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The Power of Recovery:
Recovery from Work-related Stress as a Predictor of
Fluctuations in Individual Job Performance

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ZUSAMMENFASSUNG

Während der arbeitsfreien Zeit haben Arbeitnehmer die Möglichkeit, sich von arbeitsbezogenen Anforderungen und Stress zu erholen. In etlichen Studien wurde der Nutzen von Erholung für die Gesundheit und das Wohlbefinden von Arbeitnehmern gezeigt. Forschung, die den Zusammenhang zwischen Erholung und Arbeitsleistung untersucht, ist dagegen noch sehr begrenzt. Diese Dissertation widmete sich dieser Forschungslücke und untersuchte den Zusammenhang zwischen Erholung und Arbeitsleistung in drei empirischen Studien.

Studie 1 beleuchtete tägliche Erholung und tägliche Arbeitsleistung. Genauer wurde das Gefühl der Erholtheit am Morgen als Prädiktor für tägliche Arbeitsleistung und die aufgewandte kompensatorische Anstrengung untersucht. Über den Zeitraum von einer Woche, beantworteten 99 Mitarbeiter aus öffentlichen Verwaltungen zweimal täglich Fragebogen auf einem Pocket Computer. Hierarchisch lineare Modelle zeigten, dass das Gefühl der Erholtheit am Morgen positiv mit täglicher Aufgabenleistung, Eigeninitiative und Hilfeverhalten stand, während es negativ mit der täglich aufgewandten kompensatorischen Anstrengung zusammenhing. Die Zusammenhänge zwischen dem Gefühl der Erholtheit am Morgen und täglicher Aufgabenleistung, Eigeninitiative und Hilfeverhalten wurden durch Handlungsspielraum moderiert. Unter hohem Handlungsspielraum gab es einen starken positiven Zusammenhang zwischen dem morgendlichen Gefühl der Erholtheit und täglicher Arbeitsleistung, während es unter niedrigen Handlungsspielraum keinen Zusammenhang gab.

Studie 2 untersuchte Erholung während des Wochenendes und wöchentliche Arbeitsleistung. Einerseits wurde der Frage nachgegangen, welche Faktoren zu einer erfolgreichen Erholung am Wochenende beitragen. Andererseits wurde geprüft, ob das Gefühl zu Beginn der Woche sehr erholt zu sein für verschiedene Dimensionen von Arbeitsleistung förderlich ist. Insgesamt beantworteten 159 Arbeitnehmer vier Wochen lang zwei internetbasierte Fragebogen, jeweils Montag morgens und Freitag nachmittags. Hierarchisch lineare Modelle zeigten, dass mentales Abschalten, Entspannung und das Erleben von Herausforderung sowie

die subjektive Einschätzung des Schlafs am Wochenende das Gefühl der Erholtheit am Montag morgen vorhersagt. Das Gefühl der Erholtheit sagte wiederum Fluktuationen in der wöchentlichen Arbeitsleistung, Eigeninitiative, im Hilfeverhalten und der aufgewandten kompensatorischen Anstrengung vorher.

Studie 3 untersuchte den Zusammenhang zwischen positiven und negativen Erlebnissen außerhalb der Arbeit mit Arbeitsleistung über einen längeren Zeitraum, nämlich über ein halbes Jahr. Genauer wurden Zusammenhänge zwischen dem Gefühl der Erholtheit während der Freizeit, positivem und negativem Reflektieren über die Arbeit während der Freizeit mit Arbeitsleistung über die Zeit hinweg untersucht. Insgesamt beantworteten 349 Arbeitnehmer, die mit behinderten Menschen arbeiteten, zwei Fragebogen im Abstand von sechs Monaten. Hierarchische Regressionsanalysen zeigten, dass das Gefühl der Erholtheit positiv mit einem Anstieg der Aufgabeeleistung nach sechs Monaten zusammen hing. Dieser Zusammenhang wurde durch arbeitsbezogene Selbstwirksamkeit mediiert. Positives Reflektieren über die Arbeit sagte einen Anstieg in Eigeninitiative, Kreativität und Hilfeverhalten vorher. Negatives Reflektieren hing nicht mit Arbeitsleistung zusammen.

Eine wichtige Stärke dieser Dissertation liegt darin, dass durch die Untersuchungsdesigns und Analysemethoden diverse Alternativerklärungen (z.B. der Einfluss von Personendrittvariablen) ausgeschlossen werden konnten. Weiterhin zeigten die Ergebnisse, dass sich positive Zusammenhänge zwischen Erholung und Arbeitsleistung über verschiedene Stichproben und Zeiträume generalisieren lassen. Die größte Schwäche besteht darin, dass Arbeitsleistung nur durch Selbsteinschätzungen und nicht durch objektiven Daten oder Fremdeinschätzungen erfasst wurde.

Zusammengefasst erweitert diese Dissertation Forschung zum Zusammenhang zwischen Erholung und leistungsbezogenen Kriterien. Die Ergebnisse von drei empirischen Studien zeigten, dass Erholung mit einem Nutzen für verschiedene Dimensionen von Arbeitsleistung einhergeht.

SUMMARY

During non-work time employees have the opportunity to recover and unwind from work-related demands. The benefits of recovery for employees' health and well-being have been shown in several studies. Research on the relationship between recovery and job performance is still scarce. This dissertation addressed this research gap and examined the relationship between recovery and job performance in three empirical studies.

Study 1 focused on daily recovery and daily job performance. More specifically, employees' state of being recovered in the morning was examined as a predictor of fluctuations in daily job performance and daily compensatory effort at work. Over the course of one work week 99 employees from public service organizations answered two daily surveys on pocket computers. Results from hierarchical linear modeling showed that the state of being recovered in the morning was positively related to daily task performance, personal initiative and organizational citizenship behavior and negatively related to daily compensatory effort at work. Furthermore, relationships between the state of being recovered and day-specific task performance, personal initiative and organizational citizenship behavior were moderated by job control. There was a strong positive relationship between feeling recovered and daily performance when job control was high and no relationship when job control was low.

Study 2 examined recovery during the weekend and weekly job performance. On the one hand, it was examined which factors contribute to employees' successful recovery during the weekend. On the other hand, it was investigated if being highly recovered in the beginning of the week benefits different dimensions of job performance during the week. Over the period of four working weeks, 159 employees responded to weekly web-based surveys on Monday mornings and Friday afternoons. Hierarchical linear modeling showed that psychological detachment, relaxation, mastery experiences and the subjective evaluation of weekend sleep predicted the state of being recovered on Monday morning. The state of being

recovered in turn predicted fluctuations in weekly task performance, personal initiative, organizational citizenship behavior and low compensatory effort.

Study 3 investigated relationships between positive and negative non-work experiences with job performance over a longer period of time, namely half a year. Specifically, this study examined relationships between feeling recovered, positive and negative work reflection during leisure time with job performance over time. In sum, 349 employees working with people with special needs responded to two questionnaires at an interval of six months. Hierarchical regression analyses showed that feeling recovered during leisure time predicted an increase in task performance after six months. This relationship was mediated by occupational self-efficacy. Positive work reflection was found to predict an increase in personal initiative, creativity and organizational citizenship behavior. Negative work reflection was unrelated to job performance.

One important strength of this dissertation is that different alternative explanations (e.g., third variables at the person-level) could be ruled out by the study designs and data analyses procedures. Moreover, the results showed that positive relationships between recovery and job performance can be generalized to different samples and time periods. The most serious limitation is that job performance was only assessed by self-reports and not by objective data or ratings of others.

Taken together, this dissertation extended research on the relationship between recovery and performance-related outcomes. Results from three empirical studies showed that recovery is associated with benefits for different dimensions job performance.

GENERAL INTRODUCTION

Probably, most employees are familiar with the experience that after a stressful day at work one looks forward to the end of a working day, the weekend or the next vacation. Time off from work offers employees the possibility to unwind from work-related demands and to seek recuperation by engaging in pleasurable activities and experiences. Research on recovery from work-related stress investigates this process of unwinding during off-work time and aims at a better understanding of the determinants that contribute to employees' successful recovery and the potential consequences for employees' health, well-being and job-related outcomes (Zijlstra & Cropley, 2006; Zijlstra & Sonnentag, 2006). The goal of this dissertation is to extend research on recovery by examining the relationships between recovery and employees' job performance.

The present dissertation is composed of three parts. In this first part (Chapter 1), I will introduce the concept of recovery from work-related stress and present the role of recovery as a research topic for industrial and organizational psychology. Furthermore, I will point out the overall research goals of this dissertation and give an outline over the following chapters. In Part 2 (Chapter 2 to 4), I will present three empirical studies examining the relationships between recovery from work-related stress and job performance. As these chapters include separate theoretical introductions and discussions, they can be read independently. Finally, in Part 3 (Chapter 5), I will summarize and discuss the findings from the studies presented in the previous chapters and conclude with the discussion of this dissertation's contribution for research and practice.

Recovery from work-related stress: A research topic for industrial and organizational psychology

During work, an individual's physical and mental resources (e.g., energy and self-regulatory resources) become depleted, because the individual has to invest resources to

accomplish his or her tasks and to deal with work-related demands (Meijman & Mulder, 1998). During non-work time, that is during breaks at work, daily leisure time, a free weekend, or a vacation, employees are no longer exposed to work-related demands and therefore have the opportunity to rest and to ‘recharge their batteries’ (Meijman & Mulder, 1998). This process of restoration is called *recovery*. Recovery can be conceptualized as the process that is opposite to the stress process, because it reverses the negative consequences of job demands and allows an individual’s functional system to return to the baseline level of functioning (Meijman & Mulder, 1998). Other terms for the recovery process are unwinding process (Frankenhaeuser & Johansson, 1986), recuperation (Strauss-Blasche, Ekmekcioglu, & Marktl, 2002), or restoration (Hartig, Bökk, Garvill, Olsson, & Gärling, 1996).

Research on recovery from work-related stress complements stress research that examines how employees react to stress, how employees can cope with stressful situations at work (e.g., Brown, Westbrook, & Challagalla, 2005; Elfering et al., 2005; Sonnentag & Frese, 2003), or how organizations can prevent or ameliorate the negative effects of stress by redesigning the workplace (Parker, 2002; Parker & Wall, 1998), or by implementing stress management interventions (Semmer, 2003). Recovery can add to stress research as it has been suggested as “an explanatory mechanism in the relation between acute stress reactions and chronic health impairment” (Geurts & Sonnentag, 2006, p. 482). During periods of rest, for example during daily leisure time, the weekend, or vacation, individuals have the possibility to ‘undo’ the negative short-term effects of work-related stress and thereby preserve and even increase their health and well-being in the long-run. In line with this view, two longitudinal studies showed that insufficient recovery is related to an increased risk of cardiovascular death (Gump & Matthews, 2000; Kivimäki et al., 2006). Considering recovery processes in the context of stress prevention and health promotion is particularly important for practice, as it enables individuals themselves to prevent negative long-term consequences of stress and to actively promote their health and well-being – independent of what they can or cannot do at

work against stressful working conditions.

Recovery research is in line with the positive psychology framework that emphasizes the necessity to examine positive conditions or processes that contribute to the flourishing or optimal functioning of individuals (Luthans & Youssef, 2007; Seligman & Csikszentmihalyi, 2000; Wright, 2003). Therefore, research on recovery further complements stress research as identifying conditions or processes that foster positive processes (i.e., recovery processes) or outcomes (i.e., increased health or performance). Fostering positive processes is not simply the opposite of preventing or ameliorating negative processes (i.e., the experience of stress) or outcomes (i.e., impaired health or low performance; Gable & Haidt, 2005).

In addition, recovery research contributes to research on work-life balance, more specifically on spillover processes between the work and non-work domain (see for example Bulger, Matthews, & Hoffman, 2007; Edwards & Rothbard, 2000; Ilies, Schwind, Wagner et al., 2007). Research on the work-non-work interface examines conditions or processes that produce conflict or enrichment between both domains (Eby, Casper, Lockwood, Bordeaux, & Brinley, 2005; Greenhaus & Beutell, 1985). For example, an individual's engagement in the work domain may conflict with his or her engagement in the family, as working long hours reduces the time that the individual can spend with the family and further result into being more tired and less attentive to his or her spouse or children. Recovery research can complement research on the work-non-work interface, as (insufficient) recovery processes may explain mechanisms of conflict or engagement. For example, a recent study showed that need for recovery and strain-based home-work interference are reciprocally related over time indicating that insufficient recovery results in higher conflict between home and work and vice versa (Demerouti, Taris, & Bakker, 2007). In addition, the study of Demerouti et al. (2007) showed that both need for recovery and home-work interference were related to diminished concentration at work. Diminished concentration in turn was related to decreased task performance.

As indicated by the study of Demerouti et al. (2007) recovery may not only be important for employees' health, but also for performance-related outcomes that are important for an organization's functioning. However, studies that examined the relationship between recovery and job performance are rather scarce (for exceptions see Fritz & Sonnentag, 2005; Sonnentag, 2003; Trougakos, Beal, Green, & Weiss, 2008). In this dissertation, I will address this gap and investigate the relationship between recovery and different aspects of job performance. More specifically, I will examine recovery as a predictor of changes in performance over time, that is changes in performance from day to day (see Study 1 in Chapter 2), from week to week (see Study 2 in Chapter 3), and over the period of half a year (see Study 3 in Chapter 4). Thereby, I will link research on recovery with research on dynamic performance (Beal, Weiss, Barros, & MacDermid, 2005).

Although the dynamic nature of job performance has often been emphasized (Deadrick, Bennett, & Russell, 1997; Ghiselli & Haire, 1960), this topic, and especially changes in performance over short periods of time within persons, have been largely neglected in previous empirical research (Beal et al., 2005). Beal et al. (2005) proposed that dynamic performance mainly depends on the successful allocation of an individual's resources to the task at hand (Kanfer, Ackerman, Murtha, Dugdale, & Nelson, 1994). Successful resource allocation in turn is mainly dependent on the amount of resources, especially self-regulatory resources that are available for the individual (Beal et al., 2005). Drawing on the Conservation of Resources (COR) model (Hobfoll, 1989), I will argue that being recovered, that is having one's resources successfully replenished during previous leisure time, will be positively related to fluctuations in performance over time. Therefore, this dissertation also contributes to the rather limited literature on dynamic performance (Beal et al., 2005; Ilies, Scott, & Judge, 2006; Trougakos et al., 2008).

Research goals

The main goal of this dissertation is to extend research on the relationship between recovery and job performance. More specifically, in two studies (Study 1 and 2) I examine this relationship from a within-person perspective focusing on recovery as a predictor of changes in performance over time. In Study 3, I will investigate the relationship taking a between-person perspective. To examine if recovery is rather immediately related to job performance or if relationships become obvious over longer periods of time or both, I will consider changes in recovery and performance over shorter (i.e., days, weeks) and longer (i.e., six months) periods of time. The relationship between recovery and job performance over a longer period of time has not been studied before.

Moreover, in this dissertation I consider job performance as a multidimensional construct (Campbell, 1990; Motowidlo, Borman, & Schmit, 1997) and include different performance outcomes. First, I will investigate the relationship between recovery and individual task performance (Study 1 to 3), as task performance represents an individual's direct contribution to organizational performance that is formally required from an employee (Williams & Anderson, , 1991). Second, I will examine the relationship between recovery and different types of contextual performance. Contextual performance includes behavior that indirectly contributes to an organization's performance by supporting the organizational, social and psychological environment (Borman & Motowidlo, 1993). Specifically, I will focus on personal initiative (Study 1 to 3) (Frese, Kring, Soose, & Zempel, 1996), on creativity (Study 3) (Amabile, 1996), and on the helping dimension of organizational citizenship behavior (OCB, Study 1 to 3) (Organ, 1994; Smith, Organ, & Near, 1983). Third, I will investigate the relationship between recovery and performance-related costs indicated by the amount of compensatory effort (Study 1 and 2) spent at work (Hockey, 1997).

Compensatory effort refers to the amount of resources an individual has to spend in order to fulfill tasks (Hockey, 1993). By including OCB, creativity and compensatory effort at work,

this dissertation extends previous research to outcome variables that have not yet been investigated in studies on recovery and job performance.

Furthermore, Study 3 also aims at investigating a potential mediator in the relationship between recovery and performance. As self-efficacy may be a resource that is built up during the recovery process (Hobfoll, 1989, 2002), I will examine the mediating role of occupational self-efficacy (Schyns & von Collani, 2002).

Dissertation outline

The present dissertation contains three empirical studies that investigate the relationship between recovery and job performance. These studies are presented in the following chapters (Chapter 2 to 4).

Study 1 (Chapter 2) deals with the relationship between daily recovery and daily job performance. Specifically, this study investigates the state of being recovered in the morning (i.e., feeling physically and mentally refreshed in the morning) as a predictor of fluctuations in daily task performance, daily personal initiative, daily OCB and daily compensatory effort at work. Furthermore, my co-authors and I propose that job control – as an indicator of situational strength at work – serves as a moderator in the relationship between the state of being recovered and daily job performance. In line with research on situational strength (Mischel, 1977), we argue that high job control enables employees to capitalize on being highly recovered and to show a higher level of daily job performance whereas low job control constrains employees in increasing daily job performance. We will test the propositions with a diary study over five working days. This design allows us to focus on within-person relationships.

Study 2 (Chapter 3) focuses on recovery during the weekend and relationships with weekly job performance. First, this study examines which factors contribute to employees' successful recovery during the weekend. In particular, we propose that specific recovery experiences (i.e., psychological detachment, relaxation, and mastery experiences) and sleep

during the weekend benefit an individual's state of being recovered after the weekend, that is on Monday morning. Second, we argue that an increased state of being recovered after the weekend benefits weekly task performance, weekly personal initiative, weekly OCB, and is associated with lower compensatory effort. To test our hypotheses we will conduct a longitudinal study over four working weeks that enables us to investigate within-person relationships.

Study 3 (Chapter 4) examines the relationship between recovery and job performance over a longer period of time (six months). In this longitudinal study, we propose that specific non-work experiences, namely feeling recovered and thinking about work in a positive or negative way during leisure time, are related to changes in job performance over time. We argue that feeling recovered during leisure time and positive work reflection are related to an increase in task performance, personal initiative, creativity and OCB, whereas we propose that negative work reflection is related to a decrease in performance outcomes. In addition, we will investigate occupational self-efficacy as a mediator in these relationships.

In the final chapter (Chapter 5), I will summarize the results from the empirical studies and discuss the general conclusions that can be drawn from this dissertation as well as implications for future research and practice.

STUDY 1:
DAILY PERFORMANCE AT WORK:
FEELING RECOVERED IN THE MORNING
AS A PREDICTOR OF DAY-LEVEL JOB PERFORMANCE

Summary

This study examined the state of being recovered in the morning (i.e., feeling physically and mentally refreshed in the morning) as a predictor of daily job performance and daily compensatory effort at work. Ninety-nine employees from public service organizations completed a general survey and two daily surveys on pocket computers over the course of one work week. Hierarchical linear modeling showed that being recovered in the morning was positively related to daily task performance, personal initiative and organizational citizenship behavior and negatively related to daily compensatory effort at work. Relationships between the state of being recovered and day-specific job performance were moderated by job control. There was a strong relationship between being recovered and daily performance when job control was high and no relationship when job control was low.

Introduction

Individual job performance is a dynamic multidimensional construct that consists of employees' behavior at work that directly or indirectly support organizational goals (Motowidlo et al., 1997). Although the dynamic nature of job performance has often been emphasized (Deadrick et al., 1997; Ghiselli & Haire, 1960), traditional research on job performance mainly focused on performance as a stable construct and analyzed between-person variability (Beal et al., 2005). This line of research identified personal characteristics, such as cognitive ability and personality traits (e.g., conscientiousness) as predictors of individual job performance (Hunter & Hunter, 1984; Mount & Barrick, 1995). However, the dynamic nature of performance, and especially changes in performance over short periods of time within persons, has been largely neglected in earlier research (Beal et al., 2005).

In our study, we address this gap and examine predictors of daily job performance. Specifically, we link theory on dynamic performance (Beal et al., 2005) with the Conservation of Resources (COR) model (Hobfoll, 1989) and propose the state of being recovered, that is having one's resources successfully replenished after a period of rest (Hobfoll & Shirom, 2001), as a predictor of daily job performance. Specifically, we hypothesize that individuals will show higher job performance on days when they are highly recovered in the morning than on days when they are poorly recovered.

Moreover, we examine job control as a moderator in the relationship between the state of being recovered and daily job performance. On the basis of research on situational strength (Mischel, 1977) we argue that high job control supports employees to capitalize on being highly recovered and enables employees to increase daily job performance.

Our study contributes to the literature in several ways. First, we examine the state of being recovered in the morning as a predictor of changes in performance from day to day. Examining daily performance, we focus on different dimensions of daily performance, namely daily task performance, daily proactive and helping behavior, and daily compensatory

effort at work. Thereby, we enlarge our scarce knowledge of predictors of dynamic performance.

Second, we contribute to the literature on recovery by investigating if being highly recovered is related to performance-related outcomes. In particular, we used a within-person approach to examine the relationship between the state of being recovered and daily job performance and can therefore rule out interpretations based on differences between persons. In addition to examining task performance and personal initiative as outcome variables of the state of being recovered, we investigated two outcome variables that have not yet been studied in research on recovery: helping behavior as a core aspect of organizational citizenship behavior (OCB) (Organ, 1994) and compensatory effort spent at work. Compensatory effort refers to the amount of resources an individual has to spend in order to fulfill tasks and how easy it is to accomplish tasks (Hockey, 1993). Thus, compensatory effort is an indicator of performance-related costs (Hockey, 1997).

Third, we examined if job control – as an indicator of situational strength at work – plays a moderating role in the relationship between the state of being recovered and daily job performance. Job control describes the degree to which the workplace allows or constrains employees in raising or decreasing their performance according to their state of being recovered. Therefore, by testing job control as a moderator we tested job control as a boundary condition for our theoretical assumptions on the state of being recovered and daily job performance.

The dynamic nature of daily job performance

Beal et al. (2005) proposed a model of dynamic performance and thereby provided a theoretical basis for examining changes in performance over time. In contrast to traditional performance models, a model of dynamic performance considers within-person differences to be substantial and meaningful (Beal et al., 2005). When examining dynamic performance it is

not an individual's general level of performance we are interested in, but an individual's variability in performance over time. Therefore, searching for predictors that explain within-person differences means identifying the conditions under which an individual is performing at best versus the conditions under which an individual is performing below his or her average. The main mechanism that Beal et al. (2005) proposed to be responsible for successful dynamic performance is resource allocation to the task. If an individual cannot allocate the maximum amount of resources to the task at hand, perhaps because he or she is struggling with fatigue, the individual cannot perform at his or her best. Resource allocation largely depends on the amount of an individual's available resources, especially on self-regulatory resources (Beal et al., 2005). Thus, replenishing and conserving resources is critical for upholding or increasing performance during a day or from day to day (Beal et al., 2005).

Job performance is a multidimensional construct (Campbell, 1990; Motowidlo et al., 1997) and can on a general level be divided into task performance and contextual performance (Borman & Motowidlo, 1993). Task performance refers to a person's contribution to organizational performance and is defined as behaviors "that are recognized by the formal reward systems and are part of the requirements as described in job descriptions" (Williams & Anderson, , 1991, p. 601). Contextual performance can be described as behavior that does not directly contribute to organizational performance but supports the organizational, social and psychological environment (Borman & Motowidlo, 1993). Contextual performance indirectly contributes to an organization's performance by facilitating task performance.

We propose that the basic assumptions on dynamic performance (Beal et al., 2005) apply to both task and contextual performance. Contextual performance should also show meaningful variation over time and the allocation of resources should also play a role in predicting high versus low levels of contextual performance over time.

In our study, we focused on two types of contextual behaviors, namely personal initiative (PI) (Frese et al., 1996) and the helping dimension of organizational citizenship behavior (OCB) (Organ, 1994; Smith et al., 1983). PI is one type of proactive behavior (Crant, 2000) and is defined as “a behavior syndrome resulting in an individual’s taking an active and self-starting approach to work and going beyond what is formally required in a given job” (Frese et al., 1996, p. 38). In addition, helping is a core dimension of OCB (Organ, 1994; Smith et al., 1983). Behaviors that are subsumed under this concept are helping others who have problems (Podsakoff et al., , 2000), building and preserving relationships, and emphasizing interpersonal harmony (Van Dyne & LePine, 1998). In sum, our study aims at investigating the dynamic nature of job performance including different dimensions of daily job performance, namely the qualitative aspect of task performance, and PI and OCB as two dimensions of contextual performance.

The state of being recovered: An outcome of the recovery process

An individual’s physical and mental resources are consumed and gradually depleted when accomplishing one’s work and when coping with job-related stressors (Meijman & Mulder, 1998). Recovery is the process that reverses the negative consequences of job demands and brings an individual back to his or her pre-stressor level of functioning (Craig & Cooper, 1992). According to Hobfoll’s Conservation of Resources (COR) model, individuals strive to gain, preserve and protect their resources (Hobfoll, 1989; Hobfoll & Shirom, 2001). Resources are defined as “those objects, personal characteristics, conditions, or energies that are valued by the individual or that serve as a means for attainment of these objects, personal characteristics, conditions, or energies“ (Hobfoll, 1989, p. 516). During leisure time employees are no longer confronted with work-related demands, and thus leisure time provides the opportunity to prevent a further resource loss, rebuild resources (e.g., energy, self-regulatory resources) and to gain additional resources (e.g., self-esteem) (Eden, 2001;

Sonnentag, 2001). However, leisure time is not completely free of demands. Certain activities (e.g., housework, finishing work-related tasks) and experiences (e.g., daily hassles) during leisure time further draw on individuals' resources (Fritz & Sonnentag, 2005; Sonnentag, 2001; Zijlstra & Cropley, 2006). Other activities (e.g., social activities) and experiences (e.g., mentally switching off from work) enable individuals to prevent a further resource loss and to restore resources, such as energy or self-esteem (Fritz & Sonnentag, 2005; Sonnentag & Fritz, 2007; Zijlstra & Cropley, 2006). Depending on the amount of resources that are built up versus further drained during leisure time, the employee is more or less recovered after this rest period (e.g., after the weekend or in the morning before the working day starts). In our study, we focused on the state of being recovered in the morning as an indicator of successful recovery resulting from activities or experiences pursued during previous leisure time. Being highly recovered implies feeling physically and mentally refreshed and to be full of energy (Sonnentag & Krueger, 2006). When an individual indicates that he or she feels highly recovered in the morning, the individual has successfully restored and built up resources during the period of rest.

The state of being recovered as a predictor of daily job performance

The state of being recovered before going to work is the outcome of the previous recovery period, but simultaneously represents the starting point for acting and performing during the day. Being highly recovered in the morning implies that a high amount of resources are available for performing at work, whereas being poorly recovered implies that resources for performing at work are scarce or even lacking (Fritz & Sonnentag, 2005). Such resources include energy, positive affect, self-esteem, or self-regulatory resources (Baumeister, Muraven, & Tice, 2000; Hobfoll & Shirom, 2001).

According to Beal et al. (2005, p. 1057) "performance during an episode is a joint function of resource level and resource allocation." Here, the core assumption is that an

individual can achieve maximum performance when the maximum number of resources is allocated to the task at hand. The more resources an individual has at a specific time, the more resources can be allocated to the task resulting into increased performance at this point in time. On days when an individual is highly recovered in the morning, the individual has more resources available that can be allocated to the task and thus an individual's job performance should be increased. Contrary, if an individual is poorly recovered in the morning, less resources are available that can be allocated to the task and an individual's job performance should be decreased.

Self-regulatory resources should also be increased when an individual is highly recovered (Beal et al., 2005). Self-regulatory resources are necessary for monitoring and controlling cognitive processes, feelings and behaviors (Muraven, Baumeister, & Tice, 1999; Schmeichel & Baumeister, 2004). In the context of dynamic performance, self-regulatory resources are needed for allocating attention and resources to the task at hand (Beal et al., 2005). Therefore, on days when an individual is highly recovered, the individual should possess more self-regulatory resources that facilitate resource allocation to the task and thereby foster daily job performance.

Taken together, we propose that on days when an individual is highly recovered in the morning the individual shows increased performance at work. We hypothesize that task performance as well as contextual performance, that is PI and OCB, will be higher when an individual is highly recovered.

