work-to-eating conflict and eating-to-work conflict loading on one common factor. Model 5a: All work-to-eating items loading on one factor, all eating-to-work items loading on another factor. Model 5b: All enrichment items loading on one factor and all conflict items loading on another factor

Testing the Nomological Net

After having examined construct validity in CFAs and having inspected descriptive information, we proceeded with testing the nomological net of the newly developed scales, using a correlational approach. Table 11 shows the results.

Job Factors

In line with Hypotheses 1a and 1b, job demands were positively related to work-to-exercise conflict ($r=0.33$ for time-based conflict, $r=0.39$ for strain-based conflict) and work-to-eating conflict ($r=0.41$ for time-based conflict, $r=0.41$ for strain-based conflict). Job rewards were positively related to work-to-exercise enrichment ($r=0.42$ for capital-based enrichment, $r=0.49$ for affect-based enrichment) and

Table 9 Means, standard deviations, Cronbach's Alphas and zero-order correlations between work-exercise measures (Study 3)

Variable	<i>M</i>	<i>SD</i>	Min	Max	Alpha	1	2	3	4	5	6	7
1 Capital-based work-to-exercise enrichment	2.64	1.10	1.00	5.00	.92							
2 Affect-based work-to-exercise enrichment	2.60	1.08	1.00	5.00	.90	.87						
3 Capital-based exercise-to-work enrichment	3.05	1.14	1.00	5.00	.92	.71	.69					
4 Affect-based exercise-to-work enrichment	3.21	1.14	1.00	5.00	.93	.66	.67	.90				
5 Time-based work-to-exercise conflict	2.69	1.13	1.00	5.00	.88	-.22	-.28	-.24	-.23			
6 Strain-based work-to-exercise conflict	2.85	1.19	1.00	5.00	.91	-.42	-.47	-.42	-.40	.77		
7 Time-based exercise-to-work conflict	1.90	1.00	1.00	5.00	.87	.24	.21	.07	.05	.41	.28	
8 Strain-based exercise-to-work conflict	2.07	0.92	1.00	5.00	.77	.01	.05	-.15	-.11	.51	.44	.82

N = 226. Correlations $\geq .14$ are significant with $p < .05$. Correlations $\geq .18$ are significant with $p < .01$. Correlations $\geq .22$ are significant with $p < .001$

Table 10 Means, standard deviations, Cronbach's Alphas and zero-order correlations between work-eating measures (Study 3)

Variable	<i>M</i>	<i>SD</i>	Min	Max	Alpha	1	2	3	4	5	6	7
1 Capital-based work-to-eating enrichment	2.86	0.97	1.00	5.00	.85							
2 Affect-based work-to-eating enrichment	2.87	1.03	1.00	5.00	.92	.85						
3 Capital-based eating-to-work enrichment	3.07	0.98	1.00	5.00	.83	.78	.73					
4 Affect-based eating-to-work enrichment	3.36	0.92	1.00	5.00	.86	.67	.65	.87				
5 Time-based work-to-eating conflict	2.60	1.14	1.00	5.00	.87	-.30	-.36	-.26	-.32			
6 Strain-based work-to-eating conflict	2.62	1.20	1.00	5.00	.92	-.36	-.39	-.32	-.37	.82		
7 Time-based eating-to-work conflict	1.88	0.87	1.00	4.67	.79	.06	.00	-.02	-.12	.55	.53	
8 Strain-based eating-to-work conflict	2.07	0.86	1.00	5.00	.79	.03	.00	-.02	-.13	.54	.58	.80

N = 226. Correlations $\geq .14$ are significant with $p < .05$. Correlations $\geq .18$ are significant with $p < .01$. Correlations $\geq .22$ are significant with $p < .001$

Table 11 Nomological net of enrichment and conflict scales (Study 3, *N* = 226)

