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Fakultät für Erziehungswissenschaft, Psychologie und Soziologie

WORK, LEISURE, AND IN-BETWEEN
Zur Entstehung tagesspezifischer
psychischer Beanspruchungswirkungen
im Spannungsfeld zwischen Arbeit und Freizeit

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DISSERTATION

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„Indes sie forschten, röntgten, filmten, funkten,
entstand von selbst die köstlichste Erfindung:
der Umweg als die kürzeste Verbindung
zwischen zwei Punkten.“

ERICH KÄSTNER

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Zusammenfassung

Der schnelle technologische Wandel und die zunehmende Dienstleistungsorientierung verändern die Arbeitswelt und stellen Beschäftigte vor neue Herausforderungen. Das eigene Verhalten muss permanent an wechselnde Situationserfordernisse angepasst werden. Gleichzeitig verschwimmen die Grenzen zwischen Arbeit und Freizeit – die tradierten Strukturen von Arbeit lösen sich auf.

Intention der vorliegenden Dissertation ist es, mit diesen Veränderungen einhergehende Belastungsquellen (Selbstkontrollanforderungen und berufliche Smartphone-Nutzung) und deren Auswirkungen auf die psychische Gesundheit von Beschäftigten zu beleuchten. Während sich frühere Forschung vorwiegend mit den langfristigen Folgen chronisch hoher Belastungen beschäftigte, liegt der Fokus dieser Dissertation auf *tages-spezifischen* psychischen Beanspruchungswirkungen sowie möglichen Übertragungseffekten zwischen den Lebensbereichen Arbeit und Freizeit. Einen weiteren Schwerpunkt stellt die Untersuchung von Schutzfaktoren dar, die zur Milderung der Beanspruchungswirkungen beitragen. Das Ziel sind eine differenzierte Analyse von kurzfristigen Belastungs-Beanspruchungs-Verläufen in der Gesamtsicht von beruflichem und privatem Umfeld und die Ableitung von Strategien für den Gesundheitsschutz, die bereits auf Tagesebene wirksam sind.

Zu diesem Zweck werden drei empirische Studien auf Grundlage fragebogen-basierter elektronischer Tagebuchstudien durchgeführt, die die Analyse intraindividuel-ler Zusammenhänge anhand statistischer Mehrebenen-Verfahren erlauben. In Studie I (N=86) werden tagesspezifische Zusammenhänge von Selbstkontrollanforderungen bei der Arbeit mit dem Erleben von Ich-Erschöpfung sowie damit assoziierten Vitalitätsbeeinträchtigungen in der Freizeit untersucht. Es wird außerdem geprüft, ob die psychische Distanzierung von der Arbeit die Übertragung der Beanspruchungswirkungen in die Freizeit abwendet. Studie II (N=74) ist der Untersuchung der unmittelbaren Auswirkungen

beruflicher Smartphone-Nutzung in der Freizeit auf das Beanspruchungserleben (Ich-Erschöpfung, Bedarf nach Erholung) von Beschäftigten in der Freizeit gewidmet. Zudem werden Moderatoren-Effekte der Befriedigung psychologischer Grundbedürfnisse durch die eigene Arbeit analysiert. Thema von Studie III (N=63) ist die Frage, ob berufliche Smartphone-Nutzung nach der Arbeit auch den nächsten Arbeitstag beeinflussen kann. Hierzu werden verstärkende Interaktionseffekte zwischen beruflicher Smartphone-Nutzung in der Freizeit und Selbstkontrollanforderungen am folgenden Arbeitstag in der Entstehung von Ich-Erschöpfung geprüft. Ergänzend wird untersucht, ob Schlafqualität diese Interaktion abschwächt.

Die Ergebnisse der drei Studien zeigen, dass sowohl Selbstkontrollanforderungen als auch die berufliche Smartphone-Nutzung bereits auf Tagesebene mit psychischen Beanspruchungswirkungen verbunden sind, die wechselseitig zwischen Arbeit und Freizeit übertragen werden. Für eine vollständige Abbildung der Belastungssituation von Beschäftigten müssen demnach beide Lebensbereiche berücksichtigt werden. Ferner weisen die Studienergebnisse auf wichtige Schutzfaktoren (psychische Distanzierung, Befriedigung psychologischer Grundbedürfnisse, Schlafqualität) hin, die Arbeitnehmer im Umgang mit den Belastungen unterstützen und vor kurzfristigen gesundheitlichen Folgen schützen können. Zusammenfassend liefert die Dissertation mithilfe aktueller methodischer Ansätze neue Erkenntnisse zur Entstehung tagesspezifischer psychischer Beanspruchungswirkungen im Spannungsfeld zwischen Arbeit und Freizeit. Sie enthält außerdem Impulse für den betrieblichen Gesundheitsschutz sowie Strategien zum Umgang mit akuten Belastungserfahrungen für Beschäftigte.

Summary

Rapid technological progress and increasing service orientation cause constant change in contemporary work environments. Employees continuously face new challenges, such as adapting to situational circumstances and controlling attention, behavior, and emotions. The boundaries between work and home start to blur, leading to the dissolution of traditional structures of work.

The intention of the present dissertation is to shed light on emerging job demands in modern work environments (self-control demands and work-related smartphone use) and their adverse impact on employees' psychological health. Whereas earlier research mainly focused on long-term consequences of chronically high job demands, this dissertation focuses on day-specific consequences and their potential spillover between work and home. Another emphasis is the investigation of protective resources that mitigate these effects at the day-level. The goal is to evaluate short-term trajectories between job demands and psychological strain in the interplay between work and home, and to derive both individual and occupational strategies for health protection.

For this purpose, three empirical studies are conducted using questionnaire-based electronic diary designs, which allow the analysis of day-specific relationships by means of statistical multi-level methods. Study I (N=86) investigates the day-specific relationship of self-control demands at work with the experience of ego depletion and associated impairments of subjective vitality at home. Moreover, it is examined whether psychological detachment from work can prevent the spillover of the adverse effects of self-control demands to the home domain. Study II (N=74) is dedicated to the investigation of the immediate effects of work-related smartphone use at home on indicators of psychological strain (ego depletion, need for recovery) at home. In addition, the moderating effect of employees' satisfaction of basic psychological needs at work is analyzed. Study III (N=63) deals with the question of whether work-related smartphone

use at home can impact the following work day. Therefore, reinforcing interaction effects between work-related smartphone use at home and next-day self-control demands at work in the prediction of ego depletion are analyzed. The study also examines whether sleep quality attenuates this interaction.

The results of the three studies demonstrate that self-control demands and work-related smartphone use constitute prevalent job stressors in modern working environments, which can evoke indicators of psychological strain at a daily level. Furthermore, it becomes evident that experiences at work and at home can interfere with each other, so that both life domains should be considered for a comprehensive understanding of employees' psychological health. Finally, the results point to important protective resources (psychological detachment, basic needs satisfaction, sleep quality), which can support employees in coping with job demands and prevent that short-term health-related consequences spill over between work and home. In sum, this dissertation uses current methodological approaches to provide new insights into the development of day-specific psychological strain in contemporary work environments.

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Kapitel 1

Einleitung

Die Arbeitswelt hat mit dem Einzug der Digitaltechnologie einen tiefgreifenden Wandel erfahren. Smartphones, Tablets und Laptops ermöglichen heute einen permanenten Zugriff auf arbeitsrelevante Daten und damit eine flexible Organisation der Arbeit, die räumliche und zeitliche Grenzen überwindet. Virtuelle Zusammenarbeit in internationalen Teams und ein 24 Stunden am Tag erreichbarer Kundendienst gehören in einer vernetzten Dienstleistungsgesellschaft zum Alltagsgeschäft.

Diese Veränderungen stellen Beschäftigte vor neue Herausforderungen. So verlangt die Arbeit in nahezu allen Tätigkeiten und Branchen ein wachsendes Maß an Eigeninitiative und permanenter – auch psychischer – Anpassungsleistung. Viele Arbeitgeber erwarten, dass ihre Mitarbeiter flexibel handeln und persönliche Fähigkeiten hinsichtlich neuer Technologien und Programme kontinuierlich weiterentwickeln (Diestel, Rivkin, & Schmidt, 2017). Auch der Umgang mit strukturellen Veränderungen, die aus den immer mehr verschwimmenden Grenzen zwischen Beruf und Freizeit resultieren (z.B. Home Office), fordern von Beschäftigten eine zielgerichtete Regulation ihres Verhaltens und damit den Einsatz von *Selbstkontrolle* (Schmidt & Neubach, 2007b).

Die wachsenden Anforderungen an Beschäftigte bleiben nicht ohne Folgen. Aktuelle Zahlen der Rentenversicherer und Krankenkassen offenbaren teils gravierende Fehlzeitenanstiege, die im Zusammenhang mit Erschöpfungs- und Depressionssymptomen stehen. So liegen psychische Erkrankungen heute mit an der Spitze der Berufserkrankungen und sind eine der Hauptursachen für Frühverrentungen (Bundespsychotherapeutenkammer, 2013). Die Ausfallzeiten psychisch erkrankter Beschäftigter sind weitreichend: Mit 25,7 Tagen pro Fall dauern sie mehr als doppelt so lange wie der Durchschnitt mit 11,7 Tagen (Badura, Ducki, Schröder, Klose, & Meyer, 2016) und verursachen hohe betriebs- und volkswirtschaftliche Kosten (Ahlers & Brussig, 2004). Vor diesem Hintergrund rücken

die Wirkungszusammenhänge zwischen Arbeitsbelastungen und psychischer Beanspruchung in den Fokus von Öffentlichkeit, Politik und Wissenschaft (Lohmann-Haislah, 2012).

Psychologische Studien zu diesem Thema erforschten bisher vorwiegend stabile Unterschiede in der Arbeitsbelastung zwischen Menschen mit verschiedenen Berufen (sogenannte interindividuelle Effekte, also Unterschiede *zwischen* Personen) sowie die Langzeitfolgen (z. B. Burnout) chronisch hoher Belastungen. Weniger Beachtung in der Forschung fanden dagegen tagesspezifische Schwankungen von Arbeitsbelastungen und deren kurzfristige Beanspruchungswirkungen – also Unterschiede *innerhalb* von Personen zwischen verschiedenen Tagen, sogenannte intraindividuelle Effekte. Sind Arbeitsbelastungen an manchen Tagen stärker ausgeprägt als an anderen? Treten an Tagen mit besonders hoher Belastung kurzfristige Beanspruchungssymptome auf? Übertragen sich diese Beanspruchungssymptome auf die Freizeit, oder sogar auf den nächsten Arbeitstag? Und wie können sich Beschäftigte an solchen Tagen schützen? Antworten auf diese Fragen scheinen unerlässlich für eine umfassende Analyse von Belastungs-Beanspruchungsverläufen im Arbeitskontext und die Chance, bereits auf Tagesebene wirksame Maßnahmen für den Gesundheitsschutz zu etablieren.

Intention der vorliegenden Dissertation ist, diese Forschungslücke mithilfe aktueller methodischer Ansätze zu adressieren und damit einen Beitrag zum Verständnis der Belastung von Beschäftigten in modernen Arbeitsumgebungen zu leisten. Im Rahmen von drei empirischen Studien werden tagesspezifische *Arbeitsbelastungen* beleuchtet und deren Auswirkungen auf kurzfristige *psychische Beanspruchungssymptome* in der Gesamtsicht von beruflichem und privatem Umfeld untersucht. Darüber hinaus werden *Schutzfaktoren* identifiziert, die Beschäftigte im Umgang mit den Belastungen unterstützen und so die Beanspruchungswirkungen reduzieren. Die Studien basieren auf elektronischen Tagebuch-Designs, die die Analyse intraindividuelle Zusammenhänge anhand statistischer Mehrebenen-Verfahren erlauben. Sie beinhalten außerdem eine differenzierte Auseinandersetzung mit dem Konzept der Selbstkontrolle als Mechanismus zielgerichteter Tätigkeit am Arbeitsplatz.

Zunächst wird das Konzept der Selbstkontrolle vorgestellt und die Entstehung psychischer Beanspruchung im Arbeitskontext anhand des Modells der begrenzten Selbstkontrollstärke theoretisch hergeleitet. Daran anknüpfend werden die in der Dissertation untersuchten Konzepte skizziert. Eine schematische Übersicht zeigt Abbildung 1:

Als Belastungsquellen stehen Selbstkontrollanforderungen bei der Arbeit sowie berufliche Smartphone-Nutzung in der Freizeit im Zentrum des Interesses. Kurzfristige psychische Beanspruchung wird über Ich-Erschöpfung, den Bedarf nach Erholung und die subjektive Vitalität abgebildet. Als mögliche Schutzfaktoren werden die psychische Distanzierung von der Arbeit, die Schlafqualität sowie Befriedigung psychologischer Grundbedürfnisse untersucht. Auf dieser Basis werden die zentralen Fragestellungen hinsichtlich möglicher tagespezifischer Zusammenhänge in der Gesamtsicht von Arbeit und Freizeit abgeleitet.

Die anschließenden Kapitel sind der Darstellung der empirischen Studien gewidmet. Zuletzt werden die Studienergebnisse übergreifend eingeordnet und interpretiert. Dabei werden Ansätze für weitere Forschung diskutiert sowie generelle Strategien abgeleitet, um Fehlentwicklungen durch zielgerichtete Maßnahmen zur Gesundheitsförderung entgegenzuwirken.

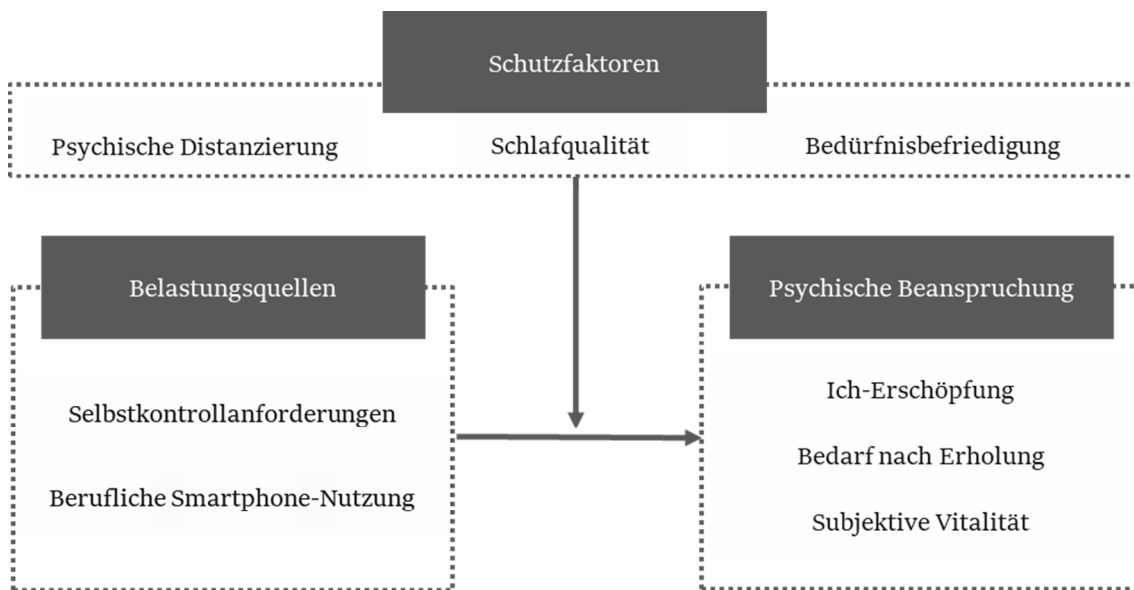


Abbildung 1: Darstellung der integrierten Konzepte

Selbstkontrolle und das Modell der begrenzten Selbstkontrollstärke

Das Konzept der Selbstkontrolle hat in den vergangenen Jahren zunehmendes Interesse in der arbeits- und organisationspsychologischen Forschung erfahren. Selbstkontrolle bezeichnet eine gezielte Steuerung und Kontrolle gewohnheitsmäßiger oder impulsiver Reaktionen, Motivationstendenzen sowie kognitiver Informationsverarbeitungsprozesse (Baumeister, Heatherton, & Tice, 1994). Sie ist zum Beispiel dann notwendig, wenn impulsive Verhaltenstendenzen zu Gunsten zielorientierten Verhaltens unterdrückt werden müssen, wenn willentliche Entscheidungen gefordert sind, oder sich eine Handlung nicht anhand früher gelernter Routinen bewältigen lässt (Schmidt & Neubach, 2009).

Für die erfolgreiche Bewältigung vieler beruflicher Anforderungen spielt die Selbstkontrolle eine entscheidende Rolle: So erfordert die Arbeit in Großraumbüros, dass sich die Mitarbeiter nicht durch ständige Außenreize ablenken lassen, sondern die Aufmerksamkeit strikt auf ihre Aufgaben richten. Auch die fortwährende Anpassung an wechselnde berufliche Interaktionspartner verlangt, dass sich das eigene Verhalten an den Wünschen und Wertvorstellungen anderer orientiert und persönliche Prioritäten zurückgestellt werden.

Ein intensiver und andauernder Einsatz solcher Selbstkontrollmechanismen ist jedoch mit psychischen und physischen Kosten verbunden: Zahlreiche Studien aus der psychologischen Grundlagenforschung belegen, dass mit der Ausübung von Selbstkontrolle gesundheitliche Beeinträchtigungen und Defizite der kognitiven Leistungsfähigkeit verbunden sind (Baumeister, Bratslavsky, Muraven, & Tice, 1998; Baumeister et al., 1994; Hagger, Wood, Stiff, & Chatzisarantis, 2010; Muraven, Baumeister, & Tice, 1999; Muraven, Tice, & Baumeister, 1998). Auf physiologischer Ebene manifestieren sich die ungünstigen Wirkungen von Selbstkontrolle beispielsweise in einer erhöhten Herzschlagfrequenz sowie einer erheblichen Zunahme des Blutdrucks (Segerstrom & Nes, 2007).

Aus diesen Befunden haben Muraven und Baumeister (2000) das Modell der begrenzten Selbstkontrollstärke abgeleitet, das in der angewandten Forschung vermehrt zur Erklärung der Entstehung psychischer Beanspruchung im Arbeitskontext herangezogen wird (für einen Überblick siehe Schmidt & Diestel, 2015). Das Modell beschreibt Selbstkontrolle als eine nur begrenzt verfügbare Kapazität (auch Selbstkontroll-Ressource genannt), die durch unterschiedliche Prozesse der Selbstkontrolle beansprucht wird und infolgedessen ähnlich wie ein Muskel vorübergehend erschöpft. Dieser akute Erschöp-

fungszustand wird als Ich-Erschöpfung (englisch: *ego depletion*; Baumeister et al., 1998) bezeichnet und zeichnet sich unter anderem durch akute kognitive Erschöpfung und Konzentrationsschwäche aus. Durch Erholungsphasen kann die erschöpfte Selbstkontroll-Ressource regenerieren. Bleibt die Möglichkeit zur Regeneration dagegen aus, drohen aus kurzfristigen Erschöpfungszuständen chronische Gesundheitsbeeinträchtigungen sowie Defizite der Selbstkontrolle zu entstehen. Über diese unmittelbaren Zusammenhänge hinaus lässt das Modell auf Wechselwirkungen strukturell ähnlicher Anforderungen schließen, die um begrenzte Ressourcenanteile konkurrieren (Diestel et al., 2017): So zeigen die Ergebnisse mehrerer Feldstudien, dass sich unterschiedliche Anforderungen an die Selbstkontrolle in ihren Beanspruchungswirkungen gegenseitig verstärken (Diestel & Schmidt, 2011; Schmidt, 2010).

Die psychischen Kosten von Selbstkontrolle verweisen auf ein häufig unterschätztes Gefährdungspotenzial moderner Arbeitsumgebungen, die sich zunehmend durch – nicht selten auch gleichzeitig oder kurz nacheinander einwirkende – Anforderungen an willentliche Regulationsprozesse auszeichnen (Diestel et al., 2017). In der vorliegenden Dissertation werden zwei solcher Anforderungen – im Folgenden als Belastungsquellen bezeichnet – näher beleuchtet. Sie sollen insbesondere hinsichtlich ihrer tagesspezifischen gesundheitlichen Auswirkungen auf Beschäftigte untersucht werden

Belastungsquellen in modernen Arbeitsumgebungen:

Selbstkontrollanforderungen und berufliche Smartphone-Nutzung

Im Fokus dieser Dissertation stehen zwei Belastungsquellen, die für viele Beschäftigte eine hohe aktuelle Relevanz besitzen: Selbstkontrollanforderungen bei der Arbeit und die berufliche Smartphone-Nutzung in der Freizeit. Diese Auswahl der Belastungsquellen ist dem Ziel geschuldet, die „Entgrenzung“ von Arbeit in modernen Lebensverhältnissen sowie die daraus resultierende Überlappung mit der Freizeit abzubilden. So soll eine vollständigere Perspektive auf die Belastungskonstellation von Beschäftigten entstehen.

Selbstkontrollanforderungen bei der Arbeit. Das Konzept der Selbstkontrollanforderungen untergliedert sich in drei verschiedene Facetten: Impulskontrolle, Ablenkungen widerstehen und innere Widerstände überwinden (Schmidt & Neubach, 2007a).

Impulskontrolle umfasst das Unterdrücken spontaner, impulsiver Reaktionstendenzen und der damit verbundenen Emotionen, die sich beispielsweise in unbedachten sprachlichen Äußerungen, Gereiztheit, oder Ungeduld widerspiegeln. Insbesondere dann, wenn ein beherrschter und souveräner Verhaltenseindruck vermittelt werden soll (zum Beispiel im Umgang mit Kunden in Dienstleistungsberufen), ist die Kontrolle von Impulsen ein wesentlicher Bestandteil der Arbeitsrolle (Neubach & Schmidt, 2008). *Ablenkungen widerstehen* bezieht sich auf das Ignorieren bzw. Ausblenden von Außenreizen, die die eigentliche Aufgabenbearbeitung zu unterbrechen drohen. Solche Ablenkungen entstehen beispielsweise durch Kommunikationsmedien (eingehende private Nachrichten auf dem Handy), das soziale Umfeld (Austausch mit Kollegen) oder äußere Wirkfaktoren (Baulärm, Geräuschkulisse im Großraumbüro). Die dritte Facette beschreibt das *Überwinden innerer Widerstände* im Sinne einer Motivationsregulation, zum Beispiel bei unattraktiven Arbeitsaufgaben, ständig wiederkehrenden Arbeitsvorgängen oder persönlichen Blockaden und Hemmungen.

Dass Selbstkontrollanforderungen bei der Arbeit langfristig die psychische Gesundheit von Beschäftigten beeinträchtigen können, zeigen die Ergebnisse zahlreicher Längs- und Querschnittsuntersuchungen aus den vergangenen Jahren. So erkrankten Beschäftigte in Berufen mit chronisch hoch ausgeprägten Selbstkontrollanforderungen, zum Beispiel im Dienstleistungssektor, überdurchschnittlich oft an Burnout oder Depressionen und weisen entsprechend höhere Fehlzeiten am Arbeitsplatz auf (für einen Überblick siehe Schmidt & Diestel, 2015).

