The Pennsylvania State University
The Graduate School
College of Health and Human Development

CHANGE TRAJECTORIES OF STRESS AND STRAIN DURING A STRESSFUL EVENT: THE ROLES OF GROUP COHESION AND GROUP MEMBERS' EMOTIONAL VARIABILITY

A Dissertation in
Hospitality Management
by
Shi Xu

Submitted in Partial Fulfillment
of the Requirements
for the Degree of

Doctor of Philosophy

May 2017

The dissertation of Shi Xu was reviewed and approved* by the following:

Hubert Van Hoof
Professor of Hospitality Management
Dissertation Advisor
Chair of Committee

Anna S. Mattila
Marriott Professor of Lodging Management
Professor-in-Charge of Graduate Program

Donna Quadri-Felitti
Marvin Ashner Director
Associate Professor of Hospitality Management

Larry Martinez
Special Member
Assistant Professor of Psychology

Alicia A. Grandey
Professor of Psychology

Peter Molenaar
Professor of Human Development and Family Studies

*Signatures are on file in the Graduate School.

ABSTRACT

Employee stress is a significant issue in the hospitality industry, and it is costly for both employees and employers. This study examined the impact of a specific event on the change trajectories of stress and strain and how group characteristics can shape those trajectories by means of testing several hypotheses that were derived from the literature on affect, stress and strain. Specifically, informed by affective events theory and the homeostatic model of stress, this study investigated how stress predicts strain outcomes, including the need for recovery, emotional exhaustion, and sleep quality, and the change trajectories of stress and strain during a stressful event. In addition, the boundary conditions of group cohesion and group members' emotional variability were examined.

The study gathered data from 69 student participants in a senior level, food production and service management course that involved a stressful event, the hosting of a "theme dinner" to the general public. Data were collected through an experience sampling methodology and analyzed by means of latent growth curve modeling. In line with affective events theory and the homeostatic model of stress, results showed that stress, need for recovery, and emotional exhaustion all displayed negative quadratic (inverted U-shaped) trajectories, and that sleep quality displayed a positive quadratic (U-shaped) trajectory. Group cohesion lowered the initial level of emotional exhaustion and increased the initial level of sleep quality. Group cohesion also flattened the linear trajectory of sleep quality over time. In addition, individuals working with group members with higher levels of emotional variability not only reported higher initial levels of stress, emotional exhaustion and need for recovery, but also higher systematic changes in their

need for recovery and emotional exhaustion during the event. The implications of the findings and directions for future research are presented.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ACKNOWLEDGEMENTS

This dissertation marks the end of my five-year graduate journey, a journey that was extremely demanding, challenging, yet also exciting and rewarding. Reaching this milestone, and every step that leads up to it, would not have been possible without my advisor, Dr. Hubert Van Hoof. Dear Dr. Van Hoof, I cannot express enough thanks to you. You truly helped me tremendously with weekly meetings, data collection in Ecuador, revisions on my numerous manuscripts day and night and investments in my professional and personal development, to name a few. You encouraged me and helped me to become a better researcher and more importantly, a better person. You were always there whenever I needed your support and guidance and I am truly thankful to have worked with you as my advisor.

I also owe sincere thanks to Dr. Larry Martinez. Dear Larry, thank you for guiding me throughout the past few years. I will never forget the time we spent in your office discussing research, editing manuscripts and sharing personal stories. Although you have been in Portland for the past year, you have unfailingly supported and trained me on my dissertation and on other research projects.

I would also like to thank my dissertation committee members. Dr. Anna Mattila, thank you for your time and effort in helping me on my dissertation. Your enthusiasm about doing research and sincere care about students has taught me so much that I can learn in my academic career. Dr. Donna Quadri-Felitti, thank you for offering me your valuable comments on my dissertation. Dr. Alicia Grandey, thank you for contributing your thoughtful feedback and challenging me to be a deeper thinker. Dr. Peter Molenaar, you helped me to appreciate the intricacies of innovative analytical tools and encouraged me to learn new and advanced statistics.

The data collection in this study was very challenging and I would like to thank the HM430 instructors in the School of Hospitality Management, Mr. Jean-Pierre Ranjeva, Mr. George Ruth and Mr. Peter Yersin, for their assistance in helping me with the data collection. The support of faculty, staff members and colleagues in the school was invaluable; you all have made my graduate journey a happy and memorable one.

Finally, special thanks to my parents, Gengxu Xu and Shu Zeng, my parents-in-law, Jiehua Yan and Liangzhao Chen and my husband, Leo Yan, for their endless love and encouragement. Thank you to my baby daughter Leah: you light up my life and you have brought me extra motivation and energy. I am dedicating this dissertation to you.

Chapter 1

Introduction

The hospitality industry has been characterized as highly demanding: it is labor-intensive and involves unusual working hours and work overload with a high degree of human interaction (Tsaur & Tang, 2012). Hospitality employees often experience conflicting demands from the organization, supervisors and customers, and these conflicts create dissonance and stress for them (O'Neill & Davis, 2011). Even during slow times, employees cannot relax and regain strength; they are required to remain alert because a customer may arrive at any moment. As a consequence, even slow periods are stressful because employees need to cope with the psychological challenges of boredom as well as a continual anticipation of a deluge (Katz, 2016). Understanding and managing hospitality employee stress and its outcomes are the critical reasons why this study was initiated.

This dissertation focuses on stressors, stress and strain in a hospitality context. Stressors are environmental or external events that trigger a series of cognitive and physiological reactions in an individual (Griffin & Clarke, 2011). Stress is internal and is defined as "an individual's psychological response to a situation in which there is something at stake and where the situation taxes or exceeds the individual's capacity or resources" (LePine, LePine, & Jackson, 2004, p. 883). Strain involves the individual's reactions to stressors and stress, and the depletion of his/her psychological and physiological resources (Sonnentag & Fritz, 2015). In short, stressors are factors that induce stress, stress is a state of negative arousal, and strain involves the maladaptive reactions to stressor and stress in the short and long term.

Workplace stress is related to many negative individual and organizational outcomes such as exhaustion, absenteeism, motivation to learn, cardiovascular disease, and sleep deprivation (e.g., Ganster & Schaubroeck, 1991; LePine et al., 2004). Previous research has looked into stress and work-related strain, yet little has been done on the impact of a specific event on the change trajectories of stress and strain and on how group dynamics can shape those trajectories. In the hospitality industry in particular, many inherent stressful events occur on a regular basis, from large conferences and weddings to high-end meals and specific customer needs that need to be met.

From a practical perspective, investigating the impact of a specific event on employee stress is vital to employees and organizations alike because of the prospective costs of stress for either party. Theoretically, a comprehensive model of the role of group affect in the job-stress context is missing from the literature. Yet, such a model is needed in order to explain how and when stressful work experiences translate into poor health and well-being. By focusing on group affect as a core resource, such a model helps in better understanding the psychological mechanisms underlying the stress-strain process.

Purpose of This Study

The purpose of this study was to test whether individuals experience significant changes in stress in the workplace over a period of time leading up to and after a stressful event, and to test the trajectory of change across time in an individual's level of stress and its relation with strain-relevant outcomes, including emotional exhaustion, need for recovery and sleep quality (Sonnentag, & Zijlstra, 2006). A potential boundary condition of group affect was also examined. The first and most noteworthy theoretical contribution of the study is that its results

add to our understanding of the role of group affect on the change trajectories of stress and strain. Although the strain aspect has been examined in earlier service work research (e.g., Shani, Uriely, Reichel, & Ginsburg, 2014; Tsaur & Tang, 2012), the group affect aspect has not received sufficient attention (Barsade & Gibson, 2007). By adopting this perspective, this study answers the call for enhanced investigation of interventions that might reduce strain (Grandey, Fisk, & Steiner, 2005).

Second, this research investigates the interplay of emotions, stress, and strain as dynamic processes, including both immediate reactions to a critical work event and cumulative effects that build over the course of the event and that spill over into evening (i.e., sleep quality) to better capture the depleting/restorative properties of resources. Third, following Gruber, Mauss and Tamir's (2011) argument that "happiness is not always good," this research also challenges the widely held notion in organizational psychology that positively-valenced emotions are related to positive outcomes and negatively-valenced emotions are related to negative outcomes by adding the impact of emotional variability (Eid & Diener, 1999). This further enriches the Conservation of Resources perspective on dispositional resources and emotional exhaustion (Hobfoll, 1989).

This research contributes to the practice of management by examining the benefits of group affect that can be initiated by creating greater group cohesion as well as less emotional variability within the group. An understanding of the relation between stressful work events and psychological and physiological strain and the buffer effect of group affect is valuable to organizations, given the financial implications associated with poor employee health (e.g., health insurance costs, sick days, illness-related productivity losses; Bono, Glomb, Shen, Kim, & Koch, 2013; Zhang, Bansback, & Anis, 2011).

Selection of Research Methodology

This research used an experience sampling methodology procedure and the data were analyzed using latent growth curve modeling. Research on job stress and strain has shown that stress changes over time and researchers have commented on the need for more longitudinal study designs and for the inclusion of a variety of work-relevant variables to study occupational stress (Zapf, Dormann, & Frese, 1996). Instead of a piecemeal, cross-sectional approach to stress, more comprehensive longitudinal studies with repeated measures are needed to better understand the development of stress and how to recover from its effects (Hakanen & Bakker, 2016).

The experience sampling methodology (ESM), which typically asks employees to record ongoing events, current affect and thoughts over time, is an increasingly popular alternative to traditional cross-sectional designs, which by nature, look at correlations of variables at a single point in time (Lindell & Whitney, 2001). Although ESM generally relies on self-reports, it relies less on memory and is less subject to global retrospective biases (Fisher & To, 2012). ESM is particularly relevant to the study of outcomes associated with work stress exposure. It allows researchers to integrate experiences with many circumstances over time in order to assess the cumulative effects of stress exposure on transient and affect-related outcomes, such as fatigue and anxiety (Ganster & Rosen, 2013). In general, this kind of research design has provided support for the notion that an individual's psychological well-being fluctuates with stress exposure (e.g., Gross, Semmer, Meier, Kalin, Jacobshagen, & Tschan, 2011; Teuchmann, Totterdell, & Parker, 1999; Totterdell, Wood, & Wall, 2006).

In order to depict the change trajectories of stress and strain and how group affect impacts the trajectories, the data collected for this study were analyzed by means of a relatively

underutilized analytical tool in the hospitality management literature, latent growth curve modeling. Latent growth curve analysis is a tool that is used to explain change over time on a continuous rather than a static basis. What happens (or changes) over time determines the shape of the curve that is found. A growth curve can be linear (increasing or decreasing) or curvilinear (such as quadratic) over time. Rather than comparing individuals' stress levels at the beginning of the study period to those at the end, as if comparing two pictures, this technique is more akin to a video, a relatively continuous recording of how individuals feel about their experiences during a period before and after a stressful event. As such, it is a much more powerful and accurate reflection of their feelings.

Overview

In order to develop this research, a summary of issues surrounding stress and strain in the workplace is presented in the review of literature. The discussion then turns to a brief overview of the specific context adopted in this study, followed by the hypotheses that drove the study. Findings from the study are reported next. Finally, theoretical and practical contributions of this dissertation are summarized and discussed and suggestions for future research are presented.

Chapter 2

Review of Literature

To generate a thorough understanding of how stressors, stress, strain and group affect are correlated, a critical review of relevant organizational psychology literature in the following three contexts is presented: (1) stress and work-related strain and the relation between the two constructs; (2) the stressful event as a contextual factor that influences the change trajectories of stress and strain; (3) the role of group affect that impacts the changes of stress and strain. Hypotheses were developed under each of those themes.

Stress and Work-Related Strain

According to Rodell and Judge (2009), stressful events are either challenging (job demands that are good for personal growth) or hindering (job demands that are obstacles to personal growth). Hindrance stress tends to result in detrimental attitudes and behaviors such as poor performance and counterproductive behaviors (Rodell & Judge, 2009). Although challenge stress may result in high performance, there are negative consequences to this "positive" type of stress as well. Indeed, psychological strain is expected if events are experienced as stressful (Boswell, Olson-Buchanan, & LePine, 2004), regardless of its potential for gains. Previous research has demonstrated that stress is strongly and positively related with psychological strain, regardless of whether it is challenge stress or hindrance stress. For instance, Teuchmann et al. (1999) conducted an ESM study in which accountants reported their affective responses three times a day for four weeks, and their results demonstrated that their mood and emotional

exhaustion changed parallel to time pressure. Similarly, Totterdell et al. (2006) showed that, over a 26-week period of time, portfolio workers (self-employed individuals working for multiple clients) experienced greater psychological strain during weeks that involved higher work demand and lower psychological control.

This research examines two important aspects of psychological strain: need for recovery after work and emotional exhaustion. The need for recovery is defined as "the subjective experience of longing for relief from regular demands and for having some time that allows for low baseline activity" (Sonnentag & Zijlstra, 2006). There is evidence showing that elevated need for recovery is a consequence of stressful events because of the repeated exposures to unfavorable work demands and a lack of job control (Sluiter, De Croon, Meijman, & Frings-Dresen, 2003).

Emotional exhaustion is the core aspect of job burnout (Maslach & Jackson, 1981) and is referred to as "the extent to which employees feel emotionally overwhelmed and drained by their work" (Janssen, Lam, & Huang, 2010). It is characterized by a feeling of being overextended and depleted of one's physical and emotional resources (Maslach, Schaufeli, & Leiter, 2001). The concepts of emotional exhaustion and need for recovery were investigated because in the hospitality industry, employees are engaging in a variety of emotional activities, which could be particularly draining and that would deplete their levels of engagement and energy (e.g., Shani et al., 2014). Understanding how need for recovery and emotional exhaustion accumulate at the daily level is important, because daily levels of strain have been shown to be related to important daily work-related outcomes, such as job performance, organizational citizenship behavior, and job satisfaction (e.g., Fuller, Stanton, Fisher, Spitzmüller, Russell, & Smith, 2003; Halbesleben & Wheeler, 2011).

Strain not only includes psychological strain but also physiological strain (Lazarus & Folkman, 1984). This research focuses on one type of physiological strain, sleep quality, as the hospitality industry involves unusual working hours that may impede restful sleep and cause employees to feel sleepy during the day. Sleep is vital to human beings and sleep quality affects an individual's mental health, well-being and even his/her mortality (Hublin, Partinen, Koskenvuo, & Kaprio, 2007). Sleep deprivation has adverse effects on work behavior and job performance. For example, Barnes and Wagner (2009) found that a 40-minute decrement in sleep was associated with a 5.6% spike in work injuries. Åkerstedt (2003) found that poor sleep quality predicted low levels of alertness, and Kessler et al. (2011) estimated a prevalence rate of insomnia of 23.3% among the US employees and found an association between insomnia and substantial workplace costs, such as reduced productivity and increased workplace accident injuries.

