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Does a Healthy Lifestyle Matter? A Daily Diary Study of Unhealthy Eating at Home and Behavioral Outcomes at Work

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With abundant health-related information, the modern workforce is advised to engage in health-promoting behaviors such as good sleep, physical activities, and a healthy diet to stay productive at work. However, no study has provided a theoretical framework or empirical evidence on the association between employees' unhealthy eating behavior and the quality of their performance. Drawing from the stress and coping literature, the current study proposes a moderated mediation model to investigate the day-specific roles of (un)healthy lifestyle in regard to personal well-being and performance at work. We used daily diary data collected from 97 full-time employees and employed an experience sampling method (ESM) to examine this within-person phenomenon for 2 weeks. Our multilevel path analysis reveals that employees' unhealthy eating behavior in the evening led to emotional strain (e.g., guilt) as well as physical strain (e.g., stomach-ache, diarrhea) on the next morning; the emotional and physical strains experienced in the morning served as key mediators resulting in decreased quality of performance (i.e., less helping and more withdrawal behaviors) in the afternoon. Furthermore, emotional stability was found to moderate the relationship between unhealthy eating behavior and morning strains, such that employees with higher emotional stability tended to experience less negative emotions and fewer physical symptoms. The theoretical and practical implications of these findings are discussed, along with suggestions for future studies on health-related behaviors.

Keywords: unhealthy eating behavior, eating-specific negative emotion, physical symptom, helping behavior, work withdrawal

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“Man is what he eats.”

—Lucretius

Today, people are exposed to abundant health-related information from diverse media channels (e.g., TV, social media, newspapers, magazines). In particular, healthy eating/diet has received considerable attention due to the greater public interest in a healthy lifestyle as well as increasing concerns about modern health-related issues such as obesity, diabetes, and cardiovascular disease. For example, most of the leading media outlets include a section that deals specifically with diet-related topics, such as “Well-Nutrition” (*New York Times*), “Health, Diet, and Nutrition” (*Time*), “Food and Diet” (*CNN*), and “Food and Drink” (*The Wall Street Journal*). These sections devote a great deal of space to providing both in-depth and broad information on nutrition and diet regimens for their readership, which reflects today's increasing public awareness

of the importance of eating behaviors on overall health and life in general.

Responding to the escalating interest in and concerns about unhealthy eating behavior in modern society, copious research has been conducted on unhealthy diets, predominantly in the fields of public health, medicine, psychiatry, and food science, and involving a wide range of subdisciplines (e.g., chemistry, microbiology, and engineering). This literature has firmly established the robust associations between diet and well-being outcomes (Newby & Tucker, 2004). In the field of organizational science, a few studies have sought to examine the causes of employees' (un)healthy eating behavior from the perspective of self-regulation and an iso-strain model. In other words, unhealthy eating behavior has been primarily studied as a reflection of ego depletion (e.g., emotional eating or stress-eating) or an unsuccessful strategy for coping with stress. For example, cross-sectional studies have shown that perceived stress and work-family conflict are associated with increased fatty food consumption and decreased healthy food consumption (Allen & Armstrong, 2006; Ng & Jeffery, 2003). More recent studies taking a multilevel approach featured unhealthy eating behavior as an outcome of stressful daily experiences at work and as a behavioral manifestation of resource depletion in the context of a spillover effect *from work to the personal domain*. Specifically, daily diary studies have introduced varying within- and between-person level antecedents of unhealthy eating, including positive affect and negative affect (PANA), work hours, job characteristics (i.e., work demand, control, and support), and customer mistreatment

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(Jones et al., 2007; Liu et al., 2017). Such research has demonstrated that individuals engage in unhealthy eating as an immediate emotion-based coping strategy and expect to experience an instant mood boost from the behavior.

Meanwhile, the consequences of unhealthy diet have been largely unexplored, leaving an important question—*why* employees' unhealthy eating behavior matters in the organization. Many people strive to consume a healthy diet so that they can ultimately be their best selves and improve their productivity and efficiency in multiple life domains, including work. However, academic knowledge on the effects of unhealthy lifestyles on work outcomes remains sparse. One recent qualitative review of diet-related worksite intervention studies (Jensen, 2011) sheds light on this topic from a corporate-level intervention perspective, suggesting that worksite nutrition policies may improve a firm's profitability. Specifically, this research asserted that corporate support for employees' consumption of a healthy diet has a long-term preventive effect on employees' absenteeism, seemingly via employees' nutritional knowledge, food intake, and health. Still, the actual behavior related to food intake was not the focus of these studies; instead, it was mainly considered as a possible outcome of the intervention, as the experimental studies did not intend to capture naturally occurring, everyday eating behaviors and work-related behaviors of working individuals. Also, the year-based time frames employed in the included studies were too broad to make inferences about day-specific connections between employees' eating behaviors and absences. More importantly, we have not been able to establish theoretical explanations of why such performance-enhancing or reducing effects exist or even whether they exist on a daily basis.

Our thorough literature review of this topic revealed unique challenges in studying the immediate organizational outcomes of unhealthy eating behavior, compared with other health-related behaviors (e.g., sleep). We attribute the scarcity of attempts to investigate this topic in organizational science to two factors: (a) unhealthy eating behavior construed as a distal or less relevant factor rather than a proximal factor for work-related behaviors (i.e., limited empirical evidence of day-to-day relationships) and (b) the lack of a theoretical mechanism to explain the immediate effects of unhealthy eating on important work outcomes (i.e., unknown mediator variables). Consequently, theoretical and empirical evidence is limited regarding whether or why we should care about employees' (un)healthy eating behavior from an organizational science perspective.

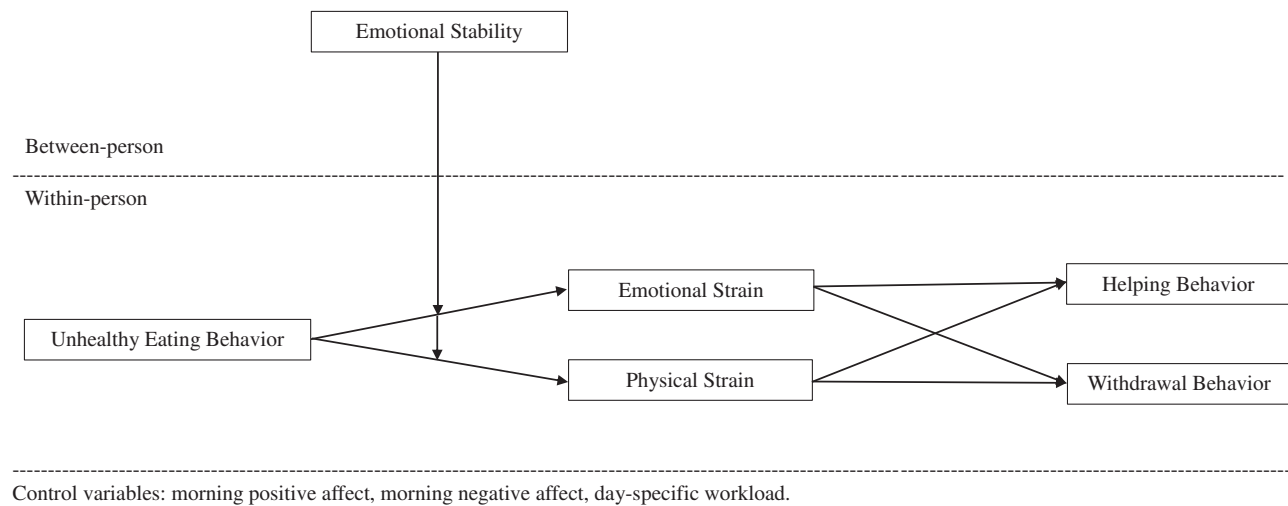
To understand the day-to-day effects of (un)healthy lifestyles in the professional domain, the current study adopts the perspective of stress and coping theory (Folkman et al., 1986; Lazarus & Folkman, 1984) and examines the relationship between employees' unhealthy eating behavior (personal domain) and their work behaviors (professional domain). In the proposed model, we view unhealthy eating behavior as a stressful event experienced from the nonwork domain and introduce a two-path mechanism that explains how employees' unhealthy eating behavior in the evening may relate to their behaviors at work the next day. Specifically, we tested the lagged effects of the prior evening's unhealthy eating on the next day's performance (i.e., helping behavior and withdrawal behavior) via emotional and physical strains experienced the next morning. Furthermore, we examined employees' emotional stability as a potential moderator that might alleviate the morning strains in

the stressor–strain process. To test this within-person level phenomenon and the cross-level interaction effect, we used a multilevel approach, utilizing daily diary data (three independent assessments of the predictor, mediators, and outcomes) collected through an ESM.