Berufliche Smartphone-Nutzung während der Freizeit. Neben Computern und Laptops sind auch Smartphones für viele Beschäftigte nicht mehr aus dem Arbeitsalltag wegzudenken. Immer mehr Arbeitgeber stellen ihren Mitarbeitern sogar Diensthandy zur Verfügung. In eingeschaltetem Zustand informieren sie rund um die Uhr über eingehende Emails, Nachrichten und Anrufe – auch nach Ende der regulären Arbeitszeit. Laut einer Studie des Verbands BITKOM zum Thema „Arbeit in der digitalen Welt“ (BITKOM, 2013) sind drei Viertel aller Berufstätigen (77 Prozent) in Deutschland grundsätzlich nach Feierabend über ihr Smartphone erreichbar. Aus Unternehmenssicht soll die ausgedehnte Erreichbarkeit für Kunden, Vorgesetzte und Kollegen Produktivitätsgewinne bewirken, zum Beispiel durch verkürzte Reaktionszeiten und beschleunigte Entscheidungsprozesse (Diestel et al., 2017). Die Beschäftigten selbst erleben eine höhere Flexibilität, insbesondere hinsichtlich der Vereinbarkeit von Beruf und Familie (Park & Jex, 2011).

Trotz dieser Vorteile bestehen auch Risiken für die Gesundheit und das Wohlbefinden der Beschäftigten, die aus der Dauer-Verfügbarkeit entstehen: Empirische Befunde zeigen Zusammenhänge von intensiver Smartphone-Nutzung mit verkürzter Schlafdauer (Lanaj, Johnson, & Barnes, 2014) und Schwierigkeiten, sich mental von der Arbeit zu distanzieren (Derks, van Mierlo, & Schmitz, 2014). Darüber hinaus kann berufliche Smartphone-Nutzung langfristig zur Entstehung von Burnout beitragen (Derks & Bakker, 2014). Einige Studien lassen darauf schließen, dass diese Beanspruchungsfolgen durch den Einsatz von Selbstkontrollprozessen vermittelt werden (Lanaj et al., 2014). Denn die berufliche Smartphone-Nutzung während der Freizeit erfordert, zwischen den Rollen als Arbeitnehmer und als Privatperson hin- und her zu wechseln und das eigene Verhalten entsprechend zu regulieren.

Erst kürzlich publizierte Forschungsergebnisse offenbaren, dass viele Belastungsquellen – so auch Selbstkontrollanforderungen und berufliche Smartphone-Nutzung – nicht nur stabile Merkmale bestimmter Arbeitstätigkeiten darstellen: Ihre Ausprägung kann zwischen verschiedenen Arbeitstagen stark variieren (Derks, Bakker, Peters, & van Wingerden, 2016; Rivkin, Diestel, & Schmidt, 2015a, 2018). So stellen Tage mit intensivem Kundenkontakt, häufigen Arbeitsunterbrechungen oder unattraktiven Aufgaben bei der Arbeit besonders hohe Anforderungen an die Selbstkontrolle der Beschäftigten. Äquivalent ist an Tagen mit hohem Zeitdruck mit einem besonders starken Gebrauch von Smartphones nach Feierabend zu rechnen, weil sie den Abschluss noch ausstehender Arbeitsaufgaben ermöglichen. Bislang ist erst wenig dazu bekannt, ob mit solchen tagesspezifisch erhöhten Belastungen unmittelbare psychische Beanspruchungswirkungen verbunden sind.

Tagesspezifische psychische Beanspruchungswirkungen im Spannungsfeld zwischen Arbeit und Freizeit

Die arbeits- und organisationspsychologische Forschung untersuchte, wie eingangs erwähnt, bislang vorwiegend andauernde Arbeitsbelastungen und daraus resultierende chronische Gesundheitsbeeinträchtigungen, zum Beispiel Burnout, Depressionen (Schmidt & Neubach, 2007b) oder psychosomatische Symptome wie Schlafstörungen (Selg, Ulich, & Faltermaier, 2017). Neuere wissenschaftliche Ansätze implizieren jedoch dynamischere Belastungs-Beanspruchungs-Zyklen: Sie nehmen an, dass sich akute Belastungsspitzen bereits taggleich in einem Anstieg kognitiver, physiologischer, emotionaler und

verhaltensbezogener Beanspruchungssymptome äußern können (Ohly, Sonnentag, Niessen, & Zapf, 2010; Schaper, 2014). Diese Beanspruchungssymptome lassen sich als kurzfristige, transiente Zustände verstehen, die sich erst mit der Zeit in chronische Gesundheitsbeeinträchtigungen zu manifestieren drohen. Ihre Analyse ermöglicht folglich eine frühere Diagnose des tatsächlichen Gefährdungspotenzials von Arbeitsbelastungen.

Vor diesem Hintergrund sollen in der vorliegenden Dissertation die Auswirkungen von Selbstkontrollanforderungen und beruflicher Smartphone-Nutzung auf drei verschiedene Indikatoren kurzfristiger psychischer Beanspruchung untersucht werden. Die **Ich-Erschöpfung** beschreiben Baumeister und Kollegen (1998) als die unmittelbare Folge aus einer Überbeanspruchung der limitierten Selbstkontrollressource. Dieser Zustand ist beispielsweise gekennzeichnet durch akute kognitive Erschöpfung sowie vorübergehende Defizite in Konzentration und Willenskraft. Der **Bedarf nach Erholung** als zweiter Indikator äußert sich in kurzfristigen Verhaltensveränderungen, zum Beispiel in reduzierten Interaktionen mit anderen Menschen und einem geringeren Aktivitätsniveau in der Freizeit (van Veldhoven & Broersen, 2003). Die **subjektive Vitalität** umfasst außerdem affektive Komponenten (Ryan & Deci, 2008): So äußert sich eine verringerte Vitalität nicht nur in akuten Produktivitätseinbußen, sondern auch in einer temporären Abnahme von positivem Affekt und Fröhlichkeit (Penninx et al., 2000; Watson & Tellegen, 1985).

In die Untersuchung der tagesspezifischen Beanspruchungswirkungen von Selbstkontrollanforderungen und beruflicher Smartphone-Nutzung sollen außerdem – angesichts der immer mehr verwischenden Grenzen zwischen den Lebensbereichen Arbeit und Freizeit – neben unmittelbaren Wirkungen innerhalb der Lebensbereiche auch Wechselwirkungen zwischen den Lebensbereichen (sogenannte Übertragungs-Effekte) einbezogen werden (Martinez-Corts, Demerouti, Bakker, & Boz, 2015; Sanz-Vergel, Rodríguez-Muñoz, & Nielsen, 2015). Denn die Verflechtung von Arbeit und Freizeit kann bewirken, dass Erfahrungen (zum Beispiel Stressreaktionen) im einen Bereich in den anderen übertragen werden und dortige Erfahrungen beeinflussen (Edwards & Rothbard, 2000). So gilt es zu untersuchen, ob sich Beschäftigte nach Arbeitstagen mit höheren Belastungen in ihrer Freizeit stärker beansprucht fühlen, oder ob umgekehrt hohe Belastungen während der Freizeit das psychische Wohlbefinden am Folgetag bei der Arbeit beeinträchtigen.

Die Kenntnis solcher tagesspezifischen Belastungs-Beanspruchungs-Verläufe kann als Basis für Präventionsansätze dienen, die bereits auf Tagesebene wirksam sind und so dazu beitragen, langfristigen Gesundheitsbeeinträchtigungen aktiv entgegenzuwirken. Eine wichtige Rolle spielen hierfür sogenannte Schutzfaktoren.

Die präventive Rolle gesundheitsförderlicher Schutzfaktoren

Die hohe Prävalenz von psychischen Erkrankungen im Arbeitskontext hat in der psychologischen Forschung die Untersuchung von Faktoren angeregt, die Beschäftigte den Umgang mit Belastungen erleichtern, indem sie zur Anstrengungsminderung sowie zur Förderung von Erholungsprozessen beitragen (Schmidt, Hupke, & Diestel, 2012; Wendsche & Lohmann-Haislah, 2017). Sowohl Beschäftigte selbst als auch deren berufliche Umwelt können als Quelle solcher Schutzfaktoren dienen. Auf persönlicher Ebene sind dies beispielsweise individuelle Handlungsmuster oder Fähigkeiten, auf beruflicher Ebene Arbeitsbedingungen oder Merkmale der Tätigkeit (Schaper, 2014).

Bislang galt das Forschungsinteresse vor allem der gesundheitsförderlichen Wirkung von Schutzfaktoren bei chronisch hohen Arbeitsbelastungen (Rivkin, Diestel, & Schmidt, 2015b; Schmidt & Diestel, 2012; Schmidt et al., 2012). Aktuellere empirische Befunde lassen jedoch darauf schließen, dass Schutzfaktoren bereits auf Tagesebene greifen und eine wichtige Rolle für die Milderung akuter psychischer Beanspruchung spielen, die aus dem Umgang mit tagesspezifischen Belastungsspitzen resultiert (z.B. Rivkin et al., 2015a).

In dieser Dissertation sollen daher insgesamt drei potentielle Schutzfaktoren beleuchtet und hinsichtlich ihrer tagesspezifischen moderierenden Wirkung zwischen den bereits vorgestellten Belastungsquellen und Beanspruchungssymptomen untersucht werden: die psychische Distanzierung von der Arbeit und die Schlafqualität auf persönlicher Ebene sowie die Befriedigung psychologischer Grundbedürfnisse auf der beruflichen Ebene. Es wird angenommen, dass diese drei Faktoren die Entlastung und Regeneration der beanspruchten Selbstkontrollkapazität fördern und auf diese Weise akuten Beanspruchungsfolgen entgegenwirken.

Psychische Distanzierung von der Arbeit. Die psychische Distanzierung umfasst die Abwesenheit von arbeitsbezogenen Gedanken und Aktivitäten in der Freizeit und somit das Gefühl, „abschalten“ zu können und „wirklich von der Arbeit weg zu sein“. Das

gelingt insbesondere durch Freizeitaktivitäten, die die volle Aufmerksamkeit beanspruchen, wie zum Beispiel soziale Interaktionen, sportliche Aktivitäten oder Entspannungsübungen. Die Annahme beruflicher Anrufe, das Beantworten von E-Mails und auch das Nachgrübeln über arbeitsrelevante Probleme sind dabei ausgeschlossen (Sonnentag & Fritz, 2007). Die psychische Distanzierung von der Arbeit gilt als Kernkomponente der Erholung. Eine Vielzahl psychologischer Studien konnte zeigen, dass eine psychische Distanzierung zur Arbeit nicht nur direkt das Wohlbefinden von Beschäftigten fördert (z. B. Sonnentag & Fritz, 2007), sondern auch dazu beiträgt, dass Belastungsquellen bei der Arbeit als weniger beanspruchend empfunden werden (Sonnentag, Binnewies, & Mojza, 2010). Denn die aus der Abwesenheit arbeitsbezogener Gedanken resultierenden Erholungsphasen ermöglichen, beanspruchte (Regulations-) Ressourcen zu regenerieren. Auf diese Weise werden drohende Beanspruchungssymptome reduziert.

Schlafqualität. Schlaf ist ein natürlicher Mechanismus des Körpers, der die Erholungsprozesse des Organismus steuert und die Wiederherstellung psychologischer und physiologischer Leistungsvoraussetzungen nach einer Belastung ermöglicht (Hobson, 2005). Eine hohe Schlafqualität, gekennzeichnet durch schnelles Einschlafen und eine geringe Anzahl an Schlafunterbrechungen während der Nacht (Barnes, 2012; Harvey, Stinson, Whitaker, Moskovitz, & Virk, 2008), gilt in der Forschung als wichtiger Prädiktor für die Wiederherstellung erschöpfter Regulationsressourcen (Barber, Munz, Babsby, & Powell, 2009; Barnes, 2012; Baumeister et al., 1998; Muraven & Baumeister, 2000). Übereinstimmend zeigen neuere Studienergebnisse aus der Arbeits- und Organisationspsychologie, dass durch Phasen qualitativ guten Schlafes die Auswirkungen von Arbeitsbelastungen auf die psychische Gesundheit entschärft werden (Diestel, Rivkin, & Schmidt, 2015; Liu et al., 2017).

Befriedigung psychologischer Grundbedürfnisse bei der Arbeit. Die Selbstbestimmungstheorie (Self-Determination Theory; Deci & Ryan, 2000) postuliert, dass intrinsisch motiviertes Handeln durch drei psychologische Grundbedürfnisse geleitet wird: Das Bedürfnis nach Kompetenz, das Bedürfnis nach Autonomie, und das Bedürfnis nach Zugehörigkeit. Auch für den betrieblichen Arbeitsalltag sind diese Bedürfnisse von Bedeutung: Beschäftigte erleben eine höhere intrinsische Motivation bei der Arbeit, wenn ihre Arbeitsaufgaben mit den eigenen Kompetenzen übereinstimmen, sie eine gewisse Autonomie in der Ausübung ihrer Tätigkeit erleben und sich am Arbeitsplatz sozial eingebunden fühlen. Intrinsisch motivierte Handlungen werden als frei gewählt empfunden, sie

entsprechen den Wünschen und Zielen des individuellen Selbst und sind keine Folge von äußerem Druck oder inneren Zwängen (Deci & Ryan, 2000; Ryan & Deci, 2000). Die energieverleihenden Eigenschaften intrinsischer Motivation und die damit einhergehenden positiven Emotionen (Reis, Sheldon, Gable, Roscoe, & Ryan, 2000) fördern die Erholung beanspruchter Regulationsressourcen (Tice, Baumeister, Shmueli, & Muraven, 2007).

Zusammenfassung der Forschungsziele und methodischer Ansatz

Die vorliegende Dissertation hat zum Ziel, die gegenwärtige Forschungslücke hinsichtlich tagesspezifischer Dynamiken zwischen Belastungsquellen, Schutzfaktoren und psychischer Beanspruchung zu adressieren. Besonderes Interesse gilt dabei der Frage, wie sich die Lebensbereiche Arbeit und Freizeit wechselseitig beeinflussen. Damit soll sowohl ein methodischer als auch ein inhaltlicher Mehrwert für die arbeits- und organisationspsychologische Fachliteratur entstehen. Außerdem soll ein praktischer Beitrag zur Prävention von Gesundheitsbeeinträchtigungen in modernen Arbeitsumgebungen geleistet werden. Zusammenfassend werden auf Basis der vorgestellten Konzepte und mit Bezug zum Modell der begrenzten Selbstkontrollstärke die folgenden Fragestellungen empirisch untersucht (siehe auch Abbildung 2):

- Sind tagesspezifisch erhöhte Selbstkontrollanforderungen bei der Arbeit mit einem Anstieg psychischer Beanspruchung in der Freizeit verbunden?
Übertragungseffekt von der Arbeit auf die Freizeit (Studie I)
- Ist tagesspezifisch erhöhte berufliche Smartphone-Nutzung in der Freizeit mit einem unmittelbaren Anstieg psychischer Beanspruchung in der Freizeit verbunden?
Direkter Effekt innerhalb der Freizeit (Studie II)
- Beeinflusst tagesspezifisch erhöhte berufliche Smartphone-Nutzung während der Freizeit den Umgang mit Selbstkontrollanforderungen am folgenden Arbeitstag und verstärkt die damit assoziierte psychische Beanspruchung?
Übertragungseffekt von der Freizeit auf die Arbeit (Studie III)
- Können die psychische Distanzierung von der Arbeit, die Schlafqualität und die Bedürfnisbefriedigung bei der Arbeit die oben genannten Effekte abmildern?
Milderung/Prävention der (Übertragungs-)Effekte (Studien I, II, III)

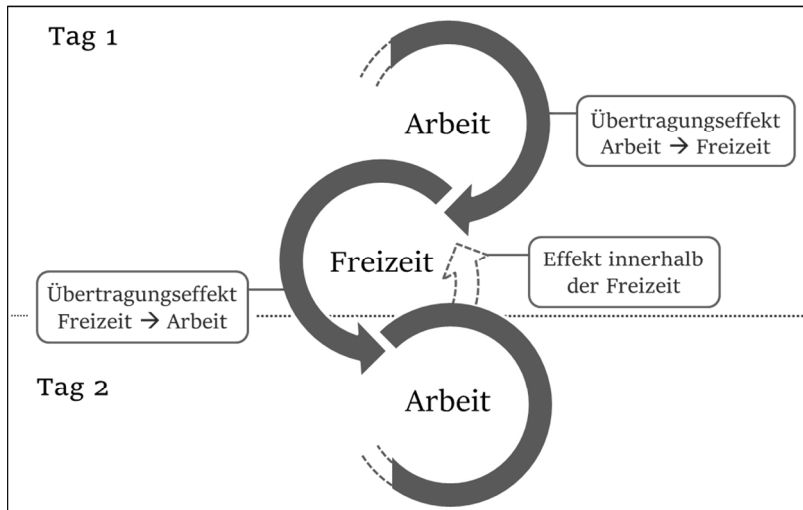


Abbildung 2: Tagesspezifische Beanspruchungswirkungen in Arbeit und Freizeit

Die Fragestellungen werden im Rahmen von drei Studien im elektronischen Tagebuch-Design untersucht. Die Studien umfassen jeweils zwei bis drei Messzeitpunkte pro Tag an insgesamt zehn aufeinanderfolgenden Arbeitstagen. Auf diese Weise ermöglichen sie die Abbildung kurzfristiger Dynamiken im Erleben einer Person über mehrere Tage hinweg (Ohly et al., 2010). Anders als bei Querschnitts-Studien mit einer einmaligen Messung oder Längsschnitt-Studien mit längeren Zeitabständen zwischen den Messungen (mehrere Monate oder sogar Jahre) können in Tagebuchstudien vorübergehende Ereignisse wie Gedanken, Emotionen, affektive Zustände oder Verhalten erfasst und deren intra-individuelle Zusammenhänge analysiert werden (Bolger, Davis, & Rafaeli, 2003). Tagebuchstudien gehen also über eine statische Perspektive des menschlichen Verhaltens hinaus und tragen maßgeblich zur Implementierung einer Prozessperspektive in der Arbeits- und Organisationspsychologie bei (Ohly et al., 2010).

Die aus Tagebuchstudien gewonnenen Daten werden mittels Mehrebenen-Analysen ausgewertet. Anhand dieser Analysen kann die Abhängigkeit der Daten, die durch die mehrfache Befragung von ein und derselben Person entsteht, modelliert werden: Jeder beobachtete Wert wird am individuellen Mittelwert einer Person über alle Tage hinweg zentriert. Stabile Unterschiede zwischen Personen werden auf diese Weise kontrolliert und die rein intraindividuellen Fluktuationen und Zusammenhänge kenntlich gemacht (Nezlek, Schröder-Abé, & Schütz, 2006). Mit diesem methodischen Ansatz kann im Rahmen der drei empirischen Studien untersucht werden, welche *tagesspezifischen* Gegebenheiten – unabhängig von stabilen Bedingungen und Dispositionen der Beschäftigten – die psychische Beanspruchung verstärken oder abmildern und wie sich dabei Arbeit und Freizeit wechselseitig beeinflussen.

Ausblick auf die integrierten Studien

Studie I. Im Fokus der ersten Studie stehen die Auswirkungen tagesspezifischer Selbstkontrollanforderungen (Impulse kontrollieren, innere Widerstände überwinden und Ablenkungen widerstehen) während der Arbeit auf taggleiche Beanspruchungssymptome während der Freizeit. Mit Bezug auf das Modell der begrenzten Selbstkontrollstärke (Muraven & Baumeister, 2000) wird angenommen, dass tagesspezifische Selbstkontrollanforderungen bei der Arbeit die begrenzte Regulationsressource beanspruchen und vorübergehend erschöpfen. Aufgrund eingeschränkter Erholungsmöglichkeiten während der Arbeitszeit wird vermutet, dass sich die daraus resultierenden Beanspruchungswirkungen in die Freizeit übertragen und in erhöhter Ich-Erschöpfung am Abend manifestieren, die nachfolgend die subjektive Vitalität beeinträchtigt. Es wird überprüft, ob das mentale Abschalten in der Freizeit diesen Übertragungseffekt von der Arbeit auf die Freizeit reduziert. Das aus den Hypothesen abgeleitete *Moderierte-Mediations-Modell* wird in einer Tagebuchstudie mit 86 berufstätigen Teilnehmern geprüft. Abbildung 3 illustriert das theoretische Modell der Studie.

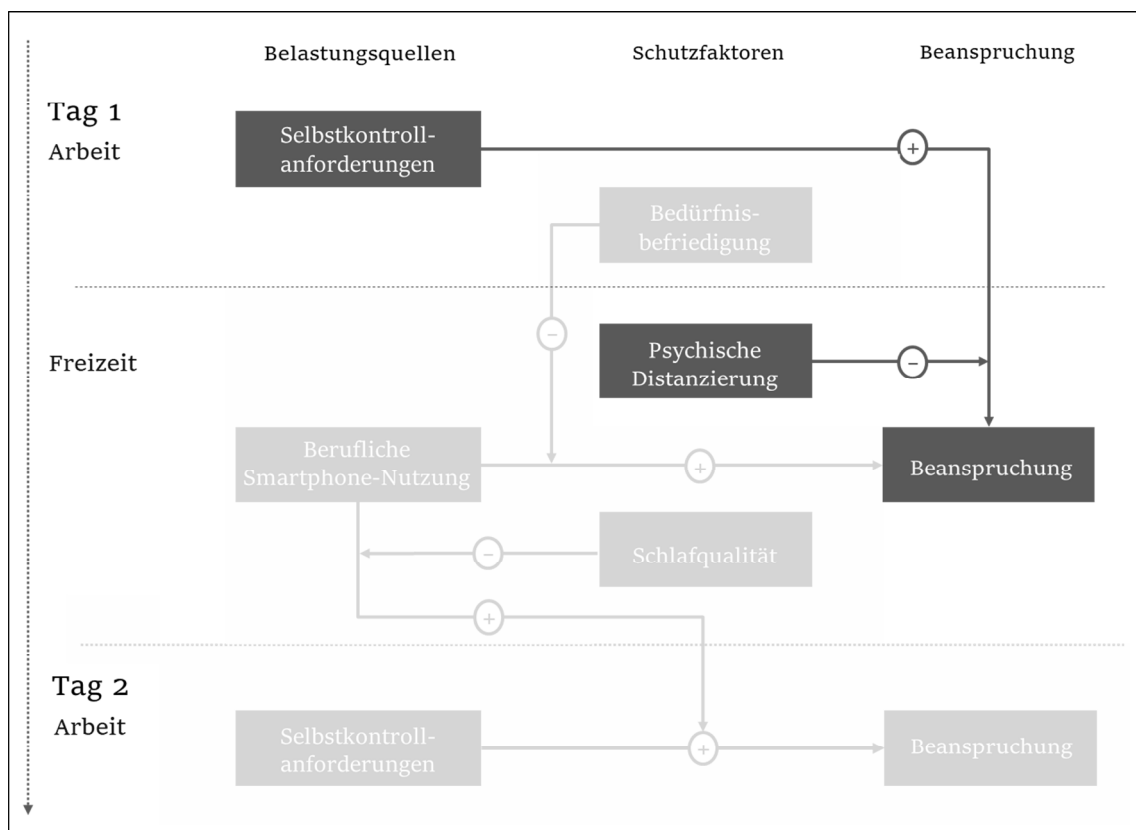


Abbildung 3: Theoretisches Modell von Studie I

Studie II. Ziel der zweiten Studie ist es zu untersuchen, ob an Tagen mit intensiver beruflicher Smartphone-Nutzung während der Freizeit die Entstehung psychischer Beanspruchungssymptome (Ich-Erschöpfung, Bedarf nach Erholung) während der Freizeit begünstigt wird. Mit Bezug auf die Selbstbestimmungstheorie (Deci & Ryan, 2000) wird die Befriedigung psychologischer Grundbedürfnisse bei der Arbeit als möglicher puffernder Schutzfaktor in diesem Zusammenhang untersucht: Es wird angenommen, dass eine hohe Bedürfnisbefriedigung bei der Arbeit und die daraus resultierende intrinsische Motivation die Regeneration der erschöpften Regulationsressource fördert und auf diese Weise die Beanspruchungswirkung reduziert. Zur Überprüfung der Hypothesen wird eine Tagebuchstudie mit 74 Beschäftigten durchgeführt. In Abbildung 4 ist das Studienmodell dargestellt.