Sleep quality refers to difficulty of falling asleep, staying asleep, and the number of awakenings experienced during the night; Sleep quantity refers to the amount of time an individual spends in a sleeping state (Barnes, 2012). One may sleep many hours in a given night but have a fitful sleep that is frequently punctuated by awakenings. Alternatively, one could sleep only a few hours, but soundly. Some people need higher amounts of sleep quantity to attenuate experiences of sleepiness (Ferrara & De Gennaro, 2001). Thus, sleep quality may be a better indicator of the sleep regulation processes than sleep quantity (Litwiller, Snyder, Taylor, & Steele, 2016). In addition, in industrial-organizational psychology research, sleep quality has been investigated more frequently than sleep quantity (Litwiller et al., 2016), and therefore, sleep quality was chosen as an outcome variable in this research.

The Stressful Event as a Contextual Factor

The literature shows that stress is a dynamic function of a relevant event and experience (Griffin & Clarke, 2011). This notion is consistent with affective events theory (AET, Weiss & Cropanzano, 1996), which provides an overarching theoretical framework to this study. AET suggests that certain behaviors are emotional responses to workplace events and situations and posits that specific work events are the proximal causes of employees' affective experiences. AET incorporates concerns for transient emotions and attempts to shed light on the impact of work events on employees' responses. Weiss and Cropanzano (1996) proposed that affective experiences would lead to spontaneous affective-driven behaviors such as acts of good or bad citizenship behaviors. In the aggregate, affective experiences contribute to the affective component of attitudes such as satisfaction with the job, and eventually to judgment-driven behaviors such as a decision to quit a job. AET presents a useful framework for understanding the role of affect in the workplace (Fisher & Ashkanasy, 2000).

This research presents an overarching model to explain the effect of emotionally significant workplace events on job-related attitudes, and raises the possibility that stress could fit naturally into AET. Stress acts as the process by which environmental events initiate a series of cognitive and physiological reactions that ultimately affect well-being (Ganster & Rosen, 2013). Resources or energy can be depleted by employees meeting demands required by the event and therefore, this study argues that workplace stressful events serve as mechanisms in depleting energy. This study was designed to explore this idea by analyzing the relation between a significant stressful event at work and stress and perceived strain over time. Analysis of daily stress and strain over time allows for an examination of the possibility that workplace strain gradually increases with time and/or fluctuates in relation to a stressful event at work. Beyond

the implications of feeling stressful on a given day, both theoretical arguments and empirical evidence show that daily levels of strain can accumulate over time. To truly understand this phenomenon, we must learn how stress levels differ between individuals across a variety of situations and time frames.

This study argues that the change of stress and strain displays an inverted U-shaped trajectory before, during and after a stressful event. This could be explained by the homeostatic model of stress (McGrath, 1970), which refers to the necessity of the body to maintain a stable internal environment so that vital organismal processes proceed optimally. The stressor causes the body to leave a state of homeostasis and enter a state of "fight-or-flight," in which the stress level peaks. The stress response serves as an alarm in a homeostatic system, producing a neurophysiological activation from one level of arousal to a higher level of arousal (Ursin & Eriksen, 2004). Once the stressor is no longer present, the body calms down and returns to an original state of homeostasis. For example, the stressor might interfere with stress via increased cognitive arousal, resulting in relatively lower psychological strain the next day due to a homeostatic rebound effect. Such a pattern would be consistent with homeostatic sleep regulation, in which deficient sleep before the stressful event leads to compensatory increases in sleep duration and depth after the event. The argument leads to the following hypotheses:

> *Hypothesis 1: Stress, need for recovery, and emotional exhaustion change as a function of stressful events. They display negative quadratic (inverted U-shaped) trajectories such that before the event, stress, need for recovery, and emotional exhaustion increase, and after the event, stress, need for recovery, and emotional exhaustion decrease.*

Hypothesis 2: Sleep quality changes as a function of stressful events. It displays a positive quadratic (U-shaped) trajectory such that before the event, sleep quality decreases, and after the event, sleep quality increases.

The Relation between Stress and Strain

Previous literature has demonstrated that stress and strain are strongly and positively correlated (Teuchmann et al., 1999; Totterdell et al., 2006). The conservation of resources (COR) model is the most prominent theoretical perspective used to understand the relations among stressors, stress and strain (Halbesleben & Buckley, 2004; Hobfoll, 1989). Resources herein are defined as "physical, psychological, social, or organizational aspects of the job that help the person to cope with job demands, increased learning, and development as an employee, and are useful in achieving work-related goals" (Mäkikangas, Bakker, Aunola, & Demerouti, 2010; p. 797). According to Hobfoll's (1989) COR model, individuals strive to gain, preserve, and protect their resources. An individual's resources are consumed, and gradually depleted when coping with job-related stressors such as work demands (Baumeister, Vohs, & Tice, 2007; Meijman & Mulder, 1998). This loss of resources will result in psychological imbalance and, if left unreplenished, will ultimately lead to emotional exhaustion (Hobfoll & Freedy, 1993).

Recovery is the process that reverses the negative consequences of job demands and brings individuals back to their pre-stressor levels of functioning (Craig & Cooper, 1992). When job demands are stressful and strain-evoking, employees will experience affective reactions with fatigue symptoms such as emotional exhaustion, attentional difficulties and even impaired cognitive functioning (e.g., Linden, Keijsers, Eling, & Schaijk, 2005). In order to reduce these negative consequences in the long run, employees need recovery time to avoid failing at

subsequent attempts at self-regulation. When recovery is not sufficient, employees may still experience exhaustion and a high need for recovery (Sonnentag & Zijlstra, 2006). Therefore, it is posited that, over the course of a stressful event, employees with a higher initial level of stress are likely to have higher initial levels of need for recovery and emotional exhaustion, and also have higher rates of change in need for recovery and emotional exhaustion over time.

The relation between stress and sleep quality is also important. As researchers have become better informed about the importance of sleep to employees and organizations, Barnes (2012) suggested that future research should consider how work experiences influence sleep quality. A number of factors could lead to sleep deprivation: receiving a pay cut, rude colleagues and customers, abusive supervision, sexual harassment and job insecurity could all lead to employees having a hard time falling asleep or suffering from insomnia (Barnes, 2011). Among those reasons, stress stands out as a significant factor. Research has shown that stressful events are associated with decreases in hours of sleep and increases in fragmentation of sleep (Hall et al., 2008). Consistent with the theoretical argument that a person's psychosocial environment affects biological outcomes (Lazarus & Folkman, 1984), research indicates that stress shares part of the blame for sleep deprivation as it involves physiological arousal and generates sympathetic nervous system activation, such that people in an activated state are less able to fall asleep easily (Wagner, Barnes, & Scott, 2013). Stress also affects sleep quality in the long run (Dahlgren, Kecklund, & Åkerstedt, 2005). This study examined how stress is related to the initial level and the change of sleep quality over the stressful event period.

Thus, the following three sets of hypotheses were formulated:

Hypothesis 3a: Initial stress is positively related to initial need for recovery.

Hypothesis 3b: Initial stress is positively related to initial emotional exhaustion.

Hypothesis 3c: Initial stress is negatively related to initial sleep quality.

Hypothesis 4a: Initial stress is positively related to rate of change in need for recovery.

Hypothesis 4b: Initial stress is positively related to rate of change in emotional exhaustion.

Hypothesis 4c: Initial stress is negatively related to rate of change in sleep quality.

Hypothesis 5a: Rate of change in stress is positively related to rate of change in need for recovery.

Hypothesis 5b: Rate of change in stress is positively related to rate of change in emotional exhaustion.

Hypothesis 5c: Rate of change in stress is negatively related to rate of change in sleep quality.

The Role of Group Affect

One of the most prominent stress models is the transactional model (Lazarus, 1966; Lazarus & Folkman, 1984). It is labeled "transactional" because it asserts that stress resides in the interaction between the person and the environment. When the relationship between the person and the environment is appraised as taxing or exceeding his or her resources, stress results. Lazarus and Folkman (1984) assume that cognitive appraisals play a crucial rule in the stress process. Appraisal processes refer to an individual's categorization and evaluation of an encounter with respect to the individual's well-being. Specifically, primary and secondary appraisal can be differentiated. In the process of primary appraisal, individuals evaluate whether

an event potentially threatens or harms their well-being. In the process of secondary appraisal, individuals evaluate if anything can be done in the face of the stressful encounter – that is, they cope with the stressor. On the basis of primary and secondary appraisals, individuals start their coping processes that can stimulate reappraisal processes. Thus, possible extensions of the transactional stress model are proposed by suggesting variables that explain the initial level and the shape of the change trajectories of stress and strain.

Stress prevention can be achieved with different sorts of programs (Sonnentag & Frese, 2003). The following table displays organizational and personal approaches to stressors, strains, and resources. Although the differentiation in various approaches is convenient, in many cases multiple approaches are combined.

Table 1

Stress Interventions in Organizations

	Individual	Organizational
Stressor reduction	Reduction of individual stressor (e.g., time pressure)	Reduction of stressor (e.g., organizational problems such as task ambiguity and task difficulty)
Resource increase	Competence and skills training	Participation in decision making and increasing in social support
Strain reduction	Relaxation, meditation, stress immunization, respites (vacations, leisure time activities)	Rest periods, breaks
Lifestyle changes	Exercise program	Employee assistance programs (EAP)

(Source: Sonnentag & Frese, 2003)

The current research focuses on one resource increase intervention and one stressor reduction intervention from the perspective of the organization: an increase in within-group cohesion and a reduction in within-group emotional variability. Bolger, DeLongis, Kessler, and Schilling (1989) suggest that future investigations of stress should focus intensively on the interpersonal domain, such as group affect. Yet, there is scarce research examining how group affect operates as an explicit factor influencing team development, behavior, and outcomes (Barsade & Gibson, 2007).

Group affect is a shared experience within a group (Bartel & Saavedra, 2000). Social psychology has a rich history of cataloguing the numerous and varied ways in which people influence one another (e.g., Echterhoff, Higgins, & Levine, 2009; Van Kleef, De Dreu, & Manstead, 2004) and recent research has built on these foundations and demonstrated that merely sharing experiences causes the stimuli being experienced to become more psychologically prominent in several ways. Shared experience enhances memory of stimuli (He, Lever, & Humphreys, 2011), intensifies goal pursuit (Shteynberg & Galinsky, 2011), and facilitates social learning (Shteynberg & Apfelbaum, 2013). Similarly, shared emotions could become psychologically prominent for the target.

There is a 'top-down' approach in which collectively held norms – implicit or explicit – about appropriate emotions to express in the group, shape the type of emotions that are allowed and expressed in the group context (Kelly & Barsade, 2001). In this context, sentiments about the group become very important and have been investigated by several researchers (e.g., Homans, 2013; Willer, Flynn, & Zak, 2012). The most notable of these is cohesion, which is a group-related sentiment defined as "the group members' positive attraction to the group, that is, 'their liking of the group'" (Kelly & Barsade, 2001, p. 105). Group cohesion can be seen as a job

resource, and one of the essential premises in the Job Demands-Resources model (JD-R model; Bakker & Demerouti, 2007) is that job resources are crucial in dealing with strain. According to the JD-R model, job resources fulfill employees' needs and foster their development (Deci & Ryan, 1985). In earlier studies, job resources, such as supervisory support, autonomy, performance feedback, and coworker support, have been associated with increased work motivation (Houkes, Janssen, DeJonge, & Bakker, 2003), work engagement and retention (Schaufeli, & Bakker, 2004) and better in-role and extra-role performance (Bakker, Demerouti, & Verbeke, 2004).

Research has found that cohesion is related to employees' sense of control (Lee & Brand, 2005) because when there is higher group cohesion, interpersonal communication is enhanced, and therefore employees have the flexibility and freedom to control how to do their work and to increase or reduce stressors accordingly. In addition, cohesion has been correlated with constructs such as team spirit and morale (Dion, 2000). When the cohesion level is high, group members will report higher levels of satisfaction and enjoyment within the group (Tekleab, Quigley, & Tesluk, 2009) and less anxiety (Prapavessis & Carron, 1996). Therefore, it is predicted that the influence of group cohesion on individual dynamics will be powerful, such that group cohesion not only decreases the initial levels of stress and strain, but also dampens their change trajectories.

Hypothesis 6a: Group cohesion decreases the initial level of stress.

Hypothesis 6b: Group cohesion lowers systematic changes of stress before, during and after the stressful event.

Hypothesis 6c: Group cohesion decreases the initial level of need for recovery.

Hypothesis 6d: Group cohesion lowers systematic changes of need for recovery before, during and after the stressful event.

Hypothesis 6e: Group cohesion decreases the initial level of emotional exhaustion.

Hypothesis 6f: Group cohesion lowers systematic changes of emotional exhaustion before, during and after the stressful event.

Hypothesis 6g: Group cohesion increases the initial level of sleep quality.

Hypothesis 6h: Group cohesion lowers systematic changes of sleep quality before, during and after the stressful event.

Another way to conceptualize group emotion and its outcomes is a 'bottom-up' approach in which group emotion refers to "the affective composition of the various affective attributes of the group's members" (Barsade & Gibson, 2007, p. 49). One example is the group's affective tone, which is the "consistent or homogenous affective reactions within a group" (George, 1990, p. 108), and which is composed of the group's mean levels of positive affect and negative affect. Group positive affective tone was found to be positively related to customer service quality (George, 1995). Additionally, the positive group affective tone was beneficial for team creativity under conditions when team trust was low and the negative group affective tone was high. This is because members in low-trust teams are more likely to engage in reducing uncertainty, and high negative group affective tone alerts team members to the need to increase critical attention and promotes more constrained and detail-oriented information processing (Tsai, Chi, Grandey, & Fung, 2012).

Another example of the 'bottom-up' approach is affective diversity, which is the degree of difference in affective traits among group members. Affective diversity has been

demonstrated to influence group outcomes. In a study among top managers in U.S. corporations, it was found that the greater the degree of trait affective diversity on top management teams, the greater the task and emotional conflict was in the teams, and the less cooperation was and the poorer their financial performance (Barsade, Ward, Turner, & Sonnenfeld, 2000). Affective diversity has also been examined using measures of state affect. In lab environments, researchers have manipulated affective diversity by showing pictures or scenarios of groups with either homogeneous (all happy or all sad) or heterogeneous (mixed happy and sad) facial expressions to participants. Participants who rated a group's emotions as being more inconsistent judged the group as sharing less of a common goal. The degree of perceived similarity among group members mediated the relation between group affective consistency and common goal inferences (Magee & Tiedens, 2006).

The timing of the affect (which is also the dynamics of positive and negative affect) in the group's trajectory also matters. For example, Bledow, Rosing, and Frese (2013) argued that an increase of positive moods along with a decrease of negative moods could lead to group creativity. This is because an increase of positive affect leads to higher cognitive activation and flexible processing of existing knowledge, while a decrease of negative affect activates associative networks of memory and enables new ideas to develop that are not constrained by the cognitive content an individual has focused on before the decrease in negative affect. In addition, Jehn and Mannix (2001) found that low-performing groups exhibited escalating patterns of task conflict and relationship conflict. Conflict is strongly related to negative emotional reactions (e.g., Desivilya & Yagil, 2005), thus the results suggested that if negative emotion happens at the end, then the group functions worse than if it happens in the beginning or in the middle.