Regarding empirical evidence from within-person analyses, Sonnentag (2003) showed that day-level recovery (i.e., being recovered, relaxed and in a good mood) is positively related to daily PI. Furthermore, a recent study of Trougakos et al. (2008) using a within-person approach in a sample of cheerleader instructors provided empirical evidence that recovery during work breaks is positively related to subsequent performance of affective delivery. Finally, we are not aware of any study, neither using a within- nor a between-person

design that examined the relationship between recovery and OCB. In sum, we state the following hypotheses:

Hypothesis 1: The state of being recovered in the morning will be positively related to daily task performance.

Hypothesis 2: The state of being recovered in the morning will be positively related to daily personal initiative (PI).

Hypothesis 3: The state of being recovered in the morning will be positively related to daily organizational citizenship behavior (OCB).

When examining performance as an outcome variable it is important to keep in mind that a specific level of performance can be achieved with different extents of effort expenditure. According to Hockey's (1993) compensatory control model individuals try to compensate for a suboptimal state such as the lack of resources necessary for task fulfillment in order to prevent a performance breakdown. Spending more effort at work than usual (i.e., compensatory effort), is one prominent mechanism that individuals use to counteract a suboptimal state (Hockey, Wastell, & Sauer, , 1998; Hockey, , 1993).

Compensatory effort differs from effort in terms of work motivation (Locke & Latham, 2004). Whereas effort comprises duration, intensity, direction of behavior (Locke & Latham, 1990), compensatory effort refers to how effortful or straining it is to accomplish tasks (Hockey, 1993). An individual can perceive task accomplishment very effortful although the individual does not expend much effort in terms of duration or intensity.

On days when an individual is poorly recovered, he or she lacks resources for task accomplishment, and therefore has to spend compensatory effort to arrive at the same level of performance. The lack of self-regulatory resources should make it more difficult to allocate resources to the task and keep attention to the task (Beal et al., 2005). Thus, task accomplishment is more effortful and straining. On days when an individual is highly

recovered, increased self-regulatory resources should facilitate resource allocation and attention to the task (Beal et al., 2005) and therefore should decrease the compensatory effort an individual has to spend at work. Therefore, we propose the following hypothesis:

Hypothesis 4: The state of being recovered in the morning will be negatively related to compensatory effort at work.

The moderating role of job control as an indicator of situational strength at work

An individual's ability to capitalize on the state of being highly recovered and to increase job performance by bringing in his or her resources at work may be contingent on the work environment. We argue that the relationship between the state of being recovered and daily performance is moderated by job control, as job control is an indicator of situational strength at work (Barrick & Mount, 1993; Mischel, 1977).

Situations at work can be considered either *strong* or *weak* (Mischel, 1977). A strong situation at work is characterized by many demands or pressures to conform and restricts an individual "in the range of behaviors that she or he may be both willing and able to exhibit" (Barrick & Mount, 1993, p. 112). In contrast, a weak situation is marked by rather few demands or pressures and provides an individual with considerable freedom and discretion to determine what behaviors to undertake and how to execute them (Barrick & Mount, 1993).

In organizational settings, job control has been proposed to be the most appropriate indicator of situational strength (Barrick & Mount, 1993). Job control specifies how much influence a workplace offers over sequence, time frame, and content of one's work tasks (Jackson, Wall, Martin, & Davids, 1993; Parker & Wall, 1998). Accordingly, job control captures how much the situation prescribes and constrains (strong situation) or permits (weak situation) individual behavior at work. Thus, a high level of job control indicates a weak situation at work, whereas a low level of job control indicates a strong situation at work.

Similar to assumptions about the moderating role of situational strength in the relationship between personality and behavior (Barrick & Mount, 1993; Beaty, Cleveland, & Murphy, 2001), we propose that the strength of the situation - represented by job control - moderates the relationship between the state of being recovered and daily job performance. Feeling recovered in the morning should provide an individual with increased resources, that is the capacity to show better task performance than usual and to go beyond what is formally required by engaging in PI or OCB. However, the situation at work may either constrain or enable an individual to take advantage of being highly recovered and increase daily job performance. Job control allows individuals to choose adequate strategies for handling their tasks and reaching their goals (Frese & Zapf, 1994). Thus, job control determines an individual's possibilities to adjust performance.

When an individual is highly recovered and has a high level of job control, the individual can arrange tasks in such a way that the increased resources can be used most effectively. Accordingly, individuals with high job control can show increased performance when they are highly recovered. Furthermore, individuals with a high level of job control can deliberately decrease their performance if they are poorly recovered, for example by delaying tasks or reducing the amount of work on a specific day. Thus, individuals can conserve their drained resources until they have the opportunity to restore their resources again (Hobfoll, 1989).

A low level of job control restricts an individual in his or her possibilities to arrange tasks in a way that allows the individual to take advantage of increased resources. Moreover, a low level of job control hinders an individual to deliberately decrease daily job performance when being poorly recovered. Because tasks have to be accomplished as prescribed, the individual cannot increase or decrease performance. Thus the workplace, specifically job control, restrains individuals' actions. Taken together, we propose the following hypotheses:

Hypothesis 5: Job control will moderate the relationship between the state of being recovered and daily task performance. The relationship will be stronger when job control is high.

Hypothesis 6: Job control will moderate the relationship between the state of being recovered and day-specific personal initiative (PI). The relationship will be stronger when job control is high.

Hypothesis 7: Job control will moderate the relationship the state of being recovered and day-specific organizational citizenship behavior (OCB). The relationship will be stronger when job control is high.

We propose an interaction effect of job control with the state of being recovered in the morning for all performance dimensions, specifically for task performance, for PI and for OCB. We do not expect a moderator effect for compensatory effort at work, because compensatory effort instead represents performance-related costs and strain. On days when an individual is poorly recovered accomplishing tasks should be perceived more effortful and straining by all employees, regardless if they have a high or low level of job control.

Control variables

When examining the relationships between the state of being recovered with performance and compensatory effort at work, we have to take into account other possible confounding variables. On days when an individual is poorly recovered the individual may perceive work as being more stressful, because less resources are available to cope with job-related demands (Hobfoll, 1989; Lazarus & Folkman, 1984). Due to decreased resources on such days, an individual may be more concerned that he or she does not have enough time to fulfill tasks or that needed material and information at work are insufficient. Furthermore, when being poorly recovered an individual may experience more social stressors, because he

or she has less coping resources to tackle conflicts with supervisors or coworkers. As a result of these possibilities, we controlled for daily job stressors, specifically for day-specific time pressure, day-specific situational constraints, and day-specific social stressors at work.

In addition to day-level variables, person-level variables may impact daily performance and compensatory effort at work. An individual's general level of task performance, PI, OCB or compensatory effort at work should affect the daily levels of these behaviors. Individuals differ in their general level of job performance (Beal et al., 2005). To account for these between-person differences we controlled for the general level of the performance outcome and compensatory effort at work in the respective analyses.

Furthermore, age may be related to daily job performance. Older employees' cognitive resource can be different from younger employees since fluid intelligence declines with age and increased age is assumed to be associated with lower self-regulatory resources (Kanfer & Ackerman, 2004). Although, age is also related to increased experience that may be related to a higher general level of job performance, decreased cognitive and self-regulatory resources may make it more difficult for older employees to allocate resources to tasks and thus may be related to decreased daily job performance. Therefore, we controlled for participants' age in our analyses.

Method

Overview

Data were collected by a general survey and by daily surveys. Daily surveys were assessed by pocket computers over five consecutive working days. As this study is a part of a larger research project (Mojza, Peters, Sonnentag, & Binnewies, 2007; Sonnentag, Binnewies, & Mojza, 2008) we assessed a number of variables at three measurement occasions per day: (1) in the morning before participants went to work, (2) after work when participants arrived at home, and (3) in the evening before participants went to bed. Answering daily surveys

started with responding to the survey after work on Monday and ended with responding to the bedtime survey on Friday. Therefore, we did not collect data on Monday morning.

Consequently, this study focused on data assessed on four days in the morning and after work to examine the within-person relationships between the state of being recovered in the morning before going to work and performance during the working day. The sample used in this study is a subsample of all persons that participated in the larger research project.

Sample

Our study was conducted in 10 public service organizations located in the southern part of Germany and the northern part of Switzerland. Site managers at public service organizations were approached and informed about the study. After managers expressed organization's consent to participate in the study, employees received an information letter that contained information about the study and a return form for registration. The study was announced to examine "recovery from work-related stress".

After participants agreed on participation, we sent them the general survey and scheduled a week for answering the daily surveys. We consigned pocket computers to the participants and explained the handling of the device, specifically how and when to answer the daily surveys. Furthermore, we set alarms on the pocket computers according to participants' preferences to remind them of answering daily surveys. To encourage participation we promised organization-specific feedback and announced a lottery prize for all participants that completed the study.

A total of 106 persons agreed to participate in this study. Questionnaires were received from 104 persons corresponding to a questionnaire response rate of 98.1 %. All 106 persons received a pocket computer and provided daily survey data. Due to technical problems, four persons could not answer daily surveys from Day 3 to 5 and were completely excluded from analyses. Pocket computers recorded the time when participants answered daily surveys.

Thus, we were able to check if daily surveys were filled in at the right time, that is at a time that corresponded to our instructions for answering daily surveys in the morning (i.e., before leaving home to go to work) and after work (i.e., after returning home from work). In total, 9 morning surveys (2.3 % of all possible measurement points) and 9 bedtime surveys (2.3 % of all possible measurement points) were answered at a wrong time and were therefore excluded from analyses.¹

After excluding data answered at wrong times, response rates for correctly answered survey data for morning surveys on the four days ranged from 84.9 % to 96.2 % (mean = 91.7), and for after work surveys from 80.2 to 98.1 % (mean = 90.6). One more person was excluded because this person missed daily surveys or answered them at wrong times every day. In total, our analyses are based on daily survey and questionnaire data of 99 persons, including 359 measurement occasions corresponding to 90.7 % of all possible 396 measurement occasions.

Of the 99 persons included in analyses, 67.7 % were female and 32.3 % were male. Mean age was 38.7 years ($SD = 10.2$) ranging from 17 to 61 years. On average, participants had 15.3 years of professional experience ($SD = 9.5$) and 10.3 years of professional experience in their current organization ($SD = 8.9$). Participants held a variety of public service jobs. The majority of our sample, 50.1 % had primarily administrative jobs (e.g., civil servants in the local and financial administration of small towns and villages), 20.2 % had jobs in the field of social administration and service (e.g., social workers), 15.2 % had superior administrative jobs (e.g., chief officers of larger administrative units), 5.1 % had jobs as support staff (e.g., secretaries), 4.0 % had professional jobs in technical fields (e.g. geodesists), and the remaining 5.1 % of the sample worked in a variety of other jobs. In terms

¹ We tested whether participants whose daily survey data was partly excluded differed from the rest of participants. Furthermore, for participants with excluded data we tested whether day-level variables differed between days when daily surveys were answered at a wrong time and days when daily surveys were answered according to our study instructions. Results showed no differences suggesting that excluding data was not selective.

of educational background, 52.2 % held a degree from university, 37.4 % had completed a 2- to 3-year professional training, 5.1 % had completed a 2- to 3-year professional training and had obtained an additional professional degree, and 4.0 % held no professional degree. About one third (30.3 %) had a leadership position.

Measures

Data were assessed by a paper-based general survey and by daily surveys administered on pocket computers. All items were in German and had to be answered on a five-point Likert scale ranging from 1 = not true at all to 5 = very true (except for demographic data). Items from scales that were originally developed in English were translated into German by the first author and translated back to English by an interpreter to ensure that content and meaning remained unchanged during the translation process.

General survey data

After registration participants received the general survey and were instructed to complete this general survey before answering daily surveys. The general survey assessed job control, measures of the general level of job performance and of compensatory effort at work, and participants' age.

General level of job control was assessed with a scale developed by Semmer (1984) and Zapf (1993). This scale is widely used in German-speaking countries and has been extensively validated (Semmer, Zapf, & Dunckel, 1999; Semmer, Zapf, & Greif, 1996). The scale measures method control and consists of five items (sample item: "How much can you influence the way how you accomplish your tasks?"). Cronbach's alpha was .72.

General level of task performance was measured by three items from the performance scale of Roe, Zinovieva, Dienes and Horn (2000) that assesses how well a person accomplishes his or her tasks at work (sample item: "Compared to the standards I usually get good results from my work"). Cronbach's alpha was .77.

General level of personal initiative was measured with a seven-item scale capturing a person's general tendency to show personal initiative at work (Frese, Fay, Hilburger, Leng, & Tag, 1997, sample item: "I actively attack problems"). Cronbach's alpha was .84.

General level of organizational citizenship behavior (OCB). Originally we wanted to assess the general level of OCB and day-level OCB with the OCBI scale of Williams and Anderson (1991). However, some items of the OCBI scale of Williams and Anderson (1991) were not suitable for our day-level measure of OCB because they capture OCB behaviors that are not likely to occur every day (e.g., orienting new people or helping others who have been absent for a while). Therefore, we complemented suitable items of the OCBI scale of Williams and Anderson (1991) with suitable items of the OCB helping scale of Staufeniehl and Hartz (2000). The scale of Staufeniehl and Hartz (2000) was developed and derived on the basis of OCB concepts and scales suggested by Smith, Organ and Near (1983), Organ (1997) and Podsakoff, MacKenzie, Paine and Bachrach (2000). Our final five-item scale covers the helping dimension of OCB. All items measure a person's tendency to help co-workers and to maintain a pleasant working climate (sample items: "I pass along information to co-workers", "I take time to listen to co-workers' problems and worries"). Cronbach's alpha was .68.

General level of compensatory effort at work was measured by three items developed for this study. The scale measures how exhausting and straining it is in general to perform at work. It therefore assesses how much compensatory effort a person has to expend in general to achieve a certain level of performance. Our measure of compensatory effort differs from measures of effort that assess the duration or intensity of behavior. The three items were "It needs much energy to work on my tasks", "I am doing my work with ease" (reverse coded), "I have to expend much effort in order to accomplish my tasks" Cronbach's alpha was .81.

We conducted confirmatory factor analyses (CFAs) to examine if the three performance measures and compensatory effort were best represented by a four-factor model.

Specifically, we tested the four-factor model against a one-factor model and against various three- and two factor models. Results from CFAs for the four-factor model showed a satisfactory fit ($\chi^2 = 164.3$, $df = 129$, $p = 0.02$, RMSEA = 0.053, CFI = .95, NNFI = .93). The four-factor model fit the data better than the one-factor model ($\Delta\chi^2 = 250.8$, $\Delta df = 6$, $p < .001$), than different three-factor models ($\Delta\chi^2 \geq 38.8$, $\Delta df = 3$, $p < .001$) and two-factor models ($\Delta\chi^2 \geq 103.4$, $df = 5$, $p < .001$).

Daily survey data

Daily surveys assessed the state of being recovered, daily job performance, daily compensatory effort and daily stressors at work. The state of being recovered in the morning was measured in the morning, before participants went to work. All other daily survey measures were assessed after work.

State of being recovered in the morning was measured by a four-item scale (Sonnentag & Krueger, 2006). The scale refers to how recovered a person feels in the morning. The four items were: “This morning I feel well rested”, “This morning I feel physically refreshed”, “This morning I feel mentally refreshed”, and “This morning I am filled with new energy”. Cronbach’s alpha ranged from .88 to .93 (mean = .92) over the four days.

Day-level task performance was measured with three items adapted from the performance scale of Roe et al. (2000). Our measure assessed how well an individual accomplished his or her work task on the specific day (sample item: “Compared to the standards I got good results from my work today”). Cronbach’s alpha ranged between .67 and .81 (mean = .77).

Day-level personal initiative was assessed with seven adapted items from the scale of Frese et al. (1997) which measures the degree of personal initiative shown at work during the specific day (sample item: “Today, I actively attacked problems”). Cronbach’s alpha ranged from .85 to .88 (mean = .86).

Day-level organizational citizenship behavior (OCB) was assessed with five adapted items from the OCBI scale of Williams and Anderson (1991) and from the OCB helping scale of Staufenbiehl and Hartz (2000). All items were adapted to measure the day-specific level of OCB, that is the degree a person helped and encouraged co-workers and maintained a pleasant working climate during the specific day (sample items: “Today, I passed along information to co-workers”, “Today, I took time to listen to co-workers problems and worries“). Cronbach’s alpha ranged between .71 and .81 (mean = .78.).

Day-level compensatory effort at work was measured by three items developed for this study. The scale measures how exhausting and straining it was on the specific day to perform at work. Thus, it assessed how much compensatory effort a person had to expend during the day to achieve a certain level of performance. The three items were “Today, it needed much energy to work on my tasks”, “Today, I did my work with ease” (reverse coded), “Today, I had to expend much effort in order to accomplish my tasks”. Cronbach’s alpha ranged between .78 and .88 (mean = .85).

We conducted CFAs to confirm that the three daily performance measures and daily compensatory effort, were best represented by a four-factor model. As suggested by Bolger, Davis and Rafaeli (2003) we conducted CFAs with day-level performance data that was centered around the person-mean. Results from CFAs for the four-factor model showed a satisfactory fit ($\chi^2 = 383.99$, $df = 129$, $p < 0.001$, $RMSEA = 0.065$, $CFI = .94$, $NNFI = .93$). The four-factor model fit the data better than the one-factor model ($\Delta\chi^2 = 250.8$, $\Delta df = 6$, $p < .001$), than different three-factor models ($\Delta\chi^2 \geq 160.8$, $\Delta df = 3$, $p < .001$) and two-factor models ($\Delta\chi^2 \geq 404.8$, $\Delta df = 5$, $p < .001$).

Daily job stressors. To assess daily job stressors as control variables we measured three organizational stressors that presumably vary between days, particularly day-level situational constraints, day-level time pressure, and day-level social stressors. We used shortened scales of the situational constraints and time pressure measures developed by

Semmer (1984) and Zapf (1993) and a shortened scale of the social stressors measure developed by Frese and Zapf (1987). Situational constraints were assessed with three items (sample item: “Today, I had to work with materials and information that were incomplete and out-dated”), time pressure was assessed with three items (sample item: “Today, I was required to work fast at my work”), and social stressors were assessed with six items (sample item: “Today, some colleagues were unpleasant co-workers”). Cronbach’s alpha on the five days ranged between .76 and .81 for situational constraints (mean = .79), between .81 and .85 for day-level time pressure (mean = .83), and between .61 and .75 for social stressors (mean = .69).

Data analyses

We had data from each person at two levels: at the person-level (Level 2) and at the day-level (Level 1), with day-level data nested within persons. Job control, the general level of performance variables, compensatory effort at work and age constituted Level 2 data. The state of being recovered in the morning, daily job stressors, and day-level measures of performance variables and compensatory effort at work constituted Level 1 data. Hierarchical linear modeling was used to analyze our data because it accounts for the dependence of observations at the lower level (Bryk & Raudenbush, 1992; Snijders & Bosker, 1999). We used the MLwiN software (Rasbash et al., 2000) for data analysis. Person-level predictor variables were centered around the grand mean and day-level predictor variables were centered around the respective person mean. We centered variables at Level 1 around the respective person mean because we wanted to eliminate between-person variance in order to attribute effects of Level 1 variables to within-person effects and to rule out interpretations based on between-person differences. Thus, we were not interested if the absolute level of being recovered in the morning is related to day-specific performance, but if an increased or decreased state of being recovered in the morning within a person (i.e. compared to the

respective mean of this individual) is related to an increase or decrease in day-specific performance.

Results

Means, standard deviations and zero-order correlations are displayed in Table 1. For calculating the correlations between day-level and person-level variables, day-level variables were averaged across the four days. Before testing hypotheses we examined the variability of dependent variables across the four days. Information about the variation of dependent variables can be seen from the null models (see Table 2 to 6). For day-level task performance the variance at Level 2 was 0.216 and at Level 1 it was 0.458. Thus, the total variance was 0.654, and 68 % (0.458) of the total variance was attributable to within-person variation, whereas 32 % (0.216) was attributable to between-person variation. For day-level PI, 56 % of the variance was attributable to within-person variation, for day-level OCB 50 %, and for day-level compensatory effort at work 76 %. These results show substantive variation both between and within persons.

Table 1

Means, Standard Deviations, and Zero-Order Correlations

Variables	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1 State of being recovered	3.38	0.74		.21***	.15**	.15**	-.29***	-.07	-.16**	-.04					
2 Day-level task performance	3.98	0.59	.27**		.57***	.26***	-.33***	.03	.18**	.04					
3 Day-level personal initiative	3.29	0.72	.10	.61***		.49***	-.23***	.20***	.26***	.19***					
4 Day-level OCB	2.54	0.76	.14	.30**	.59***		-.10	.13*	.12*	.29***					
5 Day-level compensatory effort at work	2.46	0.66	-.36***	-.31**	-.15	-.01		.23***	.25***	.15**					
6 Day-level situational constraints	1.61	0.63	-.16	.06	.31**	.22*	.32**		.31***	.28***					
7 Day-level time pressure	2.35	0.90	-.28**	.15	.27**	.15	.41***	.38***		.21***					
8 Day-level social stressors	1.33	0.40	-.07	.06	.26*	.36***	.15	.32**	.24*						
9 General level of task performance	4.08	0.55	.02	.42***	.32**	.03	-.18	.12	.03	.09					
10 General level of personal initiative	3.72	0.58	.04	.41***	.53***	.15	-.20*	.03	.05	.10	.51***				
11 General level of OCB	3.89	0.57	.13	.30**	.31**	.18	-.17	.06	.16	.09	.34***	.44***			
12 General level of compensatory effort at work	2.51	0.74	-.30**	-.21*	-.10	-.06	.40***	.15	.24*	-.01	-.26*	-.11	-.13		
13 General level of job control	3.76	0.64	.23*	.12	.15	-.10	-.14	-.16	-.18	-.11	.21*	.32**	.19	-.22*	
14 Age	38.66	10.24	-.05	.06	-.08	-.21*	-.03	-.02	.09	-.14	.28**	.20	.23*	-.09	.29**

Note. Correlations below the diagonal are person-level correlations (N = 99). Correlations above the diagonal are day-level correlations (n = 359).

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

Test of Hypotheses

To test our hypotheses we conducted multilevel analyses for each dependent variable (i.e., day-level task performance, day-level PI, day-level OCB, and day-level compensatory effort). For each of these variables, we compared four different models: null model, Model 1, Model 2, and Model 3. In the null model, the intercept was the only predictor. In Model 1, control variables at the person level were entered, specifically age and the general level of the respective criterion variable (e.g., general level of task performance). In addition, we entered job control into Model 1. In Model 2, daily job stressors were entered as control variables, specifically day-specific situational constraints, day-specific time pressure, and day-specific social stressors. In Model 3, we included the state of being recovered in the morning as the predictor to test Hypotheses 1 to 4. Furthermore, we specified a fourth model for task performance, PI and OCB, in which we entered the interaction term of job control and the state of being recovered in the morning to test for the interaction effects assumed in Hypotheses 5 to 7.

Table 2 shows all models for day-level task performance including estimates, standard errors and t-values for all predictor variables, and the likelihood values for all models and differences between the likelihood values of models to be compared. Model 1 showed a significant improvement over the null model ($\Delta - 2 \times \log = 20.792$, $\Delta df = 4$, $p < .001$). The general level of task performance was the only significant predictor. Model 2 showed an additional improvement over Model 1 ($\Delta - 2 \times \log = 17.418$, $\Delta df = 3$, $p < .001$). Day-level time pressure positively predicted day-level task performance. Model 3 showed further improvement ($\Delta - 2 \times \log = 3.932$, $\Delta df = 1$, $p < .05$) and the state of being recovered in the morning was found to be a significant positive predictor of day-level task performance indicating support for Hypothesis 1. Moreover, Model 4 showed a further improvement over Model 3 ($\Delta - 2 \times \log = 4.669$, $\Delta df = 1$, $p < .05$) with the interaction term significantly predicting day-level task performance.

Table 2

Multilevel Estimates for Models Predicting Day-Specific Task Performance

	Null Model			Model 1			Model 2			Model 3			Model 4		
	Estimate	SE	t	Estimate	SE	t	Estimate	SE	t	Estimate	SE	t	Estimate	SE	t
Intercept	3.993	0.059	67.678	3.994	0.053	75.358	3.990	0.053	75.283	3.991	0.053	75.302	3.991	0.053	75.302
Age				-0.005	0.006	-0.833	-0.005	0.006	-0.833	-0.005	0.006	-0.833	-0.005	0.006	-0.833
General level of task performance				0.470	0.102	4.608***	0.472	0.102	4.627***	0.471	0.102	4.618***	0.470	0.102	4.608***
Job control (JC)				0.048	0.086	0.552	0.056	0.088	0.636	0.056	0.088	0.636	0.056	0.088	0.636
Day-level situational constraints							-0.041	0.069	-0.594	-0.049	0.068	-0.721	-0.044	0.068	-0.647
Day-level time pressure							0.239	0.056	4.268***	0.233	0.056	4.161***	0.226	0.056	4.036***
Day-level social stressors							-0.039	0.120	-0.325	-0.040	0.119	-0.336	-0.040	0.119	-0.356
State of being recovered										0.113	0.057	1.982*	0.117	0.056	2.089*
State of being recovered × JC													0.185	0.085	2.176*
-2*log (lh)			836.065			815.273			797.855			793.923			789.254
Diff -2*log						20.792***			17.418***			3.932*			4.669*
df						3			3			1			1
Level 1 Intercept Variance (SE)		0.458 (0.040)			0.458 (0.040)			0.428 (0.037)			0.421 (0.037)			0.413 (0.036)	
Level 2 Intercept Variance (SE)		0.216 (0.050)			0.150 (0.041)			0.159 (0.041)			0.162 (0.041)			0.164 (0.041)	

Note. N on person-level = 99. N on day-level = 359. * $p < .05$; ** $p < .01$; *** $p < .001$

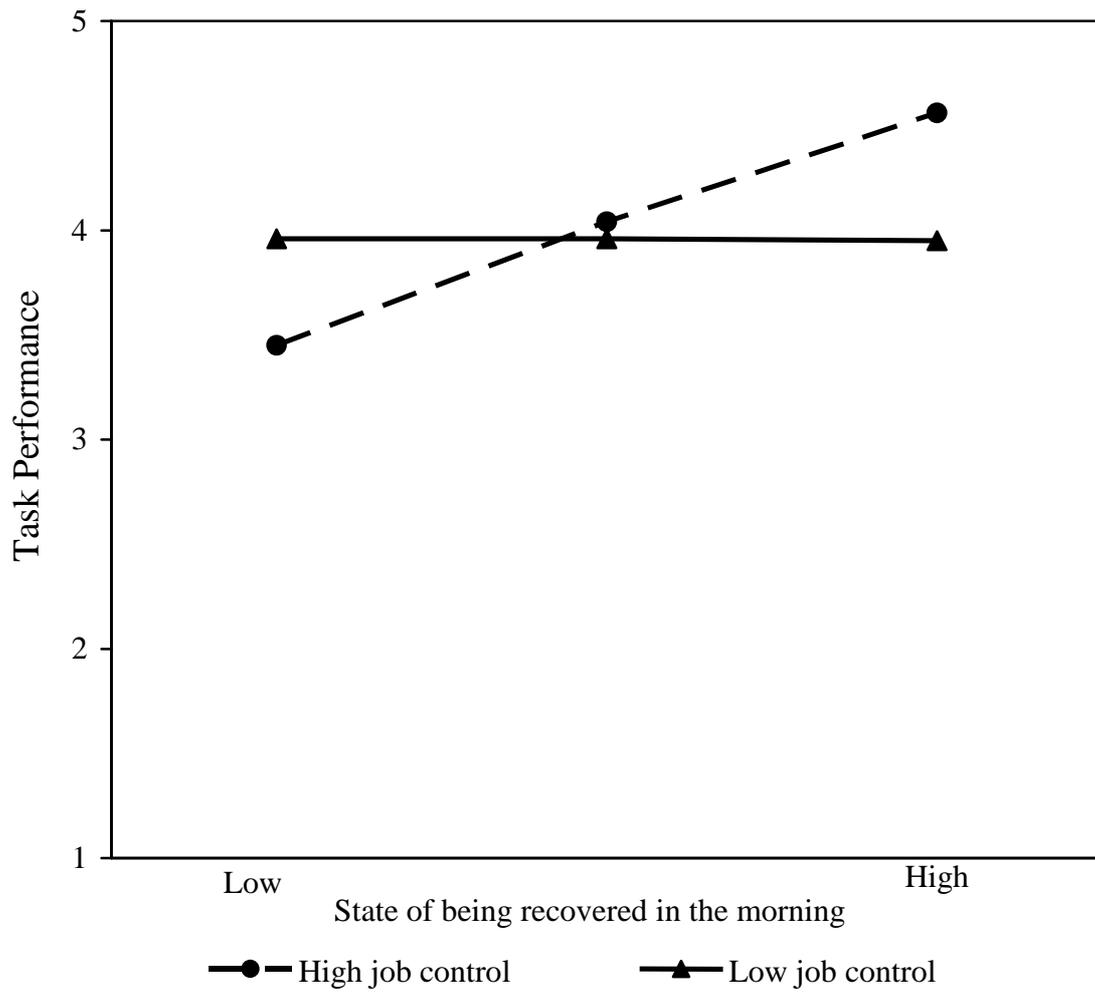


Figure 1. The Interaction Effect of the State of Being Recovered in the Morning and Job Control on Task Performance.