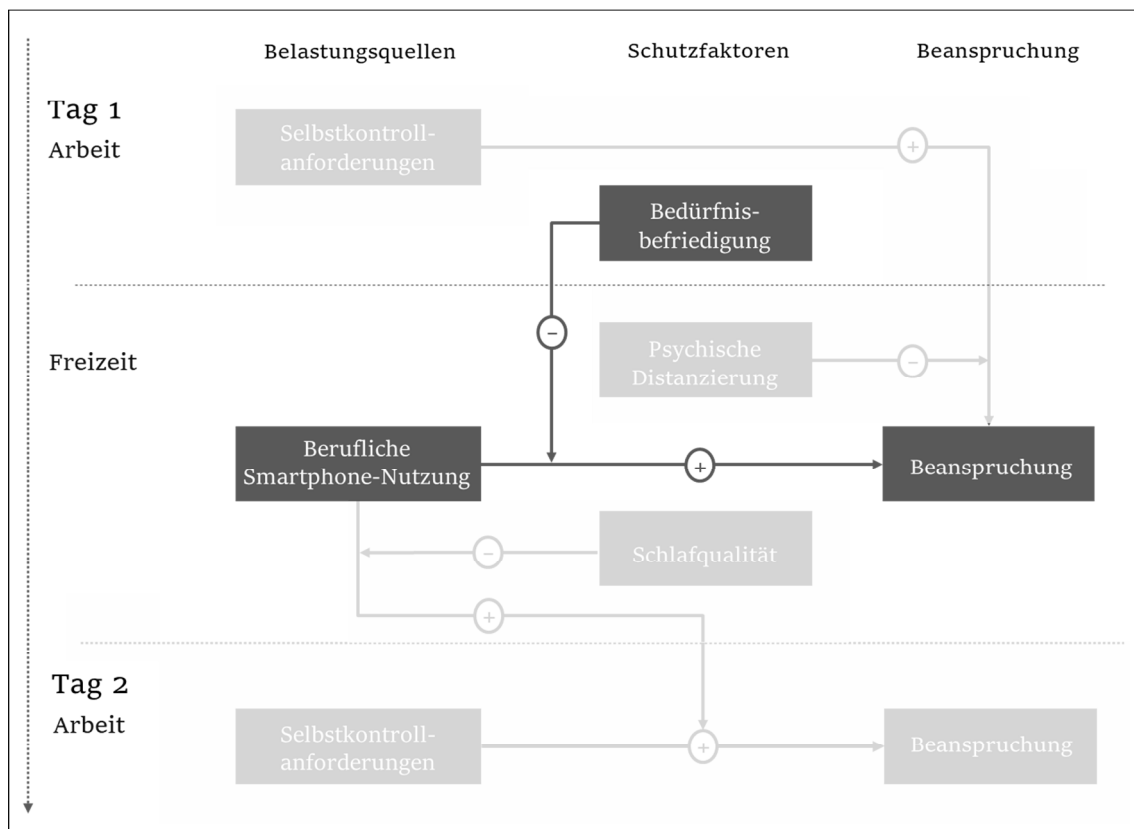


Abbildung 4: Theoretisches Modell von Studie II.¹

¹ Unter der Annahme, dass sie nicht von Tag zu Tag variiert, wurde die Befriedigung psychologischer Grundbedürfnisse bei der Arbeit als stabile Variable gemessen.

Studie III. Die dritte Studie ist der Überprüfung der Auswirkungen beruflicher Smartphone-Nutzung während der Freizeit auf den nächsten Arbeitstag gewidmet. Unter der Annahme, dass sich verschiedene Arbeitsbelastungen, die Selbstkontrolle erfordern, in ihren Folgen für die psychische Gesundheit wechselseitig verstärken, wird vermutet, dass Beschäftigte den Umgang mit Selbstkontrollanforderungen bei der Arbeit als belastender empfinden, wenn sie am Abend zuvor ihr Smartphone für berufliche Zwecke genutzt haben. Infolgedessen erleben sie überproportional starke Beanspruchungssymptome (Ich-Erschöpfung) während der Arbeit. Zusätzlich wird untersucht, ob eine hohe Schlafqualität in der dazwischen liegenden Nacht diesen Übertragungseffekt moderiert: Wenn während erholsamen Schlafs die durch Smartphone-Nutzung beanspruchte Selbstkontrollressource wiederhergestellt werden kann, sollten die Selbstkontrollprozesse am Folgetag nicht weiter beeinflusst werden. Die vorgeschlagene *3-fach-Interaktion* zwischen beruflicher Smartphone-Nutzung, Schlafqualität und Selbstkontrollanforderungen wird im Rahmen einer Tagebuchstudie mit 63 berufstätigten Teilnehmern getestet. Abbildung 5 skizziert das Modell der Studie.

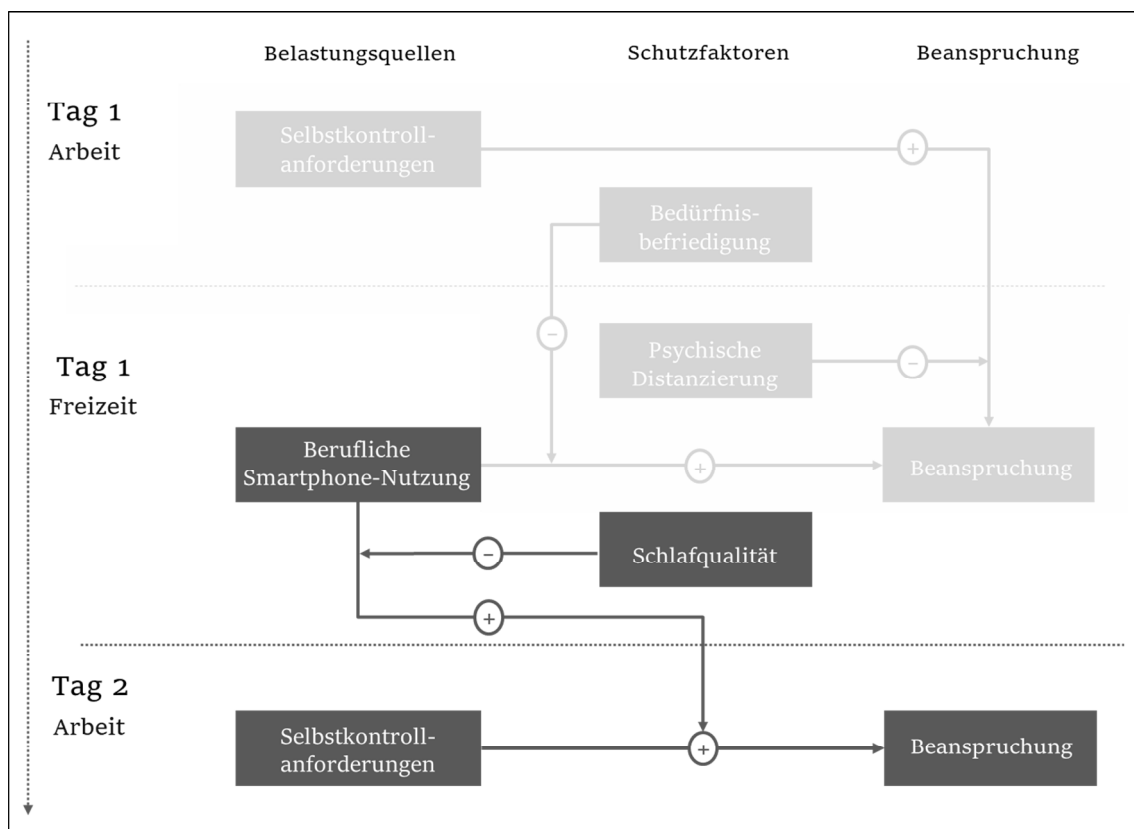


Abbildung 5: Theoretisches Modell von Studie III

Kapitel 2

Studie I

Indirect Effects of Daily Self-Control Demands on Subjective Vitality via Ego Depletion – How Daily Psychological Detachment Pays Off

Gombert, L., Rivkin, W., & Schmidt, K.-H. (2018). Indirect Effects of Daily Self-Control Demands on Subjective Vitality via Ego Depletion – How Daily Psychological Detachment Pays Off. *Applied Psychology: An International Review*. Advance online publication. <https://doi.org/10.1111/apps.12172>

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Indirect Effects of Daily Self-Control Demands on Subjective Vitality via Ego Depletion – How Daily Psychological Detachment Pays Off

Summary

The present study uses a within-person approach to provide insights into day-specific dynamics in the relation between self-control demands at work and well-being. Integrating arguments derived from the Limited Strength Model of Self-Control and research on spillover processes, we develop and test a theoretical model of how the adverse effects of day-specific self-control demands at work may spill over to the home domain. Specifically, we propose ego depletion at home (an indicator of regulatory resource depletion) as a mediator linking self-control demands on a given working day to reduced subjective vitality at home (an indicator of well-being). Furthermore, we suggest that daily psychological detachment moderates this indirect relationship to the effect that high detachment prevents the spillover of the adverse effects of self-control demands to the home domain. Results from our daily diary study across ten days ($N = 86$ employees) provide strong support for the proposed moderated mediation model, demonstrating that daily psychological detachment buffers the effect of self-control demands on ego depletion, thereby disrupting the indirect effect of self-control demands on subjective vitality at home. The study underlines the importance of within-person approaches for examining the adverse effects of self-control demands, and provides further evidence for the immediate resource-replenishing benefits of daily detachment levels.

Keywords: diary study; ego depletion; multilevel structural equation modelling; psychological detachment; self-control demands; spillover

Introduction

Self-control demands (SCDs) have become an integral part of the job in many occupations (Cascio, 2003; Rivkin et al., 2015b; Schmidt & Neubach, 2007b). Self-control involves inhibiting, modifying, or overriding spontaneous and automatic reactions, urges, emotions, and desires that would otherwise interfere with goal-directed behavior (Baumeister et al., 1994). Thus, SCDs at work cause people to alter the way they would spontaneously think, feel, or behave. For example, employees are required to engage in self-control when they have to follow certain display rules, create specific impressions, resist distractions, or overcome motivational deficits resulting from unattractive tasks (Schmidt & Neubach, 2007b). To date, there is broad empirical evidence that SCDs at work relate to impairments of psychological well-being, such as burnout and depression (for an overview see Schmidt & Diestel, 2015). The Limited Strength Model of Self-Control (Muraven & Baumeister, 2000) provides a theoretical framework for these findings. The model suggests that different acts of self-control draw on a common regulatory resource (or self-control strength), which is limited and gets depleted through use. The state of depletion after exerting self-control is referred to as *ego depletion* and is characterized by feelings of exhaustion, low willpower, and reduced capacity for further self-control. If circumstances prevent replenishment of the depleted self-control resource, prolonged ego depletion can manifest in impairments of well-being.

Initial studies conceptualized SCDs as stable work characteristics and adopted a between-person approach to examine interindividual differences in the experience of SCDs among employees with certain professions (e.g., services sector employees, nurses; Diestel & Schmidt, 2011; Schmidt & Diestel, 2012). However, more recent studies have found that SCDs can also vary *within persons* (e.g., between different working days). For example, Rivkin and colleagues (2015a) outlined that on working days characterized by higher SCDs than usual (e.g., due to frequent interruptions, intensive customer interactions, or unattractive work tasks), employees report increased levels of ego depletion compared to days with lower levels of SCDs.

Therefore, given the adverse consequences of SCDs and their relevance for individuals and organizations, consequent research has focused on factors that may protect employees' well-being when dealing with SCDs at work. Such factors are commonly referred to as "psychological resources" (Hobfoll, 2002). In their review, Halbesleben, Neveu, Paustian-Underdahl, and Westman (2014) propose recovery experiences as a promising

psychological resource in the organizational context. Accordingly, Rivkin et al. (2015b) found that psychological detachment, a core component of recovery, can mitigate the adverse effects of SCDs on employees' well-being. Psychological detachment refers to the sense of mentally being away from the work situation during non-work time (Etzion, Eden, & Lapidot, 1998). Drawing on the proposition that during psychological detachment "(...) no further demands are made on functional systems called upon during work" (Sonnentag & Fritz, 2007, p. 205), Rivkin et al. (2015b) argue that high levels of detachment reduce resource depletion resulting from work-related SCDs and facilitate resource recovery.

The current study contributes to this area of research by examining the relationships between SCDs, psychological detachment, and employees' well-being from a within-person perspective. By using a daily diary-design with assessments of work and home experiences, the study develops previous cross-sectional research designs by providing more detailed insights into the daily relation of SCDs to employees' well-being across life domains. Specifically, we disentangle how day-specific SCDs at work affect employees' well-being at home (commonly referred to as *spillover effects*, Edwards & Rothbard, 2000), and test whether day-specific levels of psychological detachment may prevent this spillover effect. Therefore, in a moderated mediation model, we test the following propositions derived from the Limited Strength Model of Self-Control (Muraven & Baumeister, 2000) and research on spillover (Edwards & Rothbard, 2000). First, we propose that SCDs at work cause increased levels of ego depletion at home, which in turn impair subjective vitality (as an indicator of well-being) at home. Put differently, we suggest ego depletion at home as a mediator of the adverse effects of SCDs at work on subjective vitality at home (Hypothesis 1). Moreover, day-specific psychological detachment is predicted to buffer the relation between SCDs at work and ego depletion at home, thereby disrupting the indirect effect of SCDs at work on subjective vitality at home (moderation of the a-path, Hypothesis 2). Figure 6 depicts the hypothesized study model.

Our research aims to make three contributions to the literature. First, it may shed light on within-person dynamics in the relation between SCDs and well-being by developing and testing a theoretical model of how the adverse effects of day-specific SCDs at work may spill over to the home domain. This distinguishes the current study from previous between-person research, which did not allow a detailed analysis of processes occurring at the within-person-level. Our study could provide initial evidence that SCDs experienced at work on a given day increase levels of ego depletion later at home, and

that ego depletion, in turn, impacts on employees' subjective vitality at home, hence contributing to an exhaustive evaluation of the adverse effects of SCDs and extending knowledge on the interconnectedness between home and work domains.

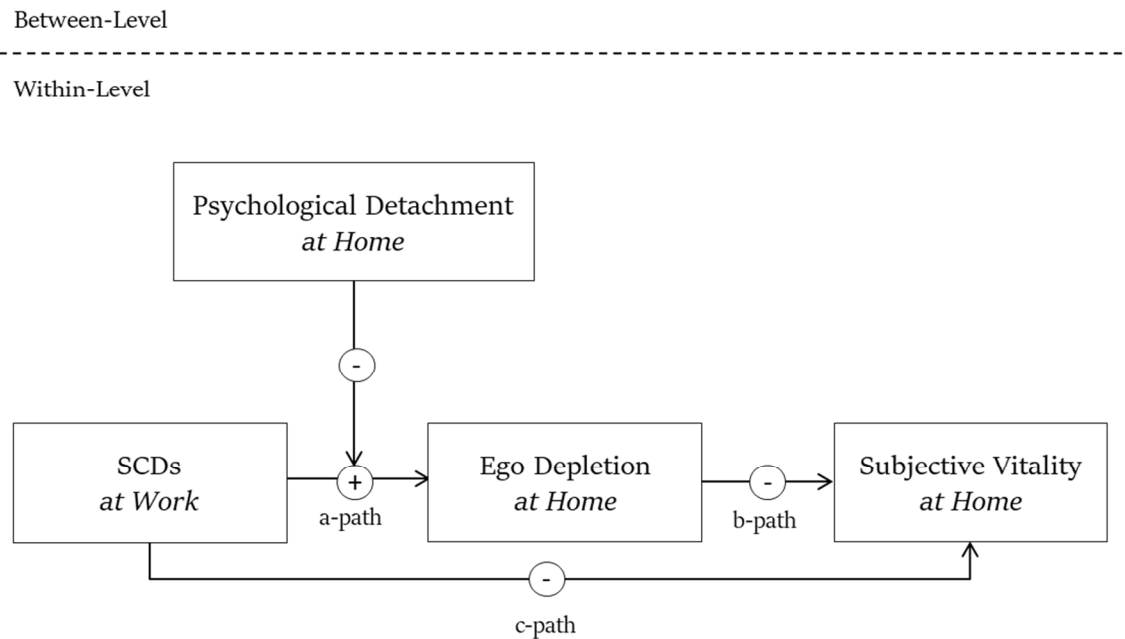


Figure 6: Research Model

Second, while Rivkin et al. (2015b) demonstrated that individuals with high overall levels of detachment (i.e., a higher general ability or trait to switch off from work in leisure time, cf., Fritz, Yankelevich, Zarubin, & Barger, 2010) are less susceptible to the adverse consequences of chronic SCDs, their study did not provide insight into potential benefits of transitory within-person variations in psychological detachment. Considering evidence that immediate (same-day) gains from detachment are stronger than delayed gains (Sonnentag & Fritz, 2015), our study examines whether day-specific psychological detachment can prevent the spillover of the adverse effects of SCDs from work to the home domain. We thereby may shed further light on the immediate resource-replenishing value of day-specific detachment levels. Since psychological detachment is a highly malleable state that can be learned (Hahn, Binnewies, Sonnentag, & Mojza, 2011), the present research could enrich our understanding on how to protect employees' subjective vitality at home on days with high SCDs at work.

Finally, the study offers important methodological advantages that extend previous research. Cross-sectional and longitudinal studies can suffer from a retrospective bias (Reis & Gable, 2000), as they rely on post-hoc evaluations of the experiences (i.e., employees are asked to report SCDs, detachment, and well-being either on an overall level or over longer time periods; cf., Ohly et al., 2010). Adopting a within-person design with real-time assessments (i.e., SCDs at work, detachment at home) may reduce measurement biases and enhance the validity of our results (cf., Xanthopoulou, Bakker, & Ilies, 2012).

The Spillover of SCDs at Work to Subjective Vitality at Home via Ego Depletion at Home

Research from the field of occupational health psychology has identified SCDs (i.e., controlling impulses, resisting distractions and overcoming inner resistances) as an influential stressor at work (Schmidt & Diestel, 2015). Controlling impulses involves inhibiting spontaneous, impulsive response tendencies and associated affective states (e.g., injudicious expressions towards other individuals). Resisting distractions refers to the demand to ignore interruptions evoked by task-irrelevant stimuli, which would interfere with successful task accomplishment (e.g., social media). Overcoming inner resistances relates to the requirement to overcome motivational blockades, for example in cases of unattractive tasks (Schmidt & Neubach, 2007b).

While there is broad empirical evidence from cross-sectional and longitudinal studies that chronic SCDs at work predict long-term indicators of impaired well-being (for an overview, see Schmidt & Diestel, 2015), to date, little attention has been drawn to day-specific SCDs and their relation to short-term indicators of employees' well-being (Rivkin et al., 2015a). In order to fully understand day-specific work demands and their consequences for employees, a growing body of research suggests to consider spillover processes that link work and home (Ilies et al., 2007; Rodríguez-Muñoz, Sanz-Vergel, Demerouti, & Bakker, 2014; Thompson, Kirk, & Brown, 2005). These spillover processes imply that experiences at work can transcend work boundaries and influence behaviors, thoughts, and feelings later at home (Edwards & Rothbard, 2000). Addressing this issue, the current study examines the potential spillover of the adverse effects of day-specific SCDs experienced at work to the home domain.

Drawing on the Limited Strength Model of Self-Control (Muraven & Baumeister, 2000), we argue that SCDs and the associated exertion of self-control draw on and deplete employees' limited regulatory resource at work. The resulting state of ego depletion endures until self-control efforts are interrupted and replenishment of the resource becomes possible (Muraven & Baumeister, 2000). It can be assumed, however, that while at work, it is difficult for employees to refrain from exerting self-control efforts in order to get appropriate rest for resource restoration. Scholars suggest that several activities during work breaks require prolonged regulatory efforts (e.g., preparing for subsequent work episodes, running errands, social lunch break activities; Sonnentag, 2001; Trougakos & Hideg, 2009; Trougakos, Hideg, Cheng, & Beal, 2014), and hence fail to cease ego depletion. Low effort activities during work breaks (e.g., relaxation), in contrast, offer momentary relief (Trougakos & Hideg, 2009), but may not have as much impact as off-job activities (e.g., sufficient sleep; Diestel et al., 2015; psychological detachment, Rivkin et al., 2015b) in fully rewinding and returning depleted resources to pre-stressor levels. We therefore propose that after having dealt with SCDs at work, employees bring taxed resources to the home domain, manifesting in increased levels of ego depletion at home. In addition, demands to exert self-control for work-related purposes at home (e.g., in form of overcoming inner resistances in order to finish work-related tasks, or resisting distractions induced by work-related stimuli, such as phone calls, when engaging in leisure time activities) may further contribute to ego depletion. Therefore, one can assume that day-specific SCDs at work positively relate to ego depletion at home.

The Limited Strength Model of Self-Control (Muraven & Baumeister, 2000) further corroborates that prolonged self-control efforts and associated ego depletion can manifest in impairments of well-being over time, leading us to assert that ego depletion may also affect employees' well-being within the same day. More precisely, we propose that on days with high SCDs at work, resulting levels of ego depletion in the evening at home will decrease employees' well-being in the form of subjective vitality. Ryan and Frederick (1997) conceptualized subjective vitality as a short-term indicator of enhanced well-being and motivation, associated with feelings of vigor, activity, and productivity (Ryan & Deci, 2008) on the one hand, and positive affect (Watson & Tellegen, 1985), happiness, and low depressiveness on the other (Penninx et al., 2000). Accordingly, states of vitality comprise behavioral as well as affective aspects of day-specific individual well-being.

As previously delineated, we argue that on days with high SCDs at work, employees' regulatory resources remain depleted in the evening, manifesting in ego depletion at home. Taking into account that a) ego depletion is associated with negative affect (Hagger et al., 2010), and b) the regulation of affect and behavior requires the availability of regulatory resources (Hagger et al., 2010; Lanaj, Johnson, & Wang, 2016), we further propose that when in states of ego depletion, employees have difficulties to shift from negative to positive affect, and to engage in behaviors that would enhance vitality (i.e., meeting friends, exercising). As a result, daily levels of subjective vitality are diminished.

In sum, integrating the arguments that SCDs at work evoke ego depletion at home, and ego depletion in turn manifests in impairments of subjective vitality at home, we propose ego depletion at home as a mediator of the adverse spillover effects of SCDs at work on subjective vitality at home.

Hypothesis 1: Day-specific ego depletion at home mediates the day-specific adverse relation between SCDs at work and subjective vitality at home.