A few studies that have examined the effect of emotional variability of coworkers within a team on group dynamics. One perspective suggests that greater variability of emotions – regardless of mean levels of positive emotions or negative emotions – is related to negative outcomes, including decreased life satisfaction and subjective happiness, and increased depression and anxiety (Gruber, Kogan, Quoidbach, & Mauss, 2013). Emotional variability refers to "the range or amplitude of someone's emotional states across time" (Houben, Van Den Noortgate, & Kuppens, 2015, p. 902). An individual characterized by higher levels of emotional variability experiences emotions that reach more extreme levels and shows larger emotional deviations from the mean level of emotions.

Emotional variability has attracted increasing interest from psychologists since Wessman and Ricks's (1966) seminal research, which argued that emotional variability differs from the average level of emotions and thus reflects different aspects of an individual's emotional life. In contrast to baseline measures of emotion, emotional variability characterizes the dynamic change of emotion over time and is critical in order to fully understand affective responses (Morris, 1989; Eid & Diener, 1999). In addition, in contrast to baseline measures of emotions, intra-individual variability marks affective reactivity to situations.

In this research, it is argued that group members' emotional variability will affect the individuals' initial levels and the change trajectories of stress and strain because of the uncertainty about other people's emotions. Uncertainty about other people's feelings and perceptions is generally an aversive state related to feelings such as unease and fear (e.g., Fiske & Taylor, 1991). When people are uncertain, they are more likely to turn to homogeneous groups that they believe are consensual and more effective at reducing uncertainty (Jetten, Hogg, & Mullin, 2000). In addition, perceived uncertainty is negatively related to a sense of control over

stressful circumstances, which in turn affects psychological strain (Bordia, Hunt, Paulsen, Tourish, & DiFonzo, 2004).

Another rationale for the effect of group-level emotional variability is through the phenomenon of emotion contagion, which means that one person's emotions may affect another person's emotions (Cheshin, Rafaeli, & Bos, 2011), where the "sender" expresses his or her emotional state and the "receiver" automatically mimics this expression, resulting in 'facial feedback' processes and the imitated vocal or facial expression induces a congruent emotional state in the receiver (Grandey, 2008). This is described as a passive mechanism. As a more active process, emotion is highly intertwined with power and influence (Keltner, Gruenfeld, & Anderson, 2003). Expressed emotion (e.g., anger vs. sadness) influences power and status position as perceived by others (Tiedens & Fragale, 2003), creating a reinforcing cycle of power and emotion (Tiedens, 2000). In fact, power differences may decrease emotion contagion (e.g., similar emotions) and instead result in complementary emotions (e.g., anger causes fear; Grandey, 2008). This study investigates group member interactions rather than the supervisor-subordinate interactions, thus it focuses on emotional contagion instead of on complementary emotions because power differences are beyond the scope of this research.

When people enter a group, they are exposed to other group members' emotions. Ekman, Friesen and Ellsworth (2013) have found that individuals' internal emotional states are observable and can "leak" even when people are trying to hide them. In addition, Barsade (2002) argued that people do not live on their own emotional islands. When team members experience emotions at work, these emotions ripple out and influence not only other team members' emotions, but also group dynamics and individual cognitions, attitudes and behaviors. A group could be affected by individual group members who are emotionally variable; the proverbial

"bad apple" causes the entire group to feel unsettled, leading to possible morale problems and more strain, thus "spoils the barrel." Therefore, it is argued that at a group level, group members' emotional variability not only increases the initial levels of stress and strain, but also steepens the change trajectories of stress and strain.

Hypothesis 7a: Group members' emotional variability increases the initial level of stress.

Hypothesis 7b: Group members' emotional variability amplifies the systematic changes of stress before, during and after the stressful event.

Hypothesis 7c: Group members' emotional variability increases the initial level of need for recovery.

Hypothesis 7d: Group members' emotional variability amplifies the systematic changes of need for recovery before, during and after the stressful event.

Hypothesis 7e: Group members' emotional variability increases the initial level of emotional exhaustion.

Hypothesis 7f: Group members' emotional variability amplifies the systematic changes of emotional exhaustion before, during and after the stressful event.

Hypothesis 7g: Group members' emotional variability decreases the initial level of sleep quality.

Hypothesis 7h: Group members' emotional variability amplifies the systematic changes of sleep quality before, during and after the stressful event.

Drawing on resource depletion theory, which proposes that depletion effects occur because of the limited availability of resources (Muraven & Baumeister, 2000), positive emotions consume fewer resources than negative emotions. According to Taylor's (1991)

review, negative emotions appear to mobilize physiological, affective, cognitive, and certain types of social resources to a greater degree than do positive or neutral ones. Mandler (1984) argued that positive emotions are rarely experienced as intensely as negative emotions because positive emotions occur when people feel in control. In contrast, the degree of arousal or activation is higher for negative (compared to positive) emotions. Schwarz (1990) suggested that negative emotions signal that action needs to be taken, whereas positive emotions do not, a point that may account for the apparent greater activation associated with negative emotions. This coincides with the view of the broaden-and-build theory (Fredrickson, 2001), which posits that negative emotions narrow one's momentary thought-action repertoire by preparing one to behave in a specific way. Meanwhile, various discrete positive emotions such as joy and contentment broaden one's thought-action repertoire, expanding the range of cognitions and behaviors that come to mind. In addition, Barsade (2002) also argued that negative emotions lead to greater emotional contagion than positive emotions because people tend to place more weight on negative information.

In the same vein, it is anticipated that the effects of variability in positive emotions may be less pronounced than the effects of variability in negative emotions from a resource depletion standpoint, because disruptions in the dynamics of negative emotions are more depleting and more indicative of psychological malfunctions than those of positive emotions (Houben et al., 2015). Indeed, while most research has found a significant negative association between variability and psychological health for both positive and negative emotions, comparisons of variability in positive and negative emotions in Houben et al.'s (2015) meta-analysis indicate that the relation between variability and psychological health was significantly stronger when based on negative emotions, as compared to positive emotions. Thus, it is argued that group members'

variability in negative emotions could be more disruptive and has a stronger steepening effect on the change trajectories of stress and strain than group members' variability in positive emotions.

Hypothesis 8a: Group members' variability in negative emotions shows a stronger steepening effect on the change trajectories of stress than group members' variability in positive emotions.

Hypothesis 8b: Group members' variability in negative emotions shows a stronger steepening effect on the change trajectories of need for recovery than group members' variability in positive emotions.

Hypothesis 8c: Group members' variability in negative emotions shows a stronger steepening effect on the change trajectories of emotional exhaustion than group members' variability in positive emotions.

Hypothesis 8d: Group members' variability in negative emotions shows a stronger steepening effect on the change trajectories of sleep quality than group members' variability in positive emotions.

Chapter 3

Methodology

To find support for the proposed hypotheses, a study was carried out in a food production and service management laboratory setting. This chapter describes the study sample and context, data collection procedures, measurement of the key variables, and the data analysis techniques.

Sample and Context

Eighty-four undergraduate students, enrolled in a senior food production and service management course in three sections (28 students in each section, on average), were asked to participate in the study. As part of their course, the students were required to plan the preparation and service of meals in a commercial restaurant setting. This context triggers a workplace stressor for the participants. As part of this project, participants were required to work in management teams (six to eight participants per team). Each team creates a marketable theme restaurant and a full business plan, and opens and manages a restaurant on two separate nights. Twice during the semester, the management team plans and supervises the preparation and service of meals in a restaurant setting. Student participants are expected to develop and produce authentic dining experiences ("two theme dinners" in a semester), and this research focused on the first of those two dinners. There were 12 teams in total, so there were 12 theme dinners. The first dinners were held on Tuesday, Wednesday and Thursday for a period of four weeks in October.

The students had to demonstrate their ability to manage the responsibilities involved in the development, production and evaluation of a wide range of food service systems, including

sales and marketing, menu planning, recipe development and evaluation, pricing, purchasing, facilities management, personnel management and financial management. This context is comparable to a real-life restaurant setting as this restaurant is open to the public and the students and customers behave in the same manner as they would in any restaurant. These teams were ideal for the proposed study, as the theme dinner itself was a stressful event for team members. They were motivated to do well in order to get a higher grade for this course and depended on each other to accomplish tasks successfully.

Procedure

The data collection procedure consisted of two steps, both of which were administered through SurveySignal, a survey distribution and survey management application. There was a one-month time gap between step 1 and step 2. In the first step of the process, a training session was held in the classroom at the beginning of the Fall semester, after the groups had been formed, to explain the study to the participants. A follow-up email was sent to the students who had signed consent forms. In the email, the students were asked to register for the study via the SurveySignal webpage. The participants were then asked to complete a survey that assessed demographic variables (e.g., age, gender, race, previous work experience) and indicators of group cohesion.

The second step entailed completing a short diary survey each day for seven consecutive days. Specifically, during the week of the theme dinner, participants were asked to fill out a phone-based text-message survey every day for three consecutive days prior the theme dinner, on the day of the theme dinner, and every day for three consecutive days after the theme dinner. For example, if a student was managing a theme dinner on Wednesday night, the student was asked

to complete the daily surveys from the previous Sunday to the following Saturday. As an incentive to participate in the study, participants were offered monetary compensation. Once they had finished the step-one survey, they received $5 as an incentive, and once they had finished the step-two diary surveys, they received another $10.

Out of the 84 students, 69 participated in the survey, and a total of 402 momentary reports were collected from the 69 participants during the seven-day period. The overall response rate to the survey requests over time was 83%. The participants ranged in age from 19 to 32 years (median age 22), 66% of them were female, and 63% were Caucasian. Sixty-eight percent of the participants was working in different types of hospitality jobs at the time and all participants had prior work experience in the hospitality industry.

Measurement

Seven-point Likert scales were used where 1 = strongly disagree, and 7 = strongly agree, except where noted. The measurement items for all the variables can be found in the Appendix, including step 1 surveys and step 2 surveys.

Stress. During the daily survey, participants were asked one item adapted from Bono et al. (2013) to indicate whether they felt stressed during the day. A single, well-chosen item should be sufficient when individuals are asked to rate straight forward unidimensional constructs in terms of a current or very recent experience (Fisher & To, 2012).

Need for recovery. During the daily survey, participants were asked to respond to a two-item scale on need for recovery adapted from Sonnentag and Zijlstra (2006): “Today I would have needed more time than usual to relax and recover” and “Considering the total of all the activities that I pursued today, I have had enough time to relax and to recover (reversed item).”

Emotional exhaustion. During the daily survey, participants were asked to respond to one item from the emotional exhaustion scale (Maslach & Jackson, 1981; Teuchmann et al., 1999). The item was "Right now, I feel emotionally drained."

Sleep quality. Sleep quality was assessed in the daily survey with one single item derived from the Pittsburgh Sleep Quality Index (Buysse, Reynolds, Monk, Berman, & Kupfer, 1989; "How do you evaluate last night's sleep?") on a 10-point Likert scale ranging from 1 (very bad) to 10 (very good).

Group cohesion. Group cohesion was assessed twice: in the first step, seven items by Dobbins and Zaccaro (1986) were used to assess the respondents' perceptions of group cohesion. Items included: "I would choose to leave my team and join another" (reversed item); "The members of my team get along well together;" "The members of my team will readily defend each other from criticism by outsiders;" "I find that I generally do not get along with the other members of my team" (reversed item); "I enjoy belonging to this team because I am friends with many group members;" "I feel that I am really a part of my team;" "The team which I belong to is a close one." All items were submitted to an exploratory principal axis factor analyses with promax rotation to determine factor structure, and the scale revealed one factor.

In the second step, the highest factor loading item was used to assess group cohesion three days prior to the theme dinner. The item was "The team which I belong to is a close one." Group cohesion was assessed twice because group cohesion could change dynamically during the teamwork activities. Perceptions of group cohesion at the beginning of the semester could be different from those right before the theme dinner. For reasons of parsimony in the diary survey in the second step, only one item was included. Individual ratings of group cohesion were

aggregated to the group level by calculating the mean ratings of cohesiveness within each group (e.g., Harrison, Price, & Bell, 1998).

General group members' emotional variability. One item was created to measure group members' emotional variability within a team: "In general, my group members' emotions change a lot." This variable was assessed three days prior to the theme dinner. Emotional variability within the group was then obtained by calculating the mean group members' emotional variability within each group.

Group members' variability on positive and negative emotions. To capture levels of positive and negative emotion in the daily survey, participants were asked to indicate the extent to which they were experiencing each emotional state by using a scale adapted from To, Fisher, Ashkanasy and Rowe (2012), which captures both positive and negative emotions.

Items measuring positive emotions included "excited," "enthusiastic," "calm," and "relaxed," and items measuring negative emotions included "angry," "fatigued," and "bored." Since emotion dynamics have been operationalized most often in terms of measures of SD or variance (Houben et al., 2015), the within-person standard deviation of emotional states was used in this research. Although variability on positive emotions and variability on negative emotions were highly correlated, based on Eid and Diener's (1999) and Dizen and Berenbaum's (2011) suggestions, variability on positive and negative emotions were kept separate for the analyses. Group members' variability on positive and negative emotions were obtained by calculating the mean of all the other team member's emotional variability within the group.

Considerations of Control Variables

Consistent with prior studies of emotions and stress, a range of potential control variables were considered, including gender, race, alcohol consumption and sleep hours (Barnes, 2012; Digdon & Landry, 2013; Eaton & Funder, 2001; Harrison et al., 1998). Although each of these may be related to the extent of stress, emotional exhaustion, need for recovery and sleep quality, contemporary recommendations caution against including control variables simply because past research has done so, because control variables are believed to be related to focal variables, or because an assumption that doing so will "purify" the relations (Bernerth & Aguinis, 2016; Carlson & Wu, 2012; Spector & Brannick, 2011). For example, Spector and Brannick (2011) highlighted that:

> "There can be a variety of connections among underlying constructs themselves. The inclusion of control variables that have such connections with variables of interest can be problematic as they can result in removal of the effects of interest from tests of the effects of interest. Thus, rather than purifying results, such practices render interpretation of such results incorrect (p. 293)."

As there was no reason to believe that these characteristics could contaminate the measurement of or cause spurious relations between our focal variables (Spector & Brannick, 2011), current recommendations were followed and a conscious effort was made not to control for these characteristics (Carlson & Wu, 2012).

Data Analysis Techniques

To test Hypotheses 1-6, latent growth curve models (LGCM) were analyzed. LGCM permits examination of within-person change over time (Preacher, Wichman, MacCallum, Briggs, 2008). LISREL, a statistical software package to analyze structural equation models for manifest and latent variables, was used to fit the models to data. Accordingly, growth curve models were specified over the course of the seven days of the study, investigating the extent to which stress, need for recovery, emotional exhaustion and sleep quality were functions of the day relative to the dinner event. Specifically, time as the predictor was coded as 0, 1, 2, 3, 4, 5, 6, representing the seven assessment periods. The zero-time point effect was related to the intercept (level) of the first day. Then, the bivariate growth model was tested, which allowed for the examination of how changes in the study outcomes (stress and strain) were associated with each other over time. Finally, group cohesion, general group members' emotional variability, group members' variability on positive and negative emotions were entered as moderators to test whether those variables were related to the initial value and rate of change in stress and strain over time. Initial value is the intercept, or the mean value of the key variables measured three consecutive days before the event; rate of change is the slope, which indicates how much the curve grows each day.