Our work makes three contributions to the stress and health behavior literature. First, our study is the first to show that employees' unhealthy eating behavior may serve as a potential nonwork stressor and relate to decreased performance at work. Although diet and sleep are the most essential restoration behaviors for human survival and functioning, eating has received substantially less academic attention compared to sleep in organizational science (Liu et al., 2017). In fact, nutritional intake plays crucial roles in numerous aspects of human functioning involving physiology, cognition, and emotion (e.g., boosting energy levels, depleting cognitive functioning, and increasing negative or positive moods). For example, caffeine has well-known benefits for vigilance and cognitive functions, whereas carbohydrate intake enhances cognitive performance and energy levels, especially for physically active individuals (Lieberman, 2003). Given the wide-ranging, complex roles of nutrition in everyday life (Burkhalter & Hillman, 2011), the impacts of (un)healthy eating behavior may not be limited to improving or deteriorating personal well-being (e.g., weight management, mood regulation, and prevention and treatment of chronic diseases): they may also be associated with professional productivity. By examining the daily effects of employees' unhealthy eating behavior, the current study seeks to address a gap in the work–nonwork interface literature (Grzywacz & Marks, 2000), which has primarily focused on the antecedents of unhealthy eating behavior. Ultimately, we purport to shed light on the importance of sustaining a healthy lifestyle outside the workplace from an organizational science perspective.

Second, we propose a two-path stressor–strain mechanism to explain the within-person-level lagged effects of the previous night's unhealthy eating behavior on work outcomes the next day. The transactional model of stress and coping (Lazarus & Folkman, 1984) posits that experienced stressors lead to emotional and physical strains and subsequently influence individuals' attitudes or behaviors as a way for them to cope with the stress. Similarly, when employees' unhealthy eating behavior is appraised as a threat to their health, it may lead to emotional and physical strains, which eventually translate into behavioral coping. Accordingly, the current model postulates that engaging in unhealthy eating behavior may not be the most proximal predictor of employees' work-related behaviors, as stressors often elicit more immediate strains prior to a behavioral change (Bliese et al., 2017; Fida et al., 2015). Thus, investigating the mediating roles of emotional and physical strains on work behaviors can help us explain the day-to-day phenomenon of how health-related stressors experienced in the personal domain influence workplace outcomes. Specifically, our conceptual mediation model (shown in Figure 1) hypothesizes that the prior night's unhealthy eating behavior has indirect effects on the quality of work, in the form of reduced helping behavior and increased withdrawal behavior, and that these relationships are explained via more immediate strains such as negative emotional reactions to unhealthy eating and undesirable physical symptoms in the morning. In summary, the proposed mechanism explains how employees' unhealthy eating behaviors relate to their behavioral outcomes at work.

Figure 1
Conceptual Model



Third, we propose that an individual difference—emotional stability—serves as a protective factor in stress–strain processes. Emotional stability, as one of the Big Five personality traits, has been shown to play a vital role in cognitive processes and emotional regulation (e.g., rumination, distancing, reappraisal) under stress, such that high emotional stability is likely to help individuals experience a stressful event less negatively or less intensively (Huang et al., 2014; Rogers & Barber, 2019). Conversely, a higher level of neuroticism emerges in conjunction with the tendency to experience negative emotions with higher degrees of frequency and intensity, and has detrimental effects on physiological and psychological well-being as well as longevity (i.e., mortality) in the long term (Bakker et al., 2006; Jerram & Coleman, 1999). Accordingly, our model proposes a moderating role for emotional stability (i.e., low neuroticism) in regard to the emotional and physical strains stemming from unhealthy eating behavior. By incorporating an individual difference variable, we attempt to demonstrate that nonequivalent stress–strain experiences occur across individuals who possess different levels of personal resources and stress-coping capacity.

Overall, the current study contributes to both theory and practice by elucidating the interface of the personal and professional domains at the microlevel (e.g., managing well-being in multiple life domains) as well as organizational policy and social benefits at the macrolevel (e.g., organizational performance, healthcare costs).

Unhealthy Eating Behavior: The Other Side of Healthy Eating

Along with quality sleep and physical activity, eating is one of the most essential human behaviors for sustaining life as well as one of the most important health-related behaviors that individuals pursue (Loef & Walach, 2012). A convincing body of research has amply demonstrated that a healthy diet is a critical component of an overall healthy lifestyle, as it is a primary way of providing nutrition (fuel

to the body, preventing adverse health issues and improving quality of life (Drewnowski & Evans, 2001). Accordingly, many suggestions have been made about what to eat, how to cook, how much to eat, and when to eat (i.e., content, process, amount, and timing), which have contributed to our understanding of what (un)healthy eating behaviors constitute (Guillén et al., 2017; Johnson et al., 2006; Karatzi et al., 2017; Rosenheck, 2008; Tian et al., 2016). For example, health professionals advise individuals to drink enough water, get enough fiber from vegetables and fruits, pursue a whole-foods-based diet, and perhaps take dietary supplements to obtain the appropriate daily amounts of vitamins, minerals, and beneficial nutrients.

Ironically, the varied, convenient access to food in industrialized societies such as in the United States has created other challenges in maintaining a healthy diet. Unlike in the past, food is no longer a scarce resource, and numerous unhealthy eating options are readily available. In consequence, individuals need to exert more deliberate efforts to make healthy decisions regarding their diet. For example, restricting the intake of unhealthy foods and limiting caloric intake to the advised quantity and proper timing have become more pertinent challenges than avoiding calorie deficiencies. Thus, health and nutrition professionals emphasize that avoiding various forms of unhealthy eating behaviors is key for a healthy diet today. Conceptualization of an “unhealthy diet” involves a wide-ranging repertoire of unhealthy eating behaviors related to the nutritional *content* of foods, *method* of culinary preparation, *quantity* of foods, and *timing* of intake. In other words, unhealthy eating is considered as a lifestyle rather than simply consuming unhealthy food content (Heizer et al., 2009; Miwa, 2012; Okami et al., 2011). For instance, individuals are said to have engaged in unhealthy eating if they consume low-nutrition ingredients or foods made through an unhealthy process (e.g., artificial coloring, heavily processed foods, added sugar), eat more than the recommended quantity, or have late-night snacks close to bedtime. Accordingly, in this study, we define unhealthy eating as consuming foods with unhealthy content

(e.g., high sugar and calories), eating fast foods and other snack-type foods (e.g., junk food), overeating, and late-night eating. We do not restrict our definition of an unhealthy diet to intake of certain types of foods, as unhealthy foods cannot be easily generalized due to the idiosyncratic diets that individuals are advised to follow based on their personal needs such as food intolerance (Alun Jones et al., 1982).

Stress Reactions to Unhealthy Eating Behavior: Negative Emotions and Physical Symptoms

Stress and coping theory posits that stressful events lead to strains via cognitive appraisal, and individuals engage in coping strategies to address the demands that they experience (Folkman et al., 1986; Lazarus & Folkman, 1984). The given demands are experienced as a stressor when individuals evaluate the event as a high-stakes threat to their well-being. The current study postulates that unhealthy eating behavior in the evening potentially serves as a nonwork-related stressor on two grounds. First, engaging in certain eating behaviors perceived as unhealthy is likely to be appraised as harmful to one's health. In modern society, eating is not just a way of sustaining one's survival but one of the most self-conscious health-related behaviors: it is not only associated with obesity and fitness but also closely related to body image and self-esteem (Furnham et al., 2002). Therefore, failings in these areas of the personal domain can be appraised as a threat both to overall well-being and to one's self-efficacy. Thus, the more individuals care about their health-related behaviors and emphasize the varying roles and consequences of a healthy diet in their lives, the more they would perceive their engagement in unhealthy eating behavior as undesirable and stressful. Second, unhealthy eating behavior holds the person accountable. Unlike with the stressors presented to individuals independent of their own decisions (e.g., job constraints, long working hours, interpersonal conflicts at work or from home), individuals can consciously choose their eating behaviors every day. In other words, the decision that individuals make about their diet, at least to a certain extent, involves a voluntary intention. Thus, upon reflection, individuals are more likely to feel responsible for their undesirable actions and potential consequences. In other words, the potential harms of unhealthy eating behavior can be easily attributed to the self, which leads to self-blame.

The cognitive-motivational-relational theory of emotion posits that individuals appraise an emotion based on its relational meaning at molar levels—that is, in terms of its relational themes (Lazarus, 1991; Smith & Lazarus, 1993). In particular, when accountability for a potentially harmful or threatening event is attributed to oneself, a person tends to experience emotions associated with self-blame. Thus, when individuals transgress or err, they are likely to feel negatively valenced self-conscious emotions, also known as moral emotions, such as guilt, shame, embarrassment, or decreased pride (Tangney et al., 2007). In contrast, when individuals approve their behaviors, they tend to experience positively valenced moral emotions, such as pride (emotion of self-credit). Accordingly, prior research has documented the intimate link between food consumption and negative moods (Canetti et al., 2002), with unhealthy eating behaviors being associated with negative emotions targeted to the self (Adams & Leary, 2007; Burney & Irwin, 2000). For example, individuals who overate or consumed alcohol in the evening may develop a critical self-judgment regarding their eating choice and experience guilt, shame, embarrassment, or decreased

pride about their eating behavior. It may also be possible that eating high-calorie foods such as sweets (e.g., a piece of chocolate cake) may instantly increase positive affect. However, upon subsequent reflective evaluation of its undesirable health consequences, negative emotions such as guilt may eventually arise (Kuijjer & Boyce, 2014). Therefore, we hypothesize that individuals who poorly manage varying aspects of eating behaviors (i.e., content, quantity, or timing) could experience negative self-conscious emotions stemming from their failure to resist unhealthy foods, unnecessary calorie intake, or late-night snacks (Jones et al., 2013).