The Buffering Function of Day-Specific Psychological Detachment

Psychological detachment from work has been defined by Etzion et al. (1998) as "the individual's sense of being away from the work situation" (p. 579). It refers to an off-job experience that can be described as "switching off" mentally (Sonnentag & Bayer, 2005). In order to successfully detach from work, an employee should not only refrain from work-related behaviors (e.g., answering work-related phone calls), but also avoid thinking about work-related issues. In their preliminary work on recovery experiences, Sonnentag and Fritz (2007) have identified psychological detachment as one out of four key components of recovery, apart from relaxation, mastery, and control. While there is convincing empirical evidence that all four recovery components have beneficial effects on employees' psychological well-being (Sonntag & Fritz, 2007), scholars propose differential mechanisms to underlie these effects. On the one hand, the positive effects of mastery and control are assumed to result from building up new internal resources (e.g., self-efficacy or skills); on the other hand, the effects of psychological detachment and relaxation are accounted for by the interruption of work-related demands and associated recovery of depleted resources.

Furthermore, previous research indicates that psychological detachment in addition to increasing employees' well-being (e.g., Sonnentag & Fritz, 2007) but can also buffer the adverse consequences of work demands on well-being (e.g., Sonnentag et al., 2010). The authors of these studies argue that during psychological detachment, the cognitive availability of experiences at work is reduced. Thus, recovery processes (e.g., recovery of depleted energetic resources) are facilitated, which in turn attenuate or even prevent resulting impairments of employees' psychological well-being. In contrast, the lack of detachment during off-job time hinders recovery, as individuals do not experience full relief from their job demands. Building on this proposition, Rivkin et al. (2015b) proposed and found that psychological detachment supports replenishment of the limited self-control resource and thus, attenuates the adverse effects of SCDs on well-being. More specifically, their findings indicate that people who are generally better able to detach from work than others (for example, due to lower job involvement or segmentation preference between work and home; Sonnentag, 2012) are less likely to suffer from impairments of well-being as a consequence of dealing with SCDs at work.

However, the literature suggests that employees' levels of psychological detachment can also vary substantially from day to day (e.g., Derks et al., 2014; Sonnentag & Binnewies, 2013). That is, irrespective of an employees' general level of detachment, day-specific circumstances can influence psychological detachment on a particular evening. For example, on days when employees engage in social interactions in the evening or keep an appointment they are looking forward to, it will be easier for them to detach from work, as work-related issues lose their importance and are no longer on employees' minds.

In their review, Sonnentag and Fritz (2015) outline that the immediate (i.e., same-day) benefits of daily psychological detachment are stronger compared to benefits that occur later in time, as unfolding events, for example at work, can override the positive effects of detachment. Recent diary studies consistently found that daily levels of psychological detachment can interrupt spillover processes and thereby uncouple the relations between daily experiences at work and well-being at home (e.g., Derks & Bakker, 2014; Sonnentag & Binnewies, 2013). Drawing on this basis, the present study examines whether day-specific psychological detachment can inhibit the spillover of the adverse effects of SCDs at work to the home domain.

As previously outlined, we propose that day-specific SCDs at work tax employees' limited regulatory resources, resulting in states of ego depletion at home. However, we assume that on days when employees succeed in mentally disengaging from their work, they do not have to exert further self-control for work-related purposes at home, so that the depletion of regulatory resources is interrupted. In addition, high daily levels of detachment may allow employees to recover their regulatory resource. We thus propose that psychological detachment prevents reductions of subjective vitality at home, which would result from prolonged ego depletion. Taken together, we suggest that daily levels of psychological detachment mitigate the daily spillover of SCDs at work to ego depletion at home, thereby interrupting the indirect effect of SCDs at work on subjective vitality at home.

Hypothesis 2: Day-specific psychological detachment moderates the day-specific (indirect) relationship between SCDs at work and subjective vitality at home, such that this relationship is weaker when day-specific psychological detachment is high (moderation of the a-path, cf. Figure 6).

Method

Participants and Procedure

We conducted a daily diary study to test our hypotheses. Participants were recruited through personal contacts. Therefore, over the course of the last year, we collected contact information from individuals who expressed their willingness to contribute to a scientific study and asked them to participate. A basic requirement for participation in our study was that employees worked in services sector occupations or held occupations with regular contact to clients or other individuals, because SCDs constitute a predominant stressor in these occupations (Diestel & Schmidt, 2011). This requirement was taken into account in the recruitment process and additionally communicated at the beginning of our study. All in all, our participants held different occupations, ranging from salespersons, consultants, and teachers to care workers, car retailers, and clerks. The final sample comprises 86 participants (107 were originally contacted). Among the participants, 64% were female and 26% worked part-time (part-time employees in this study worked less

days per week, but had full working days). Age ranged from 18 to 63 years ($M = 40.12$; $SD = 14.24$). Our participants worked an average of 33.81 ($SD = 12.90$) hours per week with other people.

The data were collected via online surveys. In advance of the day-specific measurements, respondents received an e-mail explaining the survey process and assuring confidentiality of the responses. Additionally, they were invited to fill out a background questionnaire that assessed demographic variables. Afterwards, two times per day over 10 consecutive working days, participants received e-mails including instructions and links to the day-specific questionnaires. In the afternoon at work (12 PM every day), participants were asked to rate SCDs during the “last few hours of work”. The evening-survey (6 PM) invited participants to rate ego depletion, subjective vitality, and psychological detachment at home. After receiving the e-mails, the surveys were accessible for six hours. Thus, participants were able to complete the afternoon survey between 12 PM and 6 PM, and the evening survey between 6 PM and midnight. However, they were instructed to complete the afternoon survey at work and the evening survey at home. If participants did not react to the survey within the first two hours, a reminder was sent. On average, the surveys were completed two hours after reception. On weekends or (public) holidays, the diary study was interrupted and continued on the next regular working day. Overall, the response rate to our daily questionnaires was 68%, resulting in 588 (out of 860 possible) daily measurement points.

Measures and Control Variables

SCDs (at work). We assessed day-specific SCDs with 15 items from an instrument developed by Schmidt and Neubach (2010). On a five-point Likert scale (1 = *not at all*; 5 = *a great deal*), participants rated their work in terms of the requirements to inhibit impulses, resist distractions, and overcome inner blockades during “the last hours” of work. Items such as “In the last hours, my job required me not to lose my temper” (impulse control), “In the last hours, my work required me to resist distractions” (resisting distractions), and “In the last hours, some of my tasks were such that I really needed to force myself to get them done” (overcoming inner resistances) illustrate the scale. The scale score was computed as the average of the single-item scores (see Schmidt & Diestel, 2012). Cronbach’s alpha was $\alpha = .88$, calculated using the person-mean centered items (see Geldhof, Preacher, & Zyphur, 2014).

Psychological Detachment (at home). Day-specific psychological detachment (four items) was assessed with the detachment subscale from the recovery experience questionnaire developed by Sonnentag and Fritz (2007). Participants were asked to report the extent to which they have been occupied with job-related thoughts after work so far (1 = *not at all*; 5 = *a great deal*). A typical item from the scale is “Tonight, I haven't thought about work at all”. Cronbach's alpha was $\alpha = .92$.

Ego Depletion (at home). Day-specific ego depletion was assessed using five items related to the participants' momentary experiences with resource depletion and low willpower (e.g., “At the moment, it feels increasingly difficult to concentrate.”). The scale was developed and validated by Bertrams, Unger, and Dickhäuser (2011), who intended to assess the psychological state of ego depletion as proposed by Muraven and Baumeister (2000). All items are scored using a four-point Likert scale (1 = *not at all*; 4 = *a great deal*). Cronbach's alpha was $\alpha = .89$.

Subjective Vitality (at home). Day-specific subjective vitality was measured with four items from Ryan and Frederick (1997), which indicate feelings of aliveness and energy. An exemplary item from the scale is “I am looking forward to tomorrow”. The items are scored on a seven-point Likert scale (1 = *not at all*; 7 = *a great deal*). Cronbach's alpha was $\alpha = .82$. As indicated by the sample items, ego depletion refers to momentary experiences of depletion and low willpower, whereas subjective vitality reflects rather prospective well-being.

Control Variables. We assessed age, gender, work-time (part-time vs. full-time), and negative affect as control variables. Age, gender, and work-time were included in the analyses to control for their potential confounding influence. For example, part-time employees may have more time to detach from work due to less overall work-time, resulting in higher scores of detachment. Furthermore, we controlled for trait negative affect using the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988), because trait negative affect has been found to influence the appraisal of stressors and strain (Debus, König, Kleinmann, & Werner, 2015). Negative affect reflects a dispositional dimension, with high negative affect characterized by subjective distress and unpleasant engagement, and low negative affect by the absence of these feelings. Participants were asked to rate the frequency with which they experience 10 different emotions (e.g., distress, guilt) on a five-point Likert scale (1 = *not at all*; 5 = *very often*). Cronbach's alpha was $\alpha = .74$.

Construct Validity

We conducted multilevel confirmatory factor analyses (MCFAs) to test the psychometrical distinctiveness of our variables. Therefore, we created parcels of our constructs by aggregating item indicators of the latent variables. This practice offers a number of advantages, such as a reduced number of parameters, more normally-distributed and reliable measures, and more efficient parameter estimates (Bandalos & Finney, 2001; West, Finch, & Curran, 1995).

First, we tested a four-factor model including all study variables (SCDs [five parcels], psychological detachment [two parcels], ego depletion [two parcels], and subjective vitality [two parcels]). Fit indices indicated a good fit for this model: χ^2 (76) = 118.300, $p < .01$, root mean square error of approximation (RMSEA) = .031, comparative fit index (CFI) = .989, standardized root mean square residual within-person/between-person (SRMRw/SRMRb) = .023/.045. In contrast, a model including all variables into one factor performed worse: χ^2 (88) = 2070.715, $p < .01$, RMSEA = .196, CFI = .499, SRMRw/SRMRb = .196/.290.

Furthermore, in view of the conceptual relatedness of the ego depletion and subjective vitality measures, we also tested a three-factor model. In this model, we specified both SCDs and psychological detachment as single factors, and aggregated ego depletion and subjective vitality as another factor. The four-factor model, however, performed better than this three-factor solution: χ^2 (82) = 384.699, $p < .01$, RMSEA = .079, CFI = .924, SRMRw/b = .055/.079). In sum, MCFAs suggest that all study variables represent distinct constructs.

Analytical Procedure

To test our predictions, we used multilevel structural equation modelling (MSEM) in Mplus 7.2 (Muthén & Muthén, 2012), because the day-level data (level 1) were nested within the person-level data (level 2), and this procedure allows for conducting analyses on multiple levels. In a first step (in order to test Hypothesis 1), we specified a 1-1-1 mediation model (Preacher, Zyphur, & Zhang, 2010) in which ego depletion at home mediates the adverse effects of SCDs at work on subjective vitality at home (Model 1). In a second step, we specified a moderated mediation model (Model 2) to examine the moderating role of psychological detachment in the day-level relation between SCDs and ego

depletion (Hypothesis 2). Since the focus of this analysis was to examine day-specific effects, we centered SCDs and psychological detachment around the person-mean before computing the interaction term. This procedure allows exclusively testing the interaction effect at the within-person-/day-level, as it eliminates all between-person variance (cf., van de Pol & Wright, 2009), and additionally reduces biasing effects of multicollinearity when testing interaction effects (Aiken, West, & Reno, 1991). All paths between the study variables were modelled using the robust maximum likelihood method of estimation. To obtain standardized path coefficients for the proposed models, all study variables were grand-mean centered prior to analyses (Hox, 2002).²

Results

Table 1 displays the descriptive statistics, internal consistencies (Cronbach's alpha), and correlations among all study variables. The proportions of within-person variation were 45 % in SCDs, 66 % in ego depletion, 56 % in subjective vitality, and 52 % in psychological detachment. Due to these high levels of day-specific variation, the application of multilevel modelling is necessary.

As all of our study variables were measured via self-report, we conducted Harman's single factor test (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003) to examine the degree to which common-method variance (CMV) could have biased our results. The results, however, revealed that in our data, no single factor did account for a major part of the variance (the first factor explained 28.17% of the variance), indicating that CMV is not relevant regarding our findings.

The Mediating Effect of Ego Depletion at Home

In the following, we present the study results at both the within-person and between-person level. Hypothesis 1 proposes that daily ego depletion at home mediates the adverse relation between SCDs at work and subjective vitality at home. The results of Model 1 indicate that SCDs positively relate to ego depletion (within-level: $\beta = 0.16$, $p < .01$; between-level: $\beta = 0.22$, $p < .01$; cf., Table 2), and that ego depletion negatively

² Adding previous-day measures of all focal variables to our analyses did not change the pattern of results.

relates to subjective vitality (within-level: $\beta = -0.88$, $p < .01$; between-level: $\beta = -1.31$, $p < .01$; cf., Table 2). Moreover, Model 1 provided a good model fit ($\chi^2(12) = 22.921$, $p < .05$, RMSEA = .039, CFI = .961, SRMRw/b = .061/.067).

Table 1: Means, Standard Deviations, Internal Consistencies (Cronbach's Alpha) and Intercorrelations of Study Variables

Variable	1	2	3	4	5	6	7	8
1. Age	-							
2. Gender ^a	.26	-						
3. Work time ^b	-.21	.42	-					
4. Negative affect	-.10	.03	.07	(.74)				
5. Self-control demands	.05	.16	-.21	.19	(.88)	-.12	.24	-.13
6. Psychological detachment	-.06	-.07	-.03	-.21	-.24	(.92)	-.28	.35
7. Ego depletion	-.08	-.15	-.13	.33	.22	-.25	(.89)	-.60
8. Subjective vitality	.13	.01	-.01	-.37	-.10	.41	-.60	(.82)
<i>M</i>	39.62	1.34	1.74	2.34	2.49	3.59	1.91	4.31
<i>SD</i>	14.40	0.48	0.44	0.47	0.58	0.73	0.50	0.96

Notes: Cronbach's alpha for day-level variables are based on the person-mean centered items of each scale. Correlations below the diagonal are person-level correlations ($N_{between} = 86$). Correlations above the diagonal are day-level correlations ($N_{within} = 588$).

Numbers in bold $p < .05$.

^aGender (1 = female, 2 = male). ^bwork time (1 = part-time, 2 = full-time).

To test the indirect (mediation) effect of ego depletion, we utilized the Monte Carlo re-sampling method to estimate the appropriate confidence interval for the indirect effect, because bootstrapping cannot be applied to multilevel analyses (Preacher & Selig, 2012; van der Leeden, Meijer, & Busing, 2008). More specifically, we computed bias-corrected 95% confidence intervals (CIs) for the indirect effect based on 20,000 re-samples using the software provided by Selig and Preacher (2008). In support of Hypothesis 1, the CI for the indirect effect of ego depletion at home in the relation of SCDs at work and subjective vitality at home did not include zero for the within-person part of our model ($\beta = -0.14$ [CI: -0.26:-0.02]). Thus, ego depletion at home indeed mediates the day-specific relation between SCDs at work and subjective vitality at home. Moreover, Table 2 also indicates a significant indirect effect for the between-person part of our model ($\beta = -0.29$ [CI: -0.58:-0.08]). This result implies that the mediating effect of ego depletion

is also present in the relation between cumulative SCDs and subjective vitality aggregated across ten days. Taken together, the results of our analyses strongly support Hypothesis 1 by demonstrating that the day-specific relation between SCDs at work and reduced subjective vitality at home is mediated by ego depletion at home.

The Moderating Effect of Psychological Detachment

Hypothesis 2 predicts that psychological detachment moderates the day-specific spillover of SCDs at work to ego depletion at home (i.e., the a-path of the mediation model, see Figure 6). The results of our analyses demonstrate that Model 2, which includes the interaction term of SCDs and psychological detachment, yields a good data fit ($\chi^2(11) = 16.564, p < .05, RMSEA = .029, CFI = .980, SRMRw/b = .047/.067$). To examine whether including the interaction has improved model fit, we conducted a Log-likelihood ratio test as suggested by Muthén and Muthén (2012). The results of this test indicate that compared to Model 1, Model 2 yields an improved data fit ($\Delta\log\text{-likelihood}(df) = 6.92(1); p < .01$).

Furthermore, in addition to a negative direct effect of psychological detachment on ego depletion (within-level: $\beta = -0.12, p < .01$; between-level: $\beta = -0.20, p < .01$), our analyses reveal a negative effect of the interaction between SCDs and psychological detachment in the prediction of ego depletion (within-level: $\beta = -0.20, p < .05$), thereby providing support for Hypothesis 2. To facilitate the interpretation of the interaction effect, we depicted the interaction and performed simple slope tests, as recommended by Preacher, Curran, and Bauer (2006). As illustrated in Figure 7, the interaction pattern is consistent with our predictions. In particular, on days with low levels of psychological detachment, day-specific SCDs at work increase levels of ego depletion at home. In contrast, on days with high levels of psychological detachment, there is no significant relation between day-specific SCDs at work and ego depletion at home (cf., Figure 7). Thus, day-specific psychological detachment attenuates the day-specific spillover effects of SCDs at work on ego depletion at home.

Finally, we tested whether our results provide evidence for the proposed moderated mediation model by analyzing whether the indirect (mediating) effect of ego depletion at home varies as a function of psychological detachment. Therefore, we examined

conditional indirect effects of SCDs at work on subjective vitality at home (via ego depletion at home) at average (mean) levels of detachment, at high levels of detachment (one standard deviation above the mean), and at low levels of detachment (one standard deviation below the mean; Bauer, Preacher, & Gil, 2006). For average (within-level: $\beta = -0.13$ [CI: -0.25:-0.01]) and low (within-level: $\beta = -0.25$ [CI: -0.39:-0.11]) levels of psychological detachment, the 95% CI does not include zero. These findings suggest that on days with low or average levels of psychological detachment, ego depletion at home mediates the effect of SCDs at work on subjective vitality at home. In contrast, for high detachment, the 95% CI includes zero (within-level: $\beta = -0.02$ [CI: -0.17:0.15]). Thus, there is no statistically significant mediating effect of ego depletion at home in the relation between SCDs at work and subjective vitality at home on days with high levels of detachment.

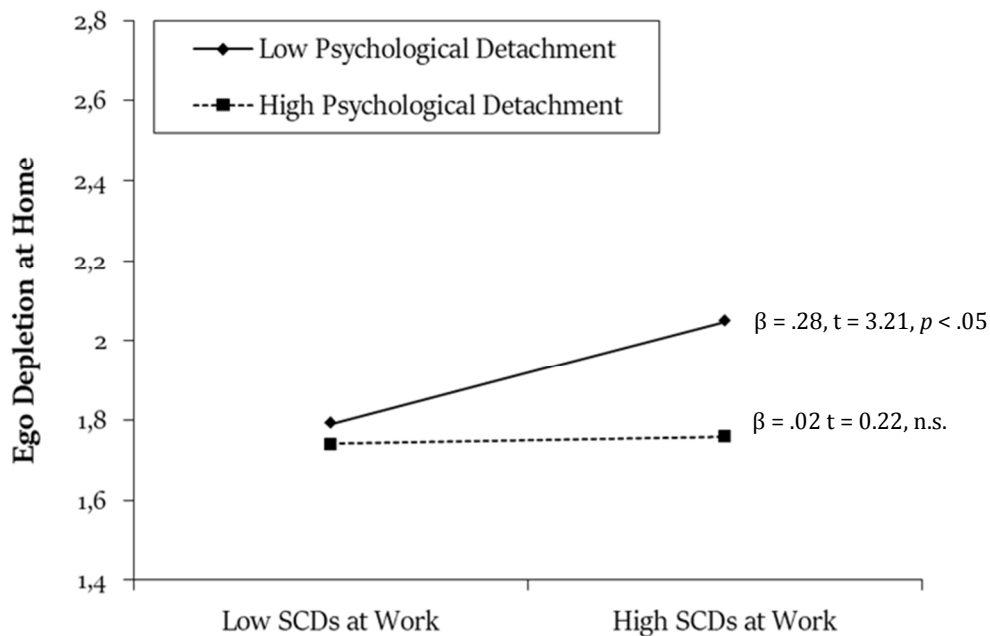


Figure 7: Interaction Effect of SCDs at Work and Psychological Detachment at Home on Ego Depletion at Home

Table 2: Estimates of Direct and Indirect Effects

	Ego depletion at home		Subjective vitality at home								
	Estimate (SE)	p	Estimate (SE)	p							
<i>Between-person direct effects (Model 2)^a</i>											
Age	-.002 (.003)	.386	.006 (.005)	.229							
Gender	-.153 (.088)	.081	-.279 (.188)	.137							
Work-time	.026 (.108)	.807	-.184 (.192)	.338							
Negative affect	.166 (.064)	.010	-.303 (.130)	.020							
SCDs at work	.220 (.075)	.003	.295 (.146)	.043							
Psychological detachment	-.199 (.070)	.005	.277 (.160)	.084							
Ego depletion			-1.313 (.291)	.000							
<i>Between-person indirect effects (Model 2)^a</i>											
SCDs → EG → SV			Estimate (SE)	LLCI	ULCI						
			-.289 (.130)	-.584	-.075						
	Ego depletion at home		Subjective vitality at home								
	Model 1 <i>Mediation</i>		Model 2 <i>Moderated Mediation</i>		Model 1 <i>Mediation</i>			Model 2 <i>Moderated Mediation</i>			
<i>Within-person direct effects</i>	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p			
SCDs at work	.162 (.070)	.020	.148 (.069)	.030	-.086 (.085)	.311	-.086 (.085)	.314			
Psychological detachment	-.123 (.041)	.003	-.131 (.040)	.001	.153 (.059)	.009	.153 (.059)	.010			
Ego depletion					-.879 (.076)	.000	-.882 (.077)	.000			
SCDs x PD			-.201 (.081)	.013							
<i>Within-person indirect effects</i>						Estimate (SE)	LLCI	ULCI	Estimate (SE)	LLCI	ULCI
SCDs → EG → SV					-.142 (.060)	-.261	-.024				
SCDs → EG → SV (low detachment)								-.245 (.073)	-.391	-.105	
SCDs → EG → SV (mean detachment)								-.131 (.059)	-.248	-.012	
SCDs → EG → SV (high detachment)								-.017 (.081)	-.166	.152	

Notes: ^aThere were no differences in the estimates and standard errors of the between-person effects between Model 1 and Model 2; SE=standard error; LLCI=lower level confidence interval (95%); ULCI= Upper level confidence interval (95%); EG=Ego depletion; SV=Subjective vitality; PD=Psychological detachment; N_{between} = 86; N_{within} = 588.

Discussion

Recent research suggests SCDs to be an often neglected job-stressor in modern working environments. Yet, for a comprehensive understanding of SCDs and their adverse effects on employees' well-being, it is also important to examine dynamic (day-specific) processes that may underlie these effects, such as within-person spillover effects linking SCDs on a given working day to enduring experiences of depletion and impaired well-being at home.