To evaluate all the models, covariance matrices and means were estimated with the computer program THEIL (Molenaar, 1996), a program for robust covariance matrix estimation. THEIL helps to improve the condition of a covariance matrix and leaves its underlying structure intact (Roben, 2012). These matrices and mean vectors were used as input for LISREL. Model fit was evaluated using the Normal Theory Weighted Least Squares Chi-Square (χ^2), the root mean

square error of approximation (RMSEA), the comparative fit index (CFI), the non-normed fit index (NNFI), and the standardized root mean residual (SRMR).

Chi-Square is influenced by sample size and it indicates a good model fit when $p > .05$ (Barrett, 2007). For RMSEA, a value less than .05 is considered a good fit, and the range of 0.05 to 0.10 is considered an indication of fair fit (MacCallum, Browne, & Sugawara, 1996). The CFI should be equal or greater than .90 to accept the model. For NNFI, when it is below .90 it is not an acceptable fit and when it is above .95, it is an excellent fit. A cut-off value close to .08 for SRMR is considered to be a good fit (Hu and Bentler, 1999).

Chapter 4

Results

The data were analyzed in several steps. In step 1, the descriptive statistics and correlations among the focal variables were tested. Step 2 tested the univariate growth model of stress and strain over time. Step 3 looked at the bivariate growth model of stress and strain over time. In step 4 the moderating roles of group cohesion and group members' emotional variability were evaluated and the last step compared the role of group members' variability in positive emotions vs. negative emotions.

Descriptive Statistics and Correlations

Table 2 shows the descriptive statistics found. It includes means, standard deviations and correlations among the focal variables (computed by using the individuals' aggregated scores over the seven days of data collection).

Testing the Univariate Growth Model of Stress and Strain Over Time

The first step in the latent growth curve model was to examine how stress and strain changed over the seven waves of data points. The quadratic growth curve model of stress was found to fit the observed data, although the fit indices were not highly acceptable ($\chi^2(21) = 79.66$, $p < .01$, CFI = .56, RMSEA = .19, NNFI = .56, SRMR = .14). The linear time function was negative and statistically significant ($b = -.23$, $p < .01$). The quadratic time function was negative and significant ($b = -0.12$, $p < .01$). Figure 1 demonstrates that the participants' stress showed a negative quadratic shape (or inverted U-shape) over time.

Table 2

Descriptive Statistics and Correlations among Variables

	M	*SD*	1	2	3	4	5	6	7	8	9
1. Stress	4.20	1.10									
2. Need for recovery	4.47	1.35	.68**								
3. Emotional exhaustion	4.03	1.31	.67**	.69**							
4. Sleep quality	5.80	1.76	-.46**	-.55**	-.46**						
5. Group cohesion	4.86	1.16	-.10	-.06	-.12	.19					
6. Group members' emotional variability	3.67	0.92	.40**	.43**	.46**	-.28*	-.47**				
7. Positive emotion	4.40	0.89	-.38**	-.34**	-.22	.26*	.28*	-.34**			
8. Negative emotion	3.31	0.75	.36**	.42**	.51**	-.29*	-.15	.40**	-.42**		
9. Group members' variability in PE	0.96	0.48	.10	.03	.02	-.10	.03	-.03	-.36**	.14	
10. Group members' variability in NE	0.78	0.40	-.07	-.07	-.15	-.01	.17	-.11	-.17	.10	.38**

Note. PE: Positive Emotions. NE: Negative Emotions

* $p < .05$; ** $p < .01$.

Variables of stress, need for recovery, emotional exhaustion, sleep quality, positive emotion, and negative emotion were assessed daily and then were aggregated to the individual level ($n = 69$).

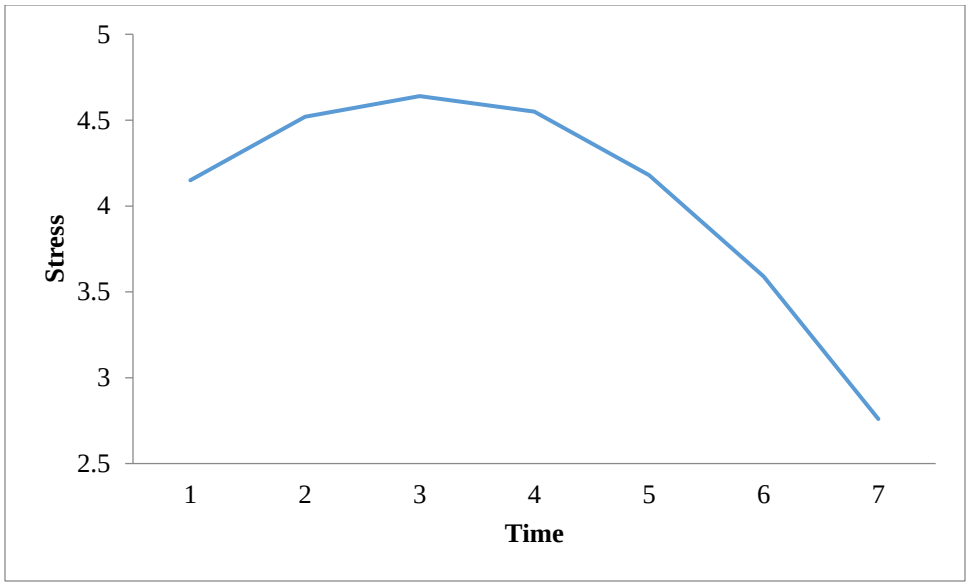


Figure 1. Change trajectory of stress over time

The quadratic growth curve model of need for recovery was then tested. The model exhibited a more acceptable fit ($\chi^2(104) = 202.67$, $p < .01$, CFI = .84, RMSEA = .11, NNFI = .87, SRMR = .13). The linear time function was negative and statistically significant ($b = -.11$, $p < .01$). The quadratic time function was negative and significant ($b = -0.08$, $p < .01$). Figure 2 demonstrates that the participants' need for recovery showed a negative quadratic shape (or inverted U-shape) over time.

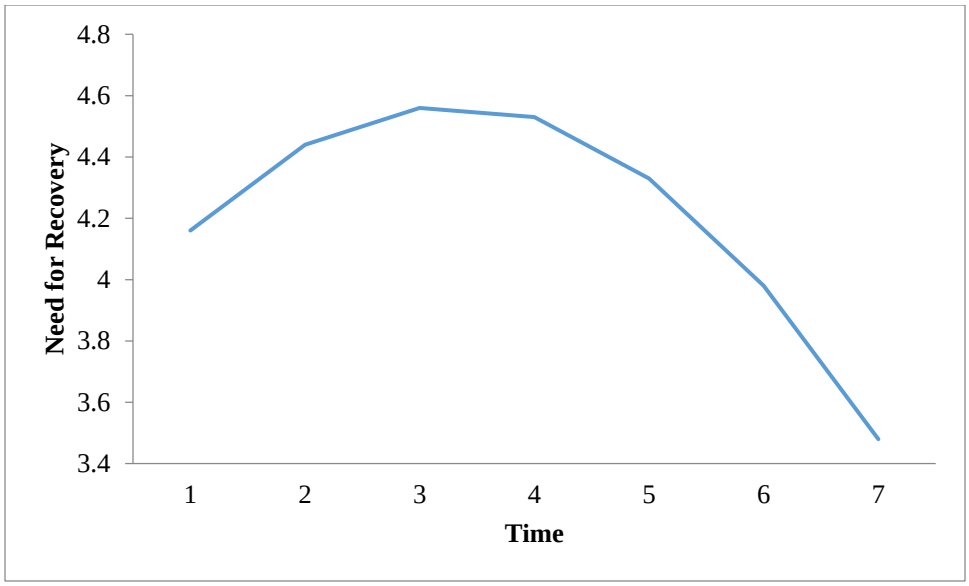


Figure 2. Change trajectory of need for recovery over time

The quadratic growth curve model of emotional exhaustion was also tested. The model exhibited fit indices of $\chi^2(17) = 41.60$, $p < .01$, CFI = .88, RMSEA = .14, NNFI = .85, SRMR = .08. The linear time function was negative and statistically significant ($b = -.11$, $p < .05$). The quadratic time function was negative and significant ($b = -0.04$, $p < .05$). Figure 3 demonstrates that the participants' emotional exhaustion showed a negative quadratic shape (or inverted U-shape) over time. Taken together, these findings offer support for Hypothesis 1: Stress, need for recovery and emotional exhaustion displayed negative quadratic trajectories.

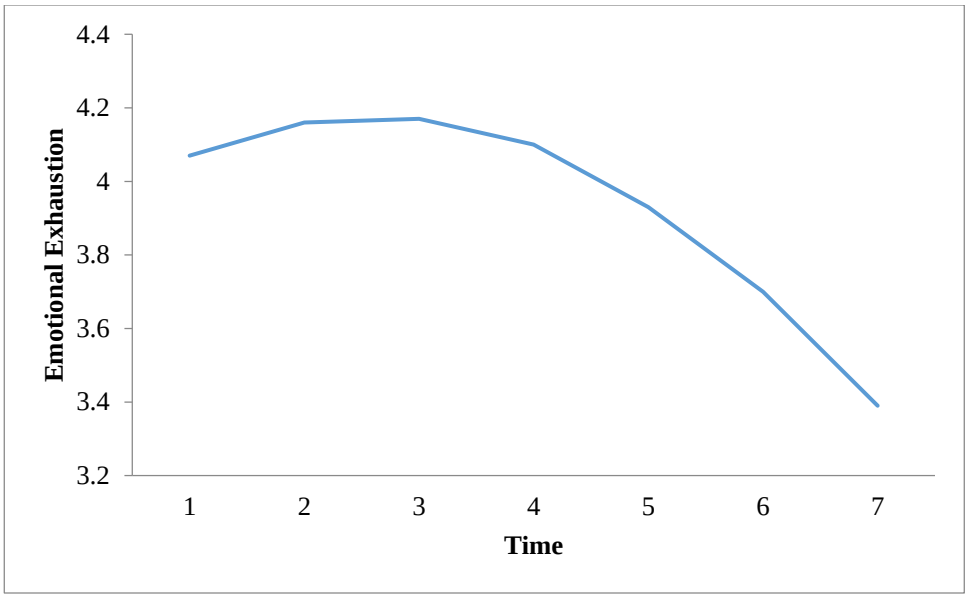


Figure 3. Change trajectory of emotional exhaustion over time

Hypothesis 2 argued that sleep quality displays a U-shaped trajectory. The model exhibited a good fit ($\chi^2(19) = 35.03$, $p = .02$, CFI = .92, RMSEA = .09, NNFI = .91, SRMR = .06). The results showed that the linear time function was positive but not significant ($b = .07$, $p > .05$), but the quadratic time function was positive and significant ($b = 0.06$, $p < .01$). Figure 4 demonstrates that the participants' sleep quality showed a negative quadratic shape (or U-shape) over time. Taken together, the finding offers support for Hypothesis 2: sleep quality displayed a positive quadratic trajectory.

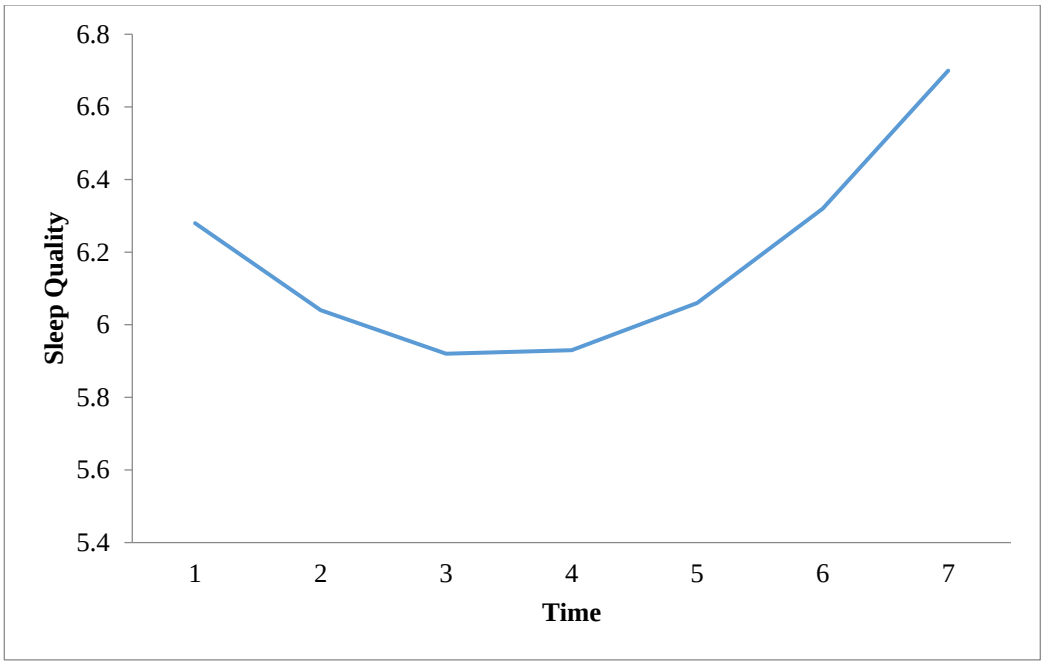


Figure 4. Change trajectory of sleep quality over time

Testing the Bivariate Growth Model of Stress and Strain Over Time

The second step of analysis was evaluating the interrelations between stress and strain growth models.

A bivariate latent growth model was estimated to examine how the initial levels and change trajectories of stress and need for recovery were associated. The bivariate growth model yielded a chi-square statistic of $\chi^2(225) = 409.61$, $p < .01$ and fit indices, CFI = .98, RMSEA = .10, NNFI = .98, indicating a good-fit model. The results of the bivariate model showed that the initial levels of the two variables were significantly and positively correlated ($r = .21$, $p < .05$). This means that high initial level of stress was associated with high initial level of need for recovery. The quadratic change factors of stress and need for recovery were also significantly and positively associated with each other ($r = .01$, $p < .05$). Therefore, change in stress was related to a change in need for recovery. In addition, there was positive relation between the

intercept of stress and the quadratic change factor of need for recovery (r = .06, p < .05), indicating that initial level of stress was associated with rate of change in need for recovery over time. Thus, H3a, H4a and H5a were supported.

A second bivariate latent growth model was estimated to examine how the initial levels and the change trajectories of stress and emotional exhaustion were associated. The bivariate growth model yielded a chi-square statistic of $\chi^2(70) = 127.15$, p < .01 and fit indices, CFI = .90, RMSEA = .10, NNFI = .88, SRMR = .10, indicating an acceptable model. The results of the bivariate model showed that the initial levels of the two variables were significantly and positively correlated (r = .90, p < .01). This means that a higher initial level of stress was associated with a higher initial level of emotional exhaustion. The quadratic change factors of stress and emotional exhaustion were also significantly and positively associated with each other (r = .05, p < .05). In other words, change in stress was significantly correlated with change in emotional exhaustion. However, there was no significant relation between the intercept of stress and the quadratic change factor of emotional exhaustion, indicating that the initial level of stress was not associated with the rate of change in emotional exhaustion over time. Thus, H3b and H5b were supported, but not H4b.