According to the procedure proposed by Aiken and West (1991), we divided our sample in two subgroups including persons with low (i.e., below the median) versus high (i.e., above the median) job control. We performed multilevel analyses for both subgroups to test the simple slopes of the state of being recovered on daily job performance. For persons with high job control, the state of being recovery was positively related to day-level task performance ($\gamma = 0.299$; $SE = 0.098$; $t = 3.05$; $p < .01$), whereas for persons with low job control, the state of being recovery was unrelated to day-level task performance ($\gamma = -0.057$; $SE = 0.083$; $t = -0.69$; ns). Consequently, Hypothesis 5 was supported. Figure 1 displays the interaction effect.

Results for day-level PI can be seen in Table 3. Model 1 showed a significant improvement over the null model ($\Delta - 2 \times \log = 38.924$, $\Delta df = 4$, $p < .001$). The general level of PI was a positive predictor and age was a negative predictor of day-level PI. Model 2 showed an additional improvement over Model 1 ($\Delta - 2 \times \log = 18.305$, $\Delta df = 3$, $p < .001$). Day-level time pressure positively predicted day-level PI. Model 3 showed further improvement over Model 2 ($\Delta - 2 \times \log = 12.007$, $\Delta df = 1$, $p < .001$) and the state of being recovered in the morning was found to be a significant positive predictor of day-level PI. Therefore, Hypothesis 2 was confirmed. Moreover, Model 4 showed a further improvement over Model 3 ($\Delta - 2 \times \log = 11.775$, $\Delta df = 1$, $p < .001$) and the interaction term significantly predicted day-level PI. For persons with high job control, the state of being recovered in the morning was positively related to day-level PI ($\gamma = 0.501$; $SE = 0.106$; $t = 4.73$; $p < .001$), whereas for persons with low job control, the state of being recovered was unrelated to day-level PI ($\gamma = 0.011$; $SE = 0.069$; $t = 0.16$; ns). Consequently, Hypothesis 6 was supported. The interaction effect is displayed in Figure 2.

Table 3

Multilevel Estimates for Models Predicting Day-Specific Personal Initiative

	Null Model			Model 1			Model 2			Model 3			Model 4		
	Estimate	SE	t	Estimate	SE	t	Estimate	SE	t	Estimate	SE	t	Estimate	SE	t
Intercept	3.296	0.071	46.423	3.298	0.059	55.898	3.298	0.059	55.898	3.300	0.059	55.932	3.300	0.059	55.932
Age				-0.012	0.006	-2.000 *	-0.012	0.006	-2.000 *	-0.013	0.006	-2.167 *	-0.013	0.006	-2.167 *
General level of personal initiative				0.696	0.107	6.505 ***	0.706	0.107	6.598 ***	0.705	0.107	6.589 ***	0.707	0.107	6.607 ***
Job control (JC)				0.021	0.100	0.210	0.027	0.099	0.273	0.028	0.099	0.283	0.027	0.099	0.273
Day-level situational constraints							0.016	0.070	0.229	0.001	0.068	0.015	0.009	0.067	0.045
Day-level time pressure							0.230	0.057	4.035 ***	0.219	0.056	3.911 ***	0.207	0.055	3.764 ***
Day-level social stressors							0.087	0.122	0.713	0.085	0.119	0.714	0.082	0.117	0.701
State of being recovered										0.199	0.057	3.461 ***	0.206	0.056	3.679 ***
State of being recovered × JC													0.293	0.084	3.489 ***
-2*log (lh)			880.710			841.924			823.619			811.612			799.837
Diff -2*log						38.924 ***			18.305 ***			12.007 ***			11.775 ***
df						3			3			1			1
Level 1 Intercept Variance (SE)		0.471 (0.041)			0.469 (0.041)			0.440 (0.038)			0.420 (0.037)			0.402 (0.035)	
Level 2 Intercept Variance (SE)		0.369 (0.072)			0.210 (0.050)			0.214 (0.049)			0.219 (0.037)			0.224 (0.049)	

Note. N on person-level = 99. N on day-level = 359. * p < .05; ** p < .01; *** p < .001

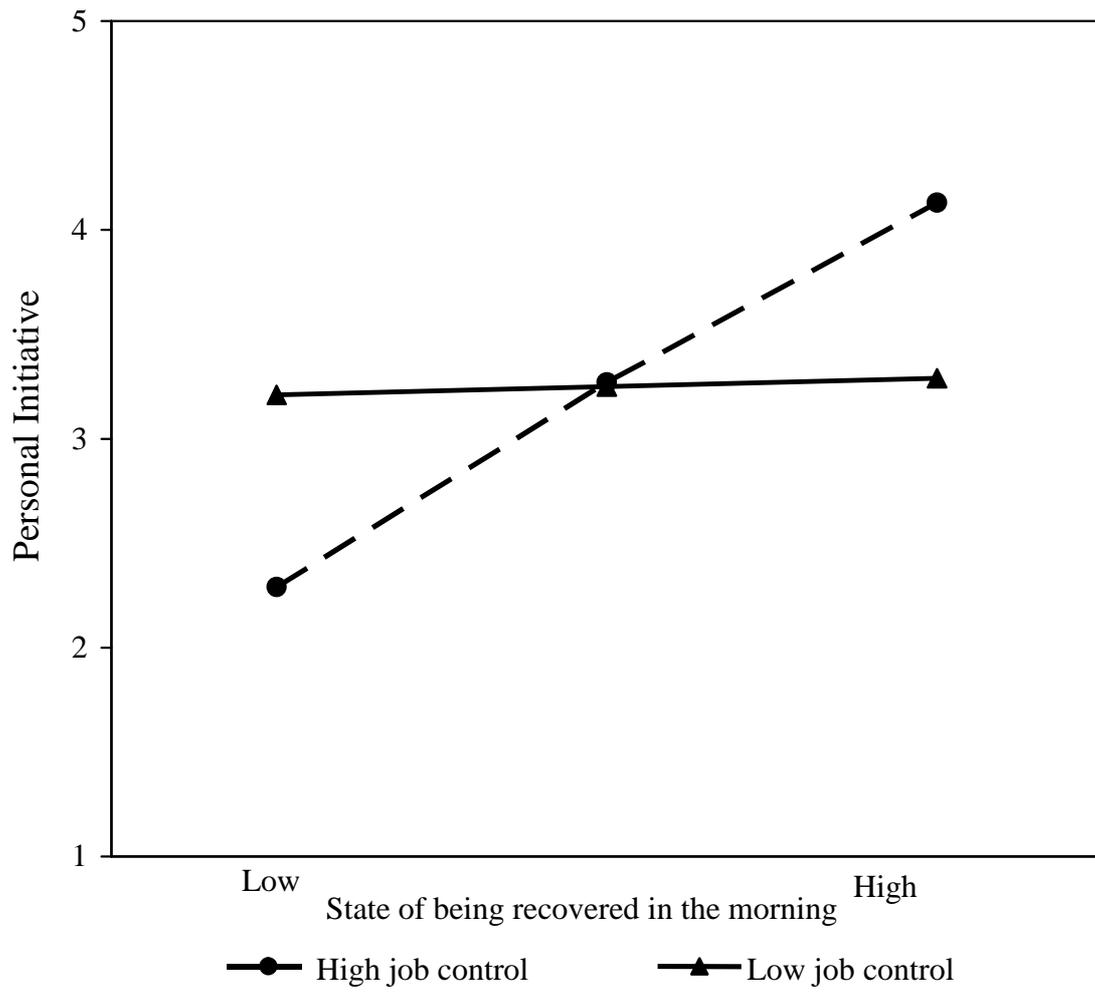


Figure 2. The Interaction Effect of the State of Being Recovered in the Morning and Job Control on Personal Initiative.

Table 4 shows the results for day-level OCB. Model 1 showed a significant improvement over the null model ($\Delta - 2 \times \log = 10.093$, $\Delta df = 4$, $p < .05$) and the general level of OCB was a positive predictor and age a negative predictor of day-level OCB. Model 2 showed an additional improvement over Model 1 ($\Delta - 2 \times \log = 11.201$, $\Delta df = 3$, $p < .05$). Day-level social stressors positively predicted day-level OCB. Model 3 showed a further improvement over Model 2 ($\Delta - 2 \times \log = 5.549$, $\Delta df = 1$, $p < .05$) and the state of being recovered in the morning was found to be a significant positive predictor of day-level OCB. Therefore, Hypothesis 3 was confirmed. Moreover, Model 4 showed a further improvement over Model 3 ($\Delta - 2 \times \log = 8.025$, $\Delta df = 1$, $p < .01$) and the interaction term significantly predicted day-level OCB. For persons with high job control, the state of being recovered in the morning was positively related to day-level OCB ($\gamma = 0.296$; $SE = 0.099$; $t = 2.99$; $p < .01$), whereas for persons with low job control, the state of being recovered was unrelated to day-level OCB ($\gamma = -0.008$; $SE = 0.075$; $t = -0.11$; ns). Consequently, Hypothesis 7 was supported. The interaction effect is displayed in Figure 3.

Results for day-level compensatory effort at work are displayed in Table 5. Model 1 showed a significant improvement over the null model ($\Delta - 2 \times \log = 19.965$, $\Delta df = 4$, $p < .001$) and the general level of compensatory effort at work was a positive predictor of day-level compensatory effort at work. Model 2 showed no improvement over Model 1 ($\Delta - 2 \times \log = 7.523$, $\Delta df = 3$, ns), and none of the estimates of the day-level stressors reached statistical significance. Model 3 showed an additional improvement over Model 2 ($\Delta - 2 \times \log = 10.915$, $\Delta df = 1$, $p < .001$) and the state of being recovered in the morning was found to be a significant negative predictor of day-level compensatory effort at work. Therefore, Hypothesis 4 was confirmed.

Table 4

Multilevel Estimates for Models Predicting Day-Specific Organizational Citizenship Behavior (OCB)

	Null Model			Model 1			Model 2			Model 3			Model 4		
	Estimate	SE	t	Estimate	SE	t	Estimate	SE	t	Estimate	SE	t	Estimate	SE	t
Intercept	2.543	0.076	33.461	2.542	0.073	34.822	2.544	0.073	34.849	2.545	0.072	35.347	2.546	0.072	35.361
Age				-0.018	0.008	-2.250 *	-0.018	0.008	-2.250 *	-0.019	0.008	-2.375 *	-0.019	0.008	-2.375 *
General level of OCB				0.320	0.133	2.406 *	0.310	0.133	2.331 *	0.315	0.132	2.386 *	0.322	0.132	2.439 *
Job control (JC)				-0.082	0.120	-0.683	-0.079	0.120	-0.658	-0.079	0.119	-0.664	-0.080	0.119	-0.672
Day-level situational constraints							-0.052	0.070	-0.743	-0.062	0.069	-0.899	-0.055	0.069	-0.797
Day-level time pressure							0.077	0.057	1.351	0.069	0.057	1.211	0.060	0.056	1.071
Day-level social stressors							0.357	0.122	2.926 **	0.355	0.121	2.934 **	0.353	0.119	2.966 **
State of being recovered										0.136	0.057	2.386 *	0.142	0.057	2.491 *
State of being recovered \times JC													0.245	0.086	2.849 **
-2*log (lh)			884.983			874.890			863.689			858.140			850.115
Diff -2*log						10.093 *			11.201 *			5.549 *			8.025 **
df						3			3			1			1
Level 1 Intercept Variance (SE)		0.455 (0.040)			0.455 (0.040)			0.436 (0.038)			0.428 (0.038)			0.415 (0.036)	
Level 2 Intercept Variance (SE)		0.447 (0.038)			0.392 (0.075)			0.395 (0.074)			0.394 (0.074)			0.396 (0.074)	

Note. N on person-level = 99. N on day-level = 359. * $p < .05$; ** $p < .01$; *** $p < .001$

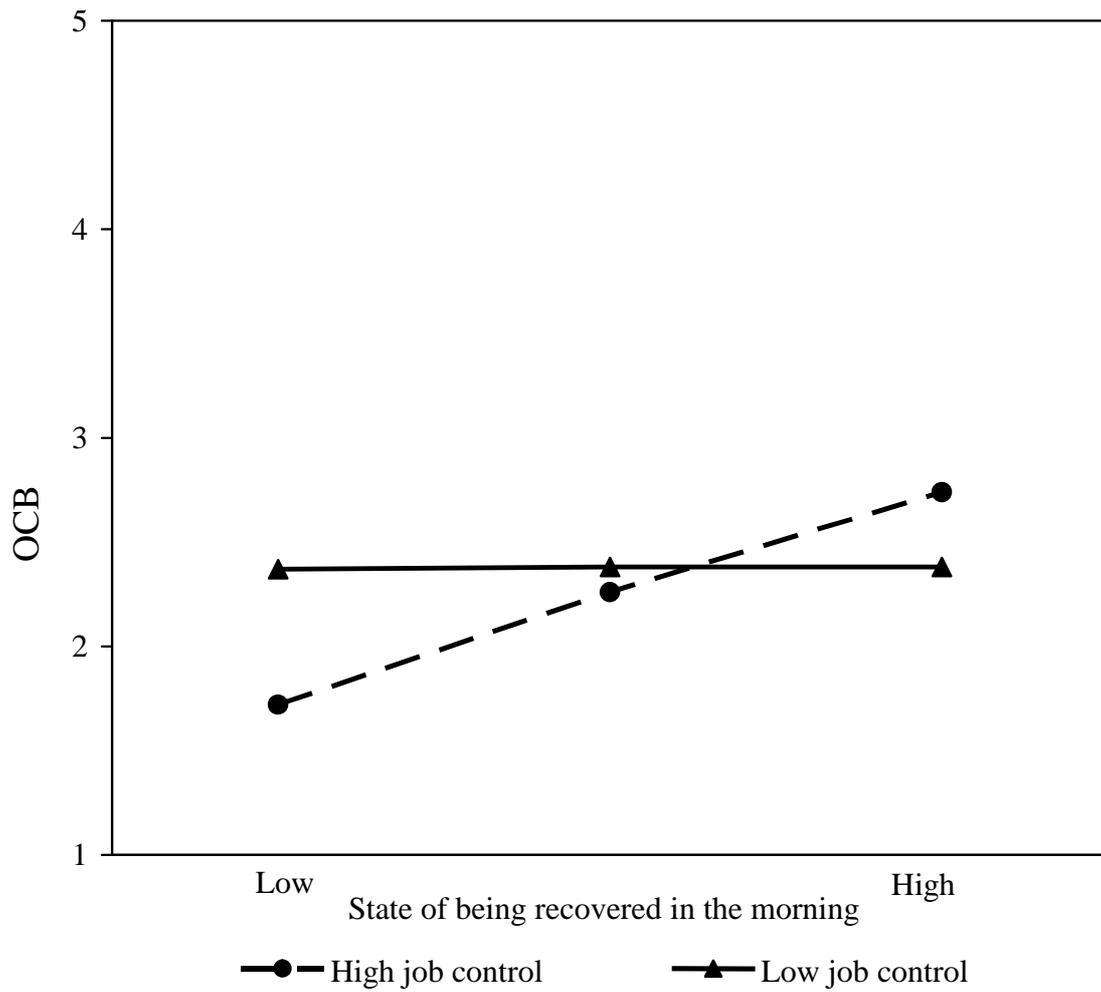


Figure 3. The Interaction Effect of the State of Being Recovered in the Morning and Job Control on Organizational Citizenship Behavior.

Table 5

Multilevel Estimates for Models Predicting Day-Specific Compensatory Effort after Work

	Null Model			Model 1			Model 2			Model 3		
	Estimate	SE	t	Estimate	SE	t	Estimate	SE	t	Estimate	SE	t
Intercept	2.445	0.065	37.615	2.442	0.058	42.103	2.451	0.058	41.542	2.449	0.058	41.508
Age				0.001	0.006	0.167	0.001	0.006	0.167	0.001	0.006	0.167
General level of comp. effort				0.361	0.081	4.457 ***	0.364	0.081	4.494 ***	0.359	0.082	4.378 ***
Job control (JC)				-0.056	0.097	-0.577	-0.052	0.097	-0.536	-0.054	0.098	-0.551
Day-level situational constraints							0.135	0.086	1.570	0.153	0.084	1.821
Day-level time pressure							0.008	0.071	0.113	0.021	0.069	0.304
Day-level social stressors							0.265	0.150	1.767	0.269	0.147	1.830
State of being recovered										-0.235	0.070	-3.357 ***
-2*log (lh)			963.659			943.694			936.171			925.256
Diff -2*log						19.965 ***			7.523			10.915 ***
df						3			3			1
Level 1 Intercept Variance (SE)		0.695 (0.061)			0.698 (0.061)			0.676 (0.059)			0.676 (0.059)	
Level 2 Intercept Variance (SE)		0.221 (0.061)			0.141 (0.050)			0.149 (0.059)			0.149 (0.059)	

Note. N on person-level = 99. N on day-level = 359. * p < .05; ** p < .01; *** p < .001

Discussion

The goal of the present study was to examine the relationship between the state of being recovered in the morning and different dimensions of job performance. Specifically, we looked at task performance, personal initiative (PI), organizational citizenship behavior (OCB) and compensatory effort at work. Moreover, we investigated if situational strength (i.e., job control) served as a moderator in the relationships with task performance, PI and OCB. All of our hypotheses were supported. The state of being recovered in the morning was positively related to daily job performance and was negatively related to daily compensatory effort at work. Job control was a boundary condition in the relationship between the state of being recovered and daily task performance, PI and OCB as it moderated these relationships. For individuals with high job control there was a strong positive relationship between being recovered in the morning and daily job performance, whereas there was no relationship for individuals with low job control.

Our results support the theoretical view that changes in daily performance are related to changes in the state of being recovered. On days when an individual is highly recovered in the morning, the individual shows higher task performance, is more proactive at work, engages more in helping behavior towards co-workers and has to expend less compensatory effort when accomplishing tasks. Because daily job performance depends on successfully allocating the maximum amount of resources to the task at hand (Beal et al., 2005), our results suggest that being highly recovered in the morning is associated with an increased amount of resources that promotes this process of resource allocation. Particularly, this enhancement may be due to increased self-regulatory resources that have been built up during the previous recovery period.

It is important to note that the state of being recovered in the morning predicted performance variables beyond control variables from the person-level, specifically the general level of the respective performance variable and age, and beyond day-level control variables,

specifically daily stressors. Thus, our results cannot be explained by between-person differences in age, the general level of job performance or by the perception of stress during the day.

Our results are in line with previous research showing that recovery is positively related to performance-related behaviors (Fritz & Sonnentag, 2005; Sonnentag, 2003). More specifically, we extended the results from a within-person study that showed that daily recovery is positively related to day-level proactive behavior (Sonnentag, 2003). We found that being highly recovered in the morning is also related to increased task performance during the day. These results complement the findings of Fritz and Sonnentag (2005) who showed with a between-person approach that individuals who engaged more in social activities during the weekend (i.e., a specific recovery experience that is assumed to benefit the recovery process) reported higher task performance after the weekend. In addition to previous research we found that the state of being recovered in the morning is also related to increased helping behavior during the day, one core dimension of OCB. Therefore, our study showed that being highly recovered does not only benefit day-specific proactive behavior but also day-specific task performance and day-specific OCB at work.

Moreover, feeling recovered in the morning is associated with less compensatory effort during the day. Performance is easier to accomplish when a person feels highly recovered. Thus, it is not only the performance itself that benefits from an increased state of being recovered, but also the psychological costs of performing at work. Again, this finding supports the view that the state of being recovered is associated with increased self-regulatory resources that facilitate resource allocation and help keep attention to the task (Beal et al., 2005). Performing one's tasks with lower psychological costs should be important for showing high performance over a longer period of time and for avoiding the costs of a sustained high-effort investment, such as fatigue and failures at work (Hockey et al., 1998; Hockey, 1997).

As predicted, the relationships between the state of being recovered and task performance, PI and OCB were moderated by job control - an indicator of situational strength at work. On days when being highly recovered an individual with high job control showed a higher level of task performance, PI and OCB, whereas on days when being poorly recovered an individual with high job control showed a lower level of task performance, PI and OCB. For individuals with low job control we found no relationship between the state of being recovered and job performance. These findings support our proposition that low job control constrains individuals in their possibilities to capitalize on being highly recovered. Because low job control limits an individual's actions and action strategies (Langfred & Moye, 2004), the individual cannot increase job performance when being highly recovered, but also cannot decrease performance when being poorly recovered. A high level of job control enables individuals to bring in increased resources on days when they are highly recovered and thus allows for a rise in daily job performance. However, a high level of job control also allows individuals to decrease daily performance on days when they are poorly recovered. Reducing performance on days when an individual is less recovered may be a coping strategy to conserve resources and prevent a further resource loss (Hobfoll, 1989). In the short run, performance may suffer on that specific day but in the long run conserving one's resources on such a day might be supportive for upholding performance over a longer period of time.

Notwithstanding, our control variables daily job stressors showed an interesting pattern of relationships with daily job performance. Day-level time pressure was positively related to daily task performance and PI, whereas day-level social stressors were positively related to daily OCB. A positive relationship between time pressure and PI was also found in previous studies (Fay & Sonnentag, 2002; Ohly, Sonnentag, & Pluntke, 2006). Fay and Sonnentag (2002) suggested control theory (Edwards, 1992) to explain this relationship. Stressors can be seen as indicators of suboptimal work situations that have to be changed. As a consequence, they trigger behaviors that counteract these suboptimal work situations. An

increased level of task performance and PI involves finishing tasks and solving problems. Thus, an increased level of day-level task performance and PI may aim to reduce time pressure. An increased level of day-level OCB may aim to reduce social stressors, because helping behavior involves ameliorating conflicts in the workplace and improving the working climate. However, as we measured day-level stressors and day-specific performance at the same time causal relationships remain unclear. It is also possible that an increased level of PI may result into a higher level of time pressure, because a person engages in extra activities that may be time consuming and therefore time for completing formal job tasks is reduced. Future studies should clarify the causal relationships between stressors and job performance using experimental study designs.

One substantial limitation of many previous diary studies was that one could not be sure if participants answered daily surveys at the right times (i.e., because participants filled out paper surveys and sent them back later). This study overcame this problem by implementing daily surveys on pocket computers that recorded the time of filling in surveys. All survey data that were filled in at wrong times were excluded from analyses.

Limitations

Our study has several limitations. First, we assessed daily performance by self-report measures. One might argue that these measures are biased in terms of social desirability or self-serving bias. However, we tried to rule out this explanation by our study design and by specific procedures in our data analyses. If participants' answers were biased, questionnaire and daily survey data should be influenced equally by such biases. Biases should influence the absolute level of performance and should be attributable between-person variation and not within-person variation. In our analyses, we centered day-level variables around the respective person mean. By this procedure between-person variance is eliminated from day-level predictor variables and interpretations based on differences between persons can be

ruled out. Furthermore, we controlled for the general level of performance variables or compensatory effort at work in order to control for between-person influences such as self-serving bias.

In addition, all of our measures are based on self-reports of the same person and thus common method variance might be a problem (Podsakoff, MacKenzie, Jeong-Yeon, & Podsakoff, 2003). We tried to minimize this problem by temporally and methodologically separating the measurement of our predictor and outcome variables. Such a procedure should reduce common method variance (Podsakoff et al., 2003). Nevertheless future studies should try to assess supervisor and peer ratings of performance or collect objective performance data. However, it is not certain if supervisors or peers are able to observe, notice and evaluate changes in performance from day to day. Thus, it is unclear if such ratings are more valid than self-reports because they might also be susceptible to biases. As researchers begin to examine dynamic performance over short periods of time, future studies should also address these methodological problems and challenges.

A further limitation is that the assessment of feeling recovered in the morning might have increased participants' attention to their state of being recovered. Participants might have been worried or happy about this state during the day and thus daily performance might have been impacted. Future research should clarify if the relationship between the state of being recovered and daily performance depends on individuals' awareness of being recovered.

Moreover, with our study design we cannot ultimately draw conclusions about the causal relationships between the state of being recovered and daily performance. Although our design and data-analysis should have ruled out many alternative explanations (e.g. between-person third variables and certain day-level variables as confounding variables), we cannot conclude that the state of being recovered caused daily job performance. Future studies with experimental designs are needed to draw conclusions about causality.

Furthermore, although our results support the view that the state of being recovered in the morning is associated with a higher level of resources (e.g. self-regulatory resources) and that these resources contribute to increases in daily performance, we did not test this assumption. Examining which resources are increased by daily recovery and which resources mediate the relationship between the state of being recovered and daily performance is a major task for future research. In our study, we did not test for potential mediators for two reasons. First, as research on the relationship between recovery and performance is relatively scarce, the aim of our study was to examine if there is a stable relationship between the state of being recovered and performance. An established relationship between two variables is the basis for assuming and testing mediators (Shrout & Bolger, 2002). Second, we think that it seems more promising to investigate and measure potential mediators in an experimental design than in a field study. For example, the assessment of self-regulatory resources may be difficult in a field study whereas assessment methods in experiments have been developed (Baumeister, 2002).

Implications for research and practice

One area for future research is to investigate the processes at work that are facilitated or impaired when an individual is highly or poorly recovered, that is examining performance from a micro perspective. The state of being recovered might be related to regulatory processes, such as goal regulation including behaviors of planning or feedback processing. Such regulatory processes might mediate the effects of the state of being recovered on performance.

In addition to examining micro processes, research should also investigate the effects of the state of being recovered on performance over longer periods of time and the effects of cumulative lack of recovery. This topic is of particular importance because it might be that the effects and adjustment strategies associated with the state of being recovered improve

performance in the short run, but may deteriorate performance in the long run. For example, persons at a workplace with a low degree of job control show a constant level of day-specific performance irrespective of their state of being recovered. However, if the state of being poorly recovered persists over time performance might also decrease.

With respect to practical implications this study illustrates that individuals and organizations should care about individuals' recovery. The state of being recovered can no longer be assumed to be a state that is limited to the non-work domain or to be only related to health-related outcomes where the main suffering or benefiting part is the employee him- or herself. Rather, it is a state that is related to day-specific task performance, day-specific contextual performance and to the psychological costs of performance. If organizations support employees' opportunities to recover (e.g., by providing sport facilities or by offering working time arrangements that allow and promote day-specific recovery), organizations can directly increase employees' state of being recovered and indirectly foster employees' performance. Thus, the effectiveness of the whole organization would likely improve. Previous research showed that specific activities (Sonnentag, 2001) or experiences (Sonnentag & Fritz, 2007) during leisure time are beneficial for employees' recovery and health. Furthermore, support in the non-work domain (e.g., social support from the family) should be important for employees' health and recovery (Halbesleben, 2006).

Our results show that the state of being recovered is especially important for employees' daily job performance when job control is high. Increasing job control allows employees to capitalize on being highly recovered. However, increasing job control also enables employees to decrease performance when they are poorly recovered. Thus, managers and organizations should also take care of employees' recovery when providing employees with high job control.

Organizations can only provide recommendations, resources and possibilities to foster the recovery process of their employees. How employees spend their leisure time is at their

own decision and their own responsibility. Therefore, we should make people aware of the fact that the state of being recovered is related to performance at work and that they themselves have the possibility to positively influence daily performance at work. For example, practical advice and specific recovery training may provide employees with the knowledge of how to spend leisure time in a way that promotes daily recovery.

In sum, our study demonstrates that the state of being recovered in the morning is important to ensure daily performance at work. One should not delay recovery by waiting for the weekend to recover because the effects of being poorly recovered on performance occur immediately. Employees should be encouraged to maintain or develop a lifestyle that allows for daily periods of rest and recovery. The state of being recovered is not only a pleasant experience for the individual but it is crucial for daily job performance in an organizational context.