Accordingly, the present study used a daily diary design to investigate the indirect effects of daily SCDs at work on subjective vitality at home via ego depletion at home. Consistent with arguments proposed by the Limited Strength Model of Self-Control (Muraven & Baumeister, 2000) and previous findings on spillover effects from work to home (Ilies et al., 2007; Judge & Ilies, 2004; Martinez-Corts et al., 2015; Sonnentag & Binnewies, 2013), our results demonstrate that day-specific SCDs experienced at work increase day-specific ego depletion in the evening at home, which in turn reduces subjective vitality at home. Put differently, the adverse effects of SCDs at work on subjective vitality at home were fully mediated by ego depletion at home, indicating ego depletion as a mechanism underlying the adverse effects of daily SCDs at work on employees' well-being at home. Furthermore, our results shed light on daily psychological detachment as a protective resource against the spillover of daily SCDs from work to the home domain. More specifically, high levels of day-specific psychological detachment prevent that daily SCDs at work manifest in prolonged states of ego depletion and associated impairments of subjective vitality at home by interrupting further self-control exertion and supporting regulatory resource replenishment. Hence, SCDs at work are less likely to affect employees' subjective vitality at home on days when psychological detachment is high.

Theoretical Implications

This research lends itself to several theoretical implications towards the current literature on SCDs, well-being, and psychological detachment. First, our study extends previous research by providing a dynamic model of SCDs and their relation to employees' well-being. Whereas most studies in this context have used cross-sectional research designs to analyze the adverse consequences of SCDs at the between-person level

(see Schmidt & Diestel, 2015 for an overview), this daily diary study considers transitory, fine-grained processes that underlie these effects, and illustrates how they evolve on a daily basis. More precisely, the results of our multilevel analysis indicate that daily SCDs at work evoke *same-day* responses in the form of regulatory resource decrements. We believe that this finding significantly contributes to the literature on SCDs by extending the previous belief that SCDs at work only have long-term resource-draining effects. Furthermore, this study demonstrates that daily adverse effects of SCDs can transcend the boundaries of work and spill over to employees' home domain, manifesting in increased levels of ego depletion at home. This finding supports our proposition that employees may not be able to recover depleted regulatory resources during work, and ties in with previous studies from spillover literature demonstrating that daily experiences at work can influence employees' life outside the workplace (e.g., Rodríguez-Muñoz et al., 2014). Finally, we demonstrated that daily levels of ego depletion caused by SCDs at work can threaten employees' subjective vitality within the same day, arguing that ego depletion impedes getting into states of positive mood and engaging in behaviors that would increase vitality. We thereby go beyond previous studies based on the Limited Strength Model of Self-Control that indicated impaired well-being only as a long-term consequence of chronic SCDs (Schmidt & Diestel, 2015). Given that recent research suggests far more behaviors at work to deplete regulatory resources (e.g., responding to help requests, Lanaj et al., 2016; time pressure, planning and decision making, Prem, Kubicek, Diestel, & Korunka, 2016), this study enables a holistic understanding of how such regulatory job demands may affect employees' psychological well-being on a daily basis.

Second, our study adds to the growing body of evidence on the beneficial effects of psychological detachment. In their study, Rivkin et al. (2015b) already shed light on psychological detachment as a protective moderator against the adverse consequences of SCDs on the inter-individual level (that is, people with higher general levels of detachment suffer less from chronic SCDs at work). However, taking into account that a) although an employee's general level of detachment is rather stable, there is substantial fluctuation from day to day around this general level (e.g., Derks, van Mierlo, et al., 2014), supported by 52% of level 1 variance in our study), and b) short-term (i.e., same-day) benefits of psychological detachment are particularly high (Sonnentag & Fritz, 2015), we extend this line of research by adopting a daily diary-design and examining the protective role of day-specific psychological detachment in the spillover of SCDs at work to the home domain. In particular, our results demonstrate that high daily levels of psychologi-

cal detachment (e.g., due a social appointment or a sport event) can prevent that the adverse effects of SCDs at work spill over and cause ego depletion and associated impairments of subjective vitality at home. Specifically, our data suggests that the mediating effect of ego depletion in the day-specific relation between SCDs at work and subjective vitality at home gets weaker with increasing levels of day-specific psychological detachment. Our findings hence support the argument that psychological detachment interrupts the depletion of regulatory resources and facilitates recovery (Rivkin et al., 2015b). At the same time, our findings add value to the current literature by demonstrating that this resource replenishment also occurs on a daily basis.

Third, in light of the recent controversial discussion on the replicability of the ego depletion effect in experimental research (Carter, Kofler, Forster, & McCullough, 2015; Dang, 2018; Hagger et al., 2010), our study contributes to the large body of convincing evidence for its validity from the applied field (Lian, Yam, Ferris, & Brown, 2017; Schmidt & Diestel, 2015). More precisely, our results substantiate two core propositions of the model in an occupational setting, namely that a) the exertion of self-control draws on and depletes a limited regulatory resource, which in turn impairs well-being, and b) once the resource is depleted, rest periods (i.e., refraining from self-control) are necessary to recover the resource (Muraven & Baumeister, 2000). Considering that these propositions refer to within-person processes, (i.e., exertion of self-control, ego depletion and recovery), which to date have been foremost examined on the basis of between-person study designs (Hagger et al., 2010; Schmidt & Diestel, 2015), our study broadens the research scope by using a within-person diary design as an appropriate research method. Moreover, our findings correspond with previous evidence on depletion as a mediator between work demands and well-being (Lanaj et al., 2014; Liang et al., 2016).

Practical Implications

Apart from theoretical contributions, our research has also some practical implications that may help improve employees' psychological detachment at day-level. From an organizational point of view, it is crucial to address the issues of high day-specific work hours, workload and time pressure. Sonnentag and Bayer (2005) argue that these factors contribute to a prolonged activation of job-related thoughts, which drag on into employees' leisure time. Thus, a reduction of these factors, for example, through an adequate distribution of work tasks or setting realistic goals within a given day, may help

employees experience their working day as less stressful and stop ruminating about job-related problems at home. More precisely, Smit (2016) recommends that supervisors could help employees creating plans at the end of the day that describe where, when, and how unfulfilled work goals will be completed during the next days to avoid that unfulfilled goals capture attentional resources in the evening. Furthermore, supervisors should encourage employees to structure the working day in such a way that short-term tasks are completed close to the end of the day.

From the individual's perspective, leisure time activities may facilitate day-specific levels of psychological detachment. Sonnentag, Kuttler, and Fritz (2010) suggest that non-work-related activities requiring one's full attention help foster a psychological distance to work. Thus, especially on days when employees experience high SCDs at work, engaging in specific hobbies (e.g., sports) may help the individual more effectively switch off mentally from work and prevent adverse spillover effects of SCDs at work on well-being at home. Moreover, meaningful off-job activities, such as volunteer work, may facilitate detachment from (paid) work in a similar way (Mojza, Sonnentag, & Bornemann, 2011).

Additionally, a factor that appears to be important both from an organizational and an individual's point of view is the use of modern communication technologies. For example, the increasing use of e-mail or cell phones for work-related purposes at home may hinder employees from mentally disengaging from work in the evening (Lanaj et al., 2014), and thus recovery processes at home (Derks, van Mierlo, et al., 2014). Hence, especially on days with high work demands (e.g., SCDs), employees should actively refrain from checking e-mails or using cell phones for work-related purposes. Moreover, organizations could establish guidelines for the use of work-related technologies at home to support employees' psychological detachment during off-job time (Olson-Buchanan & Boswell, 2006). For example, German companies such as Telekom and VW have implemented corresponding regulations for limiting the use of smartphones in the evening.

Finally, Sonnentag and Krueger (2006) propose recovery-related self-efficacy as an important factor to promote psychological detachment. They argue that similar to task-related self-efficacy (Bandura, 1997), recovery-related self-efficacy can be improved through mastery experience, vicarious learning and verbal persuasion. To address this point, Hahn et al. (2011) developed a training program, which achieved beneficial effects on recovery experiences, recovery-related self-efficacy, and well-being. Organizations

should consider such interventions in order to assist employees in recovering their regulatory resources, and in that way to prevent impairments of psychological well-being.

Limitations and Suggestions for Future Research

Our research is subject to several limitations that need to be discussed. First, our study relies on self-reports, which may raise concerns about common method variance (Podsakoff et al., 2003). However, in view of the results of our MCFAs, Harman's single factor test, and because high common method variance reduces the probability of detecting interaction effects (Siemsen, Roth, & Oliveira, 2010), there is limited evidence that common method variance may have biased the present findings. Nonetheless, future research could further alleviate common method variance concerns by using, for example, cognitive measures of SCDs at work or peer-ratings (e.g., by the partner) to assess subjective vitality at home.

Second, although our research design separated two measurement occasions per day, strong causal conclusions cannot be derived from such a correlational data structure. This is particularly relevant regarding a) the possibility of reversed causality (i.e., low levels of ego depletion or vitality may facilitate perceiving SCDs as more threatening), and b) the proposed mediating effect of ego depletion at home in the relation of SCDs at work and subjective vitality at home, which is assumed to develop over time. Our supplemental analyses addressing this issue, however, speak against reversed causality. Moreover, our findings are in line with previous longitudinal studies demonstrating that SCDs result in impaired well-being and not vice versa (Diestel & Schmidt, 2011). Nevertheless, future studies could benefit from a more thorough examination of the causal relations among our variables, for example through an experimental manipulation of SCDs or ego depletion.

Third, the specification of adequate points in time for measurements is a fundamental issue in diary studies. In particular, theories such as the Limited Strength Model of Self-Control imply relationships between focal variables, but do not specify time periods in which these relationships occur (that is, for example, how much time it takes until demands manifest in depletion and impaired well-being, or until depleted resources are recovered). In our study, we focused on relationships at the day-level and separated two measurement occasions, one in the afternoon at work and one in the evening at home.

Future studies, however, should put a stronger emphasis on the temporal order of the proposed relations by assessing study variables (e.g., mediator and outcome variables) at different points in time. As longer-term fluctuations of our study variables (e.g., weekly) are also plausible, this could be another promising aim for future research.

Moreover, the timing and type of measurement of psychological detachment is particularly difficult. In the present study, participants rated detachment in the course of the evening (the survey was available for six hours) in order to avoid data loss that might occur using a questionnaire sent at bed-time (e.g., when participants miss responding to the survey before going to bed). However, irrespective of the timing, a survey assessing previous levels of psychological detachment might at the same time interrupt participants' detachment, as they are reminded of their work. Hence, future studies could use peer-ratings in order to not influence participants' levels of detachment.

Fourth, our study focuses on psychological detachment as one of four recovery experiences (psychological detachment, relaxation, mastery, control) proposed by Sonnentag and Fritz (2007). Scholars could address relaxation, mastery, and control as further potential moderators of SCDs. In particular, whereas relaxation can be thought to serve as a buffer through replenishing the limited regulatory resource similar to detachment, mastery experiences and control rather support building up new internal resources and thereby even "require a certain degree of self-regulation" (Sonnentag & Fritz, 2007, p. 206). Thus, they could be assumed to further tax the limited regulatory resource instead of promoting its recovery. In sum, future research should address this issue to allow comparisons between the different recovery experiences, and eventually provide differential effects.

Kapitel 3

Studie II

A Diary-Study on Work-Related Smartphone Use and Employees' Well-Being: The Moderating Role of Basic Need Satisfaction

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A Diary-Study on Work-Related Smartphone Use and Employees' Well-Being: The Moderating Role of Basic Need Satisfaction

Summary

The impact of work-related smartphone use on organizational and private life is a current research topic in work and organizational psychology. In this study, we investigate the day-level effects of work-related smartphone use during non-work time on employees' psychological well-being. Drawing on the Limited Strength Model of Self-Control, we propose that work-related smartphone use depletes limited regulatory resources and thus, impairs well-being at the day-level. Furthermore, based on arguments brought up by Self-Determination Theory, we propose basic need satisfaction at work as a buffering moderator of this relationship, arguing that for employees with high levels of basic need satisfaction work-related smartphone use is less depleting due to high intrinsic motivation and higher levels of energy, which support resource recovery. A diary study covering ten working days ($N = 74$) was conducted to test our hypotheses. Results indicate that, in line with our expectations, work-related smartphone use impairs employees' psychological well-being at the day-level. The satisfaction of basic psychological needs at work (autonomy, competence and relatedness) can buffer these effects and thus, protect employees from impairments of well-being.

Keywords: basic need satisfaction; daily diary study; psychological well-being; self-determination theory; work-related smartphone use

Introduction

Technological innovations have essentially changed how, when, and where we work. Today, many employees use smartphones to have a permanent access to work-related information and tasks via e-mails, messengers, and phone calls – even during non-work time (Lanaj et al., 2014). Consequently, the boundaries between the life domains of work and home continually blur. Recent studies from the field of work and organizational psychology indicate that this trend may involve both advantages and risks for employees and thus, is often referred to as a “double-edged sword” (Diaz, Chiaburu, Zimmerman, & Boswell, 2012). More precisely, whereas the increase of control and autonomy have been demonstrated to positively affect productivity (Gajendran & Harrison, 2007) and work satisfaction (Diaz et al., 2012), a growing body of evidence indicates that work-related smartphone use during non-work time can also carry costs. For instance, many organizations increase expectations regarding employees’ availability, and employees feel forced to respond immediately to work-related messages at home (Bergman & Gardiner, 2007). The emerging consequences range from excessive working hours (Peters, den Dulk, & van der Lippe, 2009) to impairments of employees’ work-home balance and health (Derks & Bakker, 2014; Kreiner, Hollensbe, & Sheep, 2009). Both the prevalence of smartphone use for work-related purposes as well as the awareness of its risks underlines the necessity of identifying moderators that attenuate these effects in order to protect employees’ well-being.

To address this issue, the aim of the current diary study is to expand scholarly knowledge on a) the consequences of work-related smartphone use on employees’ well-being, and b) buffering moderators that help employees dealing with work-related smartphone use. First, we suggest that smartphone use, as a means for staying online and checking for new messages, requires self-control (i.e., regulating one’s thoughts, emotions, and behaviors, in order to align them with goals, rules, or other standards; Vohs & Baumeister, 2016). Accordingly, drawing on the Limited Strength Model of Self-Control (Muraven & Baumeister, 2000), which states that all acts of self-control deplete a limited regulatory resource, we propose that daily work-related smartphone use negatively relates to daily indicators of well-being associated with regulatory resource depletion. Secondly, we examine whether basic need satisfaction can buffer these adverse effects. This proposition draws on the Self-Determination Theory (SDT), which states that the satisfaction of basic psychological needs at work (autonomy, competence, and relatedness) is

associated with intrinsic motivation and thereby facilitates psychological well-being (Deci & Ryan, 1985; Ryan & Deci, 2000). We suggest that employees with high levels of basic need satisfaction are more intrinsically motivated and experience autonomous regulation while using their smartphones for work. The adverse relationship between work-related smartphone use and well-being is hence proposed to be weaker for employees with high levels of basic need satisfaction.

In sum, the present study may contribute to the existing literature in three ways. First, our study provides a self-control perspective on the adverse consequences of work related smartphone use by investigating how smartphone use is related to ego depletion and need for recovery as indicators of well-being associated with regulatory resource depletion (Rivkin et al., 2015a). Second, at the methodological level, we add to literature by testing the proposed relations at the within-person level. Previous research has demonstrated that work-related smartphone use varies substantially between days (Derks & Bakker, 2014) and that regulatory resource depletion following acts of self-control can manifest within a day (Rivkin et al., 2015a). Accordingly, we test our predictions using a daily diary design in order to display the transition of daily smartphone use to daily resource depletion. Third, our study may shed light on how employers can protect employees against the adverse consequences of work-related smartphone use by ensuring the satisfaction of psychological needs at work. In the following, we first review research on work-related smartphone use and derive arguments for its adverse effects on ego depletion and need for recovery. Then, we elaborate on SDT and recent findings on basic need satisfaction in order to derive our hypothesis for the moderating effect of basic need satisfaction

The Consequences of Daily Work-Related Smartphone Use on Employees' Psychological Well-Being

A central finding of research on work-related smartphone use is that it can bare multiple risks for employees' health. In particular, employees who use their smartphone for work-related purposes at home report increased work-home conflict (Derks & Bakker, 2014), reduced sleep quantity (Lanaj et al., 2014) as well as difficulties to detach from work and to recover from work-related stress (Derks, van Mierlo, et al., 2014). In addition, empirical evidence suggests that work-related smartphone use positively relates to negative affect (Ohly & Latour, 2014) and burnout (Derks & Bakker, 2014). Lanaj et al.

(2014) suggest that the depletion of regulatory resources following acts of self-control may be responsible for these effects. The Limited Strength Model of Self-Control (Muraven & Baumeister, 2000) can offer a theoretical basis for this proposition. This model states that all acts of self-control (that is, the inhibition, modification, or override of automatic and spontaneous response impulses, emotions, and motivational processes; Baumeister et al., 1994) draw on and deplete a limited regulatory resource. Depletion of this resource results in reduced performance on subsequent self-control tasks and, if this resource cannot be recovered, can manifest in impairments of psychological well-being, such as burnout (Schmidt & Diestel, 2015).

Accordingly, we propose that work-related smartphone use may trigger self-control processes and thus, draw on and deplete limited regulatory resources. More precisely, to align with their work tasks and requirements, some employees may engage in continuous monitoring, which generates compulsive routines of checking for new phone calls and messages during off-job time. Thus, when their smartphones ring or light up to indicate incoming messages, checking them not immediately requires self-control efforts. In contrast, other employees may have to overcome motivational blockades (i.e., monitor their behavior) when they have to answer work-related phone calls during leisure time. Lastly, it is also conceivable that work-related smartphone use may introduce competing goals between work and private life. Individuals try to achieve organizational goals as they expect to receive positive outcomes in return, but at the same time might suppress personal goals and the own (or the partner's/family's) wish for private time without work. Resolving that conflict, however, involve acts of self-control.

Integrating the argument that work-related smartphone use may require self-control and previous findings that a) the intensity of work-related smartphone can substantially vary between different working days (due to high workload or upcoming deadlines, e.g. Derks, van Mierlo, et al. 2014), and b) the depletion of regulatory resources following daily acts of self-control occurs directly at the same day (Rivkin et al., 2015a), we propose that daily work-related smartphone use predicts impairments of daily psychological well-being associated with regulatory resource depletion (i.e., ego depletion and need for recovery). Ego depletion constitutes a cognitive symptom of impaired well-being, referring to a current state of regulatory resource depletion, low willpower and an inner experience of exhaustion (Baumeister et al., 1998). Need for recovery refers to the extent to which employees experience the need to recuperate (e.g., depleted regulatory

resources) after work (van Veldhoven & Broersen, 2003). It is characterized by temporary feelings of overload, irritability, social withdrawal, lack of energy for new effort, and reduced performance after work. In sum, we propose:

Hypothesis 1: Work-related smartphone use increases ego depletion and need for recovery at the day-level.

Basic Need Satisfaction as a Buffer of the Adverse Consequences of Daily Work-Related Smartphone Use

The concept of basic needs is central to the Self-Determination Theory introduced by Deci and Ryan (2000). A core proposition of this theory is that individuals have three basic psychological needs: the need for autonomy (i.e., to experience one's actions as self-determined and volitional), the need for competence (i.e., to feel capable to effectively master one's environment), and the need for relatedness (i.e., to develop meaningful social relationships). The satisfaction of these needs reflects a key to well-being and performance (Deci & Ryan, 2000). Over the last years, research on occupational stress and health has applied SDT in the working environment. Accordingly, a growing body of empirical evidence has demonstrated that work-related basic needs satisfaction evokes beneficial outcomes such as positive affect and work engagement, and decreases burnout and strain (Van den Broeck, Ferris, Chang, & Rosen, 2016).

In the present study, we propose basic need satisfaction as a potential buffer against the adverse effects of work-related smartphone use on employees' well-being. Our proposition is based on two arguments derived by SDT (Deci & Ryan, 2000). First, SDT implies that need satisfaction can enhance intrinsic motivation, that is, self-determined and autonomously regulated behavior. Van Hooff and Geurts (2015) argue that intrinsically motivated behavior can be assumed to require less self-control compared to behavior resulting from controlled motivation (e.g., behavior performed for external causes, or preventing feelings of guilt or shame; Deci & Ryan, 2000) and hence to deplete limited regulatory resources less intensively (van Hooff & Geurts, 2015). Drawing on this argument, we suggest that employees with high levels of basic need satisfaction are more intrinsically motivated when using their smartphone for work during non-work time. This intrinsic motivation reduces the need to exert self-control when engaging in it, which, in turn, diminishes impairments of well-being due regulatory resource depletion.

Furthermore, SDT states that basic need satisfaction results in energy maintenance and enhancement (Ryan & Deci, 2008). In line with this proposition, previous research has demonstrated that employees with high levels of basic need satisfaction at work report higher energy levels (Reis et al., 2000; Sheldon, Ryan, & Reis, 1996) and recovery states (van Hooff & Geurts, 2015). Accordingly, we assume that the energy-enhancing qualities of basic need satisfaction may facilitate the recovery of employees' limited self-control resource, which is drawn upon during work-related smartphone use. In sum, our proposition implies that high levels of basic need satisfaction may reduce depletion and facilitate recovery processes of the limited regulatory resource, and thus, buffer the day-specific adverse effects of work-related smartphone use on employees' well-being. As basic need satisfaction can be assumed to be rather stable, we examine our moderator hypothesis by testing cross-level interactions with basic need satisfaction (level 2) moderating the effect work-related smartphone use (level 1) on ego depletion and need for recovery (level 1). In sum, we propose:

Hypothesis 2: Basic need satisfaction moderates the relation between daily work-related smartphone use and daily ego depletion/need for recovery. The relationship is strongest when employees experience low levels of basic need satisfaction at work.

Method

Participants and Procedure

We conducted a daily diary study to test our hypotheses. Over the course of the last years, we collected contact information from individuals who expressed their willingness to take part in a scientific study and asked them to participate. Furthermore, the researchers directly approached their own contacts to acquire participants for this study. All participants received a compensation of 50 Euro.

Our data were collected via online-surveys. In advance of the day-specific measurements, respondents received an email explaining the survey process and confidentiality of the responses. In addition, they were invited to fill out a general questionnaire that assessed demographic variables and basic need satisfaction. Afterwards, participants received emails two times per day over 10 consecutive working days including instructions and links to the day-specific questionnaires. The morning survey, which was sent at

7 AM every day, measured work-related smartphone use on the evening before. The evening survey, which was sent to participants at 7 PM each evening, assessed the outcome variables (ego depletion and need for recovery). On weekends or public holidays, the diary study was suspended and continued on the next regular working day.

Overall, 74 employees (Level 2) took part in our study (response rate: 79%), resulting in 581 data points at the within-person level (Level 1). Participants were 58 % female. The mean age was $M = 34.86$ years ($SD = 13.88$) with a range from 19 to 68 years. Most participants worked in full time (73%) and the average of work experience was 14 years ($SD = 14.92$).

Measures and Control Variables

Work-related smartphone use during non-work time. To assess work-related smartphone use during off-job time, we used the smartphone use scale developed by Derks and Bakker (2014) adjusted for daily measurement. The scale consists of four items, which are rated on a 5-point rating-scale ranging from 1 = *totally disagree* to 5 = *totally agree* and includes an explicit reference to work-related smartphone activities. Participants were instructed to answer the questions in the morning, referring to the previous evening. Accordingly, the items were adapted and then translated into German through a three-step procedure that involved the original items being translated into German, then back into English, and then compared (Chapman & Carter, 1979). Items are: “Yesterday, I used my smartphone intensively during after work hours for work-related purposes”, “Yesterday, I felt obliged to respond to work-related messages during the evening hours”, “Yesterday, I checked my work-related emails until I went to sleep”, and “Yesterday, when my smartphone blinked to indicate new messages, I could not resist checking them”.