Variable	Physical exercise						Healthy eating												
	Enrichment			Conflict			Enrichment			Conflict									
	Work to exercise	Exercise to work	Work to exercise	Exercise to work	Work to exercise	Exercise to work	Work to eating	Eating to work	Work to eating	Eating to work	Work to eating	Eating to work							
<i>M</i>	<i>SD</i>	<i>CAP</i>	<i>AFF</i>	<i>CAP</i>	<i>AFF</i>	<i>TIME</i>	<i>STR</i>	<i>CAP</i>	<i>AFF</i>	<i>TIME</i>	<i>STR</i>	<i>TIME</i>	<i>STR</i>						
Job demands	2.64	0.69	-0.15	-0.20	-0.02	-0.03	.39	.14	.14	.14	.14	-.15	-.26	-.10	-.11	.41	.41	.22	.18
Rewards	2.54	0.57	.42	.49	.31	.29	-.23	-.36	-.06	-.14	-.14	.48	.47	.38	.33	-.35	-.35	-.11	-.15
Work hours	37.33	8.52	.08	.09	.06	.02	.10	.04	.05	.01	.04	.00	.00	.01	-.04	.06	.03	.05	.08
OHBC exercise	2.26	0.93	.39	.40	.30	.29	-.05	-.13	.25	.14	.40	.38	.38	.24	-.05	-.09	-.17	.17	.17
OHBC eating	2.27	0.96	.37	.39	.25	.25	.02	-.06	.25	.14	.44	.43	.40	.26	-.10	-.11	.13	.16	.16
Exercise identity	2.83	1.02	.56	.52	.72	.69	-.23	-.45	.09	-.08	.40	.32	.53	.48	-.13	-.21	.03	.04	.04
Healthy-eater identity	3.05	0.83	.44	.42	.52	.53	-.11	-.26	.03	-.08	.46	.37	.61	.61	-.22	-.27	-.05	-.07	-.07
Low to moderate exercise (days/week)	2.07	1.82	.36	.35	.43	.42	-.23	-.37	.02	-.08	.28	.19	.31	.27	-.15	-.19	-.03	-.03	-.03
Low to moderate exercise (time/week)	2.83	3.10	.37	.41	.44	.40	-.19	-.31	.04	-.06	.30	.26	.34	.29	-.12	-.16	-.03	-.03	-.03
Intense exercise (days/week)	1.83	1.86	.26	.25	.27	.31	-.17	-.30	.04	-.03	.26	.15	.22	.16	-.10	-.18	.00	-.02	-.02
Intense exercise (time/week)	2.11	3.36	.14	.17	.15	.20	-.18	-.25	-.04	-.08	.16	.11	.14	.06	-.15	-.20	-.10	-.13	-.13
Strength training (days/week)	1.53	1.73	.28	.25	.33	.32	-.14	-.29	.03	-.03	.20	.18	.28	.26	-.09	-.15	-.02	.02	.02
Eating: Fruits and vegetables	4.71	0.99	.12	.10	.06	.09	-.04	-.08	.02	-.01	.22	.18	.25	.18	-.17	-.18	-.04	-.08	-.08
Eating: Sweets	3.83	1.06	.21	.13	.05	.01	.02	.00	.17	.18	.23	.23	.19	.15	-.03	.03	.20	.13	.13
Snacks: Fresh fruits	5.38	1.73	.14	.15	.07	.11	-.02	-.08	.02	-.01	.27	.26	.23	.16	-.14	-.17	-.02	-.05	-.05
Snacks: Sweets	4.63	1.79	.10	.03	-.01	-.03	.01	.04	.09	.06	.11	.13	.06	.07	.04	.12	.10	.09	.09
Body Mass Index	26.87	6.20	-.23	-.23	-.26	-.24	.13	.25	.00	.10	-.16	-.16	-.15	-.19	.12	.17	.03	.04	.04

CAP = Capital-based enrichment. AFF = Affect-based enrichment. TIME = Time-based conflict. STR = Strain-based conflict

OHBC = Organizational health behavior climate. Correlations $\geq .14$ are significant with $p < .05$. Correlations $\geq .18$ are significant with $p < .01$. Correlations $\geq .22$ are significant with $p < .001$

work-to-eating enrichment ($r=0.48$ for capital-based enrichment, $r=0.47$ for affect-based enrichment), supporting Hypotheses 2a and 2b. Work hours neither related to work-to-exercise conflict ($r=0.10$ for time-based conflict, $r=0.04$ for strain-based conflict) nor to work-to-eating conflict ($r=0.06$ for time-based conflict, $r=0.03$ for strain-based conflict). These findings contrast with Hypotheses 3a and 3b.