STUDY 2:

**RECOVERY DURING THE WEEKEND AND FLUCTUATIONS
IN WEEKLY JOB PERFORMANCE: A FOUR-WEEK LONGITUDINAL STUDY
EXAMINING INTRA-INDIVIDUAL RELATIONSHIPS**

Summary

For most employees, the weekend offers the opportunity to recover and unwind from stressors and demands faced during the working week. In this study, we examined which factors contribute to employees' successful recovery during the weekend. In addition, we investigated if being highly recovered in the beginning of the week benefits different dimensions of job performance during the week. Using a within-person design we conducted a longitudinal study with 159 employees over four working weeks. Participants responded to weekly web-based surveys on Monday mornings and Friday afternoons. Hierarchical linear modeling showed that psychological detachment, relaxation, mastery experiences and the subjective evaluation of weekend sleep predicted the state of being recovered on Monday morning. The state of being recovered in turn predicted fluctuations in weekly task performance, personal initiative, organizational citizenship behavior and low compensatory effort. Our results stress the importance of recovery during the weekend for both the individual and for organizations.

Introduction

Most employees would probably agree that in the end of a working week they look forward to the weekend. For many, the weekend offers the possibility and time to recover from work-related stress and to pursue pleasurable activities (Fritz & Sonnentag, 2005), although some employees (e.g., nurses, salesclerks) have to work from time to time or regularly during the weekend. Research has begun to acknowledge the importance of vacations and daily recovery for employees' well being and performance (see for example Eden, 2001; Sonnentag, 2003; Westman & Eden, 1997). However, the role of weekends for employees' recovery and potential benefits for performance during the subsequent week has been largely ignored (for an exception see Fritz & Sonnentag, 2005).

In our study, we address this gap and pursue two general goals: First, we examine which factors contribute to an individual's recovery during the weekend. In particular, we propose that specific *recovery experiences* (i.e., psychological detachment, relaxation and mastery experiences) and sleep during the weekend foster an individual's state of being recovered after the weekend. Second, we investigate if being highly recovered after the weekend (i.e., feeling physically and mentally refreshed) benefits job performance during the week. Specifically, we examine if an individual shows a higher level of task performance, proactive behavior, organizational citizenship behavior (OCB) and if the individual perceives accomplishing work as less straining and effortful in weeks when he or she feels highly recovered after the weekend. Thereby, we address the question if the state of being recovered predicts fluctuations in performance over time.

We use a within-person design for examining our research questions. Particularly, we assess individual's recovery during the weekend and job performance over several weeks and focus on within-person differences in the state of being recovered and weekly job performance during the week rather than focusing on between-person differences. Our study therefore contributes to the literature in several ways. First, our study adds to the scarce

literature on recovery during the weekend by using a within-person design over several weeks that has not been used in previous studies. Second, we enlarge our knowledge on potential benefits of non-work experiences for individuals' behavior at work (Demerouti et al., 2007; Rothbard & Wilk, 2006). Previous studies that examined the relationship between recovery and performance examined rather immediate effects of recovery on performance-related outcomes, that is performance on the same day (Sonnentag, 2003) or on the first day after the weekend (Fritz & Sonnentag, 2005). Our study investigates if being recovered in the beginning of the week benefits performance throughout the week. Third, our study contributes to the rather limited literature on dynamic performance (Beal et al., 2005; Ilies et al., 2006; Trougakos et al., 2008) by examining the state of being recovered as a predictor of within-person fluctuations in performance over time.

We can also draw practical implications from our study. As we investigate which factors contribute to successful recovery during the weekend, we can provide employees and organizations with recommendations of how to foster recovery from work-related stress. Furthermore, our study will show the importance of recovery for weekly job performance. If we establish a link between individuals' state of being recovered after the weekend and weekly job performance, we can conclude that supporting employees' recovery during the weekend also benefits organizational outcomes. As a consequence, organizations may reconsider work-time arrangements and organizational policies and even develop interventions to actively support their employees' recovery from job-related stress (Gerkovich, 2006; Semmer, 2003).

Recovery during the weekend and the state of being recovered after the weekend

Accomplishing one's work and dealing with job demands requires individuals to invest physical and mental resources (Meijman & Mulder, 1998). Thus, in the end of the day or after a working week an individual's resources are depleted and most individuals

experience fatigue and feel a need for recovery (Sluiter, van der Beek, & Frings-Dresen, 1999). After work, and especially during the weekend, individuals have time to rest and unwind from job demands faced during the previous week. During the weekend an individual no longer has to deal with job-related demands and can therefore 'recharge his or her batteries'. This process of unwinding and restoration is called recovery. Recovery is the process that reverses the negative consequences of job demands and allows an individual's functional system to return to the baseline level of functioning (Meijman & Mulder, 1998).

According to the Effort-Recovery Model (Meijman & Mulder, 1998) recovery occurs when job demands no longer drain an individual's resources. Thus, if the individual is not confronted with job demands during the weekend, successful recovery should occur and the individual's functional systems should return back to the baseline level (Meijman & Mulder, 1998). The Conservation of Resources (COR) model (Hobfoll, 1989; Hobfoll & Shirom, 2001) can further explain the recovery process. According to the COR framework (Hobfoll, 1989) individuals strive for gaining, preserving and protecting resources. Resources are defined as "those objects, personal characteristics, conditions, or energies that are valued by the individual or that serve as a means for attainment of these objects, personal characteristics, conditions, or energies" (Hobfoll, 1989, p. 516). If (1) resources are threatened to be lost, or (2) an actual loss of resources has happened, or (3) a resource gain after an investment of resources is not possible, individuals experience stress (Hobfoll, 1989). During the weekend, an individual usually no longer has to deal with work-related stressors and demands and thus a further resource loss can be prevented. Furthermore, during the weekend individuals have the opportunity to rebuild their resources or to gain additional resources, such as increased energy, positive affect or self-efficacy (Fritz & Sonnentag, 2005).

When successful recovery has occurred during the weekend, the individual is more recovered after the weekend, that is usually on Monday morning. In this study, we focus on the state of being recovered on Monday morning as an outcome of the recovery process that

occurred during the weekend. The state of being recovered refers to the degree to which an individual feels physically and mentally refreshed and full of energy (Sonnentag & Krueger, 2006). In the following, we first propose that specific experiences and good sleep during the weekend will result in a higher state of being recovered on Monday morning. Afterwards, we will argue that the state of being recovered is related to performance-related outcomes during the subsequent week.

Recovery experiences during the weekend and the state of being recovered after the weekend

After several studies investigated how people spend their off-job time and what contributes to recovery, researchers concluded that it is probably not only a specific activity per se, but its underlying attributes that helps individuals to recover from work-related stress (Sonntag & Fritz, 2007). This means that individuals may pursue different activities, such as going for a walk or taking a bath while the underlying attribute that contributes to recovery – in this case *relaxation* - may be the same across activities. Sonntag and Fritz (2007) termed these underlying attributes *recovery experiences*. In our study, we focused on three recovery experiences including *psychological detachment*, *relaxation* and *mastery experiences* and examined if an individual is more recovered after weekends when he or she experienced a higher level of these three recovery experiences.

Etzion, Eden and Lapidot (1998) introduced the concept of *psychological detachment* into research on recovery and defined it as an “individual’s sense of being away from the work situation” (p. 579). Psychological detachment not only involves being physically away from the work situation, but also involves mentally switching off from work and an end of thinking about work-related issues or problems (Sonntag & Bayer, 2005). Drawing on the Effort-Recovery Model (Meijman & Mulder, 1998) and on COR model (Hobfoll, 1989), we conclude that experiencing a higher level of psychological detachment during the weekend is

related to a higher state of being recovered on Monday morning. As psychological detachment means that the individual is both physically and mentally distanced from work (Etzion et al., 1998), an individual's resources are no longer drained and resources can be restored (Hobfoll, 1989). When an individual experiences low psychological detachment during the weekend, he or she is still occupied with work, experiences further strain and can not fully recover and restore resources (Meijman & Mulder, 1998).

Research regarding between-person differences showed that persons who detach more from work during leisure time and ruminate less about work-related issues report improved well-being (Brosschot, Gerin, & Thayer, 2006; Sonnentag & Fritz, 2007). Moreover, daily-survey studies investigating within-person relationships found that when an individual reports higher psychological detachment during the evening the individual reports improved well-being at bedtime and the next morning (Sonnentag & Bayer, 2005; Sonnentag et al., 2008). In sum, we propose the following hypothesis:

Hypothesis 1: Psychological detachment during the weekend will be positively related to the state of being recovered on Monday morning.

Relaxation is a process that involves decreased physical activation, that is indicated for example by a decreased heart rate, breathing rate or muscle tension (Smith, 2005).

Furthermore, relaxation is associated with increased positive affect (Stone, Kennedy-Moore, & Neale, 1995). An individual may deliberately initiate relaxation by engaging in meditation (Grossman, Niemann, Schmidt, & Walach, 2004), yoga (Sarang & Telles, 2006), progressive muscle relaxation (Jacobsen, 1938) or other techniques that aim to relax the body and mind (Sonnentag & Fritz, 2007). Relaxation may also be experienced during other non-demanding activities, such as taking a walk in an enjoyable natural environment (Hartig, Evans, Jamner, Davis, & Gärling, 2003) or listening to music (Pelletier, 2004).

COR model (Hobfoll, 1989) can explain why relaxation during the weekend contributes to recovery and thus to a higher state of being recovered on Monday morning. As relaxation is associated with a decrease in physical and psychological activation (Smith, 2005), it prevents a further resource loss resulting from prolonged activation due to work-related stress (Brosschot, Pieper, & Thayer, 2005). Furthermore, positive affect that comes along with relaxation can serve as a resource that helps to prevent a further resource loss and to build up new resources. As positive emotions can undo the effects of negative emotions, positive affect helps to prevent a further resource loss from experiencing negative emotions and helps to restore one's positive mood (Fredrickson, Mancuso, Branigan, & Tugade, 2000). Thus, an individual should be more recovered after weekends when having experienced a higher level of relaxation.

There is empirical evidence from between-person studies that the experience of relaxation during leisure time or during vacation is related to improved physical and psychological well-being (Fritz & Sonnentag, 2006; Sonnentag & Fritz, 2007). Furthermore, a study examining within-person relationships showed that experiencing relaxation during the evening is related to increased positive affect the next morning (Sonnentag et al., 2008). Taken together, we propose the following hypothesis:

Hypothesis 2: Relaxation during the weekend will be positively related to the state of being recovered on Monday morning.

Mastery experiences comprise off-job activities that are challenging for the individual and that provide opportunity for learning and a sense of achievement (Sonnentag & Fritz, 2007). Experiencing mastery involves feelings of competence and proficiency. An individual may experience mastery when pursuing sport, learning a new hobby or when engaging in volunteer activities (Ruderman, Ohlott, Panzer, & King, 2002; Sonnentag & Fritz, 2007).

COR model (Hobfoll, 1989) provides a theoretical framework to understand how mastery experiences during the weekend contribute to an individual's increased state of being recovered on Monday morning. Although engaging in activities that provide the opportunity to experience mastery requires some effort investment, mastery experiences should result in the restoration or acquisition of resources, such as new skills, increased self-efficacy, self-esteem and positive affect (Parkinson & Totterdell, 1999; Sonnentag & Fritz, 2007). Consequently, after a weekend when having experienced a high level of mastery experiences, an individual should have replenished and built up new resources and consequently experience a higher state of being recovered on Monday morning.

Results from between-person studies found that mastery experiences during leisure time is related to improved health and well-being (Fritz & Sonnentag, 2006; Sonnentag & Fritz, 2007). In addition, the study of Sonnentag et al. (2008) showed that mastery experiences during the evening are related to improved positive affect in the next morning. Therefore, we propose the following hypothesis:

Hypothesis 3: Mastery experiences during the weekend will be positively related to the state of being recovered on Monday morning.

The role of sleep during the weekend for the state of being recovered after the weekend

Sleep is assumed to be highly important for an individual's recovery as sleep has restorative functions for an individuals' physiology, particularly for the brain (Akerstedt, 2006). There is broad empirical evidence that even moderate sleep deprivation or sleep disturbances result into impaired health (e.g., depression, cardiovascular disease, or high blood pressure), decreased performance, an increased risk of accidents and even mortality (Akerstedt, 2006; Van Dongen, Maislin, Mullington, & Dinges, 2003). Research showed that sleep quality and sleep difficulties are better predictors of affect- and health-related outcomes than the absolute time slept or stayed in bed (Pilcher, Ginter, & Sadowsky, 1997). Thus, in

our study, we focused on the subjective evaluation of weekend sleep including sleep quality and subjective sleep duration (i.e., the feeling that one got enough and not too little sleep).

Applying COR model (Hobfoll, 1989), good and ample sleep should benefit an individual's recovery because it is associated with replenishment of an individual's physical resources (Akerstedt et al., 2002). In addition, good sleep and lack of sleep problems are related to increased positive affect and reduced fatigue (Scott & Judge, 2006; Totterdell, Reynolds, Parkinson, & Briner, 1994). Therefore, mood restoration due to good and ample sleep should further contribute to an individual's recovery. Consequently, we argue that an individual is more recovered after weekends when the individual evaluated weekend sleep as good and sufficient than after weekends when weekend sleep is evaluated as poor.

Groeger, Zijlstra and Dijk (2004) showed in a between-person study that subjective evaluation of sleep duration was positively related to the subjective feeling of having more energy available. Furthermore, within-person studies revealed that sleep quality and having less sleep problems is related to increased alertness (i.e., a state characterized by high activation and concentration) and decreased fatigue (i.e., a state characterized by low energy and feebleness; Scott & Judge, 2006; Totterdell et al., 1994). Accordingly, we state the following hypothesis:

Hypothesis 4: Subjective evaluation of weekend sleep will be positively related to the state of being recovered on Monday morning.

The state of being recovered after the weekend as a predictor of fluctuations in weekly job performance

The state of being recovered after the weekend is the outcome of the recovery process during the weekend. Simultaneously, the state of being recovered represents an individual's level of restored psychological capital (Luthans, Avolio, Avey, & Norman, 2007) for accomplishing one's task and showing extra-role behavior during the following week. In

addition to investigating predictors of the state of being recovered after the weekend, we examined the state of being recovered as a predictor of within-person fluctuations in weekly job performance.

As we investigate predictors of within-person changes in performance, we base our propositions on a theoretical model of dynamic performance (Beal et al., 2005). One major difference between traditional performance models and a model of dynamic performance is that variations in performance within persons over time are seen as substantial and meaningful and are not treated as error variance (Beal et al., 2005). Focusing on performance as a dynamic construct implies that we are not interested in which individuals perform at a higher level than others, but in investigating the conditions under which an individual is performing at his or her maximum level versus the conditions under which an individual is performing at a lower level (Beal et al., 2005). Consequently, predictors of dynamic performance are not characteristics or conditions that vary between persons, but are characteristics or conditions that vary within persons. We propose that the state of being recovered after the weekend is one characteristic that varies within persons predicting changes in performance over time.

According to Beal et al. (2005), dynamic performance mainly depends on whether the individual manages to allocate his or her resources to the task at hand (Kanfer et al., 1994). If the amount of resources that is allocated to the task is decreased or resource allocation is impaired, the individual cannot perform at best and performance at this time will suffer (Beal et al., 2005). Successful resource allocation is mainly dependent on the amount of resources, especially self-regulatory resources, that are available for the individual (Beal et al., 2005). Therefore, Beal et al. (2005) conclude that the restoration and preservation of resources is critical for upholding or increasing performance over time.

The state of being recovered after the weekend reflects the degree of recovery that occurred during the weekend. Therefore, being highly recovered after the weekend means that

a high amount of resources is available for performing at work during the week, whereas being poorly recovered after the weekend means that resources for performing at work are sparse or even lacking (Fritz & Sonnentag, 2005). According to Beal et al. (2005, p. 1057), “performance during an episode is a joint function of resource level and resource allocation.” In weeks when an individual is highly recovered in the beginning of the week (i.e., after the previous weekend), the individual possesses many resources that can be allocated to the task and the individual should show a higher job performance during the week. In weeks when an individual is poorly recovered in the beginning of the week, fewer resources are available for task allocation and an individual should show lower job performance during the week.

In our study, we consider job performance as a multidimensional construct (Campbell, 1990; Motowidlo et al., 1997) and included several performance outcomes. First, we focused on individuals’ task performance, as task performance represents an individual’s direct contribution to organizational performance that is formally required from employees (Williams & Anderson, , 1991). Second, we focused on two types of contextual performance, namely on personal initiative (PI) (Frese et al., 1996) and on the helping dimension of organizational citizenship behavior (OCB) (Organ, 1994; Smith et al., 1983). PI represents a form of proactive behavior (Crant, 2000) and is defined as “a behavior syndrome resulting in an individual taking an active and self-starting approach to work and going beyond what is formally required in a given job” (Frese, Kring, Soose & Zempel, , 1996, p. 38). Helping is a core dimension of OCB (Organ, 1994; Smith et al., 1983) and involves helping coworkers with tasks or problems (Podsakoff et al., , 2000), building and preserving interpersonal relationships, and emphasizing interpersonal harmony (Van Dyne & LePine, 1998). As all performance behaviors require the investment of energy and resources, we hypothesize that weekly task performance as well as weekly PI and OCB will benefit from being highly recovered in the beginning of the week.

With respect to empirical evidence on the relationship between recovery during the weekend and job performance, Fritz and Sonnentag (2005) found that persons that engaged more in specific recovery processes, namely in social activities (meeting friends, performing activities with others) and in positive work reflection (thinking about the positive aspects of one's job) showed an increase in task performance and pursuit of learning after the weekend. Regarding results from studies using a within-person approach, a study by Sonnentag (2003) showed that day-level recovery (i.e., being recovered, relaxed and in a good mood in the morning) is positively related to daily PI. In addition, a study by Trougakos, Beal, Green and Weiss (2008) with cheerleader instructors revealed that recovery during work breaks is positively related to subsequent performance of affective delivery. In sum, we state the following hypotheses:

Hypothesis 5: The state of being recovered on Monday morning will be positively related to weekly task performance.

Hypothesis 6: The state of being recovered on Monday morning will be positively related to weekly personal initiative (PI).

Hypothesis 7: The state of being recovered on Monday morning will be positively related to weekly organizational citizenship behavior (OCB).

In addition to focusing on weekly task performance, PI and OCB, we examined how straining and effortful it is for an individual to accomplish work during the week, that is how much compensatory effort an individual has to spend during the week (Hockey, 1997). Hockey (1993) argued in his compensatory control model that in order to prevent a decrease in performance, individuals will try to compensate for a suboptimal state (e.g., a low state of being recovered and having less resources available). They will spend more effort at work than usual, thereby spending *compensatory effort* (Hockey, Wastell, & Sauer, , 1998; Hockey, , 1993). Compensatory effort must be distinguished from effort in terms of work motivation

(Locke & Latham, 2004). Whereas effort comprises duration, intensity, and direction of behavior (Locke & Latham, 1990), compensatory effort involves how effortful and straining it is to accomplish tasks (Hockey, 1993). An individual may consider accomplishing tasks very effortful and straining, but this does not imply that the individual expends much effort in terms of duration or intensity.

In weeks when an individual is poorly recovered in the beginning of the week, the individual possesses fewer resources and has to spend compensatory effort to fulfill work tasks. In weeks when an individual is highly recovered in the beginning of the week, many resources are available and task accomplishment should be perceived as easier and less effortful. Therefore, we propose the following hypothesis:

Hypothesis 8: The state of being recovered on Monday morning will be negatively related to weekly compensatory effort at work.

Control variables

To rule out alternative interpretations, we included a number of control variables in our analyses. As all our measures are assessed by self-report measures we controlled for individual's general level of negative affect to preclude that relationships between recovery experiences and sleep with the state of being recovered or between the state of being recovered and weekly job performance are due to a person's general tendency to view his or her recovery and performance in a positive or negative way (Podsakoff et al., 2003). In addition, we controlled for an individual's negative affect on Monday morning to rule out the possibility that the relationship between recovery experiences and sleep with the state of being recovered are due to a person's negative mood on Monday morning. Controlling for an individual's negative affect on Monday morning when predicting weekly performance also eliminates the interpretation that it is an individual's negative affective state rather than the state of being recovered that predicts weekly performance.

Moreover, age may be related to both the state of being recovered on Monday morning and to weekly performance and was therefore included as a control variable. As physical and cognitive resources (i.e. fluid intelligence) usually decrease with age, older employees may have more difficulties in restoring their resources during the weekend and for older employees allocation of resources to job tasks may be impaired as they possess less resources (Kanfer & Ackerman, 2004). When predicting weekly performance, we additionally controlled for an individual's general level of task performance, PI, OCB or compensatory effort spent at work. Therefore, we took between-person differences in weekly task performance, PI, OCB or compensatory effort into account. Furthermore, an individual's rating of weekly performance on Friday afternoon may be biased by the anticipation of a nice weekend. Therefore, we included weekend anticipation on Friday afternoon as a further control variable in our analyses.

Method

Sample

We conducted our study in five different German organizations. Organizations included three manufacturing organizations from different industries, one service organization and one publisher with each organization having about 500 to 1000 employees. To ensure a homogenous sample, we only recruited employees working in the area of administration or management and excluded blue-collar workers.

After organizations showed a general interest to participate, we presented the study to different committees of the organizations during face-to-face meetings. As data were collected by an internet survey, organizations identified employees with regular internet access and sent them an information package concerning our study. Information packages included (1) a letter describing the study, requirements for participation and benefits gained from participation, and (2) a return form for registration. To encourage participation we

promised organization-specific feedback about study variables, announced a lottery prize for all participants who completed the study and offered participants to attend a training on recovery that we conducted after data collection was finished.

Participants had to fill in one general survey, four weekly surveys on Monday morning (i.e., after the previous weekend) and four weekly surveys on Friday afternoon (i.e., in the end of the working week) during four consecutive working weeks. When employees registered for participation, they received a link to the general internet survey. Furthermore, we coordinated a four-week time interval with each participant, during which the participant was able to respond to the weekly internet surveys. During the four weeks of study participation, every Monday morning and Friday afternoon participants received the link to fill in the weekly internet survey. In case participants started the working week on Tuesday or finished the working week on Thursday, they informed us about their schedule and received the link on the respective first or last day of the working week.

In sum, 193 employees registered to participate. Due to non-response to the general survey or because participants failed to fill in weekly surveys at the scheduled days, 34 persons did not provide enough data for data analyses. Our final sample consists of 159 persons with complete weekly survey data (i.e., including a Monday and Friday survey) from 432 weeks. Participants provided on average 2.7 weeks with complete weekly survey data.

About half of the participants were female (52.2 percent) and participants' average age was 40.7 years ($SD = 8.8$). On average participants' job tenure reached 16.8 years ($SD = 9.3$) and tenure in the current organization was 12.5 years ($SD = 8.7$). Participants' held a variety of jobs and our sample included managers (29.6 %), economists (15.7 %), commercial clerks (13.8 %), administrative staff (13.2 %), technicians (8.8 %), computer engineers (8.2 %), journalists (5.7 %), and computer scientists (5.0 %). Most participants worked full-time with an average working time of 39.9 hours per week ($SD = 10.3$).

General level of compensatory effort at work was measured with three items developed for Study 1 (see Chapter 2) and two additional items developed for this study. The scale measures how exhausting and straining it is in general to perform at work. It therefore assesses how much compensatory effort a person has to expend in general to achieve a certain level of performance. The five items were “It needs much energy to work on my tasks”, “I am doing my work with ease” (reverse coded), “I have to expend much effort in order to accomplish my tasks”, “I perceive accomplishing my tasks very effortful”, “I fulfill my tasks without exerting much effort” (reverse coded). Cronbach’s alpha was .82.

We conducted confirmatory factor analyses (CFAs) to test if our general-level measures of performance-related outcome variables (task performance, PI, OCB) and compensatory effort were best represented by four factors. Results showed that the four-factor model showed a satisfactory fit ($\chi^2 = 364.7$, $df = 183$, $p < .001$, RMSEA = 0.079, CFI = .91). Moreover, the four-factor model fit the data better than a one-factor model ($\Delta\chi^2 = 566.5$, $df = 6$, $p < .001$) and also had a better fit than different three-factor models ($\Delta\chi^2 \geq 72.1$, $df = 3$, $p < .001$) and two-factor models ($\Delta\chi^2 \geq 192.6$, $df = 5$, $p < .001$).

General level of negative affect was measured with six negative-affect items (sample items: “distressed”, “upset”) from the PANAS (Watson, Clark, & Tellegen, 1988). Participants had to respond to items with respect to how they felt in general. Cronbach’s alpha was .84.

Weekly survey data from Monday morning survey

Weekend recovery experiences. Psychological detachment from work, mastery experiences, and relaxation during the weekend were measured retrospectively in the Monday morning survey, each with four adapted items from the Recovery Experience Questionnaire (Sonnentag & Fritz, 2007). Items were adapted to measure how much psychological detachment, relaxation or mastery experiences an individual experienced during the previous weekend (sample item for psychological detachment: “During the weekend, I forgot about

work” ; sample item for relaxation: “During the weekend, I did relaxing things” ; sample item for mastery experiences: “During the weekend, I did things that challenge me”). Cronbach’s alpha ranged from .92 to .95 (mean = .94) for psychological detachment, from .82 to .92 (mean = .89) for relaxation, and from .82 to .90 (mean = .85) for mastery experiences over the four weeks.

Subjective evaluation of weekend sleep was measured by assessing subjective sleep quality during the weekend and subjective evaluation of weekend sleep duration. Subjective sleep quality of weekend sleep was measured with one single item (“How do you evaluate the quality of your sleep during the weekend?”) from the Pittsburgh Sleep Quality Index (Buysse, Reynolds, Monk, Berman, & Kupfer, 1989). Like in the original measure this item had to be answered on a 4-point Likert scale ranging from 1 = *very bad* to 4 = *very good*. Subjective evaluation of weekend sleep duration was assessed with three items developed for this study and assessed if weekend sleep duration was evaluated as sufficient or insufficient. The three items were “During this weekend, I did get enough sleep”, “During this weekend, I slept less than usual”(recoded) , “During this weekend, I had too little sleep”. Participants responded to items on a 5-point Likert scale ranging from 1 = *not true* to 5 = *totally true*.

As the single items of subjective sleep quality of weekend sleep and items from subjective evaluation of weekend sleep duration loaded on one factor, we collapsed the four standardized items into one measure of *subjective evaluation of weekend sleep*. Cronbach’s alpha ranged from .85 to .89 (mean = .87) over the four weeks.

State of being recovered on Monday morning was measured by a four-item scale by Sonnentag and Krueger (2006). The scale refers to how recovered and well-rested a person feels. Items had to be answered with respect to how a person felt on Monday morning. The four items were: “Now, on Monday morning I feel well rested”, “Now, on Monday morning I feel physically refreshed”, “Now, on Monday morning I feel mentally refreshed”, “Now, on

Monday morning I am filled with new energy”. Cronbach’s alpha ranged from .88 to .92 (mean = .91) over the four weeks.

Negative affect on Monday morning was measured with six negative-affect items (sample items “distressed”, “upset”) from the PANAS (Watson et al., 1988). Items had to be answered with respect to how a person felt “Now, on Monday morning”. Cronbach’s alpha ranged from .74 to .87 (mean = .82) over the four weeks.

We ran CFAs to confirm that variables measured in the Monday morning survey (psychological detachment, mastery experiences, relaxation, subjective evaluation of weekend sleep, state of being recovered and negative affect) represent distinct constructs. Because of the hierarchical structure of our data, we conducted CFAs with week-level data that was centered around the person-mean as suggested by Bolger, Davis and Rafaeli (2003). Results from CFAs showed that the six-factor model showed a satisfactory fit ($\chi^2 = 1045.41$, $df = 284$, $p < .001$, RMSEA = 0.078, CFI = .91). In addition, the six-factor model fit the data better than a one-factor model ($\Delta\chi^2 = 4089.79$, $df = 15$, $p < .001$) and also had a better fit than a four-factor model ($\Delta\chi^2 = 1617.24$, $df = 9$, $p < .001$) where items from psychological detachment, relaxation and mastery experiences during the weekend were specified to load on one factor.

Weekly survey data from Friday afternoon survey

Weekly task performance was measured with six items adapted from the performance scale by Roe et al. (2000). Our measure assessed how well an individual accomplished his or her work tasks during the last week. A sample item was “This week, the results of my work could have been better than they were” (reverse coded). Cronbach’s alpha ranged between .75 and .84 (mean = .80).