Basic need satisfaction. We assessed basic need satisfaction with nine items from a scale developed by van den Broeck, Vansteenkiste, de Witte, Soenens, and Lens (2010). Each need was measured by three items (e.g., Need for autonomy: “I feel free to do my job the way I think it could best be done”; Need for competence: “I am good at the things I do in my job”; and Need for relatedness: “At work, I can talk with people about things that really matter to me.”). We used a 5-point rating-scale (1 = *not at all*; 5 = *a great deal*) for responses. The scale score was computed as the average of all single-item scores, as the integrative measurement of all three needs covers the total or cumulative satisfaction of need satisfaction.

Ego depletion. Day-specific ego depletion was assessed using five items related to the participants' current experiences with resource depletion and low willpower (e.g., "At the moment, I feel increasingly less able to focus on anything."). The scale was developed and validated by Bertrams et al. (2011), who intended to assess the psychological state of ego depletion as proposed by Muraven and Baumeister (2000). All items are scored using a 4-point rating scale (1 = *not at all*; 4 = *a great deal*).

Need for recovery. We assessed day-specific need for recovery using five items from van Veldhoven and Broersen's (2003) scale (e.g., "Today, I cannot really show any interest in other people when I have just come home myself."). Essentially, this scale indicates the extent to which employees are incapable of expressing interest in other things and perceive a strong need for a rest period to recover from stressful activities. The response format ranges from 1 = *not at all* to 4 = *a great deal*.

Control variables. At the between-person level, we controlled for demographics (age, gender), as past research has indicated that demographics may be associated with day-level well-being (Sonnentag, 2003).

Analytical Procedure

To test our hypotheses, we used multilevel modeling because the day-level data were nested within the person-level data and this procedure takes the interdependence of both levels into account (Hox, 2002). All parameter specifications and estimates were conducted with the MLwiN software (Rasbash, Steele, Browne, & Goldstein, 2012). As the control variables age and gender exhibited significant influence on both outcome variables (ego depletion, need for recovery), they were included in the further analyses.

We specified several models. The null model only included the intercept. Model 1 additionally included person-level age, gender, and basic need satisfaction and day-level work-related smartphone use. In Model 3, we examined our moderator hypothesis by testing a cross-level interaction with basic need satisfaction (person-level) moderating the effect of work-related smartphone use (day-level) on ego depletion and need for recovery (day-level). When the parameters were included in MLwiN, work-related smartphone use was centered around the person mean, since we wanted to exclusively examine the day-specific effects of work-related smartphone use. In contrast, the person-

level variables (age, basic need satisfaction) were centered around the grand mean to reduce the risk of multicollinearity (Enders & Tofghi, 2007).

Results

Table 3 reports descriptive statistics, internal consistencies (Cronbach's alpha), and correlations among the study variables. All measures revealed satisfactory consistencies. In order to examine the proportion of variance that is attributed to the different levels of analysis, we calculated the intra-class correlation (ICC) for the day-level variables. The proportions of within-person variation were 40.5% for work-related smartphone use, 51.3% for ego depletion, and 53.9% for need for recovery, indicating that due to a high proportion of variance attributable to day-specific fluctuations, the application of multi-level modeling is necessary.

Table 3: Means, Standard Deviations, Internal Consistencies (Cronbach's Alpha) and Intercorrelations of Study Variables

Variable	1	2	3	4	5	6
1. Smartphone use	<i>(.85)</i>	.15	.21			
2. Ego depletion	.17	<i>(.92)</i>	.72			
3. Need for recovery	.33	.78	<i>(.85)</i>			
4. Basic need satisfaction	-.05	-.25	-.29	<i>(.78)</i>		
5. Age	-.05	-.46	-.16	.15	-	
6. Gender ^a	-.01	-.37	-.29	-.16	.11	-
<i>M</i>	1.64	1.89	1.84	3.88	34.86	1.42
<i>SD</i>	0.71	0.54	0.46	0.47	13.88	0.50

Notes: Cronbach's alpha for day-level variables represent the mean internal consistencies averaged over all measurement days.

Correlations below the diagonal are person-level correlations ($N_{\text{between}} = 74$).

Correlations above the diagonal are day-level correlations ($N_{\text{within}} = 581$).

Numbers in bold $p < .05$. ^aGender (1 = female, 2 = male).

Test of Hypotheses

In our first hypothesis, we proposed that work-related smartphone use is adversely related to indicators of day-specific well-being. Table 4 shows the results of the multilevel analyses. Consistent with this proposition, after controlling for age and gender, work-related smartphone use is positively related to ego depletion and need for recovery (ego-depletion: $\beta = .08$; need for recovery: $\beta = .08$; $p < .10$). Thus, Hypothesis 1 is confirmed.

Table 4: Multilevel Estimates for Predicting Ego Depletion and Need for Recovery

Parameter	Ego Depletion							
	Null model		Model 1		Model 2		Model 3	
	Estimate	(SE)	Estimate	(SE)	Estimate	(SE)	Estimate	(SE)
Intercept	1.89**	0.07	2.38**	0.17	2.45**	0.17	2.45**	0.17
Age			-0.02**	0.00	-0.02**	0.00	-0.02**	0.00
Gender			-0.35**	0.11	-0.40**	0.11	-0.40**	0.11
Smartphone use (SU)					0.08 ⁺	0.04	0.09 [*]	0.04
Basic need satisfaction (BNS)					-0.28 [*]	0.11	-0.28**	0.12
SU x BNS							-0.23 [*]	0.11
Level 1 Intercept variance	0.29		0.29		0.28		0.28	
Level 2 Intercept variance	0.27		0.19		0.17		0.17	
– 2*log (lh)	1080.18		1053.91		1044.94		1040.45	
Δ – 2*log (lh)			26.27**		8.97 [*]		4.49 ⁺	
df			2		2		1	
Parameter	Need for Recovery							
	Null model		Model 1		Model 2		Model 3	
	Estimate	(SE)	Estimate	(SE)	Estimate	(SE)	Estimate	(SE)
Intercept	1.83**	0.05	2.21**	0.16	2.28**	0.15	2.28**	0.15
Age			-0.01	0.00	0.00	0.00	0.00	0.00
Gender			-0.27 [*]	0.11	-0.32**	0.10	-0.32**	0.10
Smartphone use (SU)					0.08 ⁺	0.04	0.09 [*]	0.04
Basic need satisfaction (BNS)					-0.32**	0.11	-0.32**	0.11
SU x BNS							-0.22 [*]	0.10
Level 1 Intercept variance	0.22		0.22		0.22		0.22	
Level 2 Intercept variance	0.19		0.17		0.15		0.15	
– 2*log (lh)	917.79		909.10		895.69		890.88	
Δ – 2*log (lh)			8.69 ⁺		13.41**		4.81 ⁺	
df			2		2		1	

Note: Gender, age, and basic need satisfaction are person-level (Level 2) variables; smartphone use is a day -level (Level 1) variable. ⁺ $p < .10$. ^{*} $p < .05$. ^{**} $p < .01$. $N_{\text{within}} = 581$.

Hypothesis 2 predicted that basic need satisfaction moderates the adverse effects of smartphone use on day-specific indicators of well-being. As demonstrated in Model 3 (cf. Table 4), the day-level interaction effects between smartphone use and basic need satisfaction on both indicators of well-being were significant (ego depletion: $\beta = -.22, p < .05$; need for recovery: $\beta = -.22, p < .05$). Moreover, Model 3 provided a better data fit compared to Model 2, as indicated by the significant log likelihood differences. To facilitate the interpretation of the interaction effects, we depicted the interactions and performed simple slope tests, as recommended by Preacher et al. (2006). As shown in Figure 8, the interactions are consistent with our Hypothesis 2. In particular, only employees whose basic needs are not satisfied in their job report impairments of well-being on days with high work-related smartphone use in the evening, whereas there is no effect for employees with high levels of basic need satisfaction. Overall, the satisfaction of basic psychological needs at work attenuates the day-specific adverse effects of work-related smartphone use on ego depletion and need for recovery, thereby providing support for Hypothesis 2.

Following recommendations provided by Spector and Brannick (2011), we additionally conducted the analyses without the inclusion of age and gender as control variables to determine whether their addition influenced the relations among the main study variables. The results revealed no changes in the main and interaction effects of smartphone use and basic need satisfaction. Thus, the possibility that our results could be attributed to the control variables was ruled out.

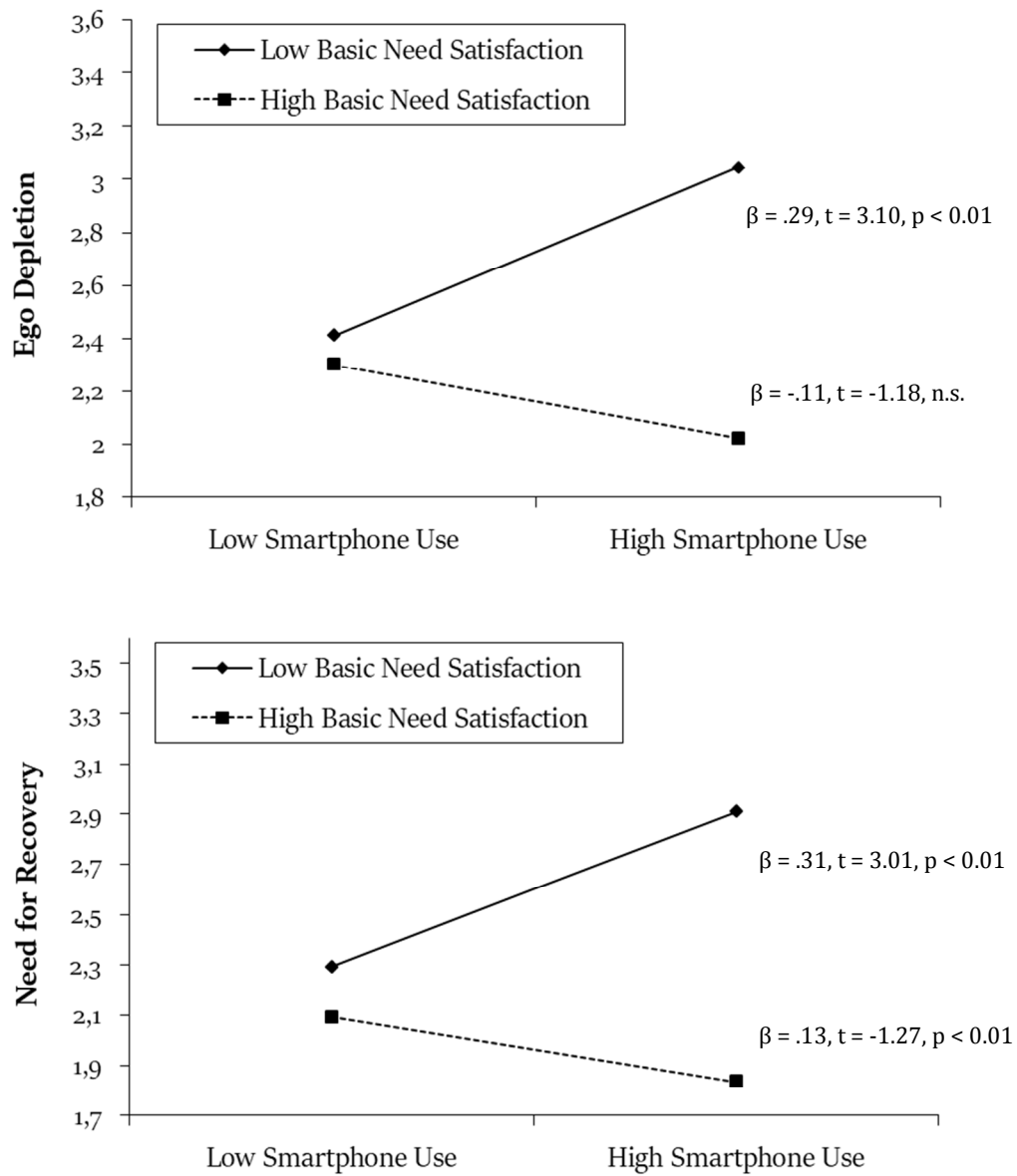


Figure 8: Interaction Effects of Work-Related Smartphone Use and Basic Need Satisfaction on Ego Depletion and Need for Recovery

Discussion

In view of the emerging prominence of smartphone use for work-related purposes, the present study sheds further light on the adverse consequences of work-related smartphone use during non-work time on employees' well-being and investigated the satisfaction of basic psychological needs at work as a buffer of this relationship. In support of our predictions, data from a diary study showed a main effect of work-related smartphone use on ego depletion and need for recovery, and additionally indicated that this day-specific relation was strongest for employees with low levels of basic need satisfaction.

Theoretical Implications

Our research offers some important theoretical implications for research on work-related smartphone use. First, our study supports previous studies demonstrating that work-related smartphone use can impair employees' psychological well-being (Derks & Bakker, 2014; Lanaj et al., 2014; Ohly & Latour, 2014). More precisely, our results provide convincing evidence that work-related smartphone use relates to ego depletion and need for recovery as indicators of regulatory resource depletion on a daily basis. Hence, our findings also highlight the importance of considering day-level processes in employees' depletion at work. Second, our study sheds light on work-related smartphone use as an additional work demand that requires employees' self-control. Whereas the majority of research on self-control at work has focused on impulse control demands or emotional dissonance (see Schmidt & Diestel 2015 for an overview), recent studies suggest that far more behaviors and boundary conditions at work can tax regulatory resources (e.g. responding to help requests; Lanaj et al., 2016; time pressure, planning and decision making; Prem et al., 2016). Identifying these behaviors is essential in order to protect employees against impairments of well-being due to regulatory resource depletion. Third, we found that the satisfaction of basic psychological needs for autonomy, competence and relatedness attenuates the adverse effects of work-related smartphone use. Our results underline the propositions brought up by SDT (Deci & Ryan, 2000) that basic need satisfaction is intrinsically motivating, and that intrinsic motivation for a behavior reduces the need to exert self-control when engaging in it. Put differently, our finding suggests that employees with high levels of basic need satisfaction are more intrinsically motivated and

thus, less depleted while using their smartphones for work in the evening. Furthermore, they experience higher levels of energy supporting the recovery of regulatory resources. In contrast, for people who do not find their basic psychological needs satisfied in their job, work-related smartphone use is more depleting.

Limitations and Suggestions for Further Research

Despite the contributions, our study is subject to several limitations, which need to be discussed. First, our study variables were operationalized by means of self-report. Thus, common method variance or a self-report bias might have contaminated the relationships under examination (Podsakoff et al., 2003). However, because a high common method variance reduces the probability of detecting interaction effects (Siemsen et al., 2010), this concern can be alleviated. Nonetheless, future research could gain additional insights by, for example, using different operationalizations of work-related smartphone use, such as quantitative measures (duration of smartphone use), or peer-ratings (e.g., by partners). Second, we did not measure overall time dedicated to work in the evening beyond work-related smartphone use in our study. It is conceivable that participants spent time on other work-related activities than smartphone use, which may have additional effects on ego depletion and need for recovery.

Practical Implications

Apart from the theoretical contributions, our research may also offer practical implications for both individuals and organizations. First, our results suggest that employees ought to use their smartphones for work with caution as it can lead to impairments of well-being. Thus, employees should become aware of how intensively they use their smartphone for work during non-work time and how much availability they want in order to set adequate boundaries between work and private life. Moreover, they should engage in behaviors that replenish depleted resources, such as taking breaks at work, doing naps, and mentally disengaging from work during leisure time to protect their well-being (Barnes, 2011; Trougakos, Beal, Green, & Weiss, 2008).

From an organizational point of view, to prevent losses of organizational productivity and performance as a result of employees' impairments of well-being, the topics of daily time pressure and workload should be addressed. It seems likely that on days with

high time pressure or workload employees rather continue working at home using their smartphone compared to days with low time pressure or workload. Hence, supervisors could help employees by agreeing on where, when and how unfulfilled work goals will be completed to avoid that unfulfilled goals capture attention resources in the evening (Smit, 2016). Furthermore, previous studies propose that the use of communication technology is strongly influenced by organizational culture (Markus, 1994; Orlikowski, 1992). For instance, social norms at the workplace regarding availability during non-work hours represented by supervisors have been demonstrated to influence the consequences of daily work-related smartphone on work-home interference (Derks, van Duin, Tims, & Bakker, 2015). Hence, supervisors should be aware of their position as role models and try to convey adequate expectations on employees' availability for work during non-work time. Moreover, organizations could establish general guidelines for the use of work-related technologies at home.

As a last point, because the satisfaction of basic psychological needs can prevent the adverse consequences of work-related smartphone use, organizations should try to foster employees' basic need satisfaction, for example through leadership (e.g., servant leadership), job control, and social support (Fernet, Austin, Trépanier, & Dussault, 2013).

Kapitel 4

Studie III

Protect Your Sleep When Work is Calling:
How Work-Related Smartphone Use
During Non-Work Time and Sleep Quality
Impact Next-Day Self-Control Processes at Work

Gombert, L., Konze, A.-K., Rivkin, W., & Schmidt, K.-H. (2018). Protect Your Sleep When Work is Calling: How Work-Related Smartphone Use During Non-Work Time and Sleep Quality Impact Next-Day Self-Control Processes at Work. *International Journal of Environmental Research and Public Health*, 15(8), 1757.
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Protect Your Sleep When Work is Calling: How Work-Related Smartphone Use During Non-Work Time and Sleep Quality Impact Next-Day Self-Control Processes at Work

Summary

In view of the rapid development of information and communication technologies, the present study sheds light on how work-related smartphone use during non-work time affects employees' subsequent working day. Specifically, we examine work-related smartphone use and sleep quality as moderators of next-day self-control processes at work. Theorizing that work-related smartphone use and self-control demands deplete a common limited regulatory resource, we suggest a strengthening two-way interaction between work-related smartphone use during non-work time and next-day self-control demands at work in predicting employees' ego depletion at work. Moreover, in a three-way interaction, we analyze whether this interaction depends on employees' sleep quality, assuming that when intensive work-related smartphone use is followed by high-quality sleep, the taxed regulatory resource can replenish overnight. Results from our diary study covering ten working days (N=63) indicate that after evenings with high work-related smartphone use, employees experience disproportionate levels of ego depletion when dealing with self-control demands at work. Sleep quality, however, attenuates this interaction. In cases of high sleep quality, next-day self-control processes at work are no longer affected by work-related smartphone use. Based on these findings, we discuss implications for employees and employers regarding work-related smartphone use and the relevance of sleep in replenishing drained resources.

Keywords: daily diary study; ego depletion; self-control; sleep; spillover; three-way interaction; work-related smartphone use

Introduction

Today's working life is characterized by global competition, increasing service orientation, and the need to adjust quickly to changing markets (Cascio, 2003). These demands cannot be met by automated and rigid patterns of behavior. Rather, they call for considerable self-control (Schmidt & Diestel, 2015). Self-control refers to the ability to regulate one's thoughts, emotions, and behaviors, in order to align them with goals, rules, or other standards. Despite its benefits for effective functioning at the workplace, self-control is not without drawbacks. According to the Limited Strength Model of Self-Control (Muraven & Baumeister, 2000), all acts of self-control draw on a common regulatory resource, which is limited and gets depleted by use. The depletion of this resource, called *ego depletion*, can temporarily impede subsequent self-control efforts, and is characterized by feelings of low willpower and cognitive exhaustion (Bertrams et al., 2011). Once depleted, individuals need to recover in order to regain full self-control strength. If there is no opportunity for recovery, long-term consequences, such as chronic impairments in psychological well-being may evolve.

This notion points towards demands on self-control as a source of stress at work. Accordingly, research on occupational health has provided convincing evidence that the demands to control impulses, to resist distractions, and to overcome inner resistances at work (summarized as self-control demands) relate to short-term (e.g., ego depletion; Rivkin et al., 2015a) and long-term (e.g., burnout, depressive symptoms, and absenteeism; Schmidt & Diestel, 2015) indicators of impaired well-being.

Yet, the rapid development of information and communication technologies in recent years has given rise to further job-related demands that necessitate self-control efforts, such as work-related smartphone use after official working hours. Smartphones enable employees to perform their work outside the confines of an office, and have thus become a prevalent technology to stay connected to customers, co-workers, and supervisors even during non-work time (Lanaj et al., 2014). As such, this new technology causes employees to balance an extended availability for their job with private life, and to flexibly adapt their behavior according to either work or family roles (and the associated expectations). These characteristics suggest that work-related smartphone use during non-work time requires executive self-control processes, and in that way depletes limited regulatory resources.

We aim to advance this proposition in our research by shedding light on the day-to-day consequences of work-related smartphone use from a self-control perspective. More precisely, using a daily diary research design, we examine how work-related smartphone use during non-work time (i.e., in the evening at home) affects self-control processes during the following working day. Figure 9 depicts the hypothesized study model. Integrating previous findings a) that the use of limited resources in one domain (e.g., at home) reduces availability of these resources in the other domain (e.g., at work, referred to as spillover; Edwards & Rothbard, 2000), and b) that multiple demands on self-control can overtax the limited resource and thereby reinforce each other's impact on resulting ego depletion (Diestel & Schmidt, 2011; Schmidt, 2010), we propose that work-related smartphone use during non-work time interacts with next-day self-control demands at work in predicting employees' experience of ego depletion at work. In other words, we assume that work-related smartphone use makes employees more vulnerable to the depleting effects of self-control demands at work. Moreover, given that time for recovery (i.e., appropriate rest; Sonnentag, 2003) can restore depleted regulatory resources, we introduce sleep quality as a driver of resource replenishment that may moderate the proposed interaction between work-related smartphone use and self-control demands. We argue that if employees experience high sleep quality after having used their smartphones for work intensively, the regulatory resource can recover overnight. As a consequence, self-control processes at work on the next day should no longer be affected.

The present study may offer several contributions to scholarly knowledge. First, whereas previous research has mainly focused on consequences of work-related smartphone use occurring in the home domain, such as depletion on the same evening or the next morning (Derks et al., 2016; Derks, ten Brummelhuis, Zecic, & Bakker, 2014; Derks, van Mierlo, et al., 2014), we provide insight into how smartphone use during non-work time can affect the subsequent working day. In that way, our study may contribute to a holistic evaluation of the adverse effects of work-related smartphone use and broaden knowledge on the interconnectedness between home and work domains. Second, we intend to provide additional support for the notion that work-related smartphone use drains regulatory resources by investigating potential interaction effects with self-control demands in the prediction of ego depletion. We believe that understanding the process, which underlies the adverse effects of work-related smartphone use, is an important step towards ensuring employees' well-being in modern work environments. Third, whereas previous studies revealed interaction effects of chronic demands on self-control in the

prediction of long-term depletion (Diestel & Schmidt, 2011; Schmidt, 2010), the present research examines whether such interactions can also manifest on a daily basis (i.e., in predicting daily levels of ego depletion). Using a daily diary approach allows for identifying more fine-grained differences in resource allocation that occur on the within-level, and could further contribute to a better understanding of the causality of these effects (Xanthopoulou et al., 2012). Finally, we address the lack of knowledge regarding how employees can protect themselves on days with intensive work-related smartphone use. Demonstrating that employees' sleep quality mitigates regulatory resource depletion effects (and in that way foster subsequent self-control processes at work) might hold valuable implications for both individuals and managerial practice.