Organizational Health Behavior Climate

Results showed that organizational health behavior climate targeting physical exercise was positively related to work-to-exercise enrichment ($r=0.39$ for capital-based enrichment, $r=0.40$ for affect-based enrichment), as predicted in Hypothesis 4a. However, it was unrelated to work-to-exercise conflict ($r=-0.05$ for time-based conflict, $r=-0.13$ for strain-based conflict), failing to support Hypothesis 4b. In line with Hypothesis 5a, organizational health behavior climate targeting healthy eating was positively related to work-to-eating enrichment ($r=0.44$ for capital-based enrichment, $r=0.43$ for affect-based enrichment). However, it was unrelated to work-to-eating conflict ($r=-0.10$ for time-based conflict, $r=-0.11$ for strain-based conflict), providing no support for Hypothesis 5b.

Exercise Identity and Healthy-Eater Identity

In line with Hypotheses 6a and 6b, exercise identity was positively related to work-to-exercise enrichment ($r=0.56$ for capital-based enrichment, $r=0.52$ for affect-based enrichment) and exercise-to-work enrichment ($r=0.72$ for capital-based enrichment, $r=0.69$ for affect-based enrichment). As predicted in Hypothesis 7, exercise identity was negatively related to work-to-exercise conflict ($r=-0.23$ for time-based conflict and $r=-0.45$ for strain-based conflict). Concerning Research Question 1, exercise identity was unrelated to exercise-to-work conflict ($r=0.09$ for time-based conflict, $r=-0.08$ for strain-based conflict).

In support of Hypotheses 8a and 8b, healthy-eater identity was positively related to work-to-eating enrichment ($r=0.46$ for capital-based enrichment, $r=0.37$ for affect-based enrichment) and eating-to-work enrichment ($r=0.61$ for capital-based and affect-based enrichment). In line with Hypothesis 9, healthy-eater identity was negatively related to work-to-eating conflict ($r=-0.22$ for time-based conflict, $r=-0.27$ for strain-based conflict). Concerning Research Question 2, healthy-eater identity was unrelated to eating-to-work conflict ($r=-0.05$ for time-based conflict, $r=-0.07$ for strain-based conflict).

Health Behaviors

In line with Hypothesis 10a, work-to-exercise enrichment was positively related to all aspects of physical exercise, including days spent on low to moderate physical exercise ($r=0.36$ for capital-based enrichment, $r=0.35$ for affect-based enrichment), time spent on low to moderate physical exercise ($r=0.37$ for capital-based enrichment, $r=0.41$ for affect-based enrichment), days spent on intense physical

exercise ($r=0.26$ for capital-based enrichment, $r=0.25$ for affect-based enrichment), time spent on intense physical exercise ($r=0.14$ for capital-based enrichment, $r=0.17$ for affect-based enrichment), and days spent on strength training ($r=0.28$ for capital-based enrichment, $r=0.25$ for affect-based enrichment). In line with Hypothesis 10b, the opposite correlational pattern emerged for work-to-exercise conflict. Specifically, work-to-exercise conflict was negatively related to days spent on low to moderate physical exercise ($r=-0.23$ for time-based conflict, $r=-0.37$ for strain-based conflict), time spent on low to moderate physical exercise ($r=-0.19$ for time-based conflict, $r=-0.31$ for strain-based conflict), days spent on intense physical exercise ($r=-0.17$ for time-based conflict, $r=-0.30$ for strain-based conflict), time spent on intense physical exercise ($r=-0.18$ for time-based conflict, $r=-0.25$ for strain-based conflict), and days spent on strength training ($r=-0.14$ for time-based conflict, $r=-0.29$ for strain-based conflict). Inspection of the correlation table further shows that persons who spent more time on physical exercise reported a higher degree of exercise-to-work enrichment. Spending more time on physical exercise, however, was unrelated to exercise-to-work conflict.