Weekly personal initiative was assessed with an adapted seven-item scale of personal initiative (Frese et al., 1997) measuring the degree of personal initiative shown at work during the week (sample item: “This week, I actively attacked problems”). Cronbach’s alpha ranged from .84 to .91 (mean = .88).

Weekly organizational citizenship behavior (OCB) was assessed with three adapted items from the OCBI scale of Williams and Anderson (1991). All items were adapted to measure the week-specific level of OCB, that is the degree a person helped and encouraged co-workers and ensured a pleasant working climate during the week (sample items: “This week, I helped others who had heavy work loads” , “This week, I took time to listen to co-workers problems and worries”). Cronbach’s alpha ranged between .68 and .78 (mean = .72).

Weekly compensatory effort at work was measured with three items developed for Study 1 (see Chapter 2) and two additional items developed for this study. The scale measured how exhausting and straining it was during the week to perform at work. Thus, it assessed how much compensatory effort a person had to expend during the week to achieve a certain level of performance (sample item: “This week, it needed much energy to work on my tasks”). Cronbach’s alpha ranged between .84 and .91 (mean = .88).

We conducted confirmatory factor analyses (CFAs) to confirm that our weekly-measures of performance-related outcome variables (task performance, PI, OCB, compensatory effort) were best represented by four factors. Specifically, CFAs were run with week-level performance data that was centered around the person-mean (Bolger et al., 2003). Results from CFAs revealed that the four-factor model showed a satisfactory fit ($\chi^2 = 482.29$, $df = 183$, $p < 0.001$, $RMSEA = 0.065$, $CFI = .91$). In addition, the four-factor model fit the data better than a one-factor model ($\Delta\chi^2 = 982.6$, $df = 6$, $p < .001$) and also had a better fit than different three-factor models ($\Delta\chi^2 \geq 93.1$, $df = 3$, $p < .001$) and two-factor models ($\Delta\chi^2 \geq 263.7$, $df = 5$, $p < .001$).

Weekend anticipation represents the anticipation of having a nice weekend during the days to come. We measured weekend anticipation with four items developed for this study (sample item “I am looking forward to a pleasant weekend”). Cronbach’s alpha ranged between .83 and .88 (mean = .86).

Data Analyses

We had data from each person at two levels: at the person-level (Level 2) and at the week-level (Level 1). Week-level data were nested within persons and thus hierarchical linear modeling was used to analyze the data, because it accounts for the dependence of observations at the lower level (Bryk & Raudenbush, 1992; Snijders & Bosker, 1999). We used the MLwiN software (Rasbash et al., 2000) for data analyses. Furthermore, to test for indirect effects of recovery experiences during the weekend and the subjective evaluation of weekend sleep on weekly performance, we applied multilevel structural equation modeling to our data (Mehta & Neale, 2005) using the Mplus software (Muthén & Muthén, 2006).

In our analyses, the general level of performance variables, the general level of negative affect and age constituted Level 2 data. Recovery experiences during the weekend (psychological detachment from work, mastery experiences, relaxation), the subjective evaluation of weekend sleep, the state of being recovered on Monday morning, negative affect on Monday morning, weekend anticipation and week-level performance variables constituted Level 1 data. Person-level predictor variables were centered around the grand mean and week-level predictor variables were centered around the respective person mean. We centered variables at Level 1 around the respective person mean because we wanted to eliminate between-person variance in order to attribute effects of Level 1 variables to effects within the person and to rule out interpretations based on between-person differences. Consequently, we did not test if the absolute level of being recovered on Monday morning is related to the general level of job performance (i.e., between-person differences), but if an increased or decreased state of being recovered on Monday morning within a person (i.e., compared to the average mean of this person) is related to higher or lower level of weekly performance within a person.

Results

Means, standard deviations and zero-order correlations are displayed in Table 6. For calculating the correlations between week-level and person-level variables, week-level variables were averaged across the four weeks. Before testing hypotheses we examined the variability of outcome variables across the four weeks. If outcome variables show substantive variation at the person and at the week level, it is necessary and important to apply hierarchical linear modeling and to search for predictors from both levels. The null model (i.e., a model without any predictor variables) provides information about the distribution of variance components at both levels. For the outcome variable state of being recovered the variance at Level 1 was 0.374, the variance at Level 2 was 0.354 (see Table 7), the total variance was 0.728. Thus, 51.4 percent of the total variance was attributable to within-person variation and 48.6 percent was attributable to between-person variation. Regarding performance-related outcome variables the ratio of within-person variance amounted to 41.3 percent for weekly task performance, 30.9 percent for weekly personal initiative, 47.1 percent for weekly OCB, and 44.9 percent for weekly compensatory effort (see Table 8 to Table 11). Therefore, we can conclude that for all outcome variables both within- and between-person variance is substantial and warrants an investigation of predictors at both levels.

Table 6

Means, Standard Deviations, and Zero-Order Correlations

Variables	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1 Detachment during the weekend	3.53	1.14		.14**	.26***	.18***	.28***	-.34***	.07	-.00	-.11*	-.28***	.17***					
2 Mastery experiences during the weekend	2.76	0.89	.12		.27***	.13**	.25***	-.05	.07	.13**	.17***	-.16**	.07					
3 Relaxation during the weekend	3.22	0.95	.28***	.34***		.32***	.37***	-.19***	.03	.10*	.02	-.15**	.29***					
4 Subjective evaluation of weekend sleep	0.00	0.87	.22**	.16*	.31***		.51***	-.23***	.10*	.10*	-.06	-.15**	.23***					
5 State of being recovered on Monday	3.58	0.87	.26**	.26**	.35***	.53***		-.41***	.21***	.27***	.05	-.24***	.28***					
6 Negative affect on Monday	1.32	0.47	-.44***	-.05	-.25**	-.24**	-.43***		-.19***	-.04	.08	.18***	-.25***					
7 Weekly task performance	4.00	0.59	.07	.04	.05	.08	.26**	-.22**		.48***	.15**	-.33***	.19***					
8 Weekly personal initiative	3.58	0.73	.01	.14	.13	.06	.25**	-.03	.50***		.34***	-.25***	.16**					
9 Weekly OCB	2.62	0.95	-.13	.26**	.05	-.11	.06	.11	.18*	.40***		-.09	-.03					
10 Weekly compensatory effort	2.68	0.89	-.31***	-.23**	-.18*	-.17*	-.23**	.21**	-.39***	-.33***	-.15		-.17***					
11 Weekend anticipation	3.89	0.82	.24**	.06	.41***	.29***	.37***	-.34***	.26**	.25**	-.02	-.18*						
12 General level of task performance	3.98	0.49	.17*	.07	.03	-.09	.16*	-.18*	.44***	.27**	.23**	-.21**	-.04					
13 General level of personal initiative	3.68	0.52	-.01	.17*	.16*	-.02	.20*	-.17*	.34***	.57***	.27**	-.18*	.20*	.42***				
14 General level of OCB	3.78	0.57	.14	.18*	.14	.02	.14	-.10	.25**	.24**	.44***	-.26**	.10	.22**	.20*			
15 General level of compensatory effort	2.54	0.72	-.35***	-.05	-.24**	.07	-.24**	.19*	-.14	-.14	-.08	.48***	-.13	-.33***	-.23**	-.33***		
16 General level of negative affect	1.71	0.61	-.36***	.00	-.09	-.17*	-.31***	.55***	-.30	-.04	.06	.26**	-.36***	-.28***	-.19*	-.05	.32***	
17 Age	40.74	8.78	-.02	-.10	-.09	.08	.09	-.04	.12	.02	-.18*	-.06	.03	-.04	.05	-.01	.19*	.01

Note. Correlations below the diagonal are person-level correlations (N = 159). Correlations above the diagonal are week-level correlations (n = 432).

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

Table 7

Multilevel Estimates for Models Predicting State of Being Recovered on Monday Morning

	Null Model			Model 1			Model 2			Model 3		
	Estim.	SE	t	Estim.	SE	t	Estim.	SE	t	Estim.	SE	t
Intercept	3.599	0.057	63.140	3.599	0.054	66.648	3.598	0.054	66.630	3.596	0.054	66.593
General level of negative affect				-0.366	0.088	-4.159 ***	-0.362	0.088	-4.114 ***	-0.359	0.088	-4.080 ***
Age				0.006	0.006	1.000	0.005	0.006	0.833	0.005	0.006	0.833
Negative affect in the beginning of the week							-0.596	0.098	-6.082 ***	-0.454	0.088	-5.159 ***
Detachment during the weekend										0.115	0.045	2.556 *
Mastery experiences during the weekend										0.104	0.046	2.261 *
Relaxation during the weekend										0.135	0.046	3.044 **
Subjective evaluation of weekend sleep										0.2993	0.047	6.234 ***
-2*log (lh)			996.507			979.594			944.724			865.745
Diff -2*log						16.913 ***			34.870 ***			78.979 ***
Df						2			1			4
Level 1 Intercept Variance (SE)												
Level 2 Intercept Variance (SE)												

Note. N on person-level = 159. N on week-level = 432. * p < .05; ** p < .01; *** p < .001

Test of Hypotheses

To test for the relationships between recovery experiences and subjective evaluation of weekend sleep with the state of being recovered on Monday morning (Hypotheses 1 to 4) and for the relationships between the state of being recovered and weekly job performance (Hypotheses 5 to 8) we conducted multilevel analyses for each outcome variable, that is for the state of being recovered on Monday morning, for weekly task performance, for weekly PI, for weekly OCB, and for weekly compensatory effort at work.

We specified and compared different models for each outcome variable: null model, Model 1, Model 2, Model 3. In the null model, the intercept was the only predictor. In Model 1, control variables at the person level (e.g., general level of negative affect, age) were entered. In Model 2, control variables at the week level (e.g., negative affect on Monday morning) were included. In Model 3, we entered week-level predictors (e.g., recovery experiences during the weekend or the state of being recovered) to test our hypotheses.

Table 7 shows the results for the state of being recovered on Monday morning as an outcome variable including coefficient estimates, standard errors of estimated coefficients, and t-values for all predictor variables, as well as the likelihood values for all models and differences between the likelihood values of models to be compared. Model 1 showed a significant improvement over the null model in predicting the state of being recovered on Monday morning ($\Delta - 2 \times \log = 16.913$, $\Delta df = 2$, $p < .001$). The general level of negative affect negatively predicted the state of being recovered whereas age was not a significant predictor. Model 2 showed an additional improvement over Model 1 ($\Delta - 2 \times \log = 34.870$, $\Delta df = 1$, $p < .001$) revealing that negative affect on Monday morning was a strong negative predictor of being recovered on Monday morning. Model 3 showed further improvement ($\Delta - 2 \times \log = 78.979$, $\Delta df = 4$, $p < .001$). All predictor variables, that is psychological detachment during the weekend, mastery experiences during the weekend, relaxation during the weekend, and subjective evaluation of weekend sleep were found to be positively related

Table 8

Multilevel Estimates for Models Predicting Weekly Task Performance

	Null Model			Model 1			Model 2			Model 3		
	Estim.	SE	t	Estim.	SE	t	Estim.	SE	t	Estim.	SE	t
Intercept	3.985	0.041	97.195	3.988	0.035	113.943	3.988	0.035	113.943	3.988	0.035	113.943
General level of negative affect				-0.162	0.060	-2.700 **	-0.161	0.060	-2.683 **	-0.160	0.060	-2.667 **
Age				0.008	0.004	2.000 *	0.008	0.004	2.000 *	0.008	0.004	2.000 *
General level of task performance				0.433	0.076	5.697 ***	0.434	0.076	5.711 ***	0.432	0.076	5.760 ***
Weekend anticipation							0.018	0.036	0.500	0.018	0.036	0.500
Negative affect in the beginning of the week							-0.032	0.065	-0.492	0.014	0.068	0.206
State of being recovered in the beginning of the week										0.080	0.039	2.051 *
-2*log (lh)			634.264			587.401			587.032			582.747
Diff -2*log						46.863 ***			0.369			4.285 *
Df						3			2			1
Level 1 Intercept Variance (SE)		0.145 (0.012)			0.145 (0.012)			0.145 (0.012)			0.143 (0.012)	
Level 2 Intercept Variance (SE)		0.206 (0.030)			0.137 (0.022)			0.137 (0.022)			0.137 (0.012)	

Note. N on person-level = 159. N on week-level = 432. * p < .05; ** p < .01; *** p < .001

Table 9

Multilevel Estimates for Models Predicting Weekly Personal Initiative

	Null Model			Model 1			Model 2			Model 3		
	Estim.	SE	t	Estim.	SE	t	Estim.	SE	t	Estim.	SE	t
Intercept	3.574	0.052	68.731	3.575	0.043	83.140	3.574	0.043	83.116	3.574	0.043	83.116
General level of negative affect				0.062	0.072	0.861	0.061	0.072	0.847	0.064	0.072	0.889
Age				-0.001	0.005	-0.200	-0.001	0.005	-0.200	-0.001	0.005	-0.200
General level of personal initiative				0.737	0.086	8.570 ***	0.737	0.086	8.570 ***	0.733	0.085	8.623 ***
Weekend anticipation							-0.046	0.038	-1.211	-0.035	0.037	-0.946
Negative affect in the beginning of the week							-0.011	0.069	-0.159	0.080	0.071	1.127
State of being recovered in the beginning of the week										0.155	0.040	3.875 ***
-2*log (lh)			740.272			678.718			677.218			662.713
Diff -2*log						61.554 ***			1.500			14.505 ***
Df												1
Level 1 Intercept Variance (SE)		0.162 (0.014)			0.161 (0.014)			0.161 (0.014)			0.152 (0.013)	
Level 2 Intercept Variance (SE)		0.362 (0.049)			0.226 (0.033)			0.226 (0.033)			0.229 (0.033)	

Note. N on person-level = 159. N on week-level = 432. * p < .05; ** p < .01; *** p < .001

to the state of being recovered. After weekends when an individual highly detached from work, experienced a high level of mastery and relaxation, and slept enough and well during the weekend, the individual was more recovered on Monday morning. Consequently, Hypotheses 1 to 4 were supported.

Table 8 shows the results for weekly task performance as outcome variable. Model 1 showed a significant improvement over the null model ($\Delta - 2 \times \log = 46.863$, $\Delta df = 3$, $p < .001$). The general level of task and age were positive predictors of weekly task performance and negative affect was a negative predictor. Model 2 showed no improvement over Model 1 ($\Delta - 2 \times \log = 0.369$, $\Delta df = 2$). Model 3 showed additional improvement over Model 2 ($\Delta - 2 \times \log = 4.285$, $\Delta df = 1$, $p < .05$) and the state of being recovered on Monday morning positively predicted weekly task performance. In weeks when an individual indicated a higher state of being recovered on Monday morning the individual showed a higher level of weekly task performance. Therefore, Hypothesis 5 was confirmed.

Results for the outcome variable weekly PI can be seen in Table 9. Model 1 showed a significant improvement over the null model ($\Delta - 2 \times \log = 61.554$, $\Delta df = 3$, $p < .001$). The general level of PI positively predicted weekly PI. The general level of negative affect and age were unrelated to weekly PI. Model 2 showed no improvement over Model 1 ($\Delta - 2 \times \log = 1.500$, $\Delta df = 2$). Model 3 showed additional improvement over Model 3 ($\Delta - 2 \times \log = 14.505$, $\Delta df = 1$, $p < .001$) and the state of being recovered on Monday morning positively predicted weekly PI. In weeks when an individual indicated to be highly recovered on Monday morning the individual showed a higher level of weekly PI. Therefore, Hypothesis 6 was confirmed.

Table 10 shows the results for the outcome variable weekly OCB. Model 1 showed a significant improvement over the null model ($\Delta - 2 \times \log = 46.616$, $\Delta df = 3$, $p < .001$). The general level of OCB positively predicted weekly OCB, age negatively predicted weekly OCB, and the general level of negative affect was unrelated to weekly OCB. Model 2 showed

no improvement over Model 1 ($\Delta - 2 \times \log = 0.917$, $\Delta df = 2$). Model 3 showed additional improvement over Model 2 ($\Delta - 2 \times \log = 5.059$, $\Delta df = 1$, $p < .05$) and the state of being recovered on Monday morning positively predicted weekly OCB. In weeks when an individual indicated a higher state of being recovered on Monday morning the individual showed a higher level of weekly OCB. Therefore, Hypothesis 7 was confirmed.

Results for the outcome variable weekly compensatory effort can be seen in Table 11. Model 1 showed a significant improvement over the null model ($\Delta - 2 \times \log = 57.084$, $\Delta df = 3$, $p < .001$) and the general level of compensatory effort spent at work positively predicted weekly compensatory effort. The general level of negative affect and age were unrelated to weekly compensatory effort. Model 2 showed no improvement over Model 1 ($\Delta - 2 \times \log = 2.080$, $\Delta df = 2$). Model 3 showed additional improvement over Model 2 ($\Delta - 2 \times \log = 4.333$, $\Delta df = 1$, $p < .05$) and the state of being recovered on Monday morning negatively predicted weekly compensatory effort. In weeks when an individual indicated a higher state of being recovered on Monday morning the individual spent less compensatory effort during the week. Therefore, Hypothesis 8 was confirmed.

Table 10

Multilevel Estimates for Models Predicting Weekly OCB

	Null Model			Model 1			Model 2			Model 3		
	Estim.	SE	t	Estim.	SE	t	Estim.	SE	t	Estim.	SE	t
Intercept	2.624	0.065	40.369	2.620	0.055	47.636	2.620	0.055	47.636	2.619	0.055	47.618
General level of negative affect				0.135	0.090	1.500	0.134	0.090	1.489	0.137	0.090	1.522
Age				-0.019	0.006	-3.167 **	-0.020	0.006	-3.333 ***	-0.020	0.006	-3.333 ***
General level of OCB				0.637	0.097	6.567 ***	0.634	0.097	6.536 ***	0.633	0.097	6.526 ***
Weekend anticipation							-0.040	0.062	-0.645	-0.030	0.061	-0.492
Negative affect in the beginning of the week							-0.080	0.112	-0.714	0.005	0.117	0.043
State of being recovered in the beginning of the week										0.149	0.066	2.258 *
-2*log (lh)			1074.835			1028.219			1027.302			1022.243
Diff -2*log						46.616 ***			0.917			5.059 *
Df						3			2			1
Level 1 Intercept Variance (SE)												
				0.429 (0.037)		0.433 (0.037)			0.432 (0.037)			0.425 (0.036)
Level 2 Intercept Variance (SE)				0.481 (0.075)		0.304 (0.055)			0.304 (0.055)			0.304 (0.055)

Note. N on person-level = 159. N on week-level = 432. * p < .05; ** p < .01; *** p < .001

Table 11

Multilevel Estimates for Models Predicting Weekly Compensatory Effort

	Null Model			Model 1			Model 2			Model 3		
	Estim.	SE	t	Estim.	SE	t	Estim.	SE	t	Estim.	SE	t
Intercept	2.684	0.061	53.947	2.681	0.049	54.714	2.681	0.049	54.714	2.681	0.049	54.714
General level of negative affect				0.138	0.085	1.624	0.138	0.085	1.624	0.136	0.085	1.600
Age				-0.011	0.006	-1.833	-0.011	0.006	-1.833	-0.011	0.006	-1.833
General level of compensatory effort				0.542	0.073	7.425 ***	0.537	0.073	7.356 ***	0.534	0.073	7.315 ***
Weekend anticipation							-0.025	0.056	-0.446	-0.034	0.056	-0.607
Negative affect in the beginning of the week							0.139	0.102	1.363	0.067	0.106	0.632
State of being recovered in the beginning of the week										-0.126	0.060	-2.100 *
-2*log (lh)			1000.944			943.860			941.780			937.447
Diff -2*log						57.084 ***			2.080			4.333 *
Df						3			2			1
Level 1 Intercept Variance (SE)												
				0.353 (0.030)		0.361 (0.031)			0.359 (0.030)			0.352 (0.030)
Level 2 Intercept Variance (SE)				0.433 (0.066)		0.238 (0.044)			0.239 (0.044)			0.243 (0.044)

Note. N on person-level = 159. N on week-level = 432. * $p < .05$; ** $p < .01$; *** $p < .001$

Testing for indirect effects of recovery experiences and subjective sleep evaluation on weekly job performance

As we found that recovery experiences (psychological detachment, mastery experiences and relaxation) and sleep during the weekend predicted the state of being recovered on Monday and that the state of being recovered on Monday predicted weekly job performance, one may ask if the state of being recovered on Monday morning is the linking mechanism. Therefore, we tested indirect effects of recovery experiences and subjective sleep evaluation on weekly job performance. Testing indirect effects is distinct from testing mediation effects (Mathieu & Taylor, 2006). Testing a mediator requires that there exists a direct relationship between predictor and criterion that is well established (Mathieu & Taylor, 2006). The relationship between recovery experiences and sleep during the weekend with job performance has not been established in previous studies. Furthermore, multilevel analyses with our data revealed no direct effects of recovery experiences and sleep on performance outcomes. An indirect effect between predictor and criterion is indicated if predictor and outcome are not directly related, but if a predictor is related to a 'mediator' that in turn is linked to an outcome and if the indirect effect turns out to be significant (Mathieu & Taylor, 2006). From a theoretical point of view, an indirect effect indicates a linking mechanism, while a mediator is the process that explains a relationship between predictor and criterion (Mathieu & Taylor, 2006). As previous research and the data from our study did not support a direct relationship between recovery experiences and sleep with weekly job performance, we followed the recommendations by Mathieu and Taylor (2006) and tested for indirect effects.

To examine if recovery experiences and sleep during the weekend were indirectly related to weekly performance via the state of being recovered on Monday morning, we specified a multilevel structural equation model (SEM) using the software Mplus (Muthén & Muthén, 2006). Multilevel SEM combines structural equation modeling with the analysis of hierarchical data (Kaplan & Elliott, 1997; Mehta & Neale, 2005; Muthén & Satorra, 1995).

The basic assumption is that part of the variance of variables at the lower level is attributable to variance of the higher level. As in multilevel analyses, variance components at both levels are determined (Kaplan & Elliott, 1997; Mehta & Neale, 2005). As noted earlier Level 1 variance for weekly task performance amounted to 41.3 percent and Level 2 variance amounted to 58.7 percent. Neglecting the measurement model, task performance was measured as a manifest variable at Level 1. Thus, the within-person variance of weekly task performance constitutes a manifest Level 1 variable. The between-person variance of weekly task performance constitutes a Level 2 variable and is modeled as a latent variable at Level 2. According to this principle, Level 1 and Level 2 variance components of predictor and criterion variables can be modeled at both levels and path analyses can be used to test predicted relationships (Kaplan & Elliott, 1997; Mehta & Neale, 2005).

As we were interested in testing indirect effects of recovery experiences and sleep during the weekend on weekly job performance via the state of being recovered on Monday morning, we specified a simplified model only containing the variables of interest for testing indirect effects. We did not integrate the measurement model in our multilevel structural equation model in order to have sufficient cases for the number of parameters to be estimated on both levels (Mehta & Neale, 2005). Thus, we integrated psychological detachment, mastery experiences, relaxation, subjective evaluation of weekend sleep, the state of being recovered on Monday morning and weekly task performance, PI, OCB and compensatory effort in our multilevel structural equation model (see Figure 4). Analogous to our multilevel analyses we centered psychological detachment, mastery experiences, relaxation, subjective evaluation of weekend sleep around the respective person mean. Thus, the between-person variance was eliminated and these variables were only modeled at Level 1. As the state of being recovered and weekly performance variables were outcome variables, we did not center these variables. The between-person variance components of the state of being recovered and weekly performance variables were modeled as latent factors at Level 2. Regarding the path

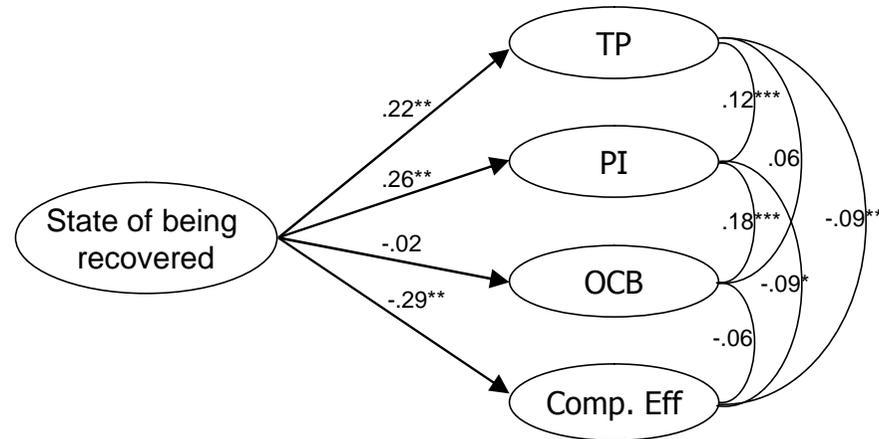
model at Level 1, we specified paths from psychological detachment, mastery experiences, relaxation, subjective evaluation of weekend sleep to the state of being recovered and from the state of being recovered to weekly task performance, PI, OCB and compensatory effort. At Level 2, we also specified the paths from the state of being recovered to weekly task performance, PI, OCB and compensatory effort assuming that individuals that are more recovered than others show higher task performance, PI, OCB and have to spend less compensatory effort at work. Furthermore, we let the performance variables correlate with each other at both levels as we knew from correlation analyses and CFAs that the performance variables represent distinct but highly related constructs.

Figure 4 shows standardized estimates of path coefficients. In sum, our model showed a very good fit to the data ($\chi^2 = 17.0$, $df = 16$, $p = .38$) and the calculation of the root mean square error of approximation (RMSEA = .012) and the comparative fit index (CFI = .996) indicated an excellent fit. Estimated path coefficients showed results similar to findings from multilevel analyses. The hypothesized relationships were confirmed by significant path coefficients, with the exception that mastery experiences during the weekend were not significantly related to the state of being recovered on Monday morning and the state of being recovered was not significantly related to weekly task performance.

For testing the indirect effects we calculated the indirect effects for each predictor and outcome variable by multiplying the path between the respective predictor and mediator (Path A) with the path between the mediator and criterion variable (Path B). The standard error of the indirect effect was calculated by using the formula suggested by Baron and Kenny (1986; Shrout & Bolger, 2002). Dividing the indirect effect by its standard error results into a test-statistic that follows a z distribution. Table 12 shows the calculation of all indirect effects. Results revealed indirect effects of psychological detachment and relaxation during the weekend on weekly PI, as well as indirect effects of sleep during the weekend on weekly PI and compensatory effort.

Figure 4.

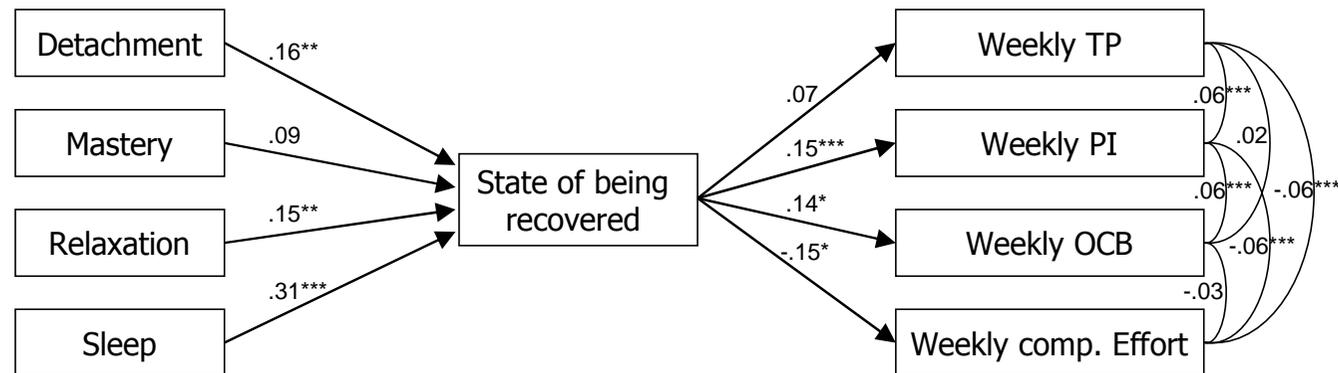
Results for Multilevel Structural Equation Model Modeling Relationships between Recovery Experiences, Sleep, State of Being Recovered and Job Performance.



between



within



Note. $\chi^2 = 17.047$, $df = 16$, $p = 0.38$, $RMSEA = 0.012$; $CFI = .996$; $TLI = .991$; * $p < .05$; ** $p < .01$; *** $p < .001$;

TP = Task Performance ; PI = Personal Initiative ; OCB = Organizational Citizenship Behavior ; Comp. Eff. = Compensatory Effort

Table 12.