Hypothesis 1a (H1a): Unhealthy eating behavior in the evening is associated with increased emotional strain (i.e., feelings of guilt, shame, embarrassment, and decreased pride) the next morning.

Despite the difficulties identifying the exact biological mechanisms, the connection between eating style and physical health has been widely studied in varying disciplines. The long-term effects of unhealthy eating behavior have been found to be associated with negative health outcomes, including nutrition imbalance, obesity, chronic disease, and mortality (Donaldson, 2004; Nicklas et al., 2001; Singh et al., 2017). On the contrary, more immediate effects tend to take the form of acute physical symptoms due to digestive discomfort, migraine, and poor sleep. Many studies have shown that an unhealthy diet is associated with undesirable physical symptoms such as gastrointestinal issues or migraines (Finocchi & Sivori, 2012; Heizer et al., 2009; Rajilić-Stojanović et al., 2015). Accordingly, we expect that unhealthy eating behavior in the evening may place physiological burdens on bodily functions overnight, with the adverse physiological effects being likely to continue until the next morning (e.g., light sleep, indigestion). The current study focused on the evening diet as unhealthy dinner is more susceptible to physiological discomforts the next morning than the day's earlier meals. In other words, dinner (or a late-night snack) is the last meal of the day, and there is less time for digestion before individuals go to bed. Numerous studies on night eating—referring to time-delayed eating close to sleep—have shown that calorie intake concentrated around nighttime is associated with undesirable strains such as wakefulness at night and indigestion (Colles et al., 2007; Gluck et al., 2008). Moreover, nighttime eating is linked with binge eating and a fatty diet via increased appetite for unhealthy foods with high sugar and sodium content (Colles et al., 2007), increasing the risk of experiencing physical strains the following day. Thus, employees who engage in unhealthy eating behaviors close to bedtime (e.g., excessive eating and drinking or late-night snacks) will be more likely to experience the physical strains that frequently follow unhealthy eating.

Hypothesis 1b (H1b): Unhealthy eating behavior in the evening is associated with increased physical strain (i.e., headache, upset stomach or nausea, diarrhea, and bloating) the next morning.

Psychological and Physical Mechanisms: Explaining the Lagged Effects of Unhealthy Eating Behavior on Helping Behavior and Work Withdrawal

According to the transactional model of stress and coping (Lazarus & Folkman, 1984), individuals' emotional and physical

strains play mediating roles in the link between stressful events and behavioral changes at work. In other words, a stressful event that induces emotional and physical reactions could ultimately influence individuals' behaviors as they try to cope with the stress. Furthermore, conservation of resources (COR) theory more specifically describes the motivational aspect of individuals' behavioral change under stress and explains the rationale for purposeful resource management (Hobfoll, 1989, 2010). That is, a lack of resources leads to defensive behavior to protect the remaining resource (Halbesleben et al., 2014). From the resource perspective, high levels of emotional and physical strains reflect low self-regulatory resources (Gallo & Matthews, 2003; Wang et al., 2011). For example, when individuals experience strong negative emotions, they need to consume resources to address those negative moods (e.g., rumination, reappraisal), and such efforts are likely to deprive individuals of resources that are required to execute tasks. Thus, we can generally expect that employees with low resources would be more motivated to allocate their limited resources more selectively while at work. Prior studies in organizational science have corroborated this notion, with high levels of strains and depleted resources being shown to correlate with employees refraining from tasks that require self-control (Kahn & Byosiore, 1992; Karasek, 1979) as well as decreased quality of performance (Lang et al., 2007; Lepine et al., 2005). Notably, among the multidimensional domains of job performance (Carpenter & Berry, 2017; Rotundo & Sackett, 2002; Viswesvaran & Ones, 2000; Zhang et al., 2014), two of the performance domains, extra-role behavior and withdrawal behavior, are strongly linked to resource levels (Lanaj et al., 2016; Sliter et al., 2012).

Considering all these arguments, we postulate that when employees' unhealthy eating behavior negatively affects their emotional and physical states in the morning, those morning strains may translate into behavioral coping efforts during the day. In particular, when this transition occurs during work hours, individuals' behavioral coping strategies may manifest as reduced quality of performance at work (unhealthy eating behavior → emotional and physical strains → decreased quality of performance) in the direction of preserving resources. To investigate the behavioral changes owing to this nonwork-related stressor and morning strains, we focus on *helping behavior* as an example of an extra-role, low-priority behavior and *withdrawal behavior* as a primary stress-coping, resource-replenishing behavior.

Helping Behavior

Helping others entails performing discretionary extra-role behaviors that benefit the organization and other members at work (Organ, 1988); it is often conceptualized as a type of interpersonal organizational citizenship behaviors (OCBIs). OCBI encompasses any behavior that positively supports the social and psychological environment of the workplace, such as taking on an additional workload to assist others with their duties, spending time to help others with work-related problems, or adjusting one's schedule to accommodate others' requests. As these extra-role behaviors (e.g., helping) are not formally included in job descriptions, they are less likely to be reinforced by the organizations than are in-role performance such as task performance (Williams & Anderson, 1991), and they are less likely to result in rewards or punishment in the workplace (Borman & Motowidlo, 1993).

Given that resource constraints generally limit the behavioral repertoire of individuals, individuals under high strain levels are motivated to prioritize their responsibilities (Chang et al., 2007; Hobfoll, 2010). In the context of effective resource management, helping would not be viewed as a priority, as it brings less direct rewards and carries fewer punitive consequences. In other words, helping behaviors may contribute to others' performance rather than the focal individual's own performance, and sometimes result in his or her sacrifice (Koopman et al., 2016). Therefore, extra-role performance, such as helping behaviors, may be the first performance domain for employees to choose to compromise in such a scenario. In fact, employees would prioritize to address the work demands associated with their core tasks that directly affect their future rewards (e.g., promotion, positive performance appraisal) or carry a high risk of a penalty for incompleteness (Halbesleben & Wheeler, 2015; Trougakos & Hideg, 2009). Accordingly, employees with low resources may be less likely to direct their energy to a low-priority or less rewarding behavior (i.e., "go the extra mile" to help their coworkers). Hence, we hypothesize that high levels of emotional and physical strains experienced in the morning will dissuade employees from exerting extra efforts to help others with their work.

Hypothesis 2a (H2a): Unhealthy eating behavior in the evening has a negative indirect effect on employees' helping behavior at work the next day via emotional strain in the morning.

Hypothesis 2b (H2b): Unhealthy eating behavior in the evening has a negative indirect effect on employees' helping behavior at work the next day via physical strain in the morning.

Withdrawal Behavior

Work withdrawal refers to employees' avoidance and disengagement from work and task situations, even when they are physically present at work (Lehman & Simpson, 1992). Although these withdrawal behaviors are undesirable in organizations, employees may choose to engage in withdrawal behaviors as an emotion-focused coping strategy when faced with undue strains (Krischer et al., 2010). For example, employees experiencing strong negative emotions may exhibit withdrawal behaviors such as leaving work early, taking longer breaks than allowed, or falling asleep at work (Fox et al., 2001; Podsakoff et al., 2007). Ultimately, they may not be able to execute the expected job duties until they at least partially recover from the strains. From the perspective of resource management, employees may be more motivated to employ strategies to conserve resources at work when their resources are already consumed by emotional distress or physical discomforts at the beginning of a workday. They would temporarily choose from a behavioral repertoire that avoids further resource expenditure and helps replenish their energy. Thus, employees' engagement in withdrawal behaviors—putting less effort into one's work—could be a way of managing their low resource levels in the morning or venting a negative state (Fox et al., 2001). Accordingly, we expect that employees' emotional and physical strains following previous-night unhealthy eating behavior may explain the increased withdrawal behavior. Specifically, employees with their resources consumed by morning strains may be more likely to engage in work withdrawal during work hours to avoid further loss of resources.

Hypothesis 3a (H3a): Unhealthy eating behavior in the evening has a positive indirect effect on employees' withdrawal behavior at work the next day via emotional strain in the morning.

Hypothesis 3b (H3b): Unhealthy eating behavior in the evening has a positive indirect effect on employees' withdrawal behavior at work the next day via physical strain in the morning.