With respect to eating behavior, work-to-eating enrichment was positively related to the overall consumption of fruits and vegetables ($r=0.22$ for capital-based enrichment, $r=0.18$ for affect-based enrichment) and to the consumption of fresh fruits as snacks ($r=0.27$ for capital-based enrichment, $r=0.26$ for affect-based enrichment), providing support for Hypothesis 11a. Contrary to Hypothesis 11a, work-to-eating enrichment was positively related to the consumption of sugar-intense foods ($r=0.23$ for capital-based enrichment, $r=0.23$ for affect-based enrichment). In line with Hypothesis 11b, work-to-eating conflict showed relatively weak but still significant negative correlations with the overall consumption of fruits and vegetables ($r=-0.17$ for time-based conflict, $r=-0.18$ for strain-based conflict) and the consumption of fresh fruits as snacks ($r=-0.14$ for time-based conflict, $r=-0.17$ for strain-based conflict). Work-to-eating conflict was unrelated to the overall consumption of sugar-intense foods and sweets snacks. Taken together, support for Hypotheses 11a and 11b was mixed, with the consumption of fruits and vegetables as relatively healthy foods and snacks being in line the hypotheses. However, for sugar-intense foods and sweet snacks, we did not find the expected correlational pattern.

Body Mass Index

Work-to-exercise enrichment was negatively related to BMI ($r=-0.23$ for capital-based enrichment, $r=-0.23$ for affect-based enrichment). Strain-based work-to-exercise conflict was positively related to BMI ($r=0.25$), but time-based work-to-exercise conflict missed the conventional significance level of $p < 0.05$ ($r=0.13$). Work-to-eating enrichment was negatively related to BMI ($r=-0.16$ for time-based conflict, $r=-0.16$ for strain-based conflict). Strain-based work-to-eating conflict was positively related to BMI ($r=0.17$), but time-based conflict was not. Taken together, correlational patterns with BMI are fully in line with our hypotheses on enrichment (Hypotheses 12a and 13a). With respect to hypotheses on conflict (Hypotheses 12b

and 13b), findings for strain-based conflict are in line with the hypotheses while findings for time-based conflict are not.

Supplementary Analysis

In a supplementary analysis, we addressed the question if the correlational patterns uncovered in our hypothesis tests can be explained by third variables. For instance, the correlation between job demands and work-to-eating conflict might be due to high trait negative affectivity because trait negative affectivity might have influenced both the experience or reporting of high demands and the experience or reporting that work interferes with healthy eating. Similarly, trait positive affectivity might have influenced both positive perceptions of one's environment (e.g., organizational health behavior climate) and the experience or reporting of work-to-exercise enrichment. To rule out these interpretations, we computed two sets of partial correlations between our core study variables. In one set, we controlled for trait negative affectivity (assessed with 10 negative-affect items from the PANAS, Watson et al., 1988; Cronbach's Alpha=0.85) and in the other we controlled for trait positive affectivity (assessed with 10 positive-affect items from the PANAS; Watson et al., 1988; Cronbach's Alpha=0.90). Analyses showed that some of the correlations dropped in size when controlling for trait positive or negative affectivity, but the overall picture remained unchanged and most of the significant bivariate correlations remained significant when controlling for trait affectivity (Tables S2 and S3 in Online Supplement). Interestingly, a notable exception occurred for the relationship between work-to-eating constructs and the consumption of fruits and vegetables, with most of the correlations that had been significant in the bivariate analysis turned marginally significant when controlling for trait affectivity.

Discussion

Summary of Findings

In this research, we addressed the everyday experience that work can enrich or harm health behaviors and that health behaviors can enrich or harm work experiences and behavior. Focusing on physical exercise and healthy eating as two important health behaviors, we introduced the concepts of enrichment versus conflict between work and health behaviors. We developed and validated short scales assessing mutual enrichment and conflict between work and health behaviors.