A third bivariate latent growth model was estimated to examine how the initial levels and change trajectories of stress and sleep quality were associated. The bivariate growth model yielded a chi-square statistic of $\chi^2(97) = 256.84$, p < .01 and fit indices, CFI = .90, RMSEA = .15, NNFI = .90, indicating an acceptable model. The results of the bivariate model showed that the initial levels of the two variables were significantly and negatively correlated (r = -.36, p < .05). This means that a higher initial level of stress was associated with a lower initial level of sleep quality. The rates of change in the two variables were not correlated. In addition, there was

no relation between the intercept of stress and the growth of sleep quality, indicating that initial level of stress was not associated with rate of change in sleep quality over time. Therefore, H3c was supported, but not H4c and H5c.

Testing the Moderating Roles of Group Cohesion and Group Members' Emotional Variability

In the third step of the analysis, moderators of group cohesion and group members' emotional variability were included in the univariate growth models to evaluate the covariates' effects on the latent growth factors of stress and strain. The findings are presented in Table 2.

When the outcome was stress, the model produced an acceptable fit to the data ($\chi^2(23) = 36.79$, $p = .04$; CFI = .90, RMSEA = .07, NNFI = .84, SRMR = .09). As Table 2 shows, there was a significant relation between group members' emotional variability and the initial level of stress ($b = .67$, $p < .01$), which indicates that individuals who experienced higher levels of group members' emotional variability reported higher initial levels of stress. However, group members' emotional variability was not a significant predictor of change of stress, and group cohesion was not found to be a significant predictor of either initial level or change of stress.

When the outcome was need for recovery, the model produced an acceptable fit to the data ($\chi^2(97) = 182.42$, $p < .01$; CFI = .90, RMSEA = .08, NNFI = .87, SRMR = .11). As Table 2 shows, there were significant positive relations between group members' emotional variability and the initial level ($b = .45$, $p < .01$), the linear trend ($b = 1.88$, $p < .05$) and the quadratic trend ($b = 6.19$, $p < .05$) of need for recovery. This indicates that individuals who experienced higher levels of group members' emotional variability reported higher initial levels of need for recovery and a steepened trajectory of need for recovery over time. However, the results showed that

group cohesion was not found to be the significant predictor of either initial level or change of need for recovery.

When the outcome was emotional exhaustion, the model produced an acceptable fit to the data ($\chi^2(97) = 230.98$, $p < .01$; CFI = .92, RMSEA = .11, NNFI = .88, SRMR = .10). As Table 2 shows, there were significant positive relations between group members' emotional variability and the initial level ($b = .48$, $p < .01$), the linear trend ($b = 1.57$, $p < .01$) and the quadratic trend ($b = 5.37$, $p < .05$) of emotional exhaustion. This indicates that individuals who experienced higher levels of group members' emotional variability reported higher initial levels of emotional exhaustion and a steepened trajectory of emotional exhaustion over time. There was a significant relation between group cohesion and the initial level ($b = -.28$, $p < .05$) of emotional exhaustion. This indicates that individuals who experienced higher levels of group cohesion showed lower initial levels of emotional exhaustion over time. Yet, group cohesion was not found as the significant predictor of change of emotional exhaustion.

When the outcome was sleep quality, the model produced an acceptable fit to the data ($\chi^2(23) = 24.78$, $p = .36$; CFI = .98, RMSEA = .02, NNFI = .96, SRMR = .08). As Table 2 shows, there was significant relation between group cohesion and the initial level ($b = .48$, $p < .05$) and the linear trend of sleep quality ($b = -.30$, $p < .05$), which indicates that individuals who experienced higher levels of group cohesion showed a higher initial level of sleep quality and a flatter linear trajectory of sleep quality over time. Yet, group cohesion was not found to be the significant predictor of the quadratic change of sleep quality. The results did not find group members' emotional variability to be a significant predictor of initial level and change of sleep quality.

Together, those results partially supported H6 and H7, such that group cohesion decreases the initial level of emotional exhaustion (H6e) and increases the initial level of sleep quality (H6g), and lowers the linear change of sleep quality over the course of the stressful event (H6h). In addition, group members' emotional variability increases the initial levels of stress (H7a), need for recovery (H7c) and emotional exhaustion (H7e), and amplifies the systematic changes of individual's need for recovery (H7d) and emotional exhaustion (H7f) over the course of the stressful event.

Table 3

Conditional Growth Models of Stress and Strain with Covariates of Group Cohesion and Group Members' Emotional Variability

Variable	Stress			Need for recovery			Emotional exhaustion			Sleep quality		
	Intercept	Linear	Quadratic	Intercept	Linear	Quadratic	Intercept	Linear	Quadratic	Intercept	Linear	Quadratic
Group cohesion	.15	.00	-.02	-.25	-1.54	-.85	-.28*	-.50	-2.57	0.48*	-.30*	.03
Group members' emotional variability	.67**	.00	-.04	.45**	1.88*	6.19*	.48**	1.57**	5.37*	-.04	-.29	.04

Note: $*p < .05$.
$**p < .01$.

Comparing the Role of Group Members' Variability in Positive Emotions vs. Negative Emotions

The last step of the analysis was to compare the effects of the two moderators (i.e., group members' variability in positive emotions vs. negative emotions) on the latent growth factors of stress and strain.

When the outcome was stress, the model produced an acceptable fit to the data ($\chi^2(23) = 38.61$, $p = .03$; CFI = .83, RMSEA = .10, NNFI = .74, SRMR = .09). As Table 3 shows, there was no significant relation between group members' variability in positive and negative emotions and the latent growth factors of stress. This indicates that neither group members' variability in positive emotions nor in negative emotions was related to the initial level and change of stress.

When the outcome was need for recovery, the model produced an acceptable fit to the data ($\chi^2(97) = 143.16$, $p < .01$; CFI = .89, RMSEA = .08, NNFI = .86, SRMR = .10). As Table 3 shows, there was no significant relation between group members' variability in positive and negative emotions and the latent growth factors of need for recovery. This indicates that neither group members' variability in positive emotions nor in negative emotions was related to the initial level and change of need for recovery.

When the outcome was emotional exhaustion, the model produced an acceptable fit to the data ($\chi^2(23) = 41.94$, $p < .01$; CFI = .91, RMSEA = .10, NNFI = .87, SRMR = .08). As Table 3 shows, there was a significant relation between group members' variability in positive emotions and the initial level ($b = 1.09$, $p < .05$) and the quadratic trend of emotional exhaustion ($b = .08$, $p < .05$). This indicates that individuals who experienced higher levels of group members' variability in positive emotions showed a higher initial level of emotional exhaustion as well as a steeper inverted U-shape trajectory of emotional exhaustion over time. Nevertheless, the results showed that group members' variability in negative emotions was not a significant predictor of the initial level and change of emotional exhaustion.

When the outcome was sleep quality, the model fit to the data was not very acceptable ($\chi^2(23) = 57.16$, $p < .01$; CFI = .80, RMSEA = .16, NNFI = .70, SRMR = .13). As Table 3 shows,

there was no significant relation between group members' variability in positive and negative emotions and the latent growth factors of sleep quality. This indicates that neither group members' variability in positive emotions nor negative emotions was related to the initial level and change of sleep quality.

Taken together, those results did not support H8. Neither group members' variability in positive emotions nor in negative emotions is related to the initial level and change of stress, need for recovery and sleep quality. However, higher levels of group members' variability in positive emotions but not negative emotions showed a higher initial level of emotional exhaustion and amplified the change in emotional exhaustion. This is in contradiction to the hypothesis. The reasons for this are considered in the Discussion section.

Table 4

Comparing the Role of Group Members' Variability in Positive Emotions vs. Negative Emotions

variable	Stress			Need for recovery			Emotional exhaustion			Sleep quality		
	Intercept	Linear	Quadratic	Intercept	Linear	Quadratic	Intercept	Linear	Quadratic	Intercept	Linear	Quadratic
Group members' variability in PE	.03	-.30	.07	.02	-.17	0.73	1.09*	-.62	.08*	-.80	-.29	-.19
Group members' variability in NE	.06	.12	-.03	-.03	.20	.42	-.41	.23	-.02	1.42	-.22	.07

Note: PE: Positive Emotions. NE: Negative Emotions
*$p < .05$.
**$p < .01$.

Chapter 5

Discussion

Job stress is an important issue in the hospitality industry and is costly for organizations and employees alike (O'Neill & Davis, 2011). The purpose of this research was to shed light on the relation between stress and strain in the hospitality workplace, using an experience sampling methodology and to investigate the change trajectories of stress and strain over the course of a stressful event using latent growth curve modeling. This research contributes to the literature by testing two potential boundary conditions of group affect, group cohesion and group members' emotional variability. This chapter discusses the implications of the findings, limitations and strengths of this research, and provides directions for future research.

Evaluating Changes in Stress and Strain

Zooming in on the dynamic aspects of stress and strain, the change trajectories in stress, need for recovery, emotional exhaustion and sleep quality over the course of one week during a stressful event were investigated in this study. Results revealed that participants experienced an inverted U-shaped trajectory such that before the stressful event, stress, need for recovery and emotional exhaustion increased, and after the stressful event, stress, need for recovery and emotional exhaustion decreased. In the same way, sleep quality displayed a U-shaped trajectory such that before the stressful event, sleep quality worsened, and after the stressful event, sleep quality improved. Those findings are in line with the affective events theory (Weiss & Cropanzano, 1996) and the homeostatic model of stress (McGrath, 1970): specific work events as the proximal cause of employees' affective experiences. When the event is stressful, the

human body leaves a state of homeostasis, the individual experiences stress, emotional exhaustion, need for recovery and sleep quality suffers. Once the event is finished, the body calms down and returns to an original state of homeostasis, which reduces the individual's experienced stress, emotional exhaustion, need for recovery and enhances the individual's sleep quality.

In addition, the quadratic-shaped figures revealed an interesting pattern such that the variables of stress, need for recovery, and emotional exhaustion increased slightly for the first three days and decreased dramatically for the last three days; and sleep quality decreased slightly for the first three days and increased dramatically for the last three days. This pattern of mean change reflects the phenomenon that at the initial measurement occasion, the build-up of stress and strain was already going on. According to the theory of future-oriented emotions (Bagozzi, Baumgartner, Pieters, 1998; Baumgartner, Pieters, & Bagozzi, 2008), one may currently experience an emotion (hope or fear) due to the prospect of a future event. This affective reaction is called anticipatory emotion, an emotion that is experienced due to something that will happen in the future. In the study context, the participants had frequent group meetings before the theme dinner and they were required to prepare themselves well for this stressful event. Anticipatory emotions such as anxiety, uncertainty, nervousness, tension and fear may arise from the anticipating and planning stages toward a goal when one is not sure how to do it or is doubtful whether one has the skills to achieve the goal. Therefore, stress and strain levels tend to be higher before the event begins. Yet, after the stressful event, the participants were also seeing that they had achieved the goal, which had positive benefits to their senses of accomplishment and relief (Latham & Locke, 1991; Locke, 2002). In addition, the source of stress such as demands and load were no longer present once the participants finished the task. Thus, after the

event, there was a quick return to their normal levels.

With respect to whether or not the changes of stress were meaningful, the results indicated that they were critical components within the strain development process. The bivariate growth model of stress and strain showed that the initial level of stress was associated with initial levels of need for recovery, emotional exhaustion, and sleep quality. This finding indicates that employees who experienced a higher initial level of stress simultaneously reported higher initial levels of need for recovery and emotional exhaustion, and a lower initial level of sleep quality. In addition, an initial level of stress predicts the change of need for recovery. The current results replicated findings from previous cross-sectional and time-lagged studies (e.g., Knudsen, Ducharme, & Roman, 2007; Sonnentag, Kuttler, & Fritz, 2010; Sonnentag & Zijlstra, 2006; Stordeur, D'hoore, & Vandenberghe, 2001), demonstrating that stress is associated with both psychological and physiological strain.

The results revealed that changes in stress were positively correlated with changes in need for recovery and emotional exhaustion, which makes a contribution of this research that changes in stress influence strain through the changes in need for recovery and emotional exhaustion. The current findings suggest that reducing need for recovery and emotional exhaustion must be a sustained effort over time. Thus, given the fact that the drivers for changes in need for recovery and emotional exhaustion were the changes in stress, sustained reduction in need for recovery and emotional exhaustion must be accomplished through sustained, not only one-time, efforts to reduce levels of stress over time.

However, the results showed that initial level of stress and change in stress were not significant predictors of change in sleep quality over time. This may suggest that work-related stress only influences “work-specific” psychological strain over time. A possible explanation

could be that while need for recovery is mostly affected by work-related factors over time, sleep quality may be caused by other life conditions, such as personal health, bedtimes and wake-up times, college roommate disruption in the late night, etc. Thus, the results contribute to the applied psychology literature by demonstrating that work-related psychological strain and general physiological strain are two distinct factors, because their patterns of association with work-related stress were different.

The Roles of Group Cohesion and Group Members' Emotional Variability

The discussion now turns to the roles of group cohesion and group members' emotional variability. The results showed that group cohesion lowered the initial level of emotional exhaustion and increased the initial level of sleep quality. The results also showed that group cohesion flattened the linear trajectory of sleep quality over time such that employees' sleep quality did not change dramatically over the course the stressful event. Those findings extend the literature by showing that group cohesion serves as a resource for the employees and helps to deal with emotional exhaustion and improve quality of life (Midtgaard, Rorth, Stelter, & Adamsen, 2006; Nielsen & Daniels, 2012).

However, group cohesion was not found to decrease the initial levels of stress and need for recovery, and did not flatten the trajectories of stress, need for recovery and emotional exhaustion. One potential explanation for these results is that members in cohesive groups tend to follow group norms. Some group norms can enable the group to function more effectively, such as encouraging every team member to participate in decision-making, whereas other norms could be detrimental to the group and cause stress to group members, which in turn, diminishes the positive aspects of group cohesion. For example, group cohesion could intensify social

pressure to conform or limit individual expression. Groupthink could happen when the group norm is that team members are reluctant to express dissenting opinions and rely on the group to make decisions (Feldman, 1984) and groupthink causes strain and lost sleep to the group members (McCauley, 1989). In addition, group cohesion in this dissertation was measured as social cohesion, not task cohesion. If group members are close to each other during their leisure time, but not during their work-time, they are more likely to waste time together, which could result in work-related stress because they are not able to get anything done (Høigaard, Säfvenbom, & Tønnessen, 2006). In fact, groups high in social cohesion are more likely to experience symptoms of groupthink than are groups high in task cohesion (Bernthal & Insko, 1993). Therefore, although group cohesion could serve as a resource of social support, this research did not find that group cohesion is related to the change trajectories of stress, need for recovery and emotional exhaustion.