Moderating Roles of Emotional Stability in Stressor–Strain Relationships

Personality serves important moderating roles in the stress process by influencing reactivity to stressors (i.e., the experienced intensity of a stressor) and the effectiveness of coping efforts (Bolger & Zuckerman, 1995). In particular, *emotional stability* (Barrick & Mount, 1991) has been the most frequently examined Big Five personality trait in this stress-coping process, as it often reflects vulnerability to stress (Schneider, 2004). Emotional stability—low neuroticism—is considered a bipolar construct of the individual disposition concerning emotional experiences: it refers to the propensity for experiencing less negative emotions such as worry, fear, sadness, loneliness, guilt, shame, and vulnerability (McCrae & Costa, 1985). Emotional stability level influences how individuals react, appraise, and cope with a given stressful situation (e.g., engagement in unhealthy eating behaviors). For example, individuals with low emotional stability tend to make higher threat appraisals (Schneider, 2004). Such vulnerability to stressors is likely to exacerbate stress experiences, which then leads to more psychological and physical strains. Indeed, research shows that emotional stability serves as a moderator for both emotional and physical strains. For example, individuals with high emotional stability are less likely to show hypersensitivity to environmental stimuli such as pain (Goubert et al., 2004), experience less undesirable physical responses (e.g., suppressed immune functioning, heightened inflammation, cardiovascular stress response), and have fewer somatic symptoms (e.g., stomach, diarrhea) (Costa & McCrae, 1987; Schneider, 2004; Watson et al., 1994; Zunhammer et al., 2013). In short, individuals with high emotional stability tend to appraise an event less negatively, choose more effective coping strategies, and, therefore, are more resistant to psychological and physical strains.

As emotional stability serves as a resilience resource against a potential stressor and alleviates distressful outcomes (Bolger & Schilling, 1991; Bolger & Zuckerman, 1995), it is not surprising that individuals with high emotional stability, in general, have less negative reactions to various daily hassles (Larsen & Ketelaar, 1991). In turn, we expect that for individuals with different levels of emotional stability, unhealthy eating behavior would have non-equivalent impacts on their stress experience. Specifically, we propose that the positive relationships between unhealthy eating behavior and emotional and physical strains will be stronger for those individuals with low levels of emotional stability than for those with high levels of emotional stability. For example, individuals with a higher level of emotional stability may appraise their engagement in unhealthy eating behavior less negatively (e.g., a temporary mistake), demonstrate constructive coping strategies (e.g., undertake a light workout to help digestion instead of ruminating), and, therefore, feel less concerned and guilty about their

previous unhealthy eating behavior and experience fewer physical discomforts in the morning. Thus, our model incorporates emotional stability as a potential moderator.

Hypothesis 4a (H4a): Emotional stability moderates the positive relationship between unhealthy eating behavior and emotional strain, such that the association is weaker when emotional stability is high.

Hypothesis 4b (H4b): Emotional stability moderates the positive relationship between unhealthy eating behavior and physical strain, such that the association is weaker when emotional stability is high.

Method

Sample and Procedure

The data reported in the current study were part of a larger data collection approved by the institutional review board of North Carolina State University (IRB Protocol No. 12686; Recovery processes, leisure, and well-being). The other parts of the data set have been reported in two other publications (Cho et al., 2020; Kim et al., in press). We recruited participants through several online community websites (e.g., Facebook group) in the United States. With the permission of the websites' administrators, we posted the recruitment message for approximately 2 weeks, including information on the study procedure (an initial survey and three daily surveys for 10 workdays for 2 weeks), eligibility for participation (full-time working adults with fixed work schedules, being fluent in English, and having accessibility to computers/smartphones for the survey), compensation for participation (a \$40 Amazon gift card), and the official research email address. During the recruitment period, a total of 203 potential candidates showed interest in participating in the study. We sent the initial survey link to the interested participants and measured their demographic information and a cross-level moderator variable (i.e., emotional stability).

Approximately 2 weeks later, participants received three short daily surveys for 10 consecutive workdays: the first survey in the morning (8 a.m.), the second survey at the end of the workday (6 p.m.), and the third survey in the evening before going to bed (9:30 p.m.). All surveys were sent in consideration of participants' local time zone. The morning survey assessed the mediating variables (i.e., emotional and physical strains in the morning) and control variables (morning PANA). The end-of-workday survey assessed the outcome variables (i.e., helping behavior and withdrawal behavior at work) and day-specific workload as a control variable. The evening survey assessed participants' day-specific unhealthy eating behavior as a predictor. To promote a better response rate, we sent friendly reminders to fill out the surveys.

After we collected the daily diary data for 10 consecutive workdays (2 weeks), we restructured our data set to test whether Day t 's unhealthy eating behavior in the evening had relationships with Day $t + 1$'s emotional and physical strains in the morning (the time-lagged relationships) and, in turn, Day $t + 1$'s helping behavior and withdrawal behavior during the workday. That is, for each week, we matched the night survey (Day t) from Monday to Thursday with the next-morning survey and the end-of-workday survey (Day $t + 1$) from Tuesday to Friday, respectively.

To obtain the final sample used in the analysis, we included only those participants who completed at least three sets of daily surveys to test the time-lagged relationships proposed in our hypothesized model (Singer and Willett, 2003; Trougakos et al., 2014). As common in ESM studies, some participants skipped some of the daily surveys (e.g., completing only the morning, end-of-workday, or evening survey; $n = 21$ participants), did not participate in the daily surveys after the initial survey ($n = 78$ participants), or completed daily surveys for fewer than 3 days ($n = 7$ participants). Accordingly, we excluded 106 participants out of the initial 203 participants, leaving 97 participants (48% of the 203 participants from the initial survey) as the final sample for the study. After conducting multiple independent t tests, we concluded that the final sample was not significantly different from those removed in terms of age, job tenure, and emotional stability ($p = .27-.88$). Furthermore, a series of χ^2 tests revealed that there was no difference between the removed sample and the final sample regarding their sex, education, and industry ($p = .34-.86$). Thus, data restructuring left 97 participants as our final sample, yielding 662 day-level cases out of possible 776 observations (97 participants \times 8-day lags observations after restructuring data) and a response rate of 85%. On average, participants completed the morning survey at 8:17 a.m. ($SD = 0.53$), the end-of-work survey at 6:21 p.m. ($SD = 0.71$), and the evening survey at 9:53 p.m. ($SD = 0.87$).

Of the participants, 51% were male. The final sample had an average age of 35.42 years ($SD = 7.59$), organizational tenure of 6.06 years ($SD = 3.52$), and job tenure of 6.98 years ($SD = 4.06$). Participants' industries included manufacturing (37.8%), IT/technology (16.3%), other (11.2%), sales/marketing (10.2%), health (10.2%), hospitality (5.2%), farming/fishing/mining (5.1%), and education (4.1%). They had similar fixed working hours (9 a.m. to 5 or 6 p.m.).

Within-Person Measures

All scales were slightly adapted to suit the daily measurement context.

Unhealthy Eating Behavior (Day t Evening)

We used the four-item daily food consumption measure adapted from Caan et al. (1995) and Liu et al. (2017) to assess participants' daily unhealthy eating behavior after work. Participants reported their evening eating behaviors before going to bed (Day t) on a 5-point Likert-type scale (1 = *strongly disagree* to 5 = *strongly agree*). The four items included "Tonight/Today, I ate too many junk foods after work," "Tonight/Today, I had too many unhealthy snacks after work," "Tonight/Today, I ate and drank excessively after work," and "Tonight/Today, I had too many late-night snacks before going to bed." The average Cronbach's alpha across observations was .86.

Emotional Strain in the Morning (Day $t + 1$ Morning)

We assessed participants' negative emotional reactions to their previous night's eating behavior with a four-item measure adapted from PANAS (Watson et al., 1988) and based on the conceptualization of moral emotions (Tangney et al., 2007). Participants were asked to answer the items in the morning (Day $t + 1$) on a 5-point

Likert-type scale (1 = *strongly disagree* to 5 = *strongly agree*). Items included "I feel guilty about my eating after work yesterday," "I feel ashamed about my eating after work yesterday," "I feel embarrassed about my eating after work yesterday," and "I am proud of my eating after work yesterday" (reverse-coded). The average Cronbach's alpha across observations was .90.

Physical Strain in the Morning (Day $t + 1$ Morning)

Participants' physical strain was assessed in the morning (Day $t + 1$) with a four-item measure adapted from the Physical Symptoms Inventory (Spector & Jex, 1998). Participants indicated their evaluation of physical discomforts in on a 5-point Likert-type scale (1 = *never* to 5 = *extremely*). The physical symptoms included "headache," "upset stomach or nausea/stomach cramps (not menstrual)," "diarrhea," and "bloating."

Helping Behavior (Day $t + 1$ End of the Workday)

We assessed employees' helping behavior at the end of the workday (Day $t + 1$), using eight items adapted from Lee and Allen (2002). Participants provided their agreement ratings for each statement on a 5-point Likert-type scale (1 = *strongly disagree* to 5 = *strongly agree*). Sample items included "Helped with coworkers' tasks" and "Adjusted my work schedule to accommodate other employee's requests for time off." The average Cronbach's alpha across observations was .94.

Withdrawal Behavior (Day $t + 1$ End of the Workday)

We used five items adapted from the withdrawal behaviors scale (Lehman & Simpson, 1992) to measure participants' daily work withdrawal. Participants reported whether or not they had engaged in the specified behaviors on that day (1 = yes; 0 = no). Sample items included "left work early," "Took a longer lunch, rest, or bathroom break than allowed," and "fell asleep at work." The dichotomous ratings on the five items were then aggregated to form a count variable to reflect the number of withdrawal behaviors in which participants engaged that day.