The final scales have good psychometric properties and correlate with job and organizational factors, identity-related constructs as well as actual physical exercise, eating behavior, and BMI. Interestingly, correlations between work hours on the one hand and enrichment and conflict on the other hand were low in size and non-significant. These findings suggest that long work hours do not matter for the perception that work enriches versus conflicts with health behaviors. This result is noteworthy

because when directly asked, employees mention time constraints as one prime reason for why they are not exercising and not following a healthy diet (Mazzola et al., 2019). Maybe, time constraints originating from other life roles (e.g., household or childcare tasks) play a more important role in compromising physical exercise and healthy eating than do long work hours.

Organizational health behavior climates targeting physical exercise and healthy eating were related to work-to-exercise enrichment and work-to-eating enrichment, respectively, but neither to work-to-exercise conflict nor work-to-eating conflict. These findings might imply that the practical impact that follows from a favorable organizational health behavior climate is not strong enough to counteract conflict experiences that originate from other sources (e.g., high effort investment into work due to high job demands).

Moreover, we found that exercise identity and healthy-eater identity were positively related to enrichment between work and physical exercise and to enrichment between work and healthy eating, respectively. These findings might imply that strong exercise and healthy-eater identities fuel the perception that the respective health behaviors benefit other life roles such as work. Strong exercise and healthy-eater identities, however, were unrelated to exercise-to-work conflict and eating-to-work conflict, respectively.

Importantly, our research showed that enrichment versus conflict between work and health behaviors were related to actual health behavior. The degree to which employees reported that work enriches their physical exercise was positively related to various categories of self-reported exercise behavior and the degree to which employees reported that work interferes with physical exercise negatively correlated with various categories of self-reported exercise behavior. Work-to-eating enrichment was positively related to healthy eating behavior (i.e., eating vegetables and fruits and consuming fresh fruits as snacks), whereas work-to-eating conflict was negatively related to these healthy eating behaviors. Work-to-eating enrichment, however, was positively related to eating sugar-intense products such as cakes and chocolate (i.e., foods that are usually seen as unhealthy; Bucher et al., 2015). This finding might be explained by a compensatory process such as morale licensing (Reily et al., 2020). When perceiving work as contributing to healthy eating by, for instance, eating fruits and vegetables one might feel entitled to consume less healthy food as well, resulting in a higher consumption of sugar-intense food.

Theoretical Implications

Our research has important theoretical implications. First, we demonstrate that employees experience that work can both enrich and conflict with physical exercise and healthy eating. Similarly, employees experience that physical exercise and healthy eating enrich work and conflict with work. Importantly, employees can differentiate between enriching and conflicting experiences (i.e., a conflict experience is not just the opposite of an enrichment experience) and they can differentiate between the two directions of the respective enriching versus conflict experiences (i.e., from work to health behaviors versus from health behaviors to work).

In more technical terms, our studies showed that the major enrichment and conflict constructs can be clearly separated. Differentiation between sub-dimensions within the major enrichment and conflict constructs, however, is less straightforward. For instance, capital-based enrichment correlated highly with affect-based enrichment. Similarly, time-based conflicts correlated highly with strain-based conflicts. These findings suggest that study participants were less able to differentiate between the specific experiences that drive enrichment (i.e., capital versus affect) and conflict (e.g., lack of time versus strain).

Second, our research shows that job factors are associated with enrichment and conflict between work and health behaviors. When work is perceived to be demanding, employees feel that work conflicts with physical exercise and healthy eating. When work is perceived to provide rewards, employees experience mutual enrichment between work and health behaviors. This result is consistent with the effort-reward imbalance model (Siegrist & Li, 2016) that argues that not only effort but also rewards matter for health, possibly by impacting health behaviors as one important pathway (French et al., 2019). Our findings are in line with the conservation-of-resources (COR) perspective which posits that the availability of resources facilitates the attainment of more resources (resource gain), whereas the lack of resources leads to a further decrease in resources (resource loss; Halbesleben et al., 2014). Considering that physical exercise and healthy eating benefit health and well-being (Calderwood et al., 2021; Wang et al., 2014), these behaviors can be seen as resources that result from the availability of other resources and support further resource gain. More specifically, the correlational pattern between rewards and job demands on the one hand and enrichment and conflict between work and health behaviors on the other hand, illustrates resource gain and resource loss suggested by the COR framework. In a situation of high resources (i.e., high rewards at work), people feel that work facilitates physical exercise and healthy eating. This enrichment experience, in turn, is associated with the respective health behaviors that have the potential to provide further resources such as positive affect, physical strength, a good nutritional state, and ultimately a better health. However, in a situation of low and threatened resources (i.e., high demands and low rewards at work), people feel that work interferes with physical exercise and healthy eating, limiting the chances that they engage in physical exercise and healthy eating that could provide further resources and protect from negative health consequences. However, these interpretations referring to the COR perspective remain speculative because our cross-sectional design does not allow any inference about causality.