The results also showed that employees who experienced higher levels of group members' emotional variability not only reported higher levels of stress, emotional exhaustion and need for recovery at the beginning of the theme dinner week, but also reported higher systematic changes of individual's need for recovery and emotional exhaustion over the course of a stressful event. Those findings were consistent with resource depletion theory (Muraven & Baumeister, 2000), which emphasizes that individuals have limited "personal resources" that allow them to complete a variety of taxing activities they engage in throughout a day. Coping with emotional coworkers requires the expenditure of inner, limited resources that will be depleted afterwards, which will lead to higher need for recovery and emotional exhaustion in the long run. The findings are also consistent with a previous meta-analysis that found a negative relation between individuals' emotional variability and well-being (Houben et al., 2015). The

findings in this research extend the emotion literature by showing how emotional variability of team members influences changes of emotional exhaustion and need for recovery. However, this research showed that group members' emotional variability did not predict the change in stress over time. A possible explanation is that individuals cannot change their group members' emotional variability, at least for a short period of time. Stress is a state of sense organs stimulated to a point of perception, and in this research, the initial level of stress was stimulated by group members' emotional variability. Therefore, the impact of other individuals' emotions on stress is instantaneous, and individuals' stress might not be impacted by other team members' emotions in the long run.

Group members' emotional variability was not found to impact the initial level or change of sleep quality. This may also suggest that work-related predictors may only influence work-related outcomes over time, but not general physiological health outcomes (Firoozabadi, Uitdewilligen, & Zijlstra, 2016), as sleep quality may be caused by other life conditions. In the context of higher education, college students' poor sleep quality could be influenced by high volume of school work, caffeine consumption, irregular daily routines such as varied bed and rise times (Carney, Edinger, Meyer, Lindman, & Istre, 2006). Group members' emotional variability therefore might not be a significant predictor of sleep quality during a course of a stressful event.

This study found that a higher level of group members' variability in positive emotions but not in negative emotions showed a higher initial level of emotional exhaustion and amplified the change in emotional exhaustion, which contradicts the hypothesis. In general, from a resource depletion standpoint, the effect of variability in positive emotions may be less pronounced than the effect of variability in positive emotions, as disruptions in the dynamics of

negative emotions are more indicative of psychological malfunctions than those of positive emotions (Houben et al., 2015). However, there is also evidence showing that variability in negative emotions is not associated with psychological health, but variability in positive emotions is associated with psychological health in a U.S. community sample (Gruber et al., 2013). The reason for the nonsignificant effect of variability in negative emotions in this study could be that there is not as much variance in this variable than in variability in positive emotions, and variability in negative emotions of the participants in this study tended to be very low. In addition, the mean levels of the participants' positive emotions were significantly higher than negative emotions. This suggests that the hospitality students in this sample tend to be happy in general, their negative emotions did not change much and variability in negative emotions did not exert an impact on the students' stress and strain-related outcomes.

Practical Implications

Organizations could use the findings of this research to reduce their employees' strain during stressful events and improve their quality of life. As discussed earlier, sustained reduction in need for recovery and emotional exhaustion must be accomplished through sustained efforts to reduce levels of stress over time. There are a variety of ways that hospitality employers can implement in order to provide a healthier work environment and reduce employee stress levels. For example, there is research showing that an onsite chair massage therapy program (one 15-minute per week) helps to reduce stress and anxiety levels, which in turn can lead to better morale and improved productivity (Shulman & Jones, 1996). A wood bookcase with magazines and journals can be added to a relaxation room to imply that it is fine to linger (Gutnick, 2007). Managers are recommended to provide adequate conditions to help employees to reduce stress

and facilitate recovery process. In addition, Leather, Beal and Sullivan (2003) found that a noisy workplace increased employee stress levels, with restaurants becoming alarmingly loud (Rusnock & Bush, 2012). Rusnock and Bush (2012) claimed that restaurant noise levels can reach 80-100 dBA and have the potential to cause high stress, hearing damage, and OSHA complaints. Consistent efforts on instituting administrative or engineering controls should be made to reduce workplace noise, such as sound-damping flooring and high-performance acoustical ceiling systems (Brown, 1997).

This research also provides practical implications by examining the benefits of group affect that can be initiated by enhancing group cohesion and reducing emotional variability within the group. Those two interventions are a combination of increases in resources and reductions in stressors. Managers could use this in the selection and hiring processes and identify those candidates who are prone to develop cohesive relationships in the workplace and who are less emotionally variable.

Moreover, group cohesion should be enhanced not only from the interpersonal cohesion perspective, but also from the task cohesion perspective. Task cohesion could improve group performance under conditions of temporal stress and results from the importance of collective task accomplishment and a sense of collective efficacy (Zaccaro, Gualtieri, & Minionis, 1995). Training efforts should therefore focus on crystallizing the goals of group tasks for group members and exercising a series of tasks to enhance group members' collective efficacy.

In addition, individuals' emotions can be trained to be less variable (Roberts, Luo, Briley, Chow, Su, & Hill, 2017). For example, a mindfulness intervention helped to improve total mood disturbance (Krasner et al., 2009). Similarly, a training program focusing on personal and spiritual growth and development for recovering drug abusers led to decreases in emotional

variability (Piedmont, 2001). In fact, trait domains linked to affect (e.g., neuroticism associated with negative affect, and extraversion closely aligned with positive affect) change most in response to intervention, according to a meta-analysis by Roberts et al. (2017). Therefore, in the hospitality industry, managers could implement innovative practices, such as regularly encouraging meditative breaks to help employees reduce emotional variability and stress (Deshpande, 2012). Managers can help arrange a mindfulness-based workshop (Davidson et al., 2003), or a loving-kindness meditation workshop (Fredrickson, Cohn, Coffey, Pek, & Finkel, 2008), to broaden people's thinking and building personal resources. Managers could also assist employees to schedule micro-breaks to help them regulate emotions (Trougakos, Beal, Green, & Weiss, 2008), such as paid 15-minute rest period for each 2-hour work period. Additional training on how to deal with difficult customers can be implemented, so that employees feel more in control and thus less likely to suffer from ups and downs (Sawyerr, Srinivas, & Wang, 2009).

Finally, the results revealed that a higher level of group members' variability in positive emotions showed a higher initial level of emotional exhaustion and amplified the change in emotional exhaustion. Therefore, it is suggested that psychological interventions may be most successful in organizations when the interventions reduce variability in positive emotional states, as opposed to only focusing on enhancing employees' peak experiences and the frequency of their positive emotions. Gruber et al. (2011) suggested that happiness is not always good. The dark sides of happiness include the following: first, excessive levels of happiness can be unhealthy; second, happiness might not be adaptive when it is experienced in every context; third, the pursuit of happiness does not always lead to desired outcomes, or even has negative effects on well-being of individuals; finally, some types of happiness may be a source of

dysfunction (e.g., hubristic pride may engender antisocial behavior (Tracy, Cheng, Robins, & Trzesniewski, 2009). Therefore, as suggested by Gruber et al. (2013), "happiness is best kept stable."

Limitations and Strengths

The results of this research should be interpreted with caution in the context of several limitations. First, while this research provided a controlled setting to test the theoretical framework without the influence of potential confounding variables, participants in this study were undergraduate students, which may threaten the external validity of the findings. However, it is important to note that all the students were in their fourth year and had been required to work for 1,000 hours before graduation; in short, they all had previous hospitality work experience. The context of the study is comparable to a real-life restaurant setting as this restaurant is open to the public, and the students were motivated to do well. Therefore, this sample is high in ecological validity, as these individuals behaved the same way in real life as they behave in the laboratory setting (Bem & Lord, 1979). Moreover, Landers and Behrend (2015) argued that shrinking the pool of legitimate data sources by uncritical and nonspecific condemnation slows scientific progress without cause. While it is expected that the results of the current sample closely resemble those of real hospitality organizations, future research is encouraged to replicate this research in hospitality organizations by measuring hospitality employees' strain and emotion-related variables during a stressful event.

Second, the final sample size was 69 participants with 402 momentary reports, and the 69 participants were in 12 groups. This sample size limits the power to reach statistical significance and may result in poor indices (Button et al., 2013). Although some fit indices do not use sample

size in the calculation, they do have sampling functions that depend on *N* (Marsh, Balla, McDonald, 1988). Therefore, researchers (e.g., Jaccard & Wan, 1996; Marsh, Balla, & Hau, 1996) recommended using a range of fit indices to overcome the limitations of each index. In the results of this study, some models did not get acceptable fit indices (e.g., CFI < .90; RMSEA > .10), such as the univariate growth model of stress. However, the values of relative chi-square (the chi-square index divided by the degrees of freedom) in this study were all less than 5, which is acceptable according to Schumacker and Lomax (2004). Nevertheless, the power and goodness-of-fit of the latent growth curve modeling would be enhanced by increasing the sample size (Zhang & Wang, 2009). In addition, there were six to eight respondents on the same team who shared the same value of group cohesion and group members' emotional variability, and there may not be enough variability to detect statistical significance.

Third, all the survey data were gathered by self-report measures and common method variance could be a potential problem. However, the key variables are best measured from the participants themselves and the diary-survey design of this research might reduce the effect of common method variance (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

Despite these limitations, the first and foremost strength of this study is its use of a diary survey and novel statistical methods (Latent Growth Curve Modeling), which are rarely explored in hospitality studies. Employing a seven-wave diary design allowed the researcher to assess the levels of stress and strain that participants experienced during the stressful event. Latent growth curve analysis is a powerful and accurate reflection of individuals' perceptions and behaviors. This technique continuously records how individuals feel about their experiences during the period of a stressful event. This study used Latent Growth Curve Modeling in order to analyze more thoroughly the relation between stress and strain and LGCM analysis provided information

about the overall change of stress and strain and their associations with each other during a certain period of time. Conducting LGCM also allowed the researcher to study how the different types of group affect predict trajectories of stress and strain over time. Second, this research includes three types of strain: need for recovery, emotional exhaustion and sleep deprivation. The first two are psychological strains and the third one is a physiological strain. This provided a comprehensive model on understanding employee strain and well-being.

Directions for Future Research

There are several directions for future research: first, further research is needed to elucidate the effects of various forms of group cohesion (e.g., social cohesion or interpersonal cohesion and task cohesion) on group functioning during a stressful event. Second, because the results showed that group members' emotional variability leads to higher initial levels and changes of stress and strain, one may be interested in designing and testing interventions to help employees cope with group members whose emotional variability is high. Third, future research needs to examine whether group members' emotional variability is always detrimental, or whether it might be adaptive when it is associated with flexibly shifting emotional states to meet external environmental changes (Kashdan & Rottenberg 2010). Future studies can also investigate in which situations it is desirable to express or suppress positive and negative emotions. Fourth, new longitudinal research is needed to investigate the relation between job demands and strain. A growing body of literature suggests that employees high in strain may create more job demands over time (Hakanen & Bakker, 2016). When employees are exhausted and develop an aversion to their jobs during a stressful event, they are less likely to make an effort and more likely to make mistakes. Reduced effort and increased mistakes decrease work

performance, which in turn leads to increased job demands. Thus, employees could end up in a vicious cycle of job demands and burnout (Schaufeli, Bakker, & Van Rhenen, 2009). Therefore, it is worth investigating the relation between job demands and strain and how external resources and help can prevent further deterioration of employee well-being.

Conclusion

Although extensive research has examined employee stress levels at work, very little is known about change trajectories of stress and strain during a stressful work event. This dissertation applied affective events theory (Weiss & Cropanzano, 1996) and the homeostatic model of stress (McGrath, 1970) to argue that stress and strain-related variables displayed quadratic trajectories, and that group cohesion and group members' emotional variability could influence initial levels and changes of stress and strain-related variables. This dissertation extends the generalizability of AET and the homeostatic model of stress theories. General support was found for many of the proposed hypotheses, highlighting the need for additional research on factors that either increase or decrease employees' stress, as well as the need for designing intervention studies in decreasing work strain and ultimately improve employees' well-being.

References

Åkerstedt, T. (2003). Shift work and disturbed sleep/wakefulness. *Occupational Medicine, 53,* 89-94.

Bagozzi, R. P., Baumgartner, H., & Pieters, R. (1998). Goal-directed emotions. *Cognition & Emotion, 12,* 1-26.

Bakker, A. B., & Demerouti, E. (2007). The job demands-resources model: State of the art. *Journal of Managerial Psychology, 22,* 309-328.

Bakker, A. B., Demerouti, E., & Verbeke, W. (2004). Using the job demands-resources model to predict burnout and performance. *Human Resource Management, 43,* 83-104.

Barnes, C. M. (2011) I'll sleep when I'm dead: Managing those too busy to sleep. *Organizational Dynamics, 40,* 18-26.

Barnes, C. M. (2012). Working in our sleep: Sleep and self-regulation in organizations. *Organizational Psychology Review, 2,* 234-257.

Barnes, C. M., & Wagner, D. T. (2009). Changing to daylight saving time cuts into sleep and increases workplace injuries. *Journal of Applied Psychology, 94,* 1305-1317.

Barrett, P. (2007). Structural equation modelling: Adjudging model fit. *Personality and Individual Differences, 42,* 815-824.

Barrett, L. F., & Russell, J. A. (1999). The structure of current affect controversies and emerging consensus. *Current Directions in Psychological Science, 8,* 10-14.

Barsade, S.G. (2002). The ripple effect: Emotional contagion and its influence on group behavior. *Administrative Science Quarterly, 47,* 644-675.

Barsade, S. G., & Gibson, D. E. (2007). Why does affect matter in organizations? *Academy of Management Perspectives, 21,* 36-59.

Barsade, S. G., Ward, A. J., Turner, J. D. F., & Sonnenfeld, J. A. (2000). To your heart's content: A model of affective diversity in top management teams. *Administrative Science Quarterly, 45*, 802-836.

Bartel, C. A., & Saavedra, R. (2000). The collective construction of work group moods. *Administrative Science Quarterly, 45*, 197-231.

Baumeister, R. F., Vohs, K. D., & Tice, D. M. (2007). The strength model of self-control. *Current Directions in Psychological Science, 16*, 351-355.

Baumgartner, H., Pieters, R., & Bagozzi, R. P. (2008). Future-oriented emotions: Conceptualization and behavioral effects. *European Journal of Social Psychology, 38*, 685-696.

Bem, D. J., & Lord, C. G. (1979). Template matching: A proposal for probing the ecological validity of experimental settings in social psychology. *Journal of Personality and Social Psychology, 37*, 833-846.

Bernerth, J. B., & Aguinis, H. (2015). A critical review and best-practice recommendations for control variable usage. *Personnel Psychology, 69*, 229-283.

Bernthal, P. R., & Insko, C. A. (1993). Cohesiveness without groupthink: The interactive effects of social and task cohesion. *Group & Organization Management, 18*, 66-87.

Bledow, R., Rosing, K., & Frese, M. (2013). A dynamic perspective on affect and creativity. *Academy of Management Journal, 56*, 432-450.

Bolger, N., DeLongis, A., Kessler, R. C, & Schilling, E. A. (1989). Effects of daily stress on negative mood. *Journal of Personality and Social Psychology, 57*, 808-818.

Bono, J., Glomb, T., Shen, W., Kim, E., & Koch, A. (2013). Building positive resources: Effects of positive events and positive reflection on work-stress and health. *Academy of Management Journal, 56,* 1601-1627.

Bordia, P., Hunt, E., Paulsen, N., Tourish, D., & DiFonzo, N. (2004). Uncertainty during organizational change: Is it all about control? *European Journal of Work and Organizational Psychology, 13,* 345-365.

Boswell, W. R., Olson-Buchanan, J. B., & LePine, M. A. (2004). The relationship between work-related stress and work outcomes: The role of felt-challenge and psychological strain. *Journal of Vocational Behavior, 64,* 165-181.