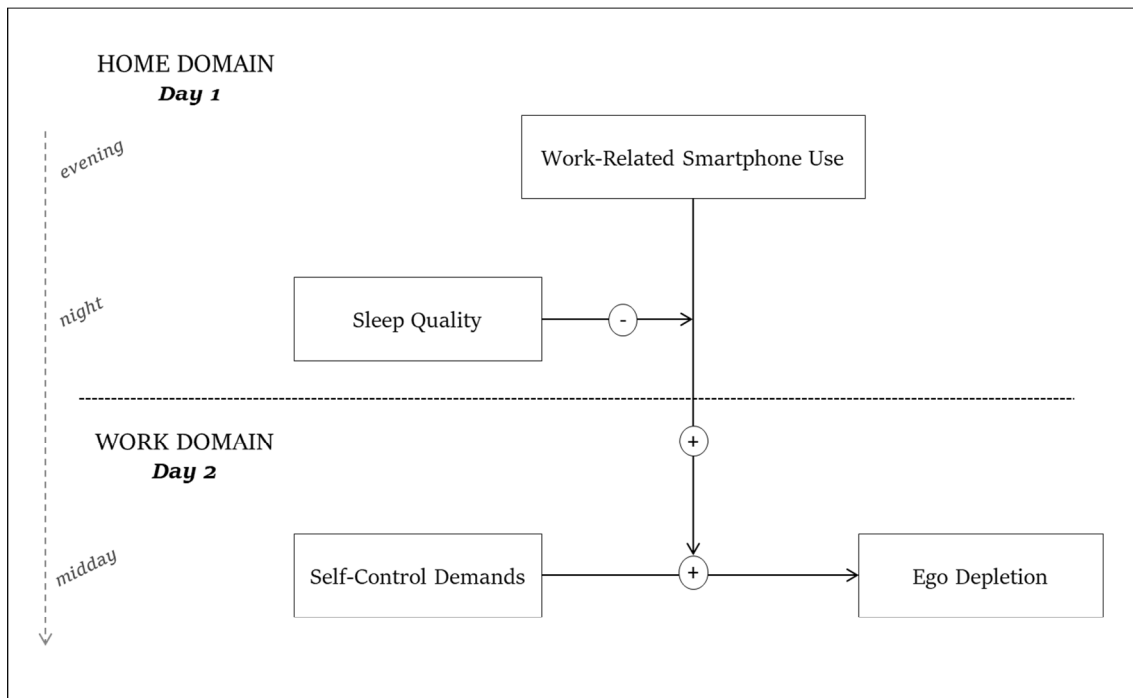


Figure 9: Research Model

Self-Control Demands – A Source of Stress at Work

During the last years, self-control demands at work have received increasing attention in the literature on occupational health. Several studies have demonstrated that self-control demands (that is, controlling impulses, resisting distractions and overcoming

inner resistances) constitute an influential stressor at work (Schmidt & Neubach, 2007b). Controlling impulses refers to the demand to inhibit spontaneous, impulsive response tendencies and associated affective states, which manifest, for example, in injudicious expressions towards other individuals. Resisting distractions involves the requirement to ignore interruptions evoked by task-irrelevant stimuli, which would interfere with successful task accomplishment (e.g., social media or private phone calls). Overcoming inner resistances relates to the requirement to overcome motivational blockades, for example in cases of unattractive tasks (Schmidt & Neubach, 2007b). There is strong evidence from cross-sectional and longitudinal studies that self-control demands at work predict long-term indicators of impaired well-being (e.g., burnout, depressive symptoms), and reduced productivity (e.g., absenteeism; Schmidt & Diestel, 2015).

While most of the previous studies have focused on self-control demands as stable (i.e., chronic) characteristics of a given job, more recent research argues that self-control demands can also vary between working days (Rivkin et al., 2015a; Sonnentag, Pundt, & Venz, 2017). More precisely, on days with intensive customer contact, frequent interruptions (e.g., by other individuals or high levels of noise at the workplace) or unattractive duties at work, required self-control efforts may be higher than on days with hardly any contact to other individuals. To capture these daily fluctuations, scholars have used daily diary designs in which self-control demands are assessed directly at work (e.g., in the afternoon) over several working days. The results indicate that self-control demands on a specific day can immediately translate to short-term indicators of impaired well-being (e.g., lower subjective vitality, higher levels of ego depletion) on this day (Rivkin et al., 2015a, 2018).

The adverse effects of self-control demands can be explained by the Limited Strength Model of Self-Control (Muraven & Baumeister, 2000). This model suggests that each person's capacity for self-control appears to be a limited, renewable resource. Various acts of self-control rely on that limited resource and deplete it with use, leaving less resource capacity available for subsequent self-control efforts. Self-control is thus costly in the short run and subject to fluctuations in capacity (Clarkson, Hirt, Jia, & Alexander, 2010). If prolonged self-control efforts prevent resource-replenishment, there is a risk of long-term consequences, such as burnout (Schmidt & Diestel, 2015). In sum, the notion that both chronic and day-specific self-control demands at work deplete regulatory resources and impact employees' well-being is well-established in current literature.

Joint Effects of Work-Related Smartphone Use at Home and Self-Control Demands at Work on Ego Depletion

New communication technologies, such as smartphones, continually blur the traditional spatial and temporal boundaries of work. They allow employees to manage their calendar, speak to colleagues or clients on the phone, and to receive and answer e-mails wherever they are. As a consequence, many employees use their smartphone to stay connected to their job after the official end of working hours (Derks & Bakker, 2014). Recent studies have outlined that, despite some benefits (e.g., a higher productivity; Gajendran & Harrison, 2007), work-related smartphone use after official working hours holds risks for health and well-being. More precisely, employees who intensively use their smartphones for work during non-work time report reduced sleep duration (Lanaj et al., 2014) as well as difficulties to detach from work and to recover from work-related stress (Derks, van Mierlo, et al., 2014). In addition, empirical evidence suggests that work-related smartphone use is positively related to work-family conflict (Derks et al., 2016), negative affect (Ohly & Latour, 2014), and burnout (Derks & Bakker, 2014). Many of these studies have used diary designs to outline the varying intensity of smartphone use between different days (e.g., due to high work-load or upcoming deadlines) and its relation to daily indicators of impaired well-being.

Scholars argue that the adverse effects of work-related smartphone use during non-work time can be traced back to the consumption of self-control resources. More precisely, because employers have raised their expectations regarding employees' availability, individuals may generate compulsive routines of checking for work-related phone calls and messages during off-job time in order to align with their work tasks and requirements. In that way, work-related smartphone use may require employees to maintain attention during leisure time although they might already feel exhausted (i.e., monitor and control themselves). As another example, work-related smartphone use can be assumed to introduce competing goals between work and private life. Individuals try to achieve organizational goals as they expect to receive positive outcomes in return, but at the same time might suppress personal goals and the own (or the partner's/family's) wish for private time without work. Managing such conflicts (e.g., deciding whether to check incoming messages when the smartphone rings or lights up during non-work time), however, has been demonstrated to involve acts of self-control (Kehr, 2004; Schmidt, 2010). Taken together, work-related smartphone use is highly likely to draw on and deplete limited regulatory resources similar to other demands on self-control.

Theoretical notions (Muraven & Baumeister, 2000) as well as empirical findings (Diestel & Schmidt, 2011; Schmidt, 2010) indicate that coping with multiple demands on self-control in a short period of time causes higher levels of depletion than accounted for by the additive effects of each demand, because the limited regulatory resource becomes overtaxed (Diestel & Schmidt, 2011). Accordingly, Schmidt (2010) found that the adverse effects of self-control demands at work on impaired well-being are amplified when employees additionally experience high goal incongruence at work (i.e., a perceived mismatch between personal and organizational goals). Diestel and Schmidt (2011), moreover, demonstrated strengthening interaction effects between self-control demands and emotional dissonance (i.e., suppressing genuine feelings in order to express organizationally desired emotions; Abraham, 1998) in predicting burnout, depressive symptoms, and absence behavior. Based on longitudinal or cross-sectional data, these studies focused on *between-person* effects, which indicate that adverse effects of chronic demands on self-control at work can cumulate to disproportionate levels of impaired well-being over time. However, little attention has been paid to whether these strengthening interaction effects also arise on a daily basis, that is, whether daily demands on self-control cumulate to higher levels of daily depletion.

To address this issue, and to extend knowledge on how work-related smartphone use affects employees' self-control processes at work, we examine joint (interaction) effects of work-related smartphone use and self-control demands in the prediction of ego depletion. Supposing that both demands deplete a common limited regulatory resource, we propose that work-related smartphone use at home (Day 1, cf. to Figure 9) strengthens the adverse effects of next-day self-control demands at work (Day 2) on next-day ego depletion at work (Day 2).

According to Edwards and Rothbard (2000), drawing on a limited resource in one life domain reduces the availability of this resource in the other domain. This notion implies that decrements in the regulatory resource may endure for some time and transcend the boundaries between home and work. We thus argue that on days when an employee intensively uses his or her smartphone for work-related purposes in the evening at home, he or she expends some of the limited regulatory resource. When this employee subsequently is confronted with high self-control demands at work on the following day (e.g., due to a monotonous task or a demanding client), the already decreased regulatory resource is taxed again. Consequently, because of lower resource availability, we assume

that coping with self-control demands will be more straining when preceding work-related smartphone use has been high. In sum, coping with both daily work-related smartphone use during non-work time and self-control demands at work the next day should result in higher levels of ego depletion than accounted for by the additive effects of both demands.

Hypothesis 1: Work-related smartphone use during non-work time moderates the day-specific relation between next-day self-control demands at work and next-day ego depletion at work. The relation is amplified when work-related smartphone use is high.

The Protective Function of Sleep Quality: Recovering the Limited Self-Control Resource

Given the costs of self-control efforts for employees' well-being, research on occupational health has broached the issue of how depleted regulatory resources can be recovered. Since recovery processes naturally occur during rest (Barnes, 2012; Sonnentag, 2003), several scholars introduced sleep quality as one essential driver of day-to-day resource restoration (Barber et al., 2009; Barnes, 2012; Baumeister et al., 1998; Muraven & Baumeister, 2000). High-quality sleep (i.e., for instance easily falling asleep, staying asleep, a small number of awakenings during the night; Barnes, 2012) allows for full re-winding from work-related effort and a reduction of responsiveness, so that affective and energetic resources can return to pre-stressor levels (Meijman & Mulder, 1998). Moreover, neurophysiological studies suggest that high sleep quality stabilizes the cerebral metabolic rate and ensures adequate resource or energetic supply of the prefrontal cortex, whose structures are essential for self-control functioning (Hofmann, Schmeichel, & Baddeley, 2012; Tabibnia et al., 2011).

In line with this proposition, high sleep quality has been demonstrated to buffer the adverse consequences resulting from demands on self-control. For instance, Diestel and colleagues (Diestel et al., 2015) found that sleep quality diminishes the impact of emotional dissonance on daily psychological well-being (ego depletion, need for recovery, and work engagement). Liu and colleagues (2017) further revealed that the association between customer mistreatment and unhealthy eating (as an indicator of self-control failure) becomes weaker as a function of sleep quality.

On the basis of these findings, we believe that sleep quality may have the potential to offset the adverse consequences of work-related smartphone use. We thus investigate daily sleep quality as a buffer of the interaction effects of work-related smartphone use and self-control demands on ego depletion. Considering high-quality sleep as a daily resource-restorative process, we propose that work-related smartphone use during non-work time (Day 1, cf. to Figure 9) only amplifies the next-day relation between self-control demands and ego depletion at work (Day 2) when sleep quality (in the night between Day 1 and Day 2) is low. We argue that when an evening with high work-related smartphone use at home is followed by a night with low sleep quality, recovery processes are impeded so that employees return to work with insufficiently restored regulatory resources (Kühnel, Bledow, & Feuerhahn, 2016; Kühnel, Zacher, de Bloom, & Bledow, 2017). As a result, self-control processes at work are affected in the way that employees are more vulnerable to the depleting effects of self-control demands due to their drained resources, manifesting in disproportionate levels of ego depletion (as described in Hypothesis 1). In contrast, when sleep quality during that night is high, employees can replenish their regulatory resources overnight so that the full strength is available on the following working day. As a consequence, self-control processes at work (i.e., handling self-control demands) should no longer be influenced by preceding levels of work-related smartphone use. We thus propose that the interaction between work-related smartphone use during non-work time and self-control demands at work on employees' ego depletion is attenuated as a function of sleep quality.

Hypothesis 2: Sleep quality moderates the day-specific interaction between work-related smartphone use during non-work time and next-day self-control demands at work on ego depletion at work. In cases of low sleep quality, work-related smartphone use moderates the positive relation between self-control demands and ego depletion, whereas in cases of high sleep quality, work-related smartphone use and self-control demands do not interact in predicting ego depletion.

Method

Participants and Procedure

We conducted a daily diary study in Germany to test our hypotheses. Participants were recruited through personal contacts, announcements on the authors' institute homepage, and social networks. All participants received a compensation of 50 Euro. The final sample includes 63 employees, among which 57 % (n = 36) were female. The mean age was 39.5 years (SD = 13.46) with a range from 20 to 64 years. Most participants worked in the service sector and had regular contact with customers, clients, patients, or other individuals. Occupations ranged from, for example, salespersons to consultants. Of the participants, 16% worked part-time (part-time employees in this study worked less days per week, but had full working days). Shift workers were not included in the study.

We collected our data by means of online surveys, which could be completed using smartphones, tablets, or computers. In advance of the day-specific measurements, participants answered a demographic questionnaire. They then received emails two times per day (in the morning at home, in the afternoon at work) over 10 consecutive working days including instructions and links to the day-specific questionnaires. The morning survey measured work-related smartphone use during off-job time in the previous evening and sleep quality. In the afternoon, participants were invited to rate self-control demands referred to the "last few hours of work" and current levels of ego depletion. On weekends or public holidays, the diary study was suspended and continued on the next regular working day. Overall, the response rate to our daily questionnaires was 97%, resulting in 603 out of 630 possible day-specific measurement points. The study was conducted in accordance with the Helsinki Declaration of 2008.

Measures and Control Variables

Age and gender were assessed and included in the analyses, as past research has indicated that demographics may be associated with day-level well-being (Sonnentag, 2003).

Work-related smartphone use during non-work time was measured with the smartphone use scale developed by Derks and Bakker (2014) adjusted for daily measurement. The scale consists of four items, which are scored on a five-point rating format (1 = *totally disagree*; 5 = *totally agree*) and include an explicit reference to work-related smartphone activities. Participants were instructed to answer the questions in the morning, referring to the previous evening (e.g., “Yesterday, I used my smartphone intensively during after work hours for work-related purposes.”). This approach follows previous research on work-related smartphone use (Lanaj et al., 2014).

Sleep quality was assessed with the following item adapted from Buysse and colleagues (Buysse, Reynolds, Monk, Berman, & Kupfer, 1989): “How do you evaluate this night’s sleep?”. This item has been used successfully in similar diary studies (Kühnel et al., 2016; Sonnentag, Binnewies, & Mojza, 2008). Participants rated their overall sleep quality on a four-point rating format (1 = *very poor*; 4 = *excellent*).

Self-control demands were measured with 15 items developed by Schmidt and Neubach (2007a). On a five-point rating format (1 = *not at all*; 5 = *a great deal*), participants evaluated the requirements to inhibit impulses, resist distractions, and overcome inner blockades within the last hours of work. Exemplary items are “In the last hours, my job required me not to lose my temper” for impulse control, “In the last hours, my work required me to resist distractions” for resisting distractions, and “In the last hours, some of my tasks were such that I really needed to force myself to get them done” for overcoming inner resistances. The scale score was computed as the average of the single-item scores (Schmidt & Diestel, 2012).

Ego depletion was assessed using five items related to participants’ current experiences with resource depletion (e.g., “At the moment, I feel less able to focus on anything.”). Bertrams et al. (2011) developed this scale in order to assess the psychological state of ego depletion proposed by Muraven and Baumeister (2000). All items are scored using a four-point rating format (1 = *not at all*; 4 = *a great deal*).

Construct Validity

Multilevel confirmatory factor analyses were conducted to test the psychometrical distinctiveness of our variables. We tested a four-factor model, which specified the three multi-item measures as latent constructs (self-control demands, work-related smartphone use, and ego depletion) and the single-item measure (sleep quality) as observed variable. Therefore, we created parcels of the latent constructs by aggregating the item indicators (self-control demands [three parcels], work-related smartphone use [two parcels], and ego depletion [two parcels]). This practice offers a number of advantages, such as a reduced number of parameters, more normally distributed and reliable measures, and more efficient parameter estimates (Bandalos & Finney, 2001; West et al., 1995). Fit indices indicated a good fit for the four-factor model ($\chi^2(44) = 215.72, p < .01$; root mean square error of approximation (RMSEA) = .091; comparative fit index (CFI) = .940; standardized root mean square residual within-person/between-person (SRMRw/SRMRb) = .055/.058).

Strategy of Analyses

We used multilevel modeling because our day-level data (Level 1) were nested within the person-level data (Level 2), and this procedure takes the interdependence of both levels into account (Hox, Moerbeek, & van de Schoot, 2017). All parameter specifications and estimates were conducted with the MLwiN software (Rasbash et al., 2012). We specified several models to test our hypotheses. The null model only included the intercept. In Model 1, we added the person-level control variables age and gender. Model 2 additionally included daily work-related smartphone use, sleep quality, and self-control demands. In Model 3, we tested the proposed interaction between work-related smartphone use and self-control demands by including a cross-product term of both predictors. Finally, Model 4 included the remaining two-way interaction terms (self-control demands \times sleep quality, work-related smartphone use \times sleep quality) as well as the three-way interaction (self-control demands \times work-related smartphone use \times sleep quality). Since we were solely interested in day-specific effects, we centered self-control demands, work-related smartphone use, and sleep quality around the person mean (group-mean centering; Enders & Tofighi, 2007) in order to remove any between person variance. Age and gender as person-level variables were centered around the grand mean to reduce the risk of multicollinearity (Enders & Tofighi, 2007).

Results

Table 5 reports descriptive statistics, internal consistencies (Cronbach's alpha), and correlations among the study variables. All measures revealed satisfactory consistencies. In order to examine the proportion of variance that is attributed to the different levels of analysis, we calculated the intra-class correlation (ICC) for the day-level variables. The high proportions of within-person variation (34% for work-related smartphone use, 73% for sleep quality, 27% for self-control demands, and 49% for ego depletion) justify the application of multilevel modelling. As depicted in Table 6 (Model 2), all study variables are directly related to ego depletion at work (work-related smartphone use: $\gamma = .09$, $p < .05$; sleep quality: $\gamma = -.12$, $p < .01$; self-control demands: $\gamma = .29$, $p < .01$).

Testing the Two-Way Interaction between Work-Related Smartphone Use and Self-Control Demands

Hypothesis 1 predicted a day-specific interaction between work-related smartphone use and next-day self-control demands at work on next-day ego depletion at work. In support of this hypothesis, the proposed interaction is significant ($\gamma = .32$, $p < .01$; cf. Model 3 in Table 6). Moreover, a log-likelihood ratio test additionally indicates that adding the interaction term improved data fit ($\Delta-2*\log(df) = 6.708(1)$; $p < .05$) as compared to Model 2.

To examine the interaction in more detail, we depicted it and conducted simple slope tests as recommended by Preacher et al. (2006). As illustrated in Figure 10, the interaction pattern is consistent with Hypothesis 1. Participants experienced highest levels of ego depletion when both work-related smartphone use and self-control demands were high. More precisely, when work-related smartphone use was high (+1 SD), self-control demands were positively related to ego depletion. In contrast, when work-related smartphone use was low (-1 SD), this relationship did not reach significance. Thus, as predicted, work-related smartphone use during non-work time strengthened the adverse effects of self-control demands on ego depletion at work the next day.

Table 5: Means, Standard Deviations, Internal Consistencies (Cronbach's Alpha), and Intercorrelations of Study Variables

Variable	1	2	3	4	5	6
1. Age	-					
2. Gender ^a	.04	-				
3. Work-related smartphone use (at home)	-.01	.03	<i>(.84)</i>	-.02	.14	.11
4. Sleep quality	.08	.04	-.01	-	-.05	-.21
5. Self-control demands (next day – at work)	-.09	-.05	.19	-.01	<i>(.93)</i>	.47
6. Ego depletion (next day – at work)	-.39	-.31	.11	-.23	.52	<i>(.93)</i>
<i>M</i>	39.49	1.43	1.51	2.29	2.66	1.80
<i>SD</i>	13.46	0.50	0.75	0.79	0.76	0.54

Note: Cronbach's alpha for day-level variables represent the mean internal consistencies averaged over all measurement days.
 Correlations below the diagonal are person-level correlations ($N_{\text{between}} = 63$).
 Correlations above the diagonal are day-level correlations ($N_{\text{within}} = 603$).
 Numbers in bold $p < .05$. ^aGender (1 = female, 2 = male).

Testing the Three-Way Interaction between Work-Related Smartphone Use, Self-Control Demands, and Sleep Quality

Hypothesis 2 predicted that sleep quality moderates the interaction effect of work-related smartphone use and self-control demands. In support of this prediction, the three-way interaction term was significantly related to ego depletion ($\gamma = -0.39$, $p < .05$; cf. Model 4 in Table 6) and improved model fit ($\Delta-2*\log(\text{df}) = 6.617(3)$; $p < .10$). Figure 11 depicts the pattern of the three-way interaction: Work-related smartphone use at home only strengthened the next-day relationship between self-control demands and ego depletion at work when employees reported low sleep quality (-1 SD). When sleep quality was high (+1 SD), there was no significant relationship between self-control demands and ego depletion at work the next day, regardless of work-related smartphone use.³

³ Controlling for working time (full-time vs. part-time) did not change the pattern of results.