Third, our studies show that work is strongly related to non-work life. Whereas past studies described that work is closely related to processes happening within the family (Ilies et al., 2007) and recovery experiences during leisure time (Kinunen & Feldt, 2013), our research demonstrates that work also matters for health behaviors such as physical exercise and healthy eating. As argued with respect to the broader work-home interface (ten Brummelhuis & Bakker, 2012), work can provide but also consume resources that can be used for initiating and maintaining health behaviors. Similarly, health behaviors can provide, but also consume resources that may be invested back into work. Thus, at a more abstract level, our study adds to the

growing evidence that work and non-work life mutually affect each other, with non-work life covering the family, leisure time, and health behaviors.

Limitations and Suggestions for Future Research

The contribution of our studies must be seen in the light of some limitations. First, because we relied on self-report data, our findings might be influenced by common method bias (Podsakoff et al., 2012). For instance, stable individual differences might explain the correlational patterns uncovered in the analysis. To address concerns about common method bias, we controlled for trait negative and trait positive affect in supplemental analyses. Although some of the correlations between the constructs of interest were reduced in size, the overall correlational pattern remained unchanged, suggesting that common method bias is not a major threat for our study findings. Nevertheless, future studies might want to use additional data sources such as co-worker reports for workplace factors and organizational health behavior climate. In addition, activity trackers could be used to assess physical exercise and food logs can help to capture healthy-eating behavior.

Second, we developed our enrichment and conflict items based on existing measures in the work-family literature (Carlson et al., 2000; Kacmar et al., 2014). As a consequence, some important aspects of enrichment and conflict might have been neglected. On the one side, for instance, work might help with physical exercise and healthy eating by simply providing a high-enough income that allows to pay for expensive sports equipment and sports-club membership. On the other side, implicit eating norms at work-related dining events may interfere with one's intentions to keep a healthy diet. Thus, future studies might expand the construct space of enrichment and conflict between work and health behaviors.

Third, to assess enrichment and conflict experiences, we used rather complex items. These items were formulated in a similar way as items assessing work-family enrichment and work-family conflict (Carlson et al., 2000; Kacmar et al., 2014) and received rather high comprehensibility ratings in Study 2. Nevertheless, a certain ambiguity remains. That is, items might not only capture actual enrichment and conflict experiences, but also respondents' causal attributions of their exercise and eating behaviors. For instance, one might argue that items targeting work-to-exercise conflict assess respondents' assumed reasons for why they do not exercise. Accordingly, high scores on the respective items could reflect a self-serving bias (Miller & Ross, 1975) with respondents blaming a situational factor (i.e., work) for their undesirable behavior (not exercising more). Although we cannot fully rule out this interpretation, overall correlational patterns speak against this perspective. If the associations between exercise and eating behavior and responses to the conflict and enrichment items were mainly caused by self-serving bias, then not only undesirable behavior would be attributed to external factors, but desirable behavior would be attributed to internal factors (i.e., the self). Thus, external factors (i.e., work) would not be reported as the cause for one's desirable behaviors (exercising and eating healthy) and accordingly correlations of work-to-exercise enrichment and work-to-eating enrichment with physical exercise and healthy eating behavior would be low.

However, correlations of physical exercise and healthy eating behaviors tended to be higher with work-to-exercise and work-to-eating enrichment than with work-to-exercise and work-to-eating conflict. This correlational pattern makes it unlikely that our results just reflect self-serving bias. Nevertheless, future studies may try to disentangle “real” enrichment and conflict processes from attributional processes driven by self-serving motives.