Control Variables

We measured day-specific morning positive PANA as control variables (Day $t + 1$). To make sure the emotional and physical strains in the morning were attributable to the unhealthy eating behavior from the previous night, morning NA was used to control for both mediators. Morning PANA also controlled for behavioral outcomes in the afternoon (Ilies, Schwind, Wagner, et al., 2007). PANA was assessed in the morning (Day $t + 1$) with positive affective descriptors from the Positive and Negative Affect Schedule (Watson et al., 1988). We used 12 affective descriptors (6 for each PA and NA) that had been used in previous diary studies (Sonnentag & Binnewies, 2013; Sonnentag et al., 2008). In the morning (Day $t + 1$), participants rated how extensively they felt the emotions *at that moment*, such as active, excited, strong, alert, and interested for morning PA, as well as distressed, upset, irritable, nervous, afraid, and jittery for morning NA (1 = *very slightly or not at all* to 5 = *extremely*). The average Cronbach's alpha values across observations were .94 for PA and .95 for NA.

In addition, we controlled for daily workload to rule out the effects of participants' perceived workloads on their behavioral outcomes (i.e., helping behavior and withdrawal behavior) at work (Ilies, Schwind, Wagner, et al., 2007). Daily workload was measured at the end of the workday (Day $t + 1$) with a short three-item Quantitative Workload Inventory (Spector & Jex, 1998), used in prior studies (e.g., Kim et al., 2018), with ratings given on a 5-point Likert-type scale (1 = *strongly disagree* to 5 = *strongly agree*). The three items included, "Today, I had to work really fast," "Today, I had a lot of work to do," and "Today, I had to finish work within a short time." The average Cronbach's alpha across observations was .82.

Between-Person Measure

Emotional Stability

We used a 10-item neuroticism scale (McCrae & Costa, 1987) to measure participants' emotional stability. Participants were asked to answer the items in the general survey using a 5-point Likert-type scale (1 = *strongly disagree* to 5 = *strongly agree*). Sample items included "I get stressed out easily" and "I get upset easily." The average Cronbach's alpha was .87.

Analytic Approach

We conducted multilevel path analyses in Mplus 7.4 (Muthén & Muthén, 2012) for the nested data (daily responses within individuals), which simultaneously estimated all path coefficients in the full model. In addition to data restructuring, we centered the within-person (Level 1) predictor variables (i.e., unhealthy eating behavior) and control variables (i.e., morning PANA and workload) on each individual's mean scores to remove between-person variances, thereby ensuring that our within-person results were not confounded by individual differences (Enders & Tofighi, 2007; Ilies, Schwind, & Heller, 2007). The between-person moderator (i.e., emotional stability) was centered on the grand mean and modeled as a person-level variable so that the cross-level moderation estimates would strictly represent the between-person differences. In the analysis, we specified the Level 1 random effects of the previous night's unhealthy eating behavior on two mediators (i.e., next morning's emotional and physical strains), and the fixed effects of the two mediators on the two outcome variables (i.e., helping behavior and withdrawal behavior). Also, we specified the direct fixed effects of the previous night's unhealthy eating behavior on helping behavior and withdrawal behavior. In our multilevel model, control variables (i.e., morning PANA and daily workload) were specified to have fixed effects on helping behavior and withdrawal behavior. In addition, all endogenous variables (two mediators: emotional and physical strains; two outcome variables: helping behavior and withdrawal behavior) were estimated to covary in the model.

Variance partitioning results revealed that our intraclass correlation coefficient, ICC(1), was .76 for the emotional strain, .87 for physical strain, .53 for helping behavior, and .59 for withdrawal behavior, indicating that intraindividual fluctuations explained a significant amount of the variances in the outcome variables. Therefore, the multilevel-modeling approach was appropriate to test our hypotheses. Multilevel mediation hypotheses at Level 1–1–1 were tested via

Monte Carlo bootstrapping simulation procedures using the open-source software R, which can be found at <http://www.quantpsy.org/medmc/medmc.htm> (Bauer et al., 2006; Preacher & Selig, 2010).

We ran a multilevel confirmatory factor analysis (MCFA) using maximum likelihood estimation with robust standard errors (MLR) to examine the construct validity of all within-person measures (i.e., unhealthy eating behavior, emotional strain, helping behavior, morning PANA, and workload), excluding formative measures (i.e., physical strain and withdrawal behavior). We loaded all items onto their corresponding latent constructs, but the MCFA model did not converge. Given that our sample size ratio was not sufficient to test the estimations at Level 2 (Bentler & Chou, 1987), this result was not surprising. Therefore, we used an item parceling technique to estimate the MCFA model for the current study. Specifically, we generated four balanced parcels for helping behavior (originally eight items) and three parcels for morning PANA (originally six items for each). We assigned the item with the highest factor loading to the first parcel, the item with the second-highest factor loading to the second parcel, and so forth (Hall et al., 1999; Landis et al., 2000). Results showed that this six-factor MCFA model fit the data well ($\chi^2[348] = 584.20$, $p < .001$, scaling correction factor = .7855, comparative fit index [CFI] = .98, root mean square error of approximation [RMSEA] = .03, standard root mean square residual [SRMR] = .03 at the within-person level and .03 at the between-person level). All parcels loaded significantly on their corresponding latent constructs (standardized factor loadings ranged from .73 to .99). We also ran an MCFA with a one-factor model to compare the two models. Our results indicated that the one-factor model did not yield a good fit ($\chi^2[378] = 10,248.08$, $p < .001$, scaling correction factor = .7688, CFI = .225, RMSEA = .199, SRMR within = .219, and SRMR between = .187). The model comparison based on the Satorra–Bentler χ^2 correction (Satorra & Bentler, 2001) revealed that the six-factor model showed a significant improvement from the single-factor model ($\Delta\text{-B}\chi^2[30] = 7,761.99$, $p = .000$, difference test scaling correction = 0.9792). Thus, we concluded that our six-factor model was superior to a one-factor model. That is, our results provided construct validity evidence of the six latent constructs in the current data.

Results

Preliminary Analysis

Table 1 presents the means, standard deviations, and intercorrelations for the study variables. As expected, at the within-person level, the previous night's unhealthy eating behavior was positively related to emotional strain ($r = .53$, $p < .001$) and physical strain ($r = .46$, $p < .001$). Both the emotional and physical strains were negatively related to helping behavior ($r = -.24$, $p < .001$; $r = -.28$, $p < .001$) and positively related to withdrawal behavior ($r = .25$, $p < .001$; $r = .28$, $p < .001$). Unhealthy eating behavior was negatively associated with helping behavior ($r = -.16$, $p < .001$) and positively related to withdrawal behavior ($r = .20$, $p < .001$).

Hypothesis Testing

Table 2 presents the results from the multilevel path analysis that estimated all the path coefficients, including those at Level 1 and

Table 1
Means, Standard Deviations, Reliability Estimates, and Intercorrelations Among Study Variables

	1	2	3	4	5	6	7	8	9	10
1. Emotional stability ^a										
2. Morning positive affect ^b	-.17									
3. Morning negative affect ^b	-.39***	.47***								
4. Workload ^b	-.43***	.08	.20							
5. Unhealthy eating behavior ^b	-.49***	.27**	.41***	.18						
6. Emotional strain ^b	-.57***	.40***	.42***	.35***	.51***					
7. Physical strain ^b	-.58***	-.34**	.27**	.42***	.43***	.59***				
8. Helping behavior ^b	.23*	-.23*	-.34**	-.04	-.42***	-.37***	-.19			
9. Withdrawal behavior ^b	-.34**	.33***	.49***	.30**	.39***	.55***	.41***	-.64***		
10. Task performance ^c	-.13	-.42***	-.17	-.18	-.15	-.19	-.14	.17	-.33**	
<i>M</i>	3.46	2.87	1.76	2.86	2.43	2.42	2.06	3.18	1.80	2.23
Within-person <i>SD</i>	—	.98	1.17	1.13	1.09	1.06	1.22	.93	1.03	0.64
Between-person <i>SD</i>	1.08	.77	1.42	.67	1.04	1.00	1.09	.71	.81	0.92
Cronbach's alpha	.87	.94 ^d	.95 ^d	.82 ^d	.86 ^d	.90 ^d	—	.94 ^d	—	—
Omega	—	.97	.98	.93	.91	.95	—	.97	—	—

Note. Correlations below the diagonal represent between-person correlations ($n = 97$). Correlations above the diagonal represent within-person correlations ($n = 662$). To calculate between-person correlations, we averaged within-person scores across days.

^a Between-person variables.

^b Within-person variables.

^c Post hoc analysis variable.

All results came from one path model that includes all variables (i.e., three controls, one between-person predictor, one within-person predictor, two mediators, and the two outcome variables).

^d Average Cronbach's alpha across observations for daily diary measures, and they include variable # 2–6, & 8.

Omega values are within-person level reliability estimates (Geldhof et al., 2014).

* $p < .05$. ** $p < .01$. *** $p < .001$.