Results for Testing Indirect Mediation Effects of Recovery Experiences and Sleep on Weekly Job Performance.

Predictor variable	Outcome variable	Path a	SE	Path b	SE	Indirect effect		
						a × b	SE	z
Detachment	Weekly task performance	0.164	0.052	0.072	0.038	0.012	0.008	1.57
	Weekly personal initiative	0.164	0.052	0.146	0.040	0.024	0.010	2.34 *
	Weekly OCB	0.164	0.052	0.137	0.066	0.022	0.013	1.68
	Weekly compensatory effort	0.164	0.052	-0.145	0.060	-0.024	0.013	-1.86
Mastery Experiences	Weekly task performance	0.093	0.053	0.072	0.038	0.007	0.006	1.20
	Weekly personal initiative	0.093	0.053	0.146	0.040	0.014	0.009	1.54
	Weekly OCB	0.093	0.053	0.137	0.066	0.013	0.010	1.26
	Weekly compensatory effort	0.093	0.053	-0.145	0.060	-0.013	0.010	-1.35
Relaxation	Weekly task performance	0.146	0.054	0.072	0.038	0.011	0.007	1.49
	Weekly personal initiative	0.146	0.054	0.146	0.040	0.021	0.010	2.12 *
	Weekly OCB	0.146	0.054	0.137	0.066	0.020	0.013	1.58
	Weekly compensatory effort	0.146	0.054	-0.145	0.060	-0.021	0.012	-1.74
Subjective sleep evaluation	Weekly task performance	0.313	0.058	0.072	0.038	0.023	0.013	1.78
	Weekly personal initiative	0.313	0.058	0.146	0.040	0.046	0.015	2.99 **
	Weekly OCB	0.313	0.058	0.137	0.066	0.043	0.022	1.91
	Weekly compensatory effort	0.313	0.058	-0.145	0.060	-0.045	0.021	-2.17 *

Note. N on person-level = 159. N on week-level = 432. * $p < .05$; ** $p < .01$; *** $p < .001$

Discussion

The aim of our study was to examine specific recovery experiences and sleep during the weekend as predictors of being recovered after the weekend. Furthermore, we investigated if the state of being recovered in the beginning of the week (i.e., after the weekend) benefits weekly task performance, personal initiative (PI), organizational citizenship behavior (OCB) and compensatory effort. Our hypotheses were largely confirmed. Results from multilevel-analyses showed that psychological detachment, relaxation, mastery experience as well as subjective evaluation of weekend sleep were positively related to the state of being recovered on Monday morning. The state of being recovered on Monday morning in turn was positively related to weekly task performance, PI and OCB and negatively related to compensatory effort spent during the week.

Analyzing our data with a multilevel SEM approach also largely supported our hypotheses. In contrast to results from multilevel analyses, mastery experiences were not significantly related to the state of being recovered after the weekend and the state of being recovered was not significantly related to weekly task performance at the within-person level. Results from testing indirect effects of recovery experiences and sleep on weekly job performance and compensatory effort revealed that psychological detachment, relaxation and subjective evaluation of sleep were indirectly related to weekly PI. Subjective evaluation of sleep also was indirectly related to weekly compensatory effort.

Taken together, our results show that sleep plays a very important role for recovery during the weekend and in the consequence for weekly performance. These results are in line with the results of other studies that showed substantial effects of sleep on employees affect, health (Scott & Judge, 2006; Stone et al., 1995) and work-related outcomes (Pilcher & Huffcutt, 1996; Scott & Judge, 2006). Sleep may be an important part of the recovery process, because it restores an individual's physical resources and also comprises mood regulation

(Scott & Judge, 2006). As sleep has been largely neglected in studies on recovery (Rook & Zijlstra, 2006), researches should pay more attention to sleep as it is crucial for recovery.

Psychological detachment, relaxation and mastery experiences during the weekend also positively predicted the state of being recovered. These results support the view that the prevention of a further resource drain and the restoration of resources by mentally switching off from work, reducing a state of prolonged activation and by pursuing challenging activities contribute to an increased level of resources and thus to a higher state of being recovered. Our study complements results from other studies using different designs and investigating different time-intervals that showed beneficial effects of recovery experiences for employees' affect and well-being (Sonnentag et al., 2008; Sonnentag & Fritz, 2007). However, the relationship between mastery experiences and the state of being recovered is small and was not supported in the multilevel SEM model. Testing for all effects at the same time is a rather conservative approach. Therefore, the small effect found in multilevel analyses was not significant in the multilevel SEM model. Furthermore, it might be that the positive effects of mastery through the buildup of resources, such as skills, self-efficacy or self-esteem need some time to unfold. In the short-term, the investment of effort and self-regulatory resources may decrease the positive effect of mastery experiences.

Considering the link between the state of being recovered in the beginning of the week and weekly performance, our results support the assumption that in weeks when an individual is highly recovered, he or she has more resources available that can be allocated to work tasks and thus a higher level of weekly performance is shown. We found the strongest relationship with weekly PI. As PI is a self-initiated behavior, increasing PI may be easier and more likely than increasing task performance or OCB when someone is highly recovered. Increasing task performance and OCB may be more difficult because task performance and OCB may be more contingent on situational factors. If a highly recovered individual actually increases weekly OCB may also depend on coworkers needing for help. Similarly, the accomplishment

of many tasks may be standardized or prescribed limiting an individual's possibilities to increase the quality of task performance.

As expected, an individual perceived the accomplishment of his or her tasks as less effortful and straining in weeks when he or she was highly recovered. Thus, the state of being recovered not only benefits weekly job performance but also decreases the psychological costs of accomplishing tasks during the week. This finding supports the view that a high state of being recovered is associated with an increased level of resources that improves and facilitates resource allocation to job tasks and makes task accomplishment easier and less straining (Beal et al., 2005). Reducing the psychological costs of task accomplishment seems to be particularly important for showing high performance over a longer period of time and for preventing negative long-term effects of a sustained high-effort investment, such as chronic fatigue and health impairments (Hockey et al., 1998; Hockey, 1997).

Beyond results on the hypothesized within-person relationships, multilevel SEM analyses provided us with information on the relationship between the state of being recovered and weekly job performance on the between-person level. Specifically, our model (see Figure 1) showed that persons who are in general more recovered on Monday mornings show a higher general level of weekly task performance, PI, and have to spend less compensatory effort at work than persons who are in general less recovered on Monday mornings. Although, we cannot rule out the potential influence of other third variables on relationships at the between person-level, the relationship between the state of being recovered and weekly job performance seems to hold at both the within- and between person-level for weekly PI and compensatory effort, whereas a relationship between feeling recovered and weekly OCB was just found at the within-person level.

Limitations

This study has several limitations. First, our measures of performance were assessed by self-reports. These self-reports might be subject to social desirability or a self-serving bias. However, the design of our study and procedures of data analyses (e.g., centering predictor variables around the respective person mean) should rule out interpretations based on differences between individuals, including such biases. Such between-person differences and biases should be related to the absolute level of performance and not to weekly fluctuations in performance that were the focus of our analyses. Accordingly, Beal et al. (2005, p. 1064) stated that “self-ratings may be more valid with EMA (ecological momentary assessment) than with other methods”. Of course, future studies should examine if the relationships are also found when using objective data, supervisor or peer ratings as indicators of job performance. However, when investigating the dynamic nature of performance over short periods of time, researchers have to choose indicators or raters that are able to reflect or evaluate short-term changes in performance. Although supervisors may be good in evaluating employees’ general level of performance, they might be poor in evaluating employees’ change in performance from week to week as they do not have sufficient opportunities to observe employees over the course of weeks.

Second, all of our measures are based on self-reports of the same person and thus common method variance might be a problem (Podsakoff et al., 2003). We tried to overcome this problem by temporally separating the measures whenever possible. Specifically, we assessed person-level control variables in the first general survey, recovery experiences, subjective evaluation of weekend sleep and the state of being recovered in the weekly Monday morning survey, and weekly job performance and compensatory effort in the weekly Friday afternoon survey. Such a procedure should reduce common method variance (Podsakoff et al., 2003). By controlling for a person’s general level of negative affect and for a person’s negative affect on Monday morning we tried to rule out most plausible alternative

explanations. Future studies could assess recovery experiences or sleep by asking spouses or significant others.

In addition, from our study we cannot draw conclusions about the causal relationships between recovery experiences and sleep during the weekend with the state of being recovered and between the state of being recovered with weekly job performance. Experimental studies or intervention studies manipulating recovery experiences, the sleep duration or quality are needed to confirm the causal links of proposed relationships.

Implications for Research and Practice

Now that we established a link between recovery experiences and sleep during the weekend with the state of being recovered in the beginning of the week and between the state of being recovered and weekly job performance, future studies should investigate which resources are restored and built up during the recovery process and which resources are the mediating mechanisms in the relationship between recovery and performance.

As our study focused on recovery during the weekend and weekly job performance, future research should examine the interplay with recovery that occurs during the week. Is recovery during the week less important if an individual is highly recovered in the beginning of the week? Can recovery during the week compensate for a poor recovery during the weekend? Future studies may examine how the effects of being recovered in the beginning of the week fade out during the week. Workplace characteristics, such as stressors or resources that consume or replenish individuals' resources may accelerate or decelerate such a fade-out process.

In addition, one task for future research should be to examine cumulative effects of recovery over time. For example, what happens if an individual lacks recovery over weeks or even months? Future studies should investigate effects over longer time-intervals than weeks. This may be particularly important because some recovery processes, such as psychological

detachment may be effective in the short-term, and other processes, such as mastery experience may unfold their effects in the long-run.

Results from our study also have direct practical implications. Assuming that recovery experiences during the weekend and subjective evaluation of weekend sleep cause the subjective state of being recovered on Monday and that being recovered in turn causes an increase in weekly job performance and a decrease in compensatory effort, our study implies that employees should be encouraged and supported to recover from work-related stress during the weekend. Increasing psychological detachment, relaxation and mastery experiences during the weekend and the subjective evaluation of weekend sleep by providing specific interventions or recommending employees certain strategies for recovery should benefit a persons' state of being recovered.

Moreover, our study revealed that weekly proactive behavior can be indirectly supported by fostering psychological detachment and relaxation during the weekend and by ensuring enough sleep of good quality. In addition, ensuring ample and good sleep indirectly contributes to employees' weekly OCB and decreases the psychological costs of performance.

In sum, organizations and employees should be aware that being recovered after the weekend is not only a pleasant experience for the employee but is also a critical factor for weekly job performance and the performance-related costs. Organizations should support and enable employees' recovery during the weekend as it pays of for both the employee and the organization.

STUDY 3:**FEELING RECOVERED AND THINKING ABOUT THE GOOD SIDES
OF ONE'S WORK: A LONGITUDINAL STUDY ON THE BENEFITS OF NON-
WORK EXPERIENCES FOR JOB PERFORMANCE****Summary**

Consistent with a positive psychology perspective, this study investigated the relations between positive and negative non-work experiences (i.e., feeling recovered during leisure time, thinking about the positive and negative aspects of one's work during leisure time) with different dimensions of job performance over time. In total, 349 employees working with people with special needs responded to two questionnaires at an interval of six months. Results from hierarchical regression analyses showed that feeling recovered during leisure time predicted an increase in task performance after six months. This relation was mediated by occupational self-efficacy. Positive work reflection was found to predict an increase in personal initiative, creativity and organizational citizenship behavior. Negative work reflection was unrelated to job performance. Our results emphasize the role of positive non-work experiences for employees' performance.

Introduction

Work and non-work domains are both important parts of an employee's life. One domain can benefit the other domain, but both domains can also interfere with each other (Ford, Heinen, & Langkamer, 2007; Rothbard, 2001). Specifically, experiences and behaviors at work affect experiences and behaviors in the non-work domain and vice versa (for recent studies see for example Gordon, Whelan-Berry, & Hamilton, 2007; Ilies, Schwind, Wagner et al., 2007; van Steenbergen, Ellemers, & Mooijaart, 2007).

Recovery is one of the experiences in the non-work domain that has been shown to benefit individuals' well-being and job performance (e.g., Fritz & Sonnentag, 2005; Trougakos et al., 2008). However, research on the benefits of recovery for job performance is still scarce and investigated rather short-term consequences of recovery, namely immediate benefits of recovery for performance on the same and next day or some weeks after vacations (see Study 1, Chapter 2; Fritz & Sonnentag, 2005, 2006; Trougakos et al., 2008).

In our study, we examined being recovered (i.e., feeling mentally and physically refreshed) during leisure time – an indicator of individuals' successful recovery during leisure time – as a predictor of individuals' job performance over a longer period of time (six months). Thereby, we complemented related research on the relation between need for recovery and fatigue with performance-related outcomes (Demerouti et al., 2007; Van der Linden, Frese, & Meijman, 2003). In line with the positive psychology framework (Seligman & Csikszentmihalyi, 2000; Wright, 2003), we focused on the positive concept of feeling recovered during leisure time. The positive psychology framework proposes that researchers should investigate positive conditions or processes that contribute to the optimal functioning of individuals (Gable & Haidt, 2005; Seligman & Csikszentmihalyi, 2000).

In addition, studies showed that thinking about work during leisure time (e.g., ruminating) and not being able to mentally switch off from work is another important non-work experience (Cropley & Purvis, 2003; Etzion et al., 1998; Sonnentag & Bayer, 2005).

Although research has shown that it is important to distinguish between positive and negative thinking (Segerstrom, Stanton, Alden, & Shortridge, 2003), most studies examining work-related thoughts during non-work time focused on negative thoughts (Cropley, Dijk, & Stanley, 2006; Cropley & Purvis, 2003) or the absence of work-related thoughts (e.g., psychological detachment; Sonnentag & Bayer, 2005) and neglected positive thoughts and their potentially positive outcomes (for an exception see Fritz & Sonnentag, 2006). Moreover, research investigating the relation between positive and negative work-related thoughts during non-work time with job performance is sparse (Fritz & Sonnentag, 2005, 2006). Our study addresses this gap and examines both the relations of positive and negative work reflection during leisure time with individual job performance.

In addition, our study investigated if self-efficacy is one of the resources that is built up during the recovery process and that benefits subsequent job performance. Self-efficacy can be viewed as a personal resource (Hobfoll, 1989) and as a part of an individuals' positive psychological capital (Luthans et al., 2007). As self-efficacy has been defined as one of the core positive psychological constructs (Luthans et al., 2007; Luthans & Youssef, 2004) and has been shown to be a predictor of job performance (Stajkovic & Luthans, 1998), we propose that self-efficacy serves as a mediator in the relation between non-work experiences and job performance.

Our study contributes to research on spillover from the non-work domain to the work domain (Edwards & Rothbard, 2000; Hammer, Cullen, Neal, Sinclair, & Shafiro, 2005; Stevens, Minnotte, Mannon, & Kiger, 2007) by examining the relations of positive (feeling recovered, positive work reflection) and negative non-work experiences (negative work reflection) with an individual's job performance. As far as we know, our study is the first that investigates the relations between feeling recovered and thinking about work during leisure time with job performance over a longer period of time (i.e., six months).

Our study is also relevant with regard to practice. If it turns out that feeling recovered, positive and negative work reflection are predictors of job performance, individuals should be supported and encouraged to take care of their recovery during leisure time by engaging in positive work reflection and preventing negative work-related thoughts.

Recovery during leisure time

At work, individuals have to invest physical and mental resources to accomplish their tasks and to deal with job-related demands (Meijman & Mulder, 1998). Consequently, over the day or working week an individual's resources are depleted resulting in the experience of fatigue and a need for recovery (Sluiter et al., 1999). After work (i.e., usually in the evening or during the weekend) individuals have time to rest and unwind from job-related stressors or demands. This process of unwinding and restoration is called recovery. Specifically, recovery is the process that reverses the negative effects of job-related demands and enables an individual's functional system to return to the pre-stressor level of functioning (Craig & Cooper, 1992).

Hobfoll's (1989; Hobfoll & Shirom, 2001) Conservation of Resources (COR) model provides a theoretical framework that can explain the recovery process. One core assumption in this model is that individuals strive to gain and protect their resources (Hobfoll, 1989). Resources are defined as "those objects, personal characteristics, conditions, or energies that are valued by the individual or that serve as a means for attainment of these objects, personal characteristics, conditions, or energies." (Hobfoll, 1989, p. 516). During leisure time, an individual is no longer confronted with work-related stressors and demands, and thus, a further resource loss can be prevented. In addition, during leisure time the individual has the opportunity to engage in activities that restore and increase an individual's resources (e.g., self-efficacy or positive affect ; Fritz & Sonnentag, 2005).

In the following, we will first propose that feeling recovered during leisure time - as an indicator of successful recovery - is related to an individual's job performance over time. Moreover, we will argue that two additional non-work experiences, namely thinking about the positive and negative aspects of one's job (Fritz & Sonnentag, 2006; Segerstrom et al., 2003), are also important for an individuals' job performance over time.

Feeling recovered during leisure time and job performance

Feeling recovered during leisure time characterizes how much an individual feels physically and mentally refreshed and full of energy (Sonnentag & Krueger, 2006). It is a positive indicator of successful recovery during leisure time. Feeling recovered during leisure time is similar, but distinct from other concepts, such as need for recovery and work-related mental fatigue (Demerouti et al., 2007; Van der Linden et al., 2003). Need for recovery is conceptualized as the short-term response following work-related demands (Sluiter et al., 1999) and refers to a person's need for recuperation from work-induced fatigue, primarily experienced after a working day (Jansen, Kant, & van den Brant, 2002). Mental fatigue is defined as a change in psychophysiological states due to sustained performance on tasks that require mental effort (Van der Linden et al., 2003). Whereas need for recovery and mental fatigue represent negative indicators of individuals' degree of being recovered after a working day or a performance episode, being recovered during leisure time is a positive indicator of recovery and reflects a more general evaluation if an individual feels physically and mentally fit during leisure time. Following the perspective of positive psychology (Seligman & Csikszentmihalyi, 2000), we focused on the positive construct feeling recovered during leisure time when predicting job performance.

Feeling highly recovered during leisure time indicates that successful recovery has occurred and that resources have been built up (Hobfoll & Shirom, 2001). When back at work, the individual should have more resources available that can be invested into the

performance process (Fritz & Sonnentag, 2005). Rebuilt resources should be particularly important for showing high performance over a longer period of time. While individuals may be able to counteract the negative consequences of feeling poorly recovered and uphold their performance level over a short period of time (e.g., a day or a week ; cf. Hockey, 1997), feeling poorly recovered may be related to decreased performance over longer periods of time. Taken together, we propose a positive relation between feeling recovered during leisure time and individuals' job performance over time.

In our study, we follow the view that job performance is a multidimensional construct (Campbell, 1990; Motowidlo et al., 1997) and included several performance outcomes. First, we addressed task performance, as it encompasses an individual's direct contribution to organizational performance that is formally required from employees (Williams & Anderson, , 1991). Second, we focused on three different types of contextual performance, namely on personal initiative (PI) (Frese et al., 1996), creativity (Amabile, 1996) and the helping dimension of organizational citizenship behavior (OCB) (Organ, 1994; Smith et al., 1983). PI is one form of proactive behavior (Crant, 2000) and is defined as "a behavior syndrome resulting in an individual's taking an active and self-starting approach to work and going beyond what is formally required in a given job" (Frese, Kring, Soose & Zempel, , 1996, p. 38). Creativity involves the generation of new and potentially useful products, practices, services or procedures (Amabile, 1996; Shalley, Zhou, & Oldham, 2004). In our sample of employees working with people with special needs, creativity is not part of the job and thus represents another construct of contextual performance (Unsworth, Wall, & Carter, 2005). Helping behavior is a core dimension of OCB and includes helping coworkers with their tasks or problems (Podsakoff et al., , 2000), as well as building and preserving interpersonal relations (Van Dyne & LePine, 1998). We propose that feeling recovered during leisure time is positively related to all performance outcomes over time, that is to task performance, PI, creativity and OCB.

Some previous studies investigated the relation between recovery during leisure time and job performance: First, two day-level studies examined within-person relations between feeling recovered in the morning and daily job performance and found positive relations with daily personal initiative, task performance, and OCB (Study 1, Chapter 2; Sonnentag, 2003). Furthermore, Trougakos, Beal, Green and Weiss (2008) revealed in a sample of cheerleader instructors that recovery during work breaks is positively related to subsequent performance of affective delivery. In addition, a week-level study over four weeks showed that when individuals felt highly recovered in the beginning of the working week (measured on Mondays), they showed higher task performance, personal initiative, and OCB during the week (measured on Fridays, Study 1, Chapter 2). In sum, we state the following hypothesis:

Hypothesis 1: Feeling recovered during leisure time is positively related to task performance (1a), personal initiative (1b), creativity (1c), and OCB (1d) over time.

Positive and negative work reflection during leisure time and job performance

Previous research on thinking about work in the context of recovery mainly focused on a specific negative form of work-related thoughts, namely rumination (Cropley et al., 2006; Cropley & Purvis, 2003) or on the (in)ability to cognitively switch off from work (i.e., psychological detachment, Etzion et al., 1998; Sonnentag & Bayer, 2005). Whereas rumination refers to unintentional preservative thoughts (Nolen-Hoeksema & Morrow, 1993), psychological detachment refers to refraining from work-related thoughts or problems (Sonnentag & Bayer, 2005). Research showed that rumination and low psychological detachment during leisure time are related to impaired well-being (e.g., Cropley & Purvis, 2003; Sonnentag & Bayer, 2005). Associations between rumination or psychological detachment with job performance have not been studied so far. However, research examining rumination as an individual difference variable showed that rumination impairs concentration

and performance on a variety of tasks (Davis & Nolen-Hoeksema, 2000; Lyubomirsky, Kasri, & Zehm, 2003).

Research on thinking about work during leisure time in a positive way is sparse (Fritz & Sonnentag, 2005, 2006). This lack of research is quite surprising, because research has shown that it is important to distinguish between positive and negative thinking (Segerstrom et al., 2003) and that capitalizing on positive events (e.g., by talking about positive experiences) has beneficial effects for individuals' health and well-being (Gable, Reis, Impett, & Asher, 2004; Langston, 1994).

In our study, we focused on both positive and negative reflection about work during leisure time and examined relations with individual's job performance over time. Thereby, we extended the research of Fritz and Sonnentag (2005, 2006) who examined relations between positive and negative work reflection during the weekend or during vacations with an increase in health- and performance-related outcomes after the weekend or after vacations.

Positive work reflection comprises thinking about the positive aspects of one's job and deliberating about what one likes about one's job. Reflecting about work in a positive way is assumed to be a resource-providing experience that benefits employees' well-being and performance (Fritz & Sonnentag, 2006). First, positive work reflection involves the positive reappraisal of work experiences and thus reduces the negative consequences of work-related stress (Lazarus & Folkman, 1984). Second, reflecting about positive aspects of one's work includes thinking about successfully accomplished tasks, pleasurable events, or supportive relations at work (Fritz & Sonnentag, 2005). Consequently, positive work reflection should directly increase employees' resources such as positive affect, a sense of competence and self-efficacy, which in turn should benefit job performance over time (Seo, Barrett, & Bartunek, 2004; Stajkovic & Luthans, 1998).

With regard to empirical evidence, Fritz and Sonnentag (2005) showed that positive work reflection during the weekend was positively related to pursuing learning activities after the weekend. Taken together, we propose the following hypothesis:

Hypothesis 2: Positive work reflection during leisure time is positively related to task performance (2a), personal initiative (2b), creativity (2c), and OCB (2d) over time.

Negative work reflection refers to thinking about the negative aspects of one's job and considering what one does not like about one's job and is assumed to be a resource-consuming experience (Fritz & Sonnentag, 2006). Drawing on the COR model (Hobfoll & Shirom, 2001), reflecting about the negative aspects of one's job such as failures, negative events or relations at work should further deplete an individual's resources, because demands are continuously put on the individual and work-related stressors remain present during leisure time. The individual may experience prolonged activation during leisure time when reflecting about the negative sides of his or her work (Brosschot et al., 2005). In addition, because negative work reflection is a negative experience in itself and focuses on failures and negative events, it should increase negative affect and reduce self-efficacy (Bandura, 1997). Research on rumination showed that this form of repetitive, negative and intrusive thinking about negative experiences is associated with negative self-evaluations, diminished feelings of control and increased feelings of helplessness (Lyubomirsky et al., 2003). Furthermore, rumination is assumed to be related to experiencing more intrusive off-task thoughts (Sarason, Pierce, & Sarason, 1996) that may reduce an individual's attentional capacity and subsequent performance (Lyubomirsky et al., 2003). Summing it up, we propose the following hypothesis:

Hypothesis 3: Negative work reflection during leisure time is negatively related to task performance (3a), personal initiative (3b), creativity (3c), and OCB (3d) over time.

The mediating role of self-efficacy

Self-efficacy is a personal resource (Hobfoll, 1989, 2002) and one of the core positive psychological constructs that form an individual's psychological capital (Luthans et al., 2007; Luthans & Youssef, 2004). As self-efficacy is a predictor of individual job performance (Stajkovic & Luthans, 1998) and also changes over time, we examined self-efficacy as a potential resource, that is a mediator in the relation between non-work-experiences and job performance. As we will argue below, we focused on *occupational self-efficacy* which is defined as an individual's "belief in one's own ability and competence to perform successfully and effectively in different situations and across different tasks in a job" (Schyns & von Collani, 2002, p. 227).

On the one hand, self-efficacy has been defined as a relatively malleable, task-specific belief in one's capability to mobilize the resources needed to meet situational demands (Bandura, 1977; Wood & Bandura, 1989). On the other hand, *generalized self-efficacy* has been defined as a trait-like, generalized competency belief and involves "individuals' perception of their ability to perform across a variety of different situations" (Judge, Erez, & Bono, 1998, p. 170). Chen, Gully, Whiteman and Kilcullen (2000) argued that generalized self-efficacy influences job performance via proximal states including task-specific self-efficacy. Similarly, Bandura (1998, p. 53) stated that "comparative studies show that domain-specific measures of self-efficacy are good predictors of motivation and action". Accordingly, Schyns and von Collani (2002) introduced the conceptualization of occupational self-efficacy that captures a domain-specific self-efficacy and enables the investigation of individual differences in job-related self-efficacy across persons that do not perform the same tasks. As

we investigated individual differences in experiencing certain non-work experiences and their relations with job performance via self-efficacy, we focused on occupational self-efficacy.

Following the COR model (Hobfoll & Shirom, 2001), feeling recovered during leisure time is associated with the successful replenishment of resources. An individual that has more resources available for accomplishing his or her tasks when back at work should be more convinced that he or she actually has the necessary resources (e.g., energy) to successfully fulfil one's tasks. According to Bandura (1977, 1997), physiological and affective states constitute one source of efficacy beliefs. Individuals rely partly on the information conveyed by physical and emotional states when judging their capabilities. As feeling recovered during leisure time is an indicator of successful recovery during leisure time and denotes how many resources are available for accomplishing tasks (cf. Fritz & Sonnentag, 2005), it should be relevant for an individual's judgement of his or her capabilities, that is for his or her self-efficacy beliefs. Feeling highly recovered during leisure time should be associated with an increase in self-efficacy beliefs, including the belief to successfully accomplish work-related tasks, i.e. occupational self-efficacy.

As self-efficacy facilitates the allocation of work-related effort and persistence (Chen, Goddard, & Casper, 2004), self-efficacy should in turn facilitate job performance when being highly recovered during leisure time. Therefore, we propose that feeling recovered during leisure time is positively related to job performance via increased occupational self-efficacy:

Hypothesis 4: The relation between feeling recovered during leisure time and task performance (4a), personal initiative (4b), creativity (4c), and OCB (4d) is mediated by occupational self-efficacy.

Bandura (1977, 1997) proposed performance accomplishments as one of the most important sources of self-efficacy. More specifically, Bandura (1997, p. 86) stated that "research on self-modeling provides evidence suggesting that efficacy is enhanced by

selective focus on personal attainments”. As positive work-reflection involves thinking about achieved work tasks, that is feelings of mastery and competence, it should be related to a higher level of occupational self-efficacy. Similarly, negative work reflection should be associated with decreased occupational self-efficacy as it includes thinking about failures at work which should be related with feelings of incompetence. Thus, we propose that positive work reflection is positively related to job performance via increased occupational self-efficacy, whereas negative work reflection is assumed to be negatively related to job performance via decreased occupational self-efficacy:

Hypothesis 5: The relation between positive work reflection during leisure time and task performance (5a), personal initiative (5b), creativity (5c), and OCB (5d) is mediated by occupational self-efficacy.