Brown, R. (1997). Now hear this! *Buildings, 91,* 26.

Button, K. S., Ioannidis, J. P., Mokrysz, C., Nosek, B. A., Flint, J., Robinson, E. S., & Munafò, M. R. (2013). Power failure: why small sample size undermines the reliability of neuroscience. *Nature Reviews Neuroscience, 14,* 365-376.

Buysse, D. J., Reynolds, C. F., Monk, T. H., Berman, S. R., & Kupfer, D. J. (1989). The Pittsburgh Sleep Quality Index: A new instrument for psychiatric practice and research. *Psychiatry Research, 28,* 193-213.

Carlson, K, D., & Wu, J. (2012). The illusion of statistical control: Control variable practice in management research. *Organizational Research Methods, 15,* 413-435.

Carney, C. E., Edinger, J. D., Meyer, B., Lindman, L., & Istre, T. (2006). Daily activities and sleep quality in college students. *Chronobiology International, 23,* 623-637.

Cheshin, A., Rafaeli, A., & Bos, N. (2011). Anger and happiness in virtual teams: Emotional influences of text and behavior on others' affect in the absence of nonverbal cues. *Organizational Behavior and Human Decision Processes, 116,* 2-16.

Craig, A., & Cooper, R. E. (1992). Symptoms of acute and chronic fatigue. In A. P. Smith & D. M. Jones (Eds.), *Handbook of human performance* (Vol. 3, pp. 289-339). London: Academic Press.

Dahlgren, A., Kecklund, G., & Åkerstedt, T. (2005). Different levels of work-related stress and the effects on sleep, fatigue and cortisol. *Scandinavian Journal of Work, Environment & Health, 31,* 277-285.

Davidson, R. J., Kabat-Zinn, J., Schumacher, J., Rosenkranz, M., Muller, D., Santorelli, S. F., et al. (2003). Alterations in brain and immune function produced by mindfulness meditation. *Psychosomatic Medicine, 65*, 564-570.

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum.

Deshpande, R. C. (2012). A healthy way to handle work place stress through Yoga, Meditation and Soothing Humor. *International Journal of Environmental Sciences, 2*, 2143-2154.

Desivilya, H. S., & Yagil, D. (2005). The role of emotions in conflict management: The case of work teams. *International Journal of Conflict Management, 16, 55*-69.

Digdon, N., & Landry, K. (2013). University students' motives for drinking alcohol are related to evening preference, poor sleep, and ways of coping with stress. *Biological Rhythm Research, 44*, 1-11.

Dion, K. L. (2000). Group cohesion: From "field of forces" to multidimensional construct. *Group Dynamics: Theory, Research, and Practice, 4*, 7-26.

Dizén, M., & Berenbaum, H. (2011). Cognitive correlates of emotional traits: perceptions of self and others. *Emotion, 11*, 115-126.

Dobbins, G. H., & Zaccaro, S. J. (1986). The effects of group cohesion and leader behavior on subordinate satisfaction. *Group & Organization Management, 11*, 203-219.

Eaton, L. G., & Funder, D. C. (2001). Emotional experience in daily life: Valence, variability, and rate of change. *Emotion, 1*, 413-421.

Echterhoff, G., Higgins, E. T., & Levine, J. M. (2009). Shared reality experiencing commonality with others' inner states about the world. *Perspectives on Psychological Science, 4,* 496-521.

Eid, M., & Diener, E. (1999). Intraindividual variability in affect: Reliability, validity, and personality correlates. *Journal of Personality and Social Psychology, 76*, 662-676.

Ekman, P., Friesen, W. V., & Ellsworth, P. (2013). *Emotion in the human face: Guidelines for research and an integration of findings*. Elmsford, NY: Pergamon Press Inc.

Feldman, D. C. (1984). The development and enforcement of group norms. *Academy of Management Review*, *9*, 47-53.

Ferrara, M., & De Gennaro, L. (2001). How much sleep do we need? *Sleep Medicine Reviews, 5*, 155-179.

Firoozabadi, A., Uitdewilligen, S., & Zijlstra, F. R. (2016). Should you switch off or stay engaged? The consequences of thinking about work on the trajectory of psychological well-being over time. *Journal of Occupational Health Psychology.* Advance online publication.

Fisher, C. D., & Ashkanasy, N. M. (2000). The emerging role of emotions in work life: An introduction. *Journal of Organizational Behavior, 21,* 123-129.

Fisher, C. D., & To, M. L. (2012). Using experience sampling methodology in organizational behavior. *Journal of Organizational Behavior, 33,* 865-877.

Fiske, S. T., & Taylor, S. E. (1991). *Social cognition* (2nd ed.). New York, NY: McGraw-Hill.

Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American Psychologist, 56*, 218-226.

Fredrickson, B. L., Cohn, M. A., Coffey, K. A., Pek, J., & Finkel, S. M. (2008). Open hearts build lives: Positive emotions, induced through loving-kindness meditation, build consequential personal resources. *Journal of Personality and Social Psychology*, *95*, 1045-1062.

Fuller, J. A., Stanton, J. M., Fisher, G. G., Spitzmüller, C., Russell, S. S., & Smith, P. C. (2003). A lengthy look at the daily grind: time series analysis of events, mood, stress, and satisfaction. *Journal of Applied Psychology, 88,* 1019-1033.

Ganster, D. C., & Rosen, C. C. (2013). Work stress and employee health: A multidisciplinary review. *Journal of Management, 39, 1085-1122.*

Ganster, D. C., & Schaubroeck, J. (1991). Work stress and employee health. *Journal of Management, 17*, 235-271.

George, J. M. (1990). Personality, affect, and behavior in groups. *Journal of Applied Psychology, 75,* 107-116.

George, J. M. (1995). Leader positive mood and group performance: The case of customer service. *Journal of Applied Social Psychology, 25,* 778-794.

Grandey, A. A. (2008). Emotions at work: A review and research agenda. In C. L. Cooper and J. Barling (eds), *The Sage handbook of organizational behavior* (Vol. 1, pp. 235-261). Thousand Oaks, CA: Sage.

Grandey, A. A., Fisk, G. M., & Steiner, D. D. (2005). Must "service with a smile" be stressful? The moderating role of personal control for American and French employees. *Journal of Applied Psychology, 90,* 893-904.

Griffin, M. A., & Clarke, S. 2011. Stress and well-being at work. In S. Zedeck (Ed.), *APA handbook of industrial and organizational psychology,* (Vol. 3: 359-397). Washington, DC: American Psychological Association.

Gross, S., Semmer, N. K., Meier, L. L., Kälin, W., Jacobshagen, N., & Tschan, F. (2011). The effect of positive events at work on after-work fatigue: They matter most in face of adversity. *Journal of Applied Psychology, 96,* 654-664.

Gruber, J., Kogan, A., Quoidbach, J., & Mauss, I. B. (2013). Happiness is best kept stable: Positive emotion variability is associated with poorer psychological health. *Emotion, 13,* 1-6.

Gruber, J., Mauss, I. B., & Tamir, M. (2011). A dark side of happiness? How, when, and why happiness is not always good. *Perspectives on Psychological Science, 6,* 222-233.

Gutnick, L. (2007). *A workplace design that reduces employee stress and increases employee productivity using environmentally responsible materials*. (Unpublished Thesis). Eastern Michigan University, Ypsilanti, MI.

Hakanen, J., & Bakker, A. B. (2016). Born and bred to burn out: A life-course view and reflections on job burnout. *Journal of Occupational Health Psychology*. Advanced online publication.

Halbesleben, J. R., & Buckley, M. R. (2004). Burnout in organizational life. *Journal of Management, 30,* 859-879.

Halbesleben, J. R., & Wheeler, A. R. (2011). I owe you one: Coworker reciprocity as a moderator of the day-level exhaustion–performance relationship. *Journal of Organizational Behavior, 32*, 608-626.

Hall, M., Buysse, D. J., Nofzinger, E. A., Reynolds 3rd, C. F., Thompson, W., Mazumdar, S., Monk, T. H., (2008). Financial strain is a significant correlate of sleep continuity disturbances in late-life. *Biological Psychology, 77,* 217-222.

Harrison, D. A., Price, K. H., & Bell, M. P. (1998). Beyond relational demography: Time and the effects of surface-and deep-level diversity on work group cohesion. *Academy of Management Journal, 41*, 96-107.

He, X., Lever, A. G., & Humphreys, G. W. (2011). Interpersonal memory-based guidance of attention is reduced for ingroup members. *Experimental Brain Research, 211,* 429-438.

Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. *American Psychologist*, *44*, 513-524.

Hobfoll, S. E., & Freedy, J. (1993). Conservation of resources: A general stress theory applied to burnout. In W. B. Schaufeli, C. Maslach & T. Marek (Eds.) *Professional burnout: Recent developments in theory and research* (pp. 115-129). Washington, DC: Taylor & Francis.

Høigaard, R., Säfvenbom, R., & Tønnessen, F. E. (2006). The relationship between group cohesion, group norms, and perceived social loafing in soccer teams. *Small Group Research*, *37*, 217-232.

Homans, G. C. (2013). *The human group.* New York, NY: Routledge.

Houben, M., Van Den Noortgate, W., & Kuppens, P. (2015). The relation between short-term emotion dynamics and psychological well-being: A meta-analysis. *Psychological Bulletin, 141,* 901-930.

Houkes, I., Janssen, P. P. M., DeJonge, J., & Bakker, A. B. (2003). Personality, work characteristics, and employee well-being: A longitudinal analysis of additive and moderating effects. *Journal of Occupational Health Psychology, 8,* 20-38.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6,* 1-55.

Hublin, C., Partinen, M., Koskenvuo, M., & Kaprio, J. (2007). Sleep and mortality: A population-based 22-year follow-up study. *Sleep, 30,* 1245-1253.

Jaccard, J., & Wan, C. K. (1996). *LISREL approaches to interaction effects in multiple regression*. Thousand Oaks, CA: Sage Publications.

Janssen, O., Lam, C. K., & Huang, X. (2010). Emotional exhaustion and job performance: The moderating roles of distributive justice and positive affect. *Journal of Organizational Behavior, 31,* 787-809.

Jehn, K. A., & Mannix, E. A. (2001). The dynamic nature of conflict: A longitudinal study of intragroup conflict and group performance. *Academy of Management Journal, 44,* 238-251.

Jetten, J., Hogg, M. A., & Mullin, B.-A. (2000). In-group variability and motivation to reduce subjective uncertainty. *Group Dynamics: Theory, Research, and Practice, 4,* 184-198.

Kashdan, T. B. & Rottenberg, J. (2010). Psychological flexibility as a fundamental aspect of health. *Clinical Psychological Review, 30,* 865-878.

Katz, J. H. (2016, August 17). 5 tips to reduce stress in hospitality workers. Retrieved from www.thenycalliance.org.

Kelly, J. R., & Barsade, S. G. (2001). Mood and emotions in small groups and work teams. *Organizational Behavior and Human Decision Processes, 86,* 99-130.

Keltner, D., Gruenfeld, D. H., & Anderson, C. (2003). Power, approach, and inhibition. *Psychological Review, 110,* 265-284.

Kessler, R. C., Berglund, P. A., Coulouvrat, C., Hajak, G., Roth, T., Shahly, V.,... Walsh, J. K. (2011). Insomnia and the performance of US workers: Results from the America Insomnia Survey. *Sleep, 34,* 1161-1171.

Knudsen, H. K., Ducharme, L. J., & Roman, P. M. (2007). Job stress and poor sleep quality: data from an American sample of full-time workers. *Social Science & Medicine, 64,* 1997-2007.

Krasner, M. S., Epstein, R. M., Beckman, H., Suchman, A. L., Chapman, B., Mooney, C. J., & Quill, T. E. (2009). Association of an educational program in mindful communication with burnout, empathy, and attitudes among primary care physicians. *Journal of the American Medical Association, 302,* 1284-1293.

Landers, R. N., & Behrend, T. S. (2015). An inconvenient truth: Arbitrary distinctions between organizational, Mechanical Turk, and other convenience samples. *Industrial and Organizational Psychology, 8,* 142-164.

Latham, G. P., & Locke, E. A. (1991). Self-regulation through goal setting. *Organizational Behavior and Human Decision Processes, 50,* 212-247.

Lazarus, R. S. (1966). *Psychological stress and the coping process.* New York, NY: McGraw-Hill.

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York, NY: Springer Publishing Company.

Leather, P., Beale, D., & Sullivan, L. (2003). Noise, psychosocial stress and their interaction in the workplace. *Journal of Environmental Psychology*, *23*, 213-222.

Lee, S. Y., & Brand, J. L. (2005). Effects of control over office workspace on perceptions of the work environment and work outcomes. *Journal of Environmental Psychology*, *25*, 323-333.

LePine, J. A., LePine, M. A., & Jackson, C. (2004). Challenge and hindrance stress: Relationships with exhaustion, motivation to learn, and learning performance. *Journal of Applied Psychology, 89,* 883-891.

Lindell, M. K., & Whitney, D. J. (2001). Accounting for common method variance in cross-sectional research designs. *Journal of Applied Psychology*, *86*, 114-121.

Linden, D. V. D., Keijsers, G. P., Eling, P., & Schaijk, R. V. (2005). Work stress and attentional difficulties: An initial study on burnout and cognitive failures. *Work & Stress, 19*, 23-36.

Litwiller, B., Snyder, L. A., Taylor, W. D., & Steele, L. M. (2016). The relationship between sleep and work: A meta-analysis. *Journal of Applied Psychology.* Advanced online publication.

Locke, E. A. (2002). Setting goals for life and happiness. In C. R. Snyder & S. J. Lopez (Eds.), *Handbook of positive psychology*, (pp. 299-312). New York, NY: Oxford University Press.

MacCallum, R.C., Browne, M.W., and Sugawara, H., M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods, 1*, 130-149.

Magee, J. C., & Tiedens, L. Z. (2006). Emotional ties that bind: The roles of valence and consistency of group emotion in inferences of cohesiveness and common fate. *Personality and Social Psychology Bulletin, 32*, 1703-1715.

Mäkikangas, A., Bakker, A. B., Aunola, K., & Demerouti, E. (2010). Job resources and flow at work: Modelling the relationship via latent growth curve and mixture model methodology. *Journal of Occupational and Organizational Psychology, 83*, 795-814.

Mandler, G. (1984). *Mind and body: Psychology of emotion and stress*. New York, NY: Norton.

Marsh, H. W., Balla, J. R., & Hau, K. T. (1996). An evaluation of incremental fit indexes: A clarification of mathematical and empirical properties. In G. A. Marcoulides & R. E. Schumacker (Eds.), *Advanced structural equation modeling techniques* (pp.315-353 . Mahwah , NJ : Lawrence Erlbaum.

Marsh, H. W., Balla, J. R., & McDonald, R. P. (1988). Goodness-of-fit indexes in confirmatory factor analysis: The effect of sample size. *Psychological bulletin*, *103*, 391-410.

Maslach, C., & Jackson, S. E. (1981). The measurement of experienced burnout. *Journal of Occupational Behavior, 2*, 99-113.

Maslach, C., Schaufeli, W. B., & Leiter, M. P. (2001). Job burnout. *Annual Review of Psychology, 52*, 397-422.