Level 2, simultaneously. These results show that employees' previous-night unhealthy eating behavior was positively associated with their emotional strain ($\gamma = .38, p < .001$) and physical strain ($\gamma = .23, p < .001$) on the next morning, supporting both Hypotheses 1a and 1b.

Hypothesis 2 posited that the previous night's unhealthy eating behavior would have indirect effects on helping behavior through increased (a) emotional strain and (b) physical strain. Our multilevel

mediation analysis based on 20,000 Monte Carlo bootstrapping cases found that the indirect effect of unhealthy eating behavior on helping behavior via (a) emotional strain to the unhealthy eating was $-.07$, with a 95% bias-corrected bootstrap confidence interval (CI) of $[-.10, -.03]$; the effect via (b) morning physical strain was $-.08$ (95% CI $[-.06, -.02]$). Thus, both Hypotheses 2a and 2b were supported.

Hypothesis 3 postulated that the indirect effects of the previous night's unhealthy eating behavior on withdrawal behavior at work

Table 2
Unstandardized Coefficients of the Multilevel Model

Variable	Unhealthy eating behaviors → emotional strain		Unhealthy eating behaviors → physical strain		Helping behavior		Withdrawal behavior	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Intercept	2.43***	0.07	1.87***	0.09	2.96***	0.08	1.99***	0.07
Emotional stability ^a	-.62***	0.07	-.78***	.09	.04	0.07	-.18*	0.07
Morning positive affect ^b					.11	0.06	-.07	0.06
Morning negative affect ^b	.08	0.05	.11***	0.03	.08	0.05	.03	0.04
Workload ^b					.20***	0.03	-.06**	0.02
Unhealthy eating behavior ^b	.38***	0.04	.24***	0.04	.04	0.05	-.01	0.04
Emotional strain ^b					-.21**	0.06	.18**	0.06
Physical strain ^b					-.20**	0.07	.22**	0.07
Unhealthy eating behavior × emotional stability ^c	-.09*	0.04	-.15***	0.04				
Within-level residual variance	.18***	0.01	.13***	0.01	.39***	0.02	.32***	0.02
Between-level residual variance	.50***	0.08	.79***	0.12	.51***	0.08	.46***	0.08

Note. All results came from a one-path model that included all variables (i.e., three controls, one between-person predictor, one within-person predictor, two mediators, and the two outcome variables).

^a Between-person variables.

^b Within-person variables.

^c Cross-level moderator.

* $p < .05$. ** $p < .01$. *** $p < .001$.

would be mediated by the employee's (a) emotional strain and (b) physical strain. Consistent with our hypotheses, the results showed that the indirect effect of unhealthy eating behavior on withdrawal behavior via (a) emotional strain was .06 (95% CI [.02, .12]), and the effect mediated via (b) physical strain was .09 (95% CI [.01, .08]). Thus, Hypotheses 3a and 3b were also supported. In addition, the two mediators (i.e., emotional and physical strains) had a positive covariance relationship (coefficient = .06, $p < .001$); conversely, the two outcome variables (i.e., helping behavior and withdrawal behavior) had a negative covariance relationship (coefficient = $-.08$, $p < .001$). As a post hoc evaluation, we looked at the relative strength of these two pathways, but did not find a clearly stronger path between the psychological and physical mechanisms.¹

We tested a cross-level moderation effect of individuals' emotional stability on the within-person relationship between unhealthy eating behavior and emotional and physical strains. The results from the moderation analyses indicate that emotional stability was negatively associated with the random slopes between unhealthy eating behavior and emotional strain ($\gamma = -.08$, $p < .05$) and physical strain ($\gamma = -.14$, $p < .001$). We conducted simple slope tests in multilevel modeling to explore and confirm the nature of the interaction effects using the method recommended by Preacher et al. (2006). Specifically, we tested the moderation effects to determine whether the estimated effects of unhealthy eating behavior on emotional and physical strains differed at lower (-1 SD) and higher ($+1$ SD) emotional stability. Simple slope tests (Figure 2) showed that the within-person relationship between unhealthy eating behavior and emotional strain was stronger with a low level of emotional stability ($\gamma = .47$, $p < .001$) than with a high level of emotional stability ($\gamma = .28$, $p < .001$). The difference between the two slopes was significant at $-.19$ ($p < .05$). Furthermore, the within-person relationship between unhealthy eating behavior and physical strain (Figure 3) was stronger under the condition of low emotional stability ($\gamma = .39$, $p < .001$) than under the condition of high emotional stability ($\gamma = .07$, $p = .274$). The difference between the two slopes was also significant at $-.32$ ($p < .001$). Therefore, both Hypotheses 4a and 4b were supported.

Supplementary Analyses

Moderated Mediation

We tested the moderated mediation effects to determine whether the estimated indirect effects of the previous night's unhealthy eating behavior on the next day's helping and withdrawal behaviors at work via emotional and physical strains differed among participants with lower (-1 SD) and higher ($+1$ SD) emotional stability (Table 3). Our results show that unhealthy eating behavior had indirect effects of $-.07$ (95% CI $[-.143, -.017]$) for helping behavior and .08 (95% CI [.036, .148]) for withdrawal behavior under a condition of low emotional stability, versus $-.05$ (95% CI $[-.099, .001]$) for helping behavior and .06 (95% CI [.019, .115]) for withdrawal behavior, demonstrated by the psychological reaction to the eating behavior, under a condition of high emotional stability. The effects were significantly different between the two conditions: .03 (95% CI [.001, .059]) for helping behavior and $-.02$ (95% CI $[-.059, -.005]$) for withdrawal behavior.

In addition, we found that unhealthy eating behavior had indirect effects of $-.07$ (95% CI $[-.143, -.007]$) for helping behavior and

.07 (95% CI [.009, .144]) for withdrawal behavior, demonstrated by physical strain, under a condition of low emotional stability, versus $-.02$ (95% CI $[-.052, .017]$) for helping behavior and .02 (95% CI $[-.015, .055]$) for withdrawal behavior under a condition of high emotional stability. The effects were significantly different between the two conditions: .05 (95% CI [.002, .097]) for helping behavior and $-.05$ (95% CI $[-.103, -.002]$) for withdrawal behavior.

Negative Affect as a Mediator

We also investigated whether NA that is not specific to unhealthy eating might explain this stress process. Specifically, we considered whether morning NA mediates the relationship between unhealthy eating behavior and behavioral outcomes at work. The path analysis revealed that with morning NA included in the full model, the positive association between previous night's unhealthy eating behavior and morning NA remained significant ($\gamma = .13$, $p < .05$). However, morning NA was not associated with either helping behavior ($\gamma = .09$, $p = .075$) or withdrawal behavior ($\gamma = .03$, $p = .526$). Because we did not find direct effects of morning NA on helping and withdrawal behavior, further examination of morning NA as a mediator was not meaningful.

Task Performance

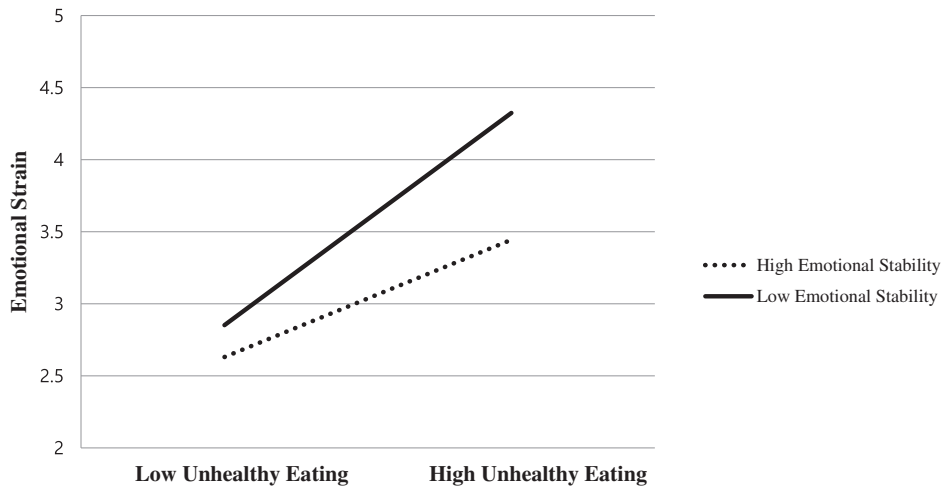
While the focal interests of our model lied on daily helping and withdrawal behaviors, we further examined whether task performance was influenced by unhealthy eating and morning strains. We ran a path analysis of a full model including a single-item measure of task performance ("Compared to the standards, today I got a good result from my work"; Roe, 1999) with other two dependent variables (i.e., helping and withdrawal behavior). The path analysis results showed that physical strain was negatively associated with task performance ($\gamma = -.20$, $p = .013$), but emotional strain was not related ($\gamma = .023$, $p = .736$). Furthermore, our bootstrapping test for multilevel mediation effects based on 20,000 Monte Carlo replications empirically supported the indirect effect of unhealthy eating behavior on task performance via physical strain (coefficient = $-.048$, 95% CI $[-.092, -.010]$). In summary, unhealthy eating showed a negative effect on task performance only via physical strain but not via emotional strain.