Hypothesis 6: The relation between negative work reflection during leisure time and task performance (6a), personal initiative (6b), creativity (6c), and OCB (6d) is mediated by low occupational self-efficacy.

Control variables

We included a number of control variables in our study to rule out alternative interpretations. First, because we used self-report measures, we controlled for an individual’s general level of negative affect. Thus, we ruled out that relations between feeling recovered, positive and negative work reflection during leisure time and job performance are due to a person’s general tendency to view things in a positive or negative way (Podsakoff et al., 2003). In addition, individuals may feel less recovered and may think less positively and more negatively about their jobs when they experience a high amount of work-related stressors (Hobfoll, 1989; Lazarus & Folkman, 1984). Second, as we conducted our study with employees who had to perform *emotional labor* (Grandey, 2000; Hochschild, 1983) or *emotion work* (Zapf, Vogt, Seifert, Mertini, & Isic, 1999), we controlled for emotional

dissonance. Emotional dissonance has been shown to be one of the most significant stressors for employees performing emotion work (Heuven & Bakker, 2003). By controlling for this stressor, we precluded that the relations between feeling recovered, positive and negative work reflection and job performance are due to the level of stress resulting from emotional dissonance perceived at work. Moreover, as physical and cognitive resources (i.e., fluid intelligence) usually decrease with age (Kanfer & Ackerman, 2004), it may be more difficult for older employees to show a high level of performance. Consequently, we included age as a control variable. Most importantly when predicting job performance at Time 2, we controlled for an individual's job performance at Time 1. By this procedure, possible third variables, such as self-serving bias, can be controlled as these variables should also be related to performance at Time 1.

Method

We used a longitudinal design to examine the relations between feeling recovered during leisure time and reflecting about work in a positive and negative way with individual job performance over a longer period of time, namely six months. Although we cannot draw conclusions about the causality of relations from a longitudinal study, we can test for and rule out alternative interpretations, such as the influence of potential third variables and reverse causation (Zapf, Dormann, & Frese, 1996).

Sample

Our sample consisted of employees from German non-profit organizations who worked with people with special needs (i.e., persons who were physically or mentally disabled). Participating organizations included residential establishments, sheltered workshops, educational facilities and facilities for day-time care of disabled persons. We chose this sample because we were interested in employees that have to perform emotion

work (Zapf et al., 1999). Performing emotion work is particularly stressful (Grandey, 2000; Zapf & Holz, 2006). Therefore, for employees experiencing the stressful nature of emotion work, successful recovery during leisure time is especially critical for showing a high level of performance over time. Furthermore, working with clients and performing emotion work may make it more difficult to psychologically disengage and mentally switch off from work (Sonnentag & Bayer, 2005).

We approached organizations by telephone, presented them the general purpose and content of our study. After organizations agreed on supporting our study, employees received a letter including information about the study and a return form for registration. We announced the study to examine “recovery from work-related stress”. In seven organizations, questionnaires were directly distributed among all employees who met participation criteria (i.e., who worked with disabled persons and worked at least half-time). To encourage participation, we offered organization-specific feedback, announced a lottery prize, and promised a booklet on recovery from work-related stress for all participants who completed the study.

Participants could respond to a paper-based or a web-based questionnaire. Those who preferred the paper-based questionnaire received the questionnaire and a pre-stamped return envelope by mail, while those who preferred the web-based questionnaire received a link to the questionnaire by email. All employees from the organizations that agreed on the participation of all employees received paper-based questionnaires.

In sum, 877 persons received a questionnaire at Time 1 including 419 persons from the organizations that distributed questionnaires among all employees as well as 458 persons who individually registered for study participation. The majority of the latter (71.6 %) received a paper-based questionnaire, while 28.4 % received a link to the web-based questionnaire. At Time 1, we received 392 questionnaires from individually registered participants corresponding to a response rate of 85.6 %. The response rate was nearly the

same for the paper-based (85.4 %) and the web-based questionnaires (86.2 %). With regard to participants from the seven organizations, we received 149 questionnaires at Time 1 corresponding to a response rate of 35.6 %. The total response rate for all participants at Time 1 was 61.7 %.

At Time 2, questionnaires were sent to all respondents from Time 1. We received 327 questionnaires from individually registered participants and 87 questionnaires from participants of the seven organizations. Thus, the response rate at Time 2 was 72.2 % for individually registered participants (71.4 % for paper-based questionnaires; 74.6 % for web-based questionnaires). For the seven organizations, the Time 2 response rate was 68.4 %. In total, we received 414 questionnaires at Time 2 corresponding to a response rate of 68.4 %.

For the Time 1 questionnaire, we received usable data from 523 persons, for the Time 2 questionnaire from 401 persons. For 368 persons (70.4 %) we could match Time 1 and Time 2 data. After excluding persons with incomplete data (15 persons) and persons who filled in a web-based questionnaire at Time 1 and a paper-based questionnaire at Time 2 or vice versa (4 persons), our final sample consisted of 349 persons. The majority of our sample was female (66.5 %) and participants' average age was 40.5 years ($SD = 9.5$). Participants' average job tenure was 16.5 years ($SD = 11.3$), average organizational tenure was 9.5 years ($SD = 8.7$), and participants worked on average 35.4 hours per week ($SD = 10.2$) including an average of 2.5 hours overtime per week ($SD = 6.4$). With regard to participants' jobs, our sample included social workers (e.g., remedial teachers, educators, 50.4 %), persons working in the area of education or psychology (e.g., pedagogues, psychologists, 24.4 %), health care workers (e.g., nurses, occupational therapists, 11.2 %), and persons holding other jobs (e.g., teachers, 10.3 % ; missing data from 3.7 %). About one quarter (25.8 %) of our participants had a leadership position.

We checked if the dropout from Time 1 and Time 2 was associated with any systematic difference between persons who participated at Time 2 and those who did not.

Therefore, we calculated t-tests and Chi square difference tests for all variables assessed at Time 1. Analyses showed no differences in participants' age, gender, tenure, working time or overtime per week. However, compared to Time 1, at Time 2 our sample included less participants working shift-work ($\chi^2 = 5.18$, $df = 1$, $p < .05$) and working during the night ($\chi^2 = 6.82$, $df = 1$, $p < .01$). Furthermore, we checked for our final sample whether there are systematic differences between participants who filled in paper-based questionnaires and participants who filled in web-based questionnaires. With respect to demographic variables, we found no differences. However, with regard to study variables, results revealed that participants who answered web-based surveys reported higher personal initiative at Time 1 ($t = -2.33$; $p < .05$), higher task performance ($t = -3.33$; $p < .01$), higher personal initiative ($t = -2.89$; $p < .01$), higher creativity ($t = -3.32$; $p < .01$) and more positive work reflection ($t = -2.17$; $p < .05$) at Time 2 and lower occupational self-efficacy at Time 2 ($t = 6.39$; $p < .001$). Although we found some mean differences in our study variables between participants who responded to a web-based versus paper-based survey, we do not think that this affects our analyses as we are interested in predicting changes in performance outcomes rather than mean differences. Nevertheless, to account for these differences, we included data type (1 = paper-based survey, 2 = web-based survey) as a control variable in our analyses.

Measures

We assessed all measures in German. All items had to be answered on five-point Likert scales (except for the measure of occupational self-efficacy). Items from scales that were originally developed in English were translated into German by the first author and translated back to English by an interpreter.

Feeling recovered during leisure time. We assessed feeling recovered during leisure time at Time 1 with a four-item scale of Sonnentag and Krueger (2006). The scale refers to how

recovered and well-rested a person feels during leisure time. A sample item was: “During leisure time, I feel well rested”. Cronbach’s alpha was .92.

Positive and negative work reflection during leisure time. Reflecting in a positive and negative way about one’s work during leisure time was measured at Time 1 with the scales developed by Fritz and Sonnentag (2005, 2006). We complemented the 3-item scales with one additional item for each scale. *Positive work reflection* assesses the degree to which an individual positively thinks about his or her job during leisure time (Fritz & Sonnentag, 2005, 2006). It was measured by the four items. Sample items were “During leisure time, I think about the good sides of my work”, “During leisure time, I realize what I like about my job” (new item). Cronbach’s alpha was .85. *Negative work reflection* involves the degree to which an individual thinks about his or her work in a negative way (Fritz & Sonnentag, 2006), and was assessed by four items. Sample items were “During leisure time, I consider the negative aspects of my job”, “During leisure time, I think about the negative sides of my work” (new item). Cronbach’s alpha was .91.

Occupational self-efficacy. We assessed occupational self-efficacy at Time 2 with the 8-item scale developed by Schyns and von Collani (2002). Items had to be answered on a 6-point Likert scale ranging from 1 (not true at all) to 6 (very true). Sample items were “No matter what comes my way in my job, I’m usually able to handle it”, “I feel prepared to meet most of the demands in my job”. Cronbach’s alpha was .89.

Job performance. Task performance, personal initiative, creativity and OCB were assessed at Time 2 as outcome variables and at Time 1 as control variables. We measured performance variables with the same scales at Time 1 and Time 2. As we wanted to examine changes in performance from Time 1 to Time 2, participants were instructed to rate their job performance considering the last three months in the Time 2 questionnaire.

Task performance was measured with six items from the performance scale of Roe, Zinovieva, Dienes and Horn (2000) that assesses how well a person accomplishes his or her

tasks at work. A sample item was “The results of my work could be better than they presently are” (reverse coded). Cronbach’s alpha was .75 at Time 1 and .78 at Time 2.

Personal initiative was gauged with a seven-item scale of Frese, Fay, Hilburger, Leng and Tag (1997) that captures how much an individual takes initiative at work and actively solves problems (sample item: “I actively attack problems”). Cronbach’s alpha was .79 at Time 1 and .82 at Time 2.

Creativity was measured with seven items from the scale of creative behavior developed by George and Zhou (2001). Items assess the degree an individual develops and brings in new ideas at work (sample items: “I come up with creative solutions to problems” , “I suggest new ways of performing work tasks”). Cronbach’s alpha was .88 at Time 1 and .89 at Time 2.

Organizational citizenship behavior (OCB) was measured with a five-item scale of the OCB measure developed by Staufenbiehl and Hartz (2000). This scale assesses how much an individual engages in helping behavior towards co-workers (Wegge, Van Dick, Fisher, Wecking, & Moltzen, 2006). Sample items were “I help colleagues to improve their work”, ”If colleagues are feeling blue, I try to cheer them up”. Cronbach’s alpha was .74 at Time 1 and .73 at Time 2.

We ran Confirmatory Factor Analyses (CFAs) to test if job performance measures (task performance, personal initiative, creativity, OCB) were best represented by four factors (Time 1 and Time 2) and if performance measures assessed at Time 2 were distinct from our mediator variable occupational self-efficacy at Time 2. Results for CFAs with performance items assessed at Time 1 showed that a four-factor model showed a satisfactory fit ($\chi^2 = 731.1$, $df = 269$, $p < .001$, RMSEA = 0.071, CFI = .95, NNFI = .94), and fit the data better than a one-factor model ($\Delta\chi^2 = 911.9$, $df = 6$, $p < .001$) and than all possible three-factor ($\Delta\chi^2 \geq 166.7$, $df = 3$, $p < .001$) and two-factor models ($\Delta\chi^2 \geq 611.0$, $df = 5$, $p < .001$). CFAs conducted with performance items and items from our measure of occupational self-efficacy

assessed at Time 2 showed that a five-factor model showed a satisfactory fit ($\chi^2 = 1171.8$, $df = 485$, $p < .001$, RMSEA = 0.065, CFI = .95, NNFI = .95), and fit the data better than a one-factor model ($\Delta\chi^2 = 2890.3$, $df = 10$, $p < .001$), a two-factor model ($\Delta\chi^2 = 679.3$, $df = 9$, $p < .001$) and than all possible four-factor ($\Delta\chi^2 \geq 330.7$, $df = 4$, $p < .001$) and three-factor models ($\Delta\chi^2 \geq 611.0$, $df = 5$, $p < .001$).

Control variables. Negative affect, emotional dissonance, age and performance were measured at Time 1. We assessed *negative affect* with the ten negative-affect items (sample items “distressed”, “upset”) from the PANAS (Watson et al., 1988). Cronbach’s alpha was .85. *Emotional dissonance* was measured with five items from the Frankfurt Emotion Work Scales (Zapf et al., 1999). This scale assesses the discrepancy perceived by individuals when displaying unfeared emotions or when suppressing felt but organizationally undesired emotions (Zapf & Holz, 2006). A sample item is “How often does it occur in your job that one has to display positive emotions that do not correspond to what is felt in this situation?” Cronbach’s alpha was .85.

We conducted CFAs to confirm that our predictor variables (feeling recovered during leisure time, positive and negative reflection during leisure time) and control variables (negative affect emotional dissonance) represent distinct constructs. CFAs showed that the five-factor model showed a satisfactory fit ($\chi^2 = 646.2$, $df = 314$, $p < 0.001$, RMSEA = 0.057, CFI = .95, NNFI = .95). Moreover, the five-factor model fitted the data better than a one-factor model ($\Delta\chi^2 = 3531.3$, $df = 10$, $p < .001$) and also had a better fit than a four-factor model ($\Delta\chi^2 = 975.2$, $df = 4$, $p < .001$), where items from positive and negative work reflection measures were specified to load on a first factor, items from feeling recovered during leisure time on a second factor, and items from the scales of emotional dissonance and negative affect on a third and fourth factor.

Results

Means, standard deviations and zero-order correlations are displayed in Table 13. To test our hypotheses we conducted hierarchical regression analyses. In these analyses, we entered control variables (data type, age, negative affect, emotional dissonance and performance at Time 1) in the first step, our predictor variables (feeling recovered during leisure time, positive and negative work reflection during leisure time) in the second step, and our mediator (occupational self-efficacy) in the third step. We conducted four sets of hierarchical regression analyses for our four performance outcomes (task performance, personal initiative, creativity, OCB). Results can be seen in Tables 14 to 17. If the conditions were met that a) the mediator (occupational self-efficacy) showed a significant relation with the outcome variable, and b) the regression coefficient of a predictor was reduced in Step 3, we followed the procedure of Baron and Kenny (1986) and recommendations provided by Shrout and Bolger (2002). First, we conducted a Sobel test (Sobel, 1982) to test if the effect of a predictor was significantly reduced, i.e. mediated by occupational self-efficacy. Second, we tested the indirect effect by applying the bootstrapping technique as recommended by Shrout and Bolger (2002) using the strategy developed by Preacher and Hayes (in press) that allows for simultaneously taking the effect of control variables into account.

Table 13

Means, Standard Deviations, and Zero-Order Correlations

Variables	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 Data type ^a	1.18	0.38															
2 Age	40.54	9.49	-.05														
3 Negative affect at t ₁	1.58	0.48	-.07	.02													
4 Emotional dissonance at t ₁	2.70	0.82	.05	-.02	.32***												
5 Feeling recovered during leisure time at t ₁	2.53	0.83	.07	.01	-.22***	-.12*											
6 Positive work reflection at t ₁	2.75	0.72	.04	.02	-.09	-.10	.15**										
7 Negative work reflection at t ₁	2.40	0.71	-.04	-.01	.34***	.24***	-.13*	.28***									
8 Occupational self-efficacy at t ₂	4.17	0.77	-.33***	.10	-.31***	-.12*	.22***	.06	-.15**								
9 Task performance at t ₁	3.97	0.49	.09	.15**	-.28***	-.12*	.07	.07	-.11*	.29***							
10 Task performance at t ₂	4.00	0.50	.18**	.10	-.32***	-.04	.17**	.09	-.04	.40***	.61***						
11 Personal initiative at t ₁	3.76	0.50	.12*	.07	-.22***	.02	.14**	.21***	-.06	.28***	.49***	.46***					
12 Personal initiative at t ₂	3.69	0.53	.15**	.10	-.21**	.07	.13*	.24***	-.01	.34***	.36***	.51***	.67***				
13 Creativity at t ₁	3.59	0.60	.10	.08	-.13*	.07	.07	.18**	.03	.25***	.41***	.32***	.65***	.51***			
14 Creativity at t ₂	3.42	0.65	.18**	.06	-.18**	.08	.08	.22***	.07	.31***	.33***	.42***	.58***	.66***	.68***		
15 OCB at t ₁	3.97	0.51	.06	.04	-.08	-.09	.12*	.17**	-.03	.21***	.23***	.22***	.33***	.34***	.24***	.16***	
16 OCB at t ₂	3.55	0.70	.07	.04	.07	-.01	.05	.25***	.09	.24***	.13*	.25***	.31***	.42***	.26***	.40***	.46***

Note. N = 349. * p < .05; ** p < .01; *** p < .001; ^a 1 = Paper-based survey, 2 = Web-based survey

Table 14

Multiple Linear Regression Model Predicting Task Performance at Time 2

	Step 1	Step 2	Step 3
Data type ^a	.11**	.11**	.22***
Age	.03	.04	.02
Negative affect	-.18***	-.18***	-.12***
Emotional Dissonance at t ₁	.08	.07	.06
Task performance at t ₁	.56***	.56***	.48***
Feeling recovered during leisure time at t ₁		.10*	.05
Positive work reflection at t ₁		-.00	-.01
Negative work reflection at t ₁		.08	.10*
Occupational self-efficacy at t ₂			.30***
F	49.03***	32.25***	36.61***
R ²	.42	.43	.49
Δ F		2.91*	41.09***
Δ R ²		.02	.06

Note. N = 349. * p < .05; ** p < .01; *** p < .001 ; ^a 1 = Paper-based survey, 2 = Web-based survey

Considering task performance as an outcome variable (see Table 14), results from Step 1 of regression analyses revealed that task performance at Time 1 was a highly significant predictor of task performance at Time 2. Furthermore, negative affect was a negative and data type was a positive predictor of task performance at Time 2. In Step 2, feeling recovered during leisure time Time 1 emerged as a significant positive predictor of task performance at Time 2. Therefore, feeling recovered during leisure time at Time 1 predicted an increase in task performance after six months. However, neither positive nor negative work reflection predicted task performance at Time 2. Taken together, these results confirmed Hypothesis 1a, but not Hypotheses 2a and 3a.

When entering our assumed mediator occupational self-efficacy in Step 3, feeling recovered during leisure time was no longer a significant predictor, but occupational self-efficacy at Time 2 positively predicted task performance at Time 2. Furthermore,

unexpectedly negative work reflection at Time 1 emerged as a significant positive predictor of task performance at Time 2. We first conducted the Sobel test (Sobel, 1982) to test if occupational self-efficacy at Time 2 significantly mediated the effect of feeling recovered during leisure time at Time 1 on task performance at Time 2. Results showed a significant mediating effect of occupational self-efficacy ($z = 3.67$, $p < .001$). Second, bias-corrected bootstrap confidence intervals were calculated (using 1000 bootstrap samples) while entering our control variables (data type, age, negative affect, job stressors and task performance at Time 1) as covariates. The lower bound of the 95% bias-corrected confidence interval was .014, while the upper bound was .053. As the confidence interval did not include zero, the results indicate a significant indirect effect of feeling recovered during leisure time at Time 1 on task performance at Time 2 through occupational self-efficacy at Time 2. In sum, we found support for Hypothesis 4a.

Results for personal initiative as an outcome variable (see Table 15) showed that personal initiative at Time 1 was a significant positive predictor of personal initiative at Time 2, while negative affect was a significant negative predictor. In Step 2, emotional dissonance and positive work reflection at Time 1 emerged as significant predictors. Individuals experiencing more emotional dissonance and higher positive work reflection at Time 1 increased their personal initiative over the following six months. Thus, analyses confirmed Hypothesis 2b, but not Hypotheses 1b and 3b. Entering occupational self-efficacy into the regression revealed that occupational self-efficacy at Time 2 was a significant positive predictor of personal initiative at Time 2, but the effect of positive work reflection remained nearly unchanged indicating no support for a mediating effect of occupational self-efficacy.

Table 15

Multiple Linear Regression Model Predicting Personal Initiative at Time 2

	Step 1	Step 2	Step 3
Data type ^a	.07	.07	.16***
Age	.06	.06	.05
Negative affect	-.09*	-.09	-.03
Emotional Dissonance at t ₁	.08	.09*	.09*
Personal Initiative at t ₁	.63***	.61***	.55***
Feeling recovered during leisure time at t ₁		.02	-.02
Positive work reflection at t ₁		.11*	.11*
Negative work reflection at t ₁		.01	.02
Occupational self-efficacy at t ₂			.23***
F	58.77***	38.26***	39.39***
R ²	.46	.47	.51
Δ F		2.65*	25.96***
Δ R ²		.01	.04

Note. N = 349. * p < .05; ** p < .01; *** p < .001 ; ^a 1 = Paper-based survey, 2 = Web-based survey

Table 16

Multiple Linear Regression Model Predicting Creativity at Time 2

	Step 1	Step 2	Step 3
Data type ^a	.10*	.10**	.19***
Age	.02	.02	-.00
Negative affect	-.11**	-.13**	-.07
Emotional Dissonance at t ₁	.07	.07	.07
Creativity at t ₁	.65***	.64***	.58***
Feeling recovered during leisure time at t ₁		-.00	-.04
Positive work reflection at t ₁		.09*	.09*
Negative work reflection at t ₁		.06	.07
Occupational self-efficacy at t ₂			.23***
F	65.77***	42.82***	44.01***
R ²	.49	.50	.54
Δ F		2.82*	27.12***
Δ R ²		.01	.04

Note. N = 349. * p < .05; ** p < .01; *** p < .001 ; ^a 1 = Paper-based survey, 2 = Web-based survey

Considering creativity (see Table 16) as an outcome variable, results from Step 1 of regression analyses showed that creativity at Time 2 was positively predicted by creativity at Time 1 and data type, while it was negatively predicted by negative affect. In Step 2, positive work reflection at Time 1 emerged as a significant predictor of creativity at Time 2. Individuals with higher positive work reflection at Time 1 increased their creativity over the following six months. In sum, Hypothesis 2c was confirmed, but Hypotheses 1c and 3c were not. Entering occupational self-efficacy in Step 3 showed that occupational self-efficacy at Time 2 was positively related to creativity at Time 2. However, the effect of positive work reflection remained nearly unchanged indicating no support for our mediator Hypothesis 5c.

Table 17

Multiple Linear Regression Model Predicting Organizational Citizenship Behavior (OCB) at Time 2

	Step 1	Step 2	Step 3
Data type ^a	.04	.04	.12*
Age	.02	.02	.00
Negative affect	-.04	-.06	.00
Emotional Dissonance at t ₁	.04	.04	.03
OCB at t ₁	.46***	.44***	.39***
Feeling recovered during leisure time at t ₁		-.03	-.07
Positive work reflection at t ₁		.16***	.16***
Negative work reflection at t ₁		.07	.07
Occupational Self-Efficacy at t ₂			.22***
F	18.98***	14.37***	15.09***
R ²	.22	.25	.31
Δ F		5.45**	15.83**
Δ R ²		.04	.03

Note. N = 349. * p < .05; ** p < .01; *** p < .001 ; ^a 1 = Paper-based survey, 2 = Web-based survey

Finally, results for our outcome variable OCB (see Table 17) showed that OCB at Time 1 positively predicted OCB at Time 2. Step 2 revealed that positive work reflection at Time 1 was positively related to OCB at Time 2. Individuals with higher positive work reflection at Time 1 increased their OCB over the following six months. Thus, Hypothesis 2d was supported, while we found no support for Hypotheses 1d and 3d. Adding occupational self-efficacy into the regression showed the same results as for personal initiative and creativity. Occupational self-efficacy at Time 2 significantly predicted OCB at Time 2, but the effect of positive work reflection remained unchanged disconfirming our mediator Hypothesis 5d.

To strengthen our results and to make a causal pathway from feeling recovered during leisure time and positive work reflection more plausible, we conducted additional regression analyses testing for reverse causation. Specifically, we predicted feeling recovered during leisure time (see Table 18), positive (see Table 19) and negative work reflection (see Table 20) at Time 2 by performance variables at Time 1. In general, results did not support the reverse-causation assumption that job performance was a predictor of feeling recovered, positive work reflection and negative work reflection, with one exception: Individuals who engaged more in OCB at Time 1 showed an increase in positive work reflection over the following six months ($\beta = .10, p < .05$). Therefore, for the relation between positive work reflection and OCB, we found evidence for a reciprocal relation. In addition, our analyses revealed that creativity at Time 1 negatively predicted feeling recovered at Time 2 ($\beta = -.18, p < .01$) and positively predicted negative work reflection at Time 2 ($\beta = .13, p < .05$).

Table 18

Multiple Linear Regression Model Predicting Feeling Recovered during Leisure Time at Time 2

	Step 1	Step 2
Data type ^a	.03	.04
Age	.10*	.11*
Negative affect	-.09	-.09
Being recovered during leisure time at t ₁	.39***	.39***
Task Performance at t ₁		.03
Personal initiative at t ₁		.05
Creativity at t ₁		-.18**
OCB at t ₁		-.01
F	19.32***	10.96***
R ²	.18	.21
Δ F		2.31
Δ R ²		.02

Note. N = 349. * p < .05; ** p < .01; *** p < .001 ; ^a 1 = Paper-based survey, 2 = Web-based survey

Table 19

Multiple Linear Regression Model Predicting Positive Work Reflection at Time 2

	Step 1	Step 2
Data type ^a	.09*	.09*
Age	-.02	-.02
Negative affect	-.03	-.02
Positive Work Reflection at t ₁	.64***	.63***
Task Performance at t ₁		-.01
Personal initiative at t ₁		.03
Creativity at t ₁		-.05
OCB at t ₁		.10*
F	64.87***	33.42***
R ²	.43	.44
Δ F		1.55
Δ R ²		.01

Note. N = 349. * p < .05; ** p < .01; *** p < .001 ; a 1 = Paper-based survey, 2 = Web-based survey

Table 20

Multiple Linear Regression Model Predicting Negative Work Reflection at Time 2

	Step 1	Step 2
Data type ^a	.07	.06
Age	-.04	-.05
Negative affect	.18***	.19***
Negative Work Reflection at t ₁	.45***	.44***
Task Performance at t ₁		-.01
Personal initiative at t ₁		-.02
Creativity at t ₁		.13*
OCB at t ₁		.04
F	35.94***	19.13***
R ²	.30	.31
Δ F		1.93
Δ R ²		.02

Note. N = 349. * p < .05; ** p < .01; *** p < .001 ; a 1 = Paper-based survey, 2 = Web-based survey

Discussion

The aim of the current study was to examine the lagged relations between specific non-work experiences, namely feeling recovered during leisure time, positive and negative work reflection with job performance over the time of six months. Furthermore, we investigated occupational self-efficacy as a mediator in these relations. Our results showed that feeling recovered during leisure time was related to increased task performance over time, but not to increased contextual performance. Furthermore, occupational self-efficacy mediated the relation between feeling recovered during leisure time and increased task performance. These results support the proposition that feeling recovered is associated with an increase in an individual's resources, that in turn benefits task accomplishment. More specifically, when an individual feels highly recovered during leisure time, the individual shows increased task performance after six months, because he or she feels more capable of successfully accomplishing work-related tasks.

Moreover, our study revealed that positive work reflection is related to increased contextual performance, that is personal initiative, creativity and OCB over time. However, these relations were not mediated by occupational self-efficacy. Thus, the mediating mechanism is not an increased belief in successfully accomplishing one's work tasks. It may be that increased positive affect (Amabile, Barsade, Mueller, & Staw, 2005; Fritz & Sonnentag, in press; George, 1991) or developing future-oriented, creative goals (Shalley, 1995) play a mediating role in the relation between positive work reflection and personal initiative, creativity and OCB. Feeling recovered during leisure time was unrelated to an increase in contextual performance over time. Having more resources available may not be sufficient to trigger an increase in extra-role behavior. Positive affective experiences or specific self-initiated, future-oriented goals and plans may be necessary to increase behaviors that go beyond what is formally required at the job.