Fourth, another potentially problematic aspect of our measures is that they use double-barreled items (i.e., asking about one aspect of work or health behavior then asking about the impact of this aspect on health behavior or work, respectively). This issue is well known in work-family research (Carlson et al., 2006) where participants usually cope well with these types of items. To gain more insights into respondents’ thinking process when answering the items on work and health behavior, future studies may use cognitive-interviewing methods (Peterson et al., 2017). This approach also can be valuable for gaining more insight into how people who do not care about or do not enjoy exercising and healthy eating respond to our items. Probably, eliciting prototypicality and comprehensibility ratings from the general working population could be helpful in this regard as well.⁸ As a final note on the measures, future studies should continue to pay attention to the reliabilities because in Study 1 two of the reliability coefficients were quite low.

Fifth, we focused on correlations between enrichment versus conflict experiences and their potential predictors and outcomes, neglecting the mediating pathways underlying the relationships. Although examining the nomological net of new constructs is an important step in the research process, more needs to be known about the mechanisms that link job factors to enrichment and conflict experiences and that link enrichment and conflict experiences to actual health and workplace behaviors. Future research can build on our studies and use the enrichment and conflict scales to bring more light into the interplay between work and health behaviors. It would be promising to follow a resource perspective (Halbesleben et al., 2014; Ten Brummelhuis & Bakker, 2012) and identify the type of resources that, first, are needed for enabling enrichment and avoiding conflict experiences and, second, that are strengthened by enrichment experiences and threatened by conflict experiences.

Moreover, it would be interesting to examine how enrichment and conflict experiences unfold during daily lives. For instance, researchers may address the question about which events and encounters at work stimulate the perception that work facilitates versus hinders physical exercise and healthy eating behaviors. Similarly, it would be worthwhile to examine how the enrichment versus conflict experiences from exercise or eating behavior to work manifest in specific work behaviors.

Practical Implications

Our research has practical implications. First, our newly developed scales can be used in organizational health psychology programs as a tool for measuring

⁸ We are grateful to one of the anonymous reviewers for these suggestions.

employees' perceptions of how work relates to health behavior. Findings from such assessments can point to the necessity to further explore potential reasons for low enrichment and high conflict scores, such as workplace factors or (false) perceptions about the role of specific features of one's work. Second, findings from the correlational analysis highlight some starting points for practical interventions. As enrichment and conflict scores showed significant correlations with BMI which is a risk factor for severe health problems (Guh et al., 2009), in a first step the scales may help to identify perceptions about the role of work for an elevated BMI score. In a second step, workplace factors need to be addressed as potential causes of low enrichment and high conflict experiences. As a consequence, workplace interventions that link job-design efforts with stress-management programs could be implemented. In a third step, following from our correlational analysis, programs fostering physical exercise and healthy eating could be offered (Díaz-Benito et al., 2020; Naicker et al., 2021), particularly to high-risk and highly vulnerable groups. Probably, it will not only be important to encourage and teach the respective health behaviors, but to address employees' perceptions of enrichment versus conflict (Zahrt & Crum, 2020) as well as their physical exercise and healthy-eater identities (Anderson & Cychosz, 1994; Strachan & Brawley, 2008).

Conclusion

To conclude, our studies showed that employees can experience the mutual impact of work and health behavior as enriching and conflicting. Moreover, the various enrichment and conflict experiences can be clearly differentiated in confirmatory factor analyses. Enrichment and conflict experiences show meaningful correlations with job and organizational factors, identity, and behavioral outcomes. We hope that the availability of the short scales will inspire researchers to examine in greater depth enrichment and conflict between work and health behaviors and the implications of these experiences for living a healthy life.

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Data Availability (Data Transparency) Data are available upon request; please contact the corresponding author.

Code Availability Mplus and R code are available upon request; please contact the corresponding author.

Declarations

Ethics Approval This is a correlational study. No ethical approval is required for purely correlational studies in Germany.

Consent to Participate Informed consent was obtained from all individual participants included in the studies.

Competing Interests The authors have no relevant financial or non-financial interests to disclose.

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