McCauley, C. (1989). The nature of social influence in groupthink: Compliance and internalization. *Journal of Personality and Social Psychology*, *57*, 250-260.

McGrath, J. E. (1970). A conceptual formulation for research on stress. In J. E. McGrath (Ed.), Social and psychological factors in stress (pp. 10-21). New York: Holt, Rinehart & Winston.

Meijman, Th. F., & Mulder, G. (1998). Psychological aspects of workload. In P. J. D. Drenth & H. Thierry (Eds.), *Handbook of work and organizational psychology: Vol. 2. Work psychology* (pp. 5-33). Hove, England: Psychology Press.

Midtgaard, J., Rorth, M., Stelter, R., & Adamsen, L. (2006). The group matters: An explorative study of group cohesion and quality of life in cancer patients participating in physical exercise intervention during treatment. *European Journal of Cancer Care, 15*, 25-33.

Molenaar, P. (1996). *THEIL: A FORTRAN program for robust covariance matrix estimation.* Unpublished program manual.

Morris, W. N. (1989). *Mood: The frame of mind.* New York, NY: Springer.

Muraven, M., & Baumeister, R. F. (2000). Self-regulation and depletion of limited resources: Does self-control resemble a muscle? *Psychological Bulletin, 126*, 247-259.

Nielsen, K., & Daniels, K. (2012). Does shared and differentiated transformational leadership predict followers' working conditions and well-being? *The Leadership Quarterly, 23*, 383-397.

O'Neill, J. W., & Davis, K. (2011). Work stress and well-being in the hotel industry. *International Journal of Hospitality Management, 30*, 385-390.

Piedmont, R. L. (2001). Cracking the plaster cast: Big Five personality change during intensive outpatient counseling. *Journal of Research in Personality, 35*, 500–520.

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88,* 879–903.

Prapavessis, H., & Carron, A. V. (1996). The effects of group cohesion on competitive state anxiety. *Journal of Sport & Exercise Psychology, 18,* 64-74.

Preacher, K. J., Wichman, A. L., MacCallum, R. C., & Briggs, N. E. (2008). *Latent growth curve modeling: Quantitative applications in the social sciences.* Thousand Oaks, CA: Sage Publications, Inc.

Roben, C. K. P. (2012). *Parental depressive symptoms over time and transmission of risk to adopted toddlers' emotion regulation* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database. (UMI No. 3534759)

Roberts, B. W., Luo, J., Briley, D. A., Chow, P. I., Su, R., & Hill, P. L. (2017). A systematic review of personality trait change through intervention. *Psychological Bulletin.* Advance online publication.

Rodell, J. B., & Judge, T. A. (2009). Can "good" stressors spark "bad" behaviors? The mediating role of emotions in links of challenge and hindrance stressors with citizenship and counterproductive behaviors. *Journal of Applied Psychology, 94,* 1438-1451.

Rusnock, C. F., & Bush, P. M. (2012). Case study: an evaluation of restaurant noise levels and contributing factors. *Journal of Occupational and Environmental Hygiene, 9,* 108-113.

Sawyerr, O. O., Srinivas, S., & Wang, S. (2009). Call center employee personality factors and service performance. *Journal of Services Marketing, 23,* 301-317.

Schaufeli, W. B., & Bakker, A. B. (2004). Job demands, job resources, and their relationship with burnout and engagement: A multi-sample study. *Journal of Organizational Behavior, 25,* 293-315.

Schaufeli, W. B., Bakker, A. B., & Van Rhenen, W. (2009). How changes in job demands and resources predict burnout, work engagement, and sickness absenteeism. *Journal of Organizational Behavior, 30,* 893–917.

Schumacker, R. E., & Lomax, R. G. (2004). *A beginner's guide to structural equation modeling*, Second edition. Mahwah, NJ: Lawrence Erlbaum Associates.

Schwarz, N. (1990). Feelings as information: Informational and motivational functions of affective states. In R. Sorrentino & E. T. Higgins (Eds.), *Handbook of motivation and cognition: Foundations of social behavior* (Vol. 2, pp. 527-561). New York: Guilford Press.

Shani, A., Uriely, N., Reichel, A., & Ginsburg, L. (2014). Emotional labor in the hospitality industry: The influence of contextual factors. *International Journal of Hospitality Management*, *37*, 150-158.

Shteynberg, G., & Apfelbaum, E. P. (2013). The power of shared experience: Simultaneous observation with similar others facilitates social learning. *Social Psychological & Personality Science, 4,* 738-744.

Shteynberg, G., & Galinsky, A. D. (2011). Implicit coordination: Sharing goals with similar others intensifies goal pursuit. *Journal of Experimental Social Psychology, 47,* 1291-1294.

Shulman, K. R., & Jones, G. E. (1996). The effectiveness of massage therapy intervention on reducing anxiety in the workplace. *The Journal of Applied Behavioral Science, 32,* 160-173.

Sluiter, J. K., De Croon, E. M., Meijman, T. F., & Frings-Dresen, M. H. W. (2003). Need for recovery from work-related fatigue and its role in the development and prediction of subjective health complaints. *Occupational and Environmental Medicine, 60,* 62-70.

Sonnentag, S. & Frese, M. (2003). Stress in organizations. In W. C. Borman, D. R. Ilgen, & R. J. Klimoski (Eds.), *Comprehensive handbook of psychology, Volume 12: Industrial and organizational psychology* (pp. 453-491). Hoboken: Wiley.

Sonnentag, S., & Fritz, C. (2015). Recovery from job stress: The stressor-detachment model as an integrative framework. *Journal of Organizational Behavior, 36,* 72-103.

Sonnentag, S., Kuttler, I., & Fritz, C. (2010). Job stressors, emotional exhaustion, and need for recovery: A multi-source study on the benefits of psychological detachment. *Journal of Vocational Behavior, 76,* 355-365.

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

Spector, P. E., & Brannick, M. T. (2011). Methodological urban legends: The misuse of statistical control variables. *Organizational Research Methods, 14,* 287-305.

Stordeur, S., D'hoore, W., & Vandenberghe, C. (2001). Leadership, organizational stress, and emotional exhaustion among hospital nursing staff. *Journal of Advanced Nursing, 35,* 533-542.

Taylor, S. E. (1991). Asymmetrical effects of positive and negative events: The mobilization-minimization hypothesis. *Psychological Bulletin, 110,* 67-85.

Tekleab, A. G., Quigley, N. R., & Tesluk, P. E. (2009). A longitudinal study of team conflict, conflict management, cohesion, and team effectiveness. *Group & Organization Management, 34,* 170-205.

Teuchmann, K., Totterdell, P., & Parker, S. K. (1999). Rushed, unhappy, and drained: An experience sampling study of relations between time pressure, perceived control, mood, and emotional exhaustion in a group of accountants. *Journal of Occupational Health Psychology, 4,* 37-54.

Tiedens, L. Z. (2000). Powerful emotions: The vicious cycle of social status positions and emotions. In N. M. Ashkanasy, C. E. J. Hartel & W. J. Zerbe (Eds), *Emotions in the workplace: Research, theory and practice* (pp. 71-81). Westport, CT: Quorum.

Tiedens, L., & Fragale, A. (2003). Power moves: Complementarily in dominant and submissive nonverbal behavior. *Journal of Personality and Social Psychology, 84,* 558-568.

To, M. L., Fisher, C. D., Ashkanasy, N. M., & Rowe, P. A. (2012). Within-person relationships between mood and creativity. *Journal of Applied Psychology, 97,* 599-612.

Totterdell, P., Wood, S., & Wall, T. (2006). An intra-individual test of the demands-control model: A weekly diary study of psychological strain in portfolio workers. *Journal of Occupational and Organizational Psychology, 79,* 63-84.

Tracy, J. L., Cheng, J. T., Robins, R. W., & Trzesniewski, K. H. (2009). Authentic and hubristic pride: The affective core of self-esteem and narcissism. *Self and Identity, 8,* 196-213.

Trougakos, J. P., Beal, D. J., Green, S. G., & Weiss, H. M. (2008). Making the break count: An episodic examination of recovery activities, emotional experiences, and positive affective displays. *Academy of Management Journal, 51*, 131-146.

Tsai, W. C., Chi, N. W., Grandey, A. A., & Fung, S. C. (2012). Positive group affective tone and team creativity: Negative group affective tone and team trust as boundary conditions. *Journal of Organizational Behavior, 33*, 638-656.

Tsaur, S.-H., & Tang, Y.-Y. (2012). Job stress and well-being of female employees in hospitality: The role of regulatory leisure coping styles. *International Journal of Hospitality Management, 31*, 1038-1044.

Ursin, H., & Eriksen, H. R. (2004). The cognitive activation theory of stress. *Psychoneuroendocrinology, 29,* 567-592.

Van Kleef, G. A., De Dreu, C. K., & Manstead, A. S. (2004). The interpersonal effects of anger and happiness in negotiations. *Journal of Personality and Social Psychology, 86*, 57-76.

Wagner, D. T., Barnes, C. M., & Scott, B. A. (2013). Driving it home: How workplace emotional labor harms employee home life. *Personnel Psychology, 67*, 487-516.

Weiss, H. M. & Cropanzano, R. (1996). Affective events theory: A theoretical discussion of the structure, causes and consequences of affective experiences at work. *Research in Organizational Behavior, 18,* 1-74.

Wessman, A. E., & Ricks, D. F. (1966). *Mood and personality.* New York: Holt, Rinehart & Winston.

Willer, R., Flynn, F. J., & Zak, S. (2012). Structure, identity, and solidarity a comparative field study of generalized and direct exchange. *Administrative Science Quarterly, 57*, 119-155.

Zaccaro, S. J., Gualtieri, J., & Minionis, D. (1995). Task cohesion as a facilitator of team decision making under temporal urgency. *Military Psychology, 7*, 77-93.

Zapf, D., Dormann, C., & Frese, M. (1996). Longitudinal studies in organizational stress research: A review of the literature with reference to methodological issues. *Journal of Occupational Health Psychology, 1*, 145-169.

Zhang, W., Bansback, N., & Anis, A. H. (2011). Measuring and valuing productivity loss due to poor health: A critical review. *Social Science & Medicine, 72*, 185-192.

Zhang, Z., & Wang, L. (2009). Statistical power analysis for growth curve models using SAS. *Behavior Research Methods, Instruments & Computers, 41*, 1083-1094.

Appendix

Step 1 Survey Questions

To what extent do you agree with the following statements about your HM 430 team? (from 1 = strongly disagree to 5 = strongly agree)

1. I would choose to leave my team and join another	1	2	3	4	5
2. The members of my team get along well together	1	2	3	4	5
3. The members of my team will readily defend each other from criticism by outsiders	1	2	3	4	5
4. I find that I generally do not get along with the other members of my team	1	2	3	4	5
5. I enjoy belonging to this team because I am friends with many group members	1	2	3	4	5
6. I feel that I am really a part of my team	1	2	3	4	5
7. The team which I belong to is a close one	1	2	3	4	5

Some information about yourself:

1. What is your gender? □male □female

2. What is your age? _____

3. What is your race? □White □Black □ Hispanic □Asian □Middle Eastern □South Asian/Indian □Hawaiian/Pacific Islander □Other (please specify) _____

4. Are you currently employed? □yes □no

5. If you are currently employed, how long have you been employed in that organization? (in months) _____ What is your job title? _____

Step 2 Diary Survey Questions

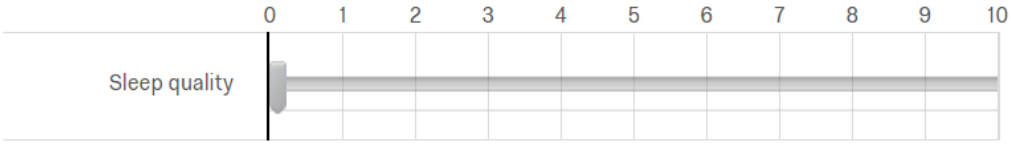
Please assess your emotions at this very moment. To what extent are you:
(from 1 = strongly disagree to 7 = strongly agree)

1. excited	1	2	3	4	5	6	7
2. enthusiastic	1	2	3	4	5	6	7
3. calm	1	2	3	4	5	6	7
4. relaxed	1	2	3	4	5	6	7
5. angry	1	2	3	4	5	6	7
6. fatigued	1	2	3	4	5	6	7
7. bored	1	2	3	4	5	6	7

Please indicate the extent to which you agree or disagree with each statement for today in general.
(from 1 = strongly disagree to 7 = strongly agree)

1. I felt stressed during the day today	1	2	3	4	5	6	7
2. Today I would have needed more time than usual to relax and recover	1	2	3	4	5	6	7
3. Considering the total of all the activities that I pursued today, I have had enough time to relax and to recover	1	2	3	4	5	6	7
4. Right now, I feel emotionally drained	1	2	3	4	5	6	7
5. The team which I belong to is a close one (measured on the first day)	1	2	3	4	5	6	7
6. In general, my group members' emotions change a lot (measured on the first day)	1	2	3	4	5	6	7

How do you evaluate last night's sleep? (0 = very bad, 10 = very good)



Vita

Shi (Tracy) Xu

EDUCATION

Ph. D., The Pennsylvania State University, University Park, PA. 2017
- School of Hospitality Management
- Focus: Human Resource Management and Organizational Behavior in Hospitality

M. S., Beijing International Studies University, Beijing, China. 2012
- School of Hospitality Management
- Focus: Subjective Well-Being of Hospitality Employees

Course-Exchange Student, University of Central Florida, Orlando, FL. 2010
- Rosen College of Hospitality Management

B. S., South China University of Technology, Guangzhou, China. 2009
- School of Economics and Commerce

SELECTED PUBLICATIONS

Xu, S., Martinez, L. R., Van Hoof, H., Tews, M. J., Torres, L., & Farfan, K. (Accepted). The impact of abusive supervision and coworker support on hospitality and tourism student employees' turnover intentions in Ecuador. *Current Issues in Tourism*.

Xu, S., Martinez, L. R., & Lv, Q. (Accepted). Explaining the link between emotional labor and turnover intention: The role of in-depth communication. *International Journal of Hospitality & Tourism Administration.*

Xu, S., Van Hoof, H., Serrano, A., Fernandez, L., & Ullauri, N. (2017). The role of coworker support in the relationship between moral efficacy and voice behavior. *Journal of Human Resources in Hospitality & Tourism, 16, 252-269.*

Xu, S., Martinez, L. R., Van Hoof, H., Eljuri, M. I., & Arciniegas, L. (2016). Fluctuating emotions: Relating emotional variability and job satisfaction. *Journal of Applied Social Psychology, 46,* 617-626.

Smith, N. A., Sabat, I. E., Martinez, L. R., Weaver, K., & **Xu, S.** (2015). A convenient solution: Using MTurk to sample from hard-to-reach populations. *Industrial and Organizational Psychology: Perspectives on Science and Practice, 8*(2), 220-228.

Tews, M. J., Michel, J., **Xu, S.**, & Drost, A. (2015). Workplace fun matters … But what else? *Employee Relations*, *37*(2), 248-267.

* In May 2017, Tracy will begin her academic career as a lecturer in the School of Hospitality and Tourism Management at the University of Surrey in the UK.