We tested if the relations between feeling recovered and task performance and between positive work reflection and contextual performance can be explained by reverse causation effects. With the exception that our results indicate a reciprocal relation between positive work reflection and OCB, we found no evidence for reverse causation. The finding that OCB was related to an increase in positive work reflection over time is an interesting finding, because it is in line with research showing that individuals who show more helping behavior towards their co-workers receive more acknowledgment and social support (Bowling et al., 2004) what in turn fosters an increase in positive affect (Murrell, Norris, & Chipley, 1992; Neely et al., 2006). Receiving more social support and experiencing a higher level of positive affect may be responsible for the positive relation between OCB and positive work reflection over time.

In addition, analyses testing for reverse causation revealed that creativity was related to a decrease in feeling recovered and to an increase in negative work reflection during leisure time. One explanation may be that developing and bringing in new ideas at work may be exhausting and related to more negative work reflection because individuals may face some resistance to changes and refusal from supervisors and coworkers (Grant, Parker, & Collins, in press). Another explanation may be that individuals who are more creative engage more in a 'problem-focused form' of negative work reflection during leisure time that may also decrease an individual's feeling of being recovered.

Contrary to our expectations, positive work reflection was not related to an increase in task performance over time. Task performance may depend more heavily on employees' availability of resources and the capability to allocate many resources to the task at hand than on the specific affective and motivational benefits that are associated with positive work reflection. Thus, an individual's state of being recovered and the associated amount of available resources may determine the degree of task performance an individual *can* show,

but not an individual's increase in positive affect or motivation that determines the degree of task performance an individual *is willing to show*.

We found no evidence that negative work reflection is negatively related to task performance. We even found a positive effect of negative work reflection on task performance over time when adding occupational self-efficacy into the regression equation. Negative work reflection may not be equated with rumination (Nolen-Hoeksema & Morrow, 1993) and may not always be negative for an individual's job performance. Research showed that in addition to the distinction between positive and negative thoughts, individuals further distinguish different forms of negative thoughts according to their purpose (i.e., searching for meaning versus focussing on problem solving, Segerstrom et al., 2003). These different forms of negative thoughts showed distinct relations with individuals' well-being, although results did not clearly support one form of negative thinking to be better than the other.

Our study was one of the first that examined the relations between non-work experiences and performance with a longitudinal design. Furthermore, by partialling out the respective performance criterion at Time 1, we focused on predicting the increase or decrease of performance over time instead of predicting the general level of performance. As our performance outcomes also show a great amount of stability over time (with stability coefficients ranging between .46 and .68), one would not expect our predictor variables to explain a great amount of variance in our outcomes.

Limitations

Our study also has several limitations. First, our measures of performance were assessed by self-reports. Self-reported performance ratings may be subject to social desirability or a self-serving bias. However, as we included performance measured at Time 1 as a control variable, the influence of third variables, such as social desirability or self-serving bias should be ruled out. By controlling for the respective performance criterion at Time 1, we

did not predict the absolute level of performance at Time 2 by our predictor variables, but change over time. Nevertheless, future research should examine if similar results are found when measuring performance by objective data or by supervisor or peer ratings.

Second, all of our measures are based on self-reports of the same person and thus common method variance might be a problem (Podsakoff et al., 2003). However, we tried to minimize this problem by temporally separating our predictor and outcome variables (Podsakoff et al., 2003) and by including negative affectivity as a control variable.

Moreover, we conducted our study with a sample of employees performing emotion work. We chose our sample because we thought that recovery may be especially important for employees performing emotion work. The relations may be different (for example smaller) for employees who do not work with customers or clients. Future studies should aim at replicating our results with other samples in order to establish the generalizability of these results.

Implications for Future Research and Practice

As occupational self-efficacy was found to be a mediator only in the relation between feeling recovered during leisure time and task performance, future studies should investigate other mediating mechanisms that explain the positive relations between positive work reflection with personal initiative, creativity and OCB. A recent study showed that it is another form of self-efficacy, namely role-breadth self-efficacy (i.e., "the extent to which people feel confident that they are able to carry out a broader and more proactive role" , Parker, 1998, p. 835) that predicts proactive behavior, whereas job self-efficacy does not (Ohly & Fritz, 2007). Thus, role-breadth self-efficacy may be the mediator in the relation between positive work reflection during leisure time and outcomes of contextual performance. Another potential mediator may be positive affect, as it has been shown as a resource that is

built up during the recovery process (Sonnentag et al., 2008) and because it is related to all outcome variables (Amabile et al., 2005; Fritz & Sonnentag, in press; George, 1991).

In addition, a promising area for future research is to refine the concept of negative work-reflection. One promising distinction may be to distinguish between a ‘ruminative form’ of negative work reflection (Cropley & Purvis, 2003; Nolen-Hoeksema & Morrow, 1993) and a ‘problem-focused form’ of negative work reflection. Whereas the ruminative form of negative work reflection should be negatively related to an individual’s job performance, as it should be associated with negative outcomes and decreased resources (Lyubomirsky & Nolen-Hoeksema, 1995; Lyubomirsky & Tkach, 2004), the problem-focused form of negative work reflection may be positively related to job performance, as it motivates the individual to solve a work-related problem during leisure time. However, a problem-focused form of negative work reflection may still be associated with decreased health and well-being as it further draws on individuals’ resources during leisure time (Hobfoll, 1989).

Our study also yields implications for practice. First, as we found a positive relation between feeling recovered during leisure time and task performance, our study implies that employees should be encouraged and supported to recover from work-related stress during leisure time. Previous research on recovery from work-related stress showed that the engagement in specific recovery experiences during leisure time, such as relaxation and mastery experiences, is related to successful recovery (Sonnentag & Fritz, 2007). Therefore, employees can be encouraged to engage in such experiences. Furthermore, organizations and researches could also develop trainings on recovery from work-related stress to actively support employees’ recovery.

In addition, our results imply that positive work reflection should be fostered because it promotes contextual performance over time. Supervisors and organizations could stimulate employees to think about the positive aspects of work. Providing positive feedback may highlight a sense of achievement and competence (cf. Battmann, 1988; Ilies & Judge, 2005)

and make it more likely that employees think positively about work during leisure time. Rewarding employees for special achievements may also raise positive work reflection. In addition, promoting and taking care of a supportive team climate may also contribute to employees' positive work reflection as employees may perceive their environment as more positive and supportive (Anderson & West, 1998; Elovainio, Kivimäki, Eccles, & Sinervo, 2002).

Conclusion

Our study shows that positive non-work experiences, specifically feeling recovered during leisure time and positive work reflection, are related to an increase in performance over time. Therefore, in order to promote high performance over time, it is beneficial for employees to take care of their recovery during leisure time and to engage in positive work reflection, that is a form of capitalizing on positive experiences.

GENERAL DISCUSSION

The goal of the present dissertation was to extend research on the relationship between recovery during leisure time and job performance. Three independent empirical studies examined recovery as a predictor of changes in job performance over time, that is from day to day, from week to week, and changes over the period of half a year. In the present chapter, I will first summarize and integrate the results from the three studies. Second, I will describe how the findings contribute to research in industrial and organizational psychology. Afterwards, I will discuss the strengths and limitations of the studies, before I conclude with the implications for future research and practice.

Overall summary and discussion of results

In Study 1, together with my coauthors I investigated the relationship between daily recovery and performance. Specifically, we focused on the state of being recovered in the morning, that is the outcome of the previous recovery period and an indicator of successful recovery as a predictor of daily job performance. Moreover, we examined the moderating role of job control as an indicator of situational strength at work. We tested our propositions in a diary study assessing data twice a day over five working days. Results showed that on days when an individual felt highly recovered in the morning, he or she showed a higher level of daily task performance, personal initiative (PI) and organizational citizenship behavior (OCB). Furthermore, on these days task accomplishment was perceived as easier and less straining. In addition, we found that job control moderated the relationships between feeling recovered in the morning and daily task performance, PI and OCB. Only employees with a high level of job control showed an increased level of daily performance when they felt highly recovered in the morning. Moreover, these employees showed a decreased level of performance when they felt poorly recovered in the morning. Overall, Study 1 indicated that feeling highly recovered in the morning, that is after the previous rest period, is beneficial for

several dimensions of daily job performance, including task performance as well as contextual performance and performance-related costs (indicated by less compensatory effort that has to be spent at work).

Study 2 addressed recovery during the weekend and weekly job performance. As in Study 1, we used a within-person approach but now conducted a study over four weeks assessing data on recovery during the weekend in a survey after the weekend (i.e., on Monday mornings) and data on weekly job performance in the end of the working week (i.e., on Friday afternoons). In this study, we investigated three recovery experiences, namely psychological detachment, relaxation and mastery experiences, as well as sleep during the weekend as predictors of the state of being recovered after the weekend. In addition, we examined the state of being recovered as a predictor of changes in weekly job performance. Results confirmed that after weekends when an individual experienced a high level of psychological detachment, relaxation, mastery experiences and reported a good sleep during the weekend, he or she felt more recovered on Monday morning. In addition, we found that in weeks when an individual felt highly recovered after the weekend, he or she showed a higher level of weekly task performance, PI and OCB and indicated that task accomplishment was less effortful and straining. Consequently, results from Study 2 are fully in line with results from Study 1. Being recovered after the weekend benefits different dimensions of weekly job performance and performance-related costs. In addition, we confirmed that the state of being recovered is related to recovery processes (i.e., psychological detachment, relaxation, mastery experiences and sleep) during the weekend. Moreover, by analyzing our data with a multilevel structural equation modeling approach, we showed that certain recovery processes are indirectly related to weekly performance via the state of being recovered on Monday morning. Results indicated that sleep plays an important role for an individual's recovery during the weekend. According to our knowledge, this study was the first study that showed that the intra-individual relationships between recovery and performance last for several days.

Finally, in Study 3 we investigated the relationships between certain non-work experiences and job performance over the period of half a year. Based on the results from Study 1 and 2, we examined feeling recovered during leisure time as a positive non-work experience that should be positively related to an increase in job performance over time. In addition, we investigated the role of thinking about work during leisure time in a positive or negative way (i.e., positive and negative work reflection) as further non-work experiences. We proposed positive work reflection to be related to an increase in job performance over time, whereas we argued that negative work reflection should be related to a decrease in performance over time. This study also investigated a potential mediator, namely occupational self-efficacy. Results indicated that feeling recovered during leisure time was related to an increase in task performance over time and this relationship was mediated by occupational self-efficacy. However, feeling recovered during leisure time was not related to an increase in contextual performance. In addition, we found that positive work reflection predicted an increase in PI, creativity and OCB over time, but occupational self-efficacy was not confirmed as the mediator in these relationships. Negative work reflection was neither related to task performance nor to contextual performance. Moreover, we found no evidence for reverse causation effects, except for a reciprocal relationship between positive work reflection and OCB. In sum, Study 3 shows the importance of positive non-work experiences for maintaining and increasing job performance over a longer period of time (i.e., six months). Feeling recovered seems to be especially important for task performance, whereas positive work reflection appears to benefit contextual performance.

Overall, all three studies show that being recovered after a previous rest period or in general during leisure time, is positively related to changes in job performance. These findings suggest that being more recovered is associated with having more resources - especially self-regulatory resources - available for performing at work (Fritz & Sonnentag, 2006; Hobfoll & Shirom, 2001). Our results are also in line with the assumption that

successful resource replenishment is critical for allocating resources to work-related tasks and for showing a high level of performance over time (Beal et al., 2005).

Study 1 and 2 confirmed that being recovered is related to different aspects of daily and weekly job performance, including task performance as well as contextual performance and performance-related costs. Study 3 also found a positive relationship between feeling recovered and task performance. In addition, we showed that occupational self-efficacy mediated this relationship. This suggests that self-efficacy is one of the resources that is built up during the recovery process and that benefits subsequent job performance. However, as we did not find a positive relationship between feeling recovered and contextual performance in Study 3, we do not know if occupational self-efficacy is also a mediating mechanism in the relationship between feeling recovered with PI and OCB.

The finding from Study 3, that feeling recovered during leisure time is not related to contextual performance, suggests that feeling recovered is not sufficient for showing a high level of contextual performance over time. Feeling recovered does not necessarily involve that an individual is motivated or in a positive mood to show increased engagement in extra-role behaviors, such as PI, creativity or OCB. Motivation and positive affect may be especially important for showing extra-role behavior over time, as showing PI and creativity requires to expend a substantial amount of effort and to be persistent in the face of occurring problems and associated frustration (Binnewies, Ohly, & Sonnentag, 2007; Frese et al., 1996). Similarly, engagement in OCB should require extra effort because it involves working on additional tasks or problems of coworkers (Organ, 1997).

In addition, Study 3 stresses the importance of positive non-work experiences (i.e., feeling recovered and positive work reflection) compared to the negative experience of reflecting about the negative aspects of one's job. This finding underlines that a perspective consistent with the positive psychology framework may be especially fruitful when

examining positive effects of non-work experiences for employees' job-related behavior (Gable & Haidt, 2005; Wright, 2003).

Findings in the Context of Industrial and Organizational Psychology Research

In Chapter 1, I outlined how research on recovery complements other research areas of industrial and organizational psychology. In the following section I will discuss, how the findings of this dissertation contribute to research on stress, work-life balance and dynamic performance.

First, the findings of the present dissertation contribute to stress research. We showed that recovery during leisure time benefits job performance in the short and in the long run. Thus, our findings indicate that during rest periods employees themselves have the opportunity to 'undo' the negative effects of work-related stress and to prevent impairment in job performance. More specifically, results from Study 2 and 3 revealed that engaging in specific experiences during non-work time (e.g., relaxation, sleep, positive work reflection) indirectly or directly benefited individual's job performance. As findings from stress research showed that the relationships between stressors and job performance are not uniformly positive or negative (Lepine, Podsakoff, & Lepine, 2005; Sonnentag & Frese, 2003), the potential of stress prevention and stress management interventions for improving performance are limited. Here, our findings complement stress research and provide a possibility for developing interventions (e.g., recovery trainings) that can promote employees' performance. We showed that recovery is related to increased job performance and reduced costs of performing (e.g., compensatory effort). These positive outcomes should in turn be related to a further gain of resources (e.g., positive affect, increased self-efficacy ; cf. Bandura, 1997; Fisher & Noble, 2004). Promoting recovery may initiate a positive gain spiral, that is a process where successful resource replenishment facilitates further gain of resources (Hobfoll, 1989). As a consequence individuals should become more resistant to stress and coping with

work-related demands should be facilitated (Hobfoll, 1989). Our findings thereby complement stress research because promoting positive recovery processes has an added value compared to preventing or ameliorating negative stress processes.

Second, our findings contribute to the literature on work-life balance, specifically to the growing number of studies that examine enrichment or positive spillover processes between the work and non-work domain (Edwards & Rothbard, 2000; Hanson, Hammer, & Colton, 2006). We showed that certain non-work experiences (e.g., feeling recovered, positive work reflection, relaxation) are positively related to job-related outcomes, namely various dimensions of individual job performance. Studies that examined relationships between non-work experiences and performance related outcomes are rather scarce (Eby et al., 2005). Findings concerning performance-related outcomes are of particular importance, because they will probably gain more attention from managers and organizations and may play an important role when it comes to decisions on supporting programs or initiatives that aim at improving employees' work-life balance or facilitating the integration of work and family. In addition, studies using a longitudinal design or examining within-person processes are largely missing in this research area, although such designs are necessary to rule out alternative interpretations, such as reverse causation or the influence of third variables (Casper, Eby, Bordeaux, Lockwood, & Lambert, 2007; Ilies, Schwind, & Heller, 2007).

Third, our findings from Study 1 and 2 contribute to the scarce literature on dynamic performance (Beal et al., 2005; Ilies et al., 2006; Trougakos et al., 2008). Taking a within-person perspective we showed that recovery, specifically the state of being recovered, is a predictor of daily and weekly fluctuations in job performance. Our results support the theoretical assumption that the restoration and preservation of resources, particularly self-regulatory resources, is critical for maintaining and augmenting performance over time. Future studies should examine if the restoration of self-regulatory resources is actually the mediating process in the relationship between recovery and performance.

Strengths and limitations

This dissertation has several strengths and limitations that will be addressed in the following section. Specifically, I will discuss the perspective of examining intra-individual relationships, the use of self-reports, the generalizability of results and alternative interpretations for our findings.

The perspective of examining intra-individual relationships

In Study 1 and 2, my coauthors and I examined the relationship between recovery from work-related stress and job performance from a within-person perspective. More specifically, we were interested in predicting within-person changes in performance over different periods of time by the state of being recovered and by other non-work experiences. Such a perspective has several advantages: First, it enables us to examine within-person processes over time, especially over short periods of time (e.g., days or weeks). With respect to job performance, such a perspective allows us to investigate research questions, such as when and under which conditions an individual performs at best versus below average. In contrast, studies with a between-person perspective examine which persons perform at best.

Second, by predicting changes in performance rather than the absolute level of performance the influence of several third variables should be ruled out. For example, biases, such as socially desirable responses or a self-serving bias or influences of demographic variables, such as education, should influence the absolute level of performance and not changes in performance over time. In all our analyses we controlled for the general level of outcome variables and should therefore have ruled out the influence of such third variables. In addition, in Study 1 and 2 we analyzed our data with hierarchical linear models using a specific centering method (i.e., centering around the respective person mean). Thereby, interpretations based on between-person differences (e.g., personality differences) have been ruled out in these studies. This is a major advantage because we can be more confident that

the relationships between our predictor of interest, i.e., the state of being recovered, and performance outcomes are not artificially caused by third variables at the person level.

The use of self-reports

Probably, the most serious limitation of this dissertation is that all variables, especially performance measures were assessed by self-reports. One resulting problem might be common method variance that can inflate the relationships between predictor and outcome variables (Podsakoff et al., 2003). In all three studies we tried to minimize this problem by temporally and methodologically separating the measures whenever possible. For example, in Study 1 we assessed our predictor variable (the state of being recovered in the morning) by a daily morning survey that was answered on a handheld computer, and our outcome measures and day-level control variables in a daily afternoon survey that was also filled in on a handheld computer. A similar approach was used in Study 2. In Study 3, we also temporally separated the measurement of predictor and outcome variables. Therefore, the problem of common method variance should at least be reduced in our studies.

Furthermore, self-reports, and in particular self-reported performance measures might be susceptible to social desirability or a self-serving bias. However, as described in the previous section the study design and specific procedures of data analyses in Study 1 and 2 (e.g., centering predictor variables around the respective person mean) should have ruled out interpretations based on differences between individuals, including such biases. In Study 3, we controlled for the respective performance criterion at Time 1. Thereby we did not predict the absolute level of performance at Time 2, but an increase or decrease over time. Between-person differences and biases should rather be related to the absolute level of performance and not to daily, weekly or longer-term changes in performance that were in the focus of our analyses. With regard to Study 1 and 2 we can also refer to Beal et al. (2005, p. 1064) who

stated that “self-ratings may be more valid with EMA (ecological momentary assessment) than with other methods”.

Nevertheless, future studies should investigate the relationships between recovery and performance using objective data, supervisor or peer ratings as indicators of job performance. However, when examining changes in performance over time, researchers have to rely on indicators or raters that can actually detect or evaluate *changes* in performance. With regard to daily or weekly performance we doubt that supervisors or peers can always give ratings that are more valid than self-reports, because they may not have sufficient opportunities to observe the subordinate’s or coworker’s performance from day to day or from week to week.

Assessing objective performance data that is sensitive to daily fluctuations may be a possibility. A within-person study of Rothbard and Wilk (2006) provides an example for measuring daily performance by objective data. In a sample of call-center workers, Rothbard and Wilk assessed the percentage of time employees were available for answering calls, the number of calls that were further transferred (because they could not be handled by the employee him- or herself), and the number of answered calls per hour. Study results indicated that each outcome variable tapped a specific aspect of performance, as outcome variables were not highly related and different results were obtained for the three performance measures. Therefore, the study of Rothbard and Wilk also highlights that it is important to assess multiple job performance outcome variables, as each may capture a different quantitative or qualitative performance aspect and may show distinct relationships with the predictor of interest.

Future research could also use experimental designs to examine the relationship between recovery and job performance. Although the external validity of such experimental studies may be limited, they can be useful in investigating the effects of recovery on performance-related outcomes using objective data instead of self-ratings. In sum, it will be necessary to accumulate evidence from different studies using different assessment strategies

and operationalization of performance outcomes, in order to conclude if recovery is also related to different performance outcomes when using objective performance data.

Besides gaining performance measures from other sources than the individual him- or herself, future studies could also try to assess non-work experiences by asking spouses or significant others. For example, Sonnentag and Krueger (2006) used ratings provided by family members for assessing psychological detachment during leisure time. Similarly, family members could provide ratings of an individual's state of being recovered or sleep. However, assessing non-work experiences by others may not always be appropriate, because it may be the subjective experience of the individual that matters with regard to health- and performance-related outcomes.

Ruling out alternative interpretations

When examining the relationship between recovery and changes in job performance, we tried to rule out alternative interpretations for our findings. In addition to using a within-person design and a specific centering procedure for data analyses, we controlled for a number of variables that might influence our proposed relationships. In Study 2 and 3, we controlled for an individual's general level of negative affect and for an individual's negative mood on Monday morning. Thus, we can rule out that it is a person's general view or the affective state that explains our findings. Moreover, we controlled for job-related stressors in Study 1 and 3 to preclude that a poorly recovered individual perceives his or her work as more stressful and therefore shows lower job performance (cf. Jex, 1998). Furthermore, we controlled for an individual's age to eliminate the interpretation that our results are due to age-related differences.

In addition, in Study 3 we tested for a reverse causation effect of performance outcomes on feeling recovered, positive and negative work reflection. Except for a reciprocal relationship between positive work reflection and OCB, we found no evidence for reverse

causation. Thus, our results suggest that feeling recovered and positive work reflection influence job performance. However, from this dissertation we cannot finally conclude that recovery has a causal effect on job performance. The question of causality has to be answered by future experimental or intervention studies that manipulate recovery and examine its effect on performance.

Generalizability of results

The research goals of this dissertation were examined in three independent studies that were conducted with different samples and over different time frames. Study 1 was conducted with a sample of employees working in public service organizations. In Study 2 we assessed data from employees working in different medium-sized profit organizations. The sample in Study 3 comprised employees working with people with special needs, that is employees that have to perform emotion work (Zapf et al., 1999). With regard to the different time frames, in Study 1 we examined relationships within a day, in Study 2 we considered relationships within a week, and in Study 3 we investigated relationships over the period of six months. In all three studies we found support for our proposition that recovery, and specifically the state of being recovered, was related to increased job performance over time. Therefore, we think we can be rather confident in concluding that recovery is related to increased performance over time.

Our results indicate that recovery is both related to immediate changes in job performance (i.e., from day to day and from week to week) and to changes over a longer period of time (i.e., half a year). Furthermore, these results were found for employees from different occupations. Consequently, individuals should take care of their daily recovery during the week and during the weekend as it is related to immediate and long-term changes in performance.

Implications for research and practice

This dissertation has several implications for future research and for practice. With regard to future research, one goal should be to clarify the causal pathway between recovery and performance. This can be tested in an experiment or an intervention study manipulating recovery (i.e., specific recovery experiences or the state of being recovered) and observing effects on performance-related outcomes. As suggested above, an experimental design may simultaneously enable researches to assess different forms of objective performance data.

A major task for future research should be to identify the resources that are built-up during the recovery process and that mediate the relationship between recovery and performance. Identifying mediating mechanisms is important as it can provide us with further knowledge how to foster the intervening processes between recovery and job performance. In Study 3, we found first support that an increase in occupational self-efficacy is one mediating mechanism. However, occupational self-efficacy did not mediate the relationship between positive work reflection and contextual performance. It might be that a more specific form of self-efficacy, namely role-breadth self-efficacy (i.e., "the extent to which people feel confident that they are able to carry out a broader and more proactive role" , Parker, 1998, p. 835), is the mediator in the relationship between recovery and contextual performance. A recent study showed that it is role breadth-self efficacy and not task-related self-efficacy that predicts proactive behavior (Ohly & Fritz, 2007). In addition, positive affect may be investigated as potential mediator by future research, because previous research showed that it is an outcome of the recovery process (Sonnentag et al., 2008) and because it is related to performance-related outcomes (Amabile et al., 2005; Fritz & Sonnentag, in press; George, 1991; Staw, Sutton, & Pelled, 1994).

Future studies should examine if self-regulatory resources are restored by certain recovery processes and if this restoration of self-regulatory resources is a mediating mechanism in the relationship between recovery and job performance (Beal et al., 2005;

Hobfoll, 2002). Future research may conduct studies in the style of experimental studies conducted by Baumeister and his coworkers (see for example Baumeister, Bratslavsky, Muraven, & Tice, 1999; Vohs, Baumeister, & Ciarocco, 2005) and study the restoration processes of self-regulatory resources rather than the depletion process.

Another line for future research may be to examine the fade-out of positive recovery effects. For example, one could examine if certain workplace characteristics (e.g., stressors or resources) that deplete or replenish individuals' resources accelerate or decelerate such a fade-out process. Answers to such questions will provide us with important knowledge regarding actions and interventions that can be taken by organizations to support the positive effects of recovery for performance.

A similar area for future research may be to examine moderators in the relationship between recovery and job performance. Such research would give us an answer to the question if recovery is more or less beneficial for certain persons, or if its effect depends on workplace characteristics. In Study 1, we could already show that job control plays a moderating role. Being highly recovered is only beneficial for individuals' daily job performance when job control is high. Research on moderators in the stressor-performance relationship may stimulate such research. For example, perceived effort-reward fairness has been shown as a moderator in the relationship between stressors and performance (cf. Janssen, 2000). When confronted with high demands individuals only show increased performance when they perceive the ratio between spent efforts to received rewards at work as fair. Similarly, only individuals who perceive effort-reward fairness may increase their performance when being highly recovered.

With regard to practice this dissertation also yields several implications. As this dissertation showed that being highly recovered is related to different aspects of performance in the short and in the long run, individuals should take care of their recovery and aim at

engaging in experiences that foster the recovery process. Specifically, results from Study 2 suggest that relaxation, psychological detachment, mastery experiences and sleep during the weekend are important for feeling recovered after the weekend. These experiences have also been shown to benefit individuals' daily recovery (Sonnentag et al., 2008). Thus, developing trainings or exercises (see for example Weh, 2006) that support individuals in experiencing relaxation, psychological detachment or mastery experiences or that help individuals in achieving a good sleep seems promising to directly foster individuals' recovery and indirectly increase performance-related outcomes. Such recovery trainings could also become part of organizations' personal development programs in order to promote their employees' recovery, well-being and performance. Probably, there is more than one optimal way to recover from work-related stress that works for all individuals. Therefore, interventions should aim at helping individuals to identify their personal preferences and capabilities to recover from work-related stress.

With regard to implications for organizations, I think that a first step involves that organizations, i.e., supervisors and human resource managers, become aware that time off from work is important for employees to replenish their resources and for showing a constant high level of performance over time. Concerning interventions that can be taken by organizations, I recommend that organizations should care about work-time arrangements that provide employees with sufficient time and possibilities to recover during leisure time. This should be particularly important for organizations with shift-work employees (cf. Demerouti, Geurts, Bakker, & Euwema, 2004). In addition, organizations can directly support employees' recovery opportunities by providing sport facilities or offering participation in other leisure activities, such as visiting an exhibition or learning a foreign language. However, it is important to note that organizations can only provide employees with resources and possibilities that make a successful recovery more likely.

Furthermore, results from Study 3 show that positive work reflection during leisure time is important for increasing contextual performance over a longer period of time. Therefore, supervisors and organizations could take care of a workplace environment that stimulates employees to think about the good sides of their work during leisure time. Providing positive feedback (cf. Battmann, 1988; Ilies & Judge, 2005), rewarding employees for special achievements and promoting a supportive organizational climate (Anderson & West, 1998; Elovainio et al., 2002) may contribute to employees' positive work reflection during leisure time.

In sum, organizations and employees should aim at establishing a culture that values recovery because it is not only a hedonistic experience in itself, but can be seen as an important mechanism to undo the negative effects of work-related stress and to maintain well-being and performance in the short and in the long run.

General Conclusion

This dissertation extended research on the relationship between recovery during leisure time and job performance by showing that recovery is related to changes in different aspects of performance in the short and in the long run. As previous research showed that recovery benefits employees' well-being, our findings are good news for both employees and organizations as recovery pays off for both the individual and for organizations. Therefore, our findings regarding recovery and performance fit into a positive psychology perspective and underline that it may be especially fruitful to investigate positive conditions or processes that contribute to the flourishing and optimal functioning of individuals (Luthans & Youssef, 2007; Seligman & Csikszentmihalyi, 2000; Wright, 2003).

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