Time Trend

We tested the effects of the linear time trend in each path for psychological reaction on the two mediators and two outcome variables. We did not find any significant linear time trends in emotional strain ($\gamma = .69$, $p = .465$), physical strain ($\gamma = 1.13$, $p = .154$), helping behavior ($\gamma = 1.11$, $p = .335$), or withdrawal behavior ($-\gamma = 1.03$, $p = .310$).

¹ To confirm the robustness of our findings, we ran the full model without control variables (Bernierth & Aguinis, 2016). When we excluded the control variables (i.e., morning positive affect, morning negative affect, and workload), our results showed that the previous night's unhealthy eating behavior was positively related to the next morning's emotional strain ($r = .40$, $p < .001$) and physical strain ($r = .26$, $p < .001$). Both the emotional and physical strains were negatively related to helping behavior ($r = -.18$, $p < .01$; $r = -.15$, $p < .05$) and positively related to withdrawal behavior ($r = .17$, $p < .01$; $r = .21$, $p < .001$). Overall, the pattern of the findings remained the same with and without control variables.

Figure 2
Cross-Level Moderation Effect of Emotional Stability on Emotional Strain



Discussion

Summary of Findings

In this daily diary study, we focused on evening unhealthy eating behavior as a potential stressor in the nonwork domain and tested its within-person effects on morning strains as well as work-related outcomes. Although we did not find the main effects of unhealthy eating behavior on the next day's helping and withdrawal behaviors, the time-lagged relationships were explained by emotional and physical strains experienced in the morning. In other words, the lagged effects of unhealthy eating behavior existed only when employees experienced the subsequent morning strain, either emotional or physical, as a reaction to the stressor (e.g., feelings of guilt and shame, upset stomach). Moreover, we found that employees' emotional stability played a stress-buffering role, alleviating the

negative emotions and physical symptoms from the prior evening's unhealthy eating behavior. In summary, the current study represents the first attempt to explain how employees' unhealthy eating behavior affects their quality of performance through a dual-path mechanism and introduces the boundary condition of attenuating emotional and physical strains in the process of coping with stress.

Theoretical Implications

Our findings have several important theoretical implications for the stress literature and health behavior literature. First, our study sheds light on the psychological, physical, and behavioral consequences of unhealthy eating behavior, by introducing it as a potential stressor in the nonwork domain. Although prior literature has partially acknowledged the important role of health-related

Figure 3
Cross-Level Moderation Effect of Emotional Stability on Physical Strain

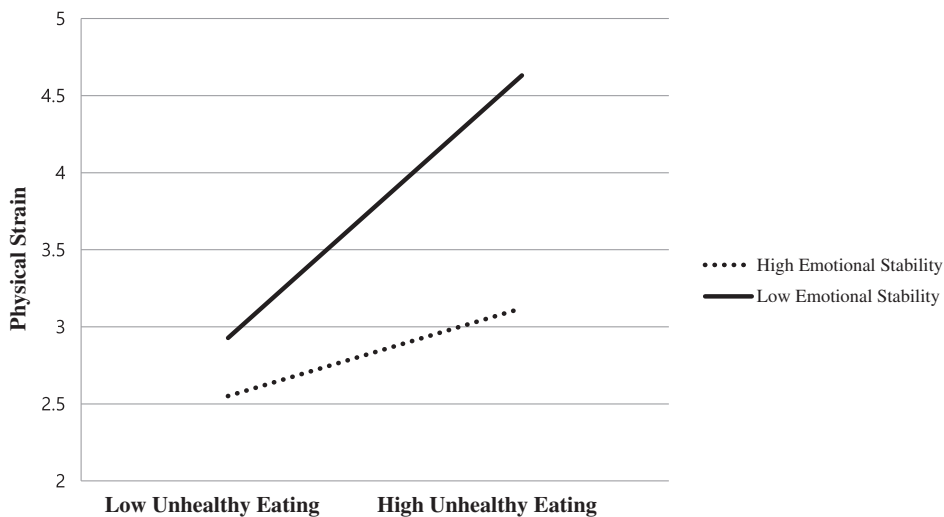


Table 3*Results of Conditional Indirect Effects of Unhealthy Eating Behavior on Following Day's Behavioral Outcomes at Work*

Mediating mechanism	Condition	Helping behavior			Withdrawal behavior		
		Estimate	SE	95% CI	Estimate	SE	95% CI
Emotional strain	Low emotional stability	-.072	0.03	[-.143, -.017]	.084	0.03	[.036, .148]
	High emotional stability	-.045	0.03	[-.099, .001]	.061	0.03	[.019, .115]
	Difference	.027	0.02	[.001, .059]	-.023	0.02	[-.059, -.005]
Physical strain	Low emotional stability	-.067	0.04	[-.143, -.007]	.070	0.03	[.009, .144]
	High emotional stability	-.021	0.02	[-.052, .017]	.021	0.02	[-.015, .055]
	Difference	.046	0.03	[.002, .097]	-.048	0.03	[-.103, -.002]

Note. SE = standard error; CI = confidence interval.

behaviors (e.g., sleep, physical activity) in employees' personal and work lives, their diet has drawn relatively less academic attention than the other behaviors (Liu et al., 2017). More importantly, researchers have not been able to provide clear theoretical explanations of whether or why employees' diet would matter in their organizational life. To answer the calls from the health behavior literature and to provide empirical evidence for the increased emphasis on a healthy diet, a pressing issue was to examine the immediate impacts of eating behaviors on daily well-being and work-related outcomes from an organizational science perspective. Bridging this gap in the literature, the current study demonstrated that unhealthy eating behavior in the evening can potentially serve as an important nonwork-related stressor that is associated with emotional and physical strains as well as behavioral inefficiency at work on the following day. Also, the findings on helping and withdrawal behaviors inform that low resource levels, resulted from coping with morning strains, would motivate employees to engage in resource conservation strategies at work, which manifests as decreased daily performance.

Relatedly, we note that in modern society, dietary choices have numerous implications that go beyond simple nutritional intake. In particular, the negative consequences of unhealthy eating are applicable not only to those individuals who are especially susceptible to serious health issues but also to the broader public. Any individuals who are concerned about their body image, watching for weight changes, or striving to meet strict dietary criteria can be acutely and immediately affected by unhealthy eating behaviors (defined in their own terms). Thus, the findings of this study contribute to a more comprehensive understanding of daily health-related behaviors—in this case, the potential adverse effects of individuals' unhealthy eating behavior on their day-to-day emotional and physical well-being when that behavior is perceived as a stressor.

Second, our results showed that unhealthy eating behavior may elicit unpleasant emotional reactions via negative attribution to self. As the association between eating and emotion has become more prevalent in modern populations, the psychological consequences have evolved to become just as important as the physical consequences of unhealthy eating. Engaging in unhealthy eating behavior has been associated with self-blaming emotions such as guilt or shame, as individuals are likely to attribute the negative consequences of their unhealthy dietary choices (e.g., overeating, eating late-night snacks) to themselves (Lazarus, 1991; Smith & Lazarus, 1993). In addition, our supplementary analyses revealed that individuals who engage in evening unhealthy eating behaviors are likely to experience more intense NA (e.g., upset, irritable) in the

morning. However, unlike the moral emotions (e.g., guilt), morning NA did not explain the relationship between evening unhealthy eating behavior and work behaviors (i.e., helping and withdrawal behaviors) the next day. These results indicate that individuals who engaged in unhealthy eating in the evening may experience both increased NA and eating-specific negative emotions on the next morning, but their actual performance at work depends on how guilty they feel about their dietary slip-up.

Third, our study initiates an important conversation about healthy diet, well-being, and performance. Going beyond the health-related outcomes of unhealthy eating behavior investigated in previous research, our study is the first to provide empirical evidence on how unhealthy eating behavior translates into decreased work performance. Drawing upon the transactional model of stress and coping (Lazarus & Folkman, 1984) with resource perspective (Hobfoll, 1989), our work introduced a two-path mechanism that explains the indirect effects of employees' unhealthy eating behavior in the evening on reduced quality of performance at work. At first glance, the link between unhealthy eating and work behaviors was neither clear nor intuitive. However, our study explained the nonwork-to-work spillover effects of unhealthy eating behavior on performance by examining the mediating effects of emotional and physical strains (i.e., immediate emotional impairment and undesirable physical symptoms). Our findings suggest that promoting a healthy lifestyle is important not just for individuals' well-being but also for their work-related behaviors. These findings emphasize the importance of healthy eating in general and reconfirm the intimate connection between the *personal domain* and the *professional domain*, which directly speaks to the nonwork interface literature (Frone et al., 1992).

Fourth, we found that a personal resource—that is, a higher level of emotional stability—can weaken the undesirable effects of unhealthy eating behavior on emotional and physical states. When individuals are exposed to a potential stressor, their emotional stability appears to determine the extent to which they negatively react to this event. The significant cross-level interaction effects between unhealthy eating behavior and emotional stability have important implications for the role of individual difference in the stress process (Bolger & Zuckerman, 1995), as they reconfirm that the stressor-strain link is not uniform for everyone. Furthermore, the boundary condition emphasizes the role of emotion—specifically, the subjective experience of negative emotions (i.e., interpretation and regulation)—in unhealthy eating. Emotional stability is associated with less frequent or less intense experiences of negative emotion and seems to have benefits for coping. For example,

individuals with high emotional stability may interpret negative events more positively or not brood about such events (John & Gross, 2007), thereby avoiding any amplification of their negative emotions. Thus, our findings inform a more sophisticated understanding of the idiosyncratic roles of individual differences in health behaviors and stress-coping processes.

Practical Implications

Our findings also provide organizations with practical insights regarding employees' well-being and performance. Previous research has shown that work-related stressors are positively related to unhealthy eating (Liu et al., 2017). The current study established the empirical bidirectionality of this relationship: That is, unhealthy eating behavior in the evening has both health-related and performance-related implications. Organizations would be well advised to recognize the important roles of employees' diet in work outcomes and take relevant actions. Along with sleep and physical activity, diet serves one important criterion for determining how successfully employees manage their personal domain. Indeed, the implications of a healthy diet go beyond simple nutritional intake to encompass long-term health-related outcomes. A healthful approach to nutrition also has immediate benefits in employees' personal and professional domains. Whereas successfully meeting dietary goals may bolster a person's sense of achievement, consuming an unhealthy diet may contribute to feelings of failure in the personal domain and increase employee's internal doubts about his or her ability to sustain a successful work-life balance.

From a human resource management perspective, recognizing employees' concerns with maintaining a healthy diet would be a good starting point when implementing policies and procedures. To enhance employee motivation, commitment, and performance, some corporations now offer food-related benefits. Our findings suggest that such strategies can benefit not only the employees but also their organization. These strategies might include organizational efforts such as making balanced meals accessible on-site and encouraging employees to pursue a healthy lifestyle by providing information on healthy dietary routines (e.g., ways to prevent late-night snacking or stress-related eating). Such gestures serve as practical aids that support employees' healthy nutritional intake as well as create a health-promoting climate that signals the corporation's values are well aligned with employees' primary interest.

Furthermore, as our findings emphasized the detrimental effects of employees' emotional and physical strains in the morning on the quality of their daily performance, organizations may want to administer on-site interventions that facilitate employees' recovery and restoration of their resources. All too often, employees start the workday with a low level of resources due to inefficient management of personal health (e.g., poor sleep or unhealthy eating) or due to the need to complete extra work during the previous night. In addition, within-person resource levels typically fluctuate across working hours (Sonnentag et al., 2012). By establishing appropriate strategies to address these issues in the workplace, organizations may be able to enhance their employees' daily performance. Although protecting employees from unnecessary work stressors (e.g., abusive supervision) is the most obvious strategy to prevent further resource loss, performing their focal tasks inevitably requires that employees expend self-regulatory resources. To counteract these losses, we recommend that organizations provide employees

with opportunities or environments that allow for brief periods of personal rejuvenation. For example, companies might provide break rooms in which employees can relax (Hunter & Wu, 2016), educate managers to offer useful advice to their employees about work stress (Krajewski et al., 2010), and build a health climate that tolerates or even encourages employees' microbreaks (Zweber et al., 2016).

Limitations and Future Research Directions

We suggest readers interpret the current findings in light of the following limitations. First, our findings on unhealthy eating behavior should be understood in the context of only the evening diet, rather than as reflective of an overall unhealthy eating pattern. We specifically captured employees' unhealthy eating behavior in the evening over 2 weeks as one indicator of their health behaviors in the personal domain. Research into the effects of other meals in the personal domain may provide additional information on the diet-work quality relationship. For example, as breakfast is a more proximal meal, occurring soon before daily work begins, it might bring about more intense emotional and physiological reactions and influence the employee's performance on that day. In addition, employees' eating behaviors at work (i.e., lunch or snack) may play an important role by governing their resource availability during the rest of the workday. For example, certain nutritional intake (e.g., a protein bar or caffeine consumption) in the middle of the day might boost employees' physical and psychological resources, whereas unhealthy eating (e.g., overeating high-sodium foods) might lead to instant drowsiness, lethargy, mental foginess, sleepiness, and subsequent laziness. As discussed above, we encourage future studies to consider incorporating alternative timeframes or temporal intervals (e.g., shorter or longer temporal distance) for assessing eating behavior, emotional and physical (even cognitive) reactions, and work behaviors. In addition, expanding the scope of emotional and physical strains, for example, by including more extensive examples of moral emotions (e.g., regret, remorse) or physical symptoms (e.g., skin rash/acne, increased heart rate), may help improve the validity of the study.

Furthermore, our operationalization of unhealthy eating is based on unhealthy content of the foods (e.g., junk food or drink), an excessive amount of nutrition intake, and temporally close-to-bedtime consumption (Liu et al., 2017). In reality, unhealthy eating behavior can be defined in many other ways. For example, the operationalization of unhealthy eating behavior could expand in relation to food content, by including foods that are unbalanced in nutrition; high in sugar, fat, and sodium content; and highly processed (Monteiro, 2009). At the other end of the unhealthy eating spectrum from overeating is extreme fasting. Controversy persists regarding the ideal frequency of nutritional intake, but generally, spreading smaller amounts of nutrition across a series of meals is recommended. Clearly, such factors could be considered in determining what unhealthy eating means. We encourage future studies to take a broader approach to defining "unhealthy diet" by accounting for nutritional content, amount, frequency, and temporal variations in the personal domain (i.e., breakfast) as well as in the professional domain (i.e., lunch).

Second, our model introduced a two-path mechanism to explain the connection between unhealthy eating behavior in the evening and performance quality on the next workday, suggesting the emotional and physical strains experienced in the next morning

are the key mediators in the lagged relationships. However, this model did not address the potential positive effects of unhealthy eating, such as an instant release from stress or increased positive affect (Kuijjer & Boyce, 2014). In fact, previous research has found that unhealthy eating behavior may serve as a short-term coping strategy to deal with work-related demands (Jones et al., 2007; Liu et al., 2017). Considering the desirable effects that certain unhealthy eating behaviors—for example, consuming “comfort foods”—have on mood, examining this opposite mechanism could offer fresh insights. We expect that such mood-lifting effects would occur immediately after engaging in unhealthy eating behaviors—that is, before individuals have a chance to fully reflect upon the undesirable implications of the unhealthy eating behavior on their health. Although the current study chose a time interval of overnight (i.e., from the evening to the next morning and afternoon) to investigate the negative consequences of daily unhealthy eating behavior, we encourage future studies to capture the mood-boosting effects or recovery benefits of such behaviors by employing a shorter time interval. In that way, we may incorporate both positive and negative perspectives to understand employees’ emotional eating behaviors and identify potential micromediators in the positive mechanism (e.g., positive affect, satisfaction, or relaxation after indulgence).

Third, the current model presents emotional stability as a moderator that weakens the undesirable effect of unhealthy eating behavior on emotional and physical strains. While affect-related disposition is a well-studied individual difference variable (personal resource) for the stressor–strain relationship, investigating other individual differences or contextual factors may provide further insights. For example, individual attitudes toward evening eating or attitude toward a healthy lifestyle in general may strengthen the stressor–strain relationship, such that individuals with a higher goal for or focus on a healthy lifestyle view their own unhealthy eating behavior more negatively. Likewise, different coping strategies may influence the stressor–strain relationship: for example, emotion-focused coping such as positive appraisal would weaken the association. Moreover, individuals in supportive social environments might experience lower levels of strain as a reaction to stressors (Bliese & Britt, 2001). Therefore, we encourage future studies to further examine the buffering or deteriorating effects of these types of social or contextual factors.

A fourth limitation is that our findings are based on self-reported data, which may raise concerns about common method variance (Podsakoff et al., 2012). Following the procedural remedies of CMV, we incorporated different scale anchors into our surveys, placed the scales assessing momentary affect early in the surveys, and used different time frames for unhealthy eating (in the evening), mediators (in the morning), and behavioral outcomes (in the afternoon). Although evening unhealthy eating behavior, perceived strains, and withdrawal behavior may be best measured via self-reports due to issues of low observability, future studies might reduce the common rater effects by incorporating supervisors’ reports of employees’ helping behavior.

Conclusion

This study provides empirical evidence that employees’ healthy lifestyle in the personal domain has immediate implications for their daily well-being and performance in the personal and professional domains. Emphasizing a rarely investigated health behavior, employees’ diet, we showed that engaging in unhealthy eating

behaviors in the evening may lead to emotional and physical strains in the next morning, which, in turn, results in reduced quality of performance over the course of the workday. Our work is the first to propose a psychological and physical mechanism that connects employees’ personal and professional domains within the context of an unhealthy diet. Furthermore, by introducing a personality trait as a moderator, we showed that the undesirable effects of an unhealthy diet could be alleviated under a high emotional stability condition. The results call for greater organizational and societal attention to be paid to the implications of working individuals’ unhealthy diets on their daily well-being as well as work performance.

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