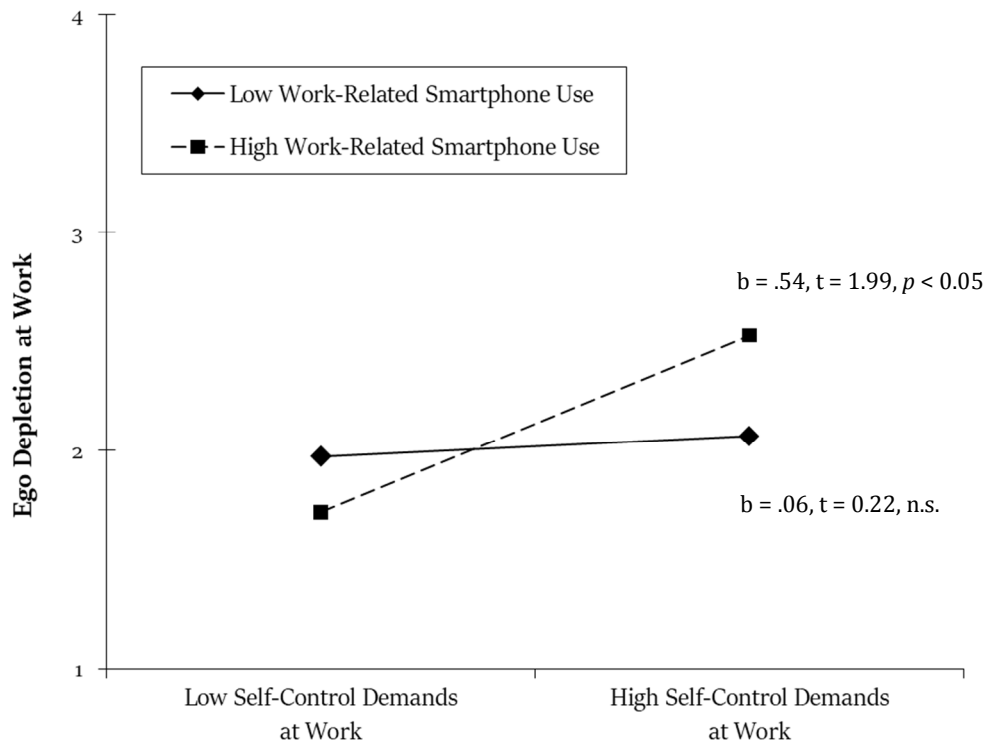


Figure 10: Two-Way Interaction of Work-Related Smartphone Use and Next-Day Self-Control Demands on Next-Day Ego Depletion at Work

Table 6: Multilevel Estimates for Predicting Next-Day Ego Depletion at Work

Parameter	Ego Depletion									
	Null model		Model 1		Model 2		Model 3		Model 4	
	Estimate	(SE)	Estimate	(SE)	Estimate	(SE)	Estimate	(SE)	Estimate	(SE)
Intercept	1.775**	0.067	2.077**	0.186	2.075**	0.185	2.072**	0.185	2.070**	0.186
Age			-0.017**	0.005	-0.017**	0.005	-0.017**	0.005	-0.017**	0.005
Gender			-0.215 ⁺	0.122	-0.213 ⁺	0.122	-0.213 ⁺	0.122	-0.210 ⁺	0.122
Smartphone use (SU)					0.088*	0.041	0.069	0.041	0.055	0.040
Sleep Quality (SQ)					-0.121**	0.038	-0.126**	0.037	-0.129**	0.037
Next-day self-control demands (SCDs)					0.290**	0.066	0.299**	0.065	0.295**	0.065
SCDs × SU							0.318**	0.123	0.325**	0.124
SCDs × SQ									0.059	0.078
SU × SQ									-0.011	0.064
SCDs × SU × SQ									-0.386**	0.171
– 2*log (lh)	1070.611		1055.378		935.070		928.362		921.745	
Δ – 2*log (lh)			15.233**		120.308**		6.708*		6.617 ⁺	
df			2		3		1		3	

Note: Age and gender are person-level (Level 2) variables; smartphone use, sleep quality and self-control demands are day -level (Level 1) variables.
⁺ $p < .10$. * $p < .05$. ** $p < .01$. $N^{\text{within}} = 603$

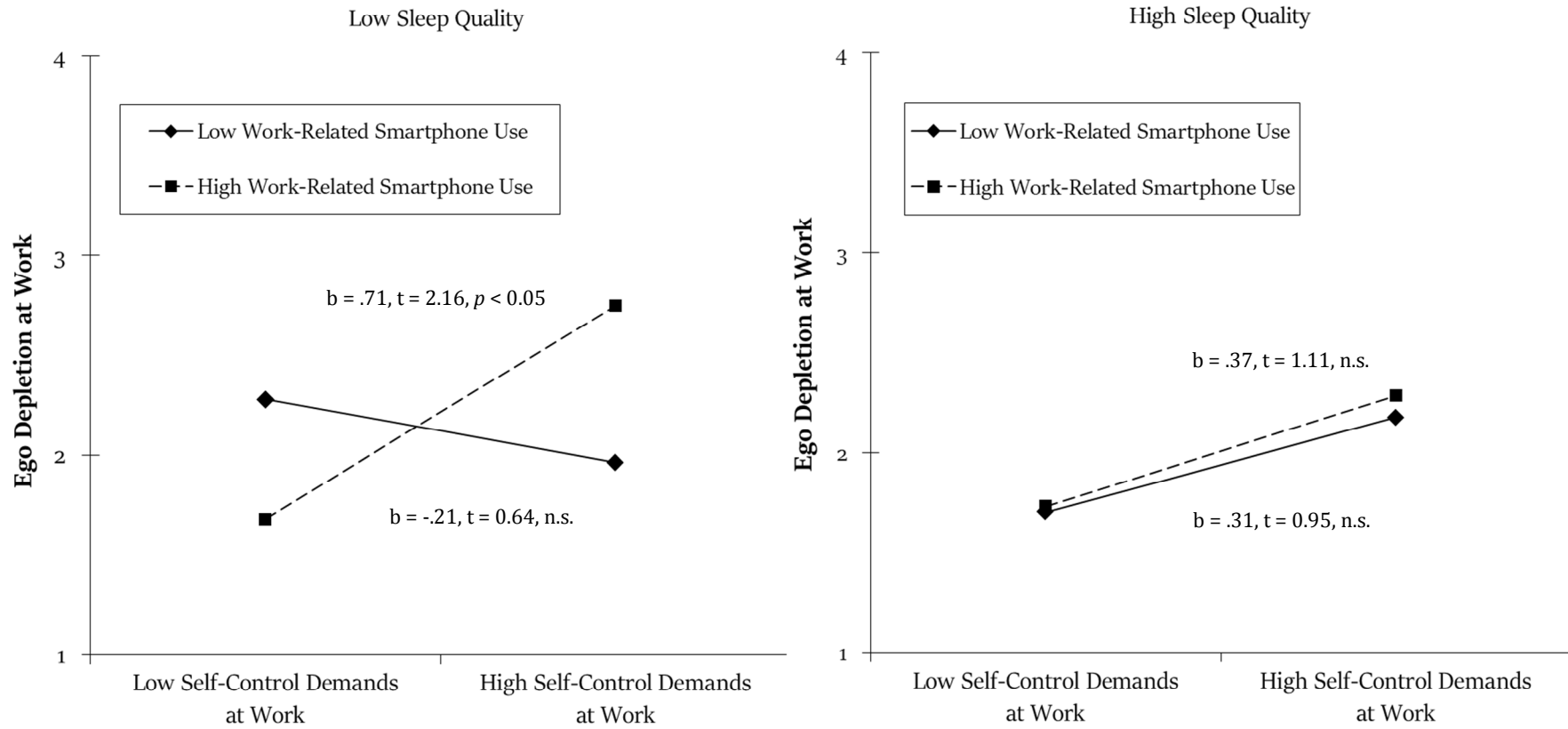


Figure 11: Three-Way Interaction of Work-Related Smartphone Use, Sleep Quality, and Next-Day Self-Control Demands on Next-Day Ego Depletion at Work. High and Low Values were Operationalized by One Standard Deviation Above and Below the Mean

Discussion

Summary of the results

We conducted a daily diary study to examine interaction effects between work-related smartphone use, sleep quality, and self-control demands at work in the prediction of employees' ego depletion at work. Our findings indicate that work-related smartphone use can affect employees' self-control processes on the following working day. Specifically, after an evening with high-work-related smartphone use at home, dealing with self-control demands at work can cause disproportionate levels of ego depletion. This finding suggests that work-related smartphone use and self-control demands draw on and deplete the same regulatory resource and supports the notion that resource decrements are transferred between life domains (Edwards & Rothbard, 2000). Moreover, we found that the interaction between work-related smartphone use and self-control demands is moderated by sleep quality: On days when employees experience high sleep quality after having used their smartphones for work intensively, next-day self-control processes at work and associated levels of ego depletion are no longer affected. This evidence is consistent with previous studies demonstrating that sleep ensures returning to work with restored self-control resources on the next day (Kühnel et al., 2016; Liu et al., 2017).

Theoretical Implications

Our research offers some important theoretical implications to the literature on work-related smartphone use, self-control, and sleep. First, the present study advances our knowledge about the mechanism that may underlie the adverse effects of work-related smartphone use. More precisely, the demonstrated interaction effects with self-control demands in the prediction of ego depletion may indicate that work-related smartphone use involves expenditure of self-control resources, and that both demands jointly overtax employees' limited regulatory resources. We therewith join recent research seeking to identify behaviors and boundary conditions at work that tax regulatory resources (e.g., responding to help requests; Lanaj et al., 2016; time pressure, planning and decision-making; Prem et al., 2016) in order to better understand fluctuations in employees' well-being.

Second, previous studies on interaction effects between different demands on self-control were foremost conducted on the basis of cross-sectional and longitudinal data with a focus on cumulative effects of chronic demands (Diestel & Schmidt, 2011; Schmidt, 2010). Since such findings on the *between-person* level do not automatically indicate the same relations on the *within-person* level (Hox et al., 2017), we adopted a daily diary design in our study to further validate existing knowledge. Our findings demonstrate that the strengthening interaction effects also manifest on a daily basis. That is, not only chronic but even short-term (daily) demands on self-control can overtax the limited regulatory resource and cause disproportionate levels of day-specific ego depletion. This strongly underlines the importance of considering day-level processes in employees' depletion at work.

Third, the current study broadens scholarly knowledge on the consequences of work-related smartphone use by examining spillover effects to the subsequent working day. So far, most prior studies on work-related smartphone use have focused on very proximal effects on impaired psychological well-being in the home domain. To date, there is only one study on work-related smartphone use dealing with spillover effects (Lanaj et al., 2014), revealing that work-related smartphone use can impede work engagement on the next day. The current study extends this line of research by demonstrating that work-related smartphone use can affect next-day self-control processes and associated depletion levels at work if individuals fail to replenish their regulatory resources overnight. Our finding strongly suggests that when employees intensively use their smartphone during non-work time at home and experience low sleep quality afterwards, they may not be prepared to effectively respond to demands on self-control on the subsequent working day. Given the close interconnection of work and home in contemporary societies, a deepened understanding of how the demands from one domain can interfere with those from another domain seems essential for both professionals and human resource practitioners.

Finally, we contribute to the growing body of research that reveals the significance of sleep for well-being and organizational behavior (e.g., Barnes, Lucianetti, Bhave, & Christian, 2015; Kühnel et al., 2016; Lanaj et al., 2014). In the context of work-related smartphone use, sleep has mainly been examined as an *outcome* (Barber & Jenkins, 2014) or as a *mediator* linking smartphone use and strain (Lanaj et al., 2014). The current study, however, provides initial evidence that sleep quality can also serve as a *moderator* mitigating the adverse consequences of work-related smartphone use. By demonstrating that

sleep quality can prevent the spillover of drained resources from home to work, and thus offset the adverse effects of work-related smartphone use on self-control processes at work, we further substantiate the role of sleep for replenishing drained regulatory resources (Barnes, 2012). Taken together, the current results suggest that sleep is not only a mediator (Lanaj et al., 2014) but also moderator in the link between work-related smartphone use and depletion.

Practical Implications

Apart from theoretical contributions, our research has also some practical implications for employees and organizations. First, findings of this study strongly suggest that work-related smartphone use during non-work time drains limited regulatory resources and thus holds risks for well-being and subsequent self-control functioning. In order to protect themselves against these consequences, employees need to become aware of how long they actually use their smartphone for work during after-hours and, if necessary, reduce the intensity. Apart from that, it seems particularly important that employees engage in behaviors that replenish their regulatory resources, especially on days when work-related smartphone use during non-work time was high. Our study has outlined the benefits of daily sleep quality in alleviating negative effects of work-related smartphone use. To ensure sleep of high quality, scholars suggest taking care of sleep hygiene (e.g., refraining from caffeinated beverages before going to bed, using the bedroom only for sleeping; Mastin, Bryson, & Corwyn, 2006) and developing sleep rituals (i.e., establish fixed times for going to bed and getting up; Brown, 2004). On days when sleep quality was low, replenishing work breaks on the next day may help to prevent that self-control demands at work become too straining (Trougakos et al., 2014).

From an organizational point of view, employers should be cautious when asking employees to respond to work-related issues outside official working time. Since communication technology use at home is strongly influenced by organizational culture (Markus, 1994; Orlikowski, 1992), supervisors should be aware of their position as role models and try to convey adequate expectations on employees' availability for work during non-work time. A policy, however, that completely disables employees from taking work home (e.g., by shutting down the e-mail server) would impose a restriction to those employees who wish to integrate work and private life. The key may be to ensure that employees

understand the risks resulting from work-related smartphone use and utilize it in a way that allows flexibility and work-family integration, but does not pose a threat to their well-being.

Finally, drawing on the finding that employees can return to work with insufficiently recovered regulatory resources, organizations could allocate opportunities for recovery at the workplace (e.g., nap rooms) or encourage employees to take self-initiate short breaks when they are needed (Kühnel et al., 2017) in order to ensure effective self-control functioning.

Limitations and Suggestions for Future Research

Despite several contributions, our study is not without limitations. First, because all study variables were operationalized by means of self-report, there is an increased risk that common method variance may have contaminated the observed relations (Podsakoff et al., 2003). However, as a high common method variance reduces the probability of detecting interaction effects, the effects of the current study can claim to reflect valid relations rather than common method artifacts (Siemsen et al., 2010). Nonetheless, future research could benefit from using objective reports (e.g., by supervisors or colleagues) or event-sampling (i.e., reporting particular events at work requiring self-control) as alternative measurement approaches of self-control demands. Moreover, future studies could use different operationalizations for work-related smartphone use, such as quantitative measures (duration, frequency, and timing of smartphone use measured via applications), and integrate other characteristics of sleep (e.g., sleep duration) to enhance the validity of the proposed relations.

Second, we did not measure overall time dedicated to work in the evening beyond work-related smartphone use in our study. It is conceivable that participants also spend time on other work-related activities than smartphone use, such as laptops or tablets, which may have additional effects on ego depletion.

Third, based on our finding that work-related smartphone use can trigger self-control processes, we encourage scholars to examine whether psychological resources that have been demonstrated to buffer the adverse effects of self-control demands (e.g., self-control capacity; Schmidt et al., 2012; affective commitment; Rivkin et al., 2015a) can also alleviate the adverse effects of work-related smartphone use, and thus protect em-

employees' well-being. Another interesting goal for future studies could be to examine whether self-control demands at work could also impact work-related smartphone use during the evening. Since some people may need self-control efforts in order to resist impulses to check work-related communications (e.g., e-mails), decreased regulatory resources due to preceding self-control demands at work may make it more difficult for them to refrain from using their smartphone for work-related purposes in the evening.

Conclusion

Technological advances in recent years have significantly changed the way employees interact with their job. Smartphones are one key facilitator of an instant access to work-related information, making work-related smartphone use during non-work time an emerging issue for employees and organizations. The present study provides new insights into the adverse effects of work-related smartphone use during non-work time. Whereas previous empirical research has mainly focused on same-day consequences, our results suggest that work-related smartphone use during non-work time can affect next-day self-control processes and associated depletion at work. Overall, our study's findings may offer important impulses for current political debates on work-related use of technology and encourage organizations to more thoroughly consider the complex dynamics between work and home domains in order to learn how these dynamics can shape employees' well-being.

Kapitel 5

Diskussion

Das übergeordnete Ziel dieser Dissertation war es, anhand von drei empirischen Studien tagesspezifische Schwankungen von Belastungsquellen in modernen Arbeitsumgebungen (Selbstkontrollanforderungen und berufliche Smartphone-Nutzung) differenziert zu erfassen und ihre kurzfristigen Auswirkungen auf die psychische Gesundheit von Beschäftigten zu analysieren. Besonderes Interesse galt dabei möglichen Übertragungseffekten zwischen den Lebensbereichen Arbeit und Freizeit sowie der beanspruchungsmildernden Wirkung verschiedener Schutzfaktoren (psychische Distanzierung von der Arbeit, Schlafqualität, Bedürfnisbefriedigung). Im Folgenden werden die Ergebnisse der Studien zusammenfassend dargestellt und hinsichtlich ihres theoretischen sowie praktischen Beitrags eingeordnet. Anschließend werden mögliche Grenzen der Studien diskutiert und Vorschläge für weitere Forschung aufgezeigt.

Zusammenfassung der Studienergebnisse

Die erste Studie (Gombert, Rivkin, & Schmidt, 2018) untersuchte den intraindividuellen Zusammenhang von Selbstkontrollanforderungen bei der Arbeit mit dem Erleben von Ich-Erschöpfung sowie damit assoziierten Vitalitätsbeeinträchtigungen in der Freizeit. Außerdem wurde die moderierende Rolle einer psychischen Distanzierung von der Arbeit als möglicher Schutzfaktor überprüft. Die 86 berufstätigen Teilnehmer der Studie beantworteten an 10 aufeinanderfolgenden Arbeitstagen je zweimal täglich elektronische Fragebögen: Mittags schätzten sie das Ausmaß der Selbstkontrollanforderungen (Impulskontrolle, Ablenken widerstehen, innere Widerstände überwinden) bei der Arbeit ein, abends bewerteten sie Fragen zur Ich-Erschöpfung, der subjektiven Vitalität und der psychischen Distanzierung von der Arbeit. Die Ergebnisse des Mehrebenen-moderierten-Mediationsmodells zeigen, dass sich Selbstkontrollanforderungen bei der Arbeit taggleich

auf die Freizeit von Beschäftigten auswirken: An Tagen mit höheren Selbstkontrollanforderungen als gewöhnlich fühlen sich Beschäftigte am Abend in der Freizeit weniger vital. In Übereinstimmung mit theoretischen Annahmen des Modells der begrenzten Selbstkontrollstärke (Muraven & Baumeister, 2000) wird dieser Zusammenhang vollständig durch die Erschöpfung der Selbstkontrollressource (Ich-Erschöpfung) in der Freizeit mediiert. Darüber hinaus ergaben die statistischen Analysen, dass eine psychische Distanzierung von der Arbeit den Übertragungseffekt zwischen den Lebensbereichen abmildert: Es wurde eine signifikante Interaktion zwischen Selbstkontrollanforderungen bei der Arbeit und der psychischen Distanzierung in der Vorhersage von Ich-Erschöpfung in der Freizeit gefunden (Moderation des a-Pfads der Mediation, siehe auch Figure 6). Gelingt es den Beschäftigten also, sich abends mental von der Arbeit abzugrenzen, kann die durch Selbstkontrollanforderungen strapazierte Ressource regeneriert werden. So treten auch an Tagen mit hohen Selbstkontrollanforderungen bei der Arbeit keine oder deutlich geringere Beanspruchungswirkungen in der Freizeit auf.

Im Fokus der zweiten elektronisch durchgeführten Studie (Gombert, Rivkin, & Kleinsorge, 2018), an der 74 Berufstätige teilnahmen, standen die tagesspezifischen psychischen Beanspruchungsfolgen beruflicher Smartphone-Nutzung in der Freizeit. Die Befriedigung der psychologischen Grundbedürfnisse nach Autonomie, Kompetenz und Zugehörigkeit bei der Arbeit wurde als möglicher Schutzfaktor untersucht, der zur Milderung der Beanspruchungswirkungen beiträgt. An 10 aufeinanderfolgenden Arbeitstagen bewerteten die Teilnehmer, wie intensiv sie ihr Smartphone für berufliche Zwecke in der Freizeit genutzt hatten. Außerdem wurden ihre Ich-Erschöpfung und ihr Bedarf nach Erholung abgefragt. Die Befriedigung psychologischer Grundbedürfnisse wurde im Rahmen einer einmaligen Vorbefragung erfasst, da angenommen wurde, dass sie nicht zwischen verschiedenen Arbeitstagen fluktuiert. Die Ergebnisse der Mehrebenen-Regressionsanalysen zeigen, dass die berufliche Smartphone-Nutzung in der Freizeit mit einem unmittelbaren Anstieg der Ich-Erschöpfung und des Bedarfs nach Erholung in der Freizeit verbunden ist – jedoch nur dann, wenn Beschäftigte eine geringe Befriedigung psychologischer Grundbedürfnisse durch ihre Arbeit erleben. Haben sie dagegen das Gefühl, Experte für die eigenen Arbeitsaufgaben zu sein, autonom arbeiten zu können und am Arbeitsplatz sozial eingebunden zu sein, sind keine kurzfristigen Beanspruchungswirkungen durch berufliche Smartphone-Nutzung zu beobachten. Dieses Ergebnis lässt darauf schließen, dass aufgrund der intrinsischen Motivation, die mit der Befriedigung psychologischer Grundbedürfnisse einhergeht, die begrenzte Selbstkontrollressource in

einem geringeren Maße beansprucht und ihre Erholung gefördert wird. Kurzfristigen Beanspruchungssymptomen wie der Ich-Erschöpfung und dem Bedarf nach Erholung wird auf diese Weise entgegengewirkt.

Schließlich sollte die dritte Studie (Gombert, Konze, Rivkin, & Schmidt, 2018) im elektronischen Tagebuch-Design einen Beitrag zur Klärung der Frage leisten, auf welche Weise berufliche Smartphone-Nutzung in der Freizeit den folgenden Arbeitstag beeinflusst. Die 63 berufstätigen Teilnehmer bewerteten an jedem der 10 Studientage morgens die Intensität ihrer beruflichen Smartphone-Nutzung am Vorabend sowie die Qualität des Schlafs in der vergangenen Nacht. Mittags bei der Arbeit beantworteten sie Fragebögen zu den Selbstkontrollanforderungen sowie dem Erleben von Ich-Erschöpfung. Zur Überprüfung der Fragestellungen wurden intraindividuelle 2-fach- und 3-fach-Interaktionseffekte zwischen beruflicher Smartphone-Nutzung in der Freizeit, der Schlafqualität und Selbstkontrollanforderung bei der Arbeit in der Vorhersage von Ich-Erschöpfung untersucht. In Übereinstimmung mit dem Argument, dass sich verschiedene Anforderungen an die Selbstkontrolle in ihren gesundheitsbeeinträchtigenden Folgen verstärken, offenbaren die statistischen Analysen intraindividuelle Wechselwirkungen von beruflicher Smartphone-Nutzung in der Freizeit und Selbstkontrollanforderungen am folgenden Arbeitstag in der Vorhersage von Ich-Erschöpfung am folgenden Arbeitstag: Nach Abenden mit intensiver beruflicher Smartphone-Nutzung fällt der positive Zusammenhang zwischen Selbstkontrollanforderungen und Ich-Erschöpfung bei der Arbeit stärker aus. An solchen Tagen drohen Beschäftigte also durch den Umgang mit Selbstkontrollanforderungen überproportional stark zu erschöpfen. Die Analysen zeigen darüber hinaus, dass die Schlafqualität diese Interaktion moderiert: Wenn die Beschäftigten im Anschluss an die berufliche Smartphone-Nutzung gut schliefen, wurden die Selbstkontrollprozesse und die damit assoziierten Erschöpfungslevels am folgenden Arbeitstag nicht signifikant beeinflusst. Durch die Möglichkeit zur Erholung während Schlafs mit hoher Qualität kann der Übertragungseffekt von der Freizeit auf die Arbeit also maßgeblich abgeschwächt werden. Abbildung 12 zeigt eine grafische Zusammenfassung der Studienergebnisse.

	Studie I	Indirect Effects of Daily Self-Control Demands on Subjective Vitality via Ego Depletion: How Daily Psychological Detachment Pays Off
	Studie II	A Diary-Study on Work-Related Smartphone Use and Employees' Well-Being: The Moderating Role of Basic Need Satisfaction
	Studie III	Protect Your Sleep When Work is Calling: How Work-Related Smartphone Use During Non-Work Time and Sleep Quality Impact Next-Day Self-Control Processes at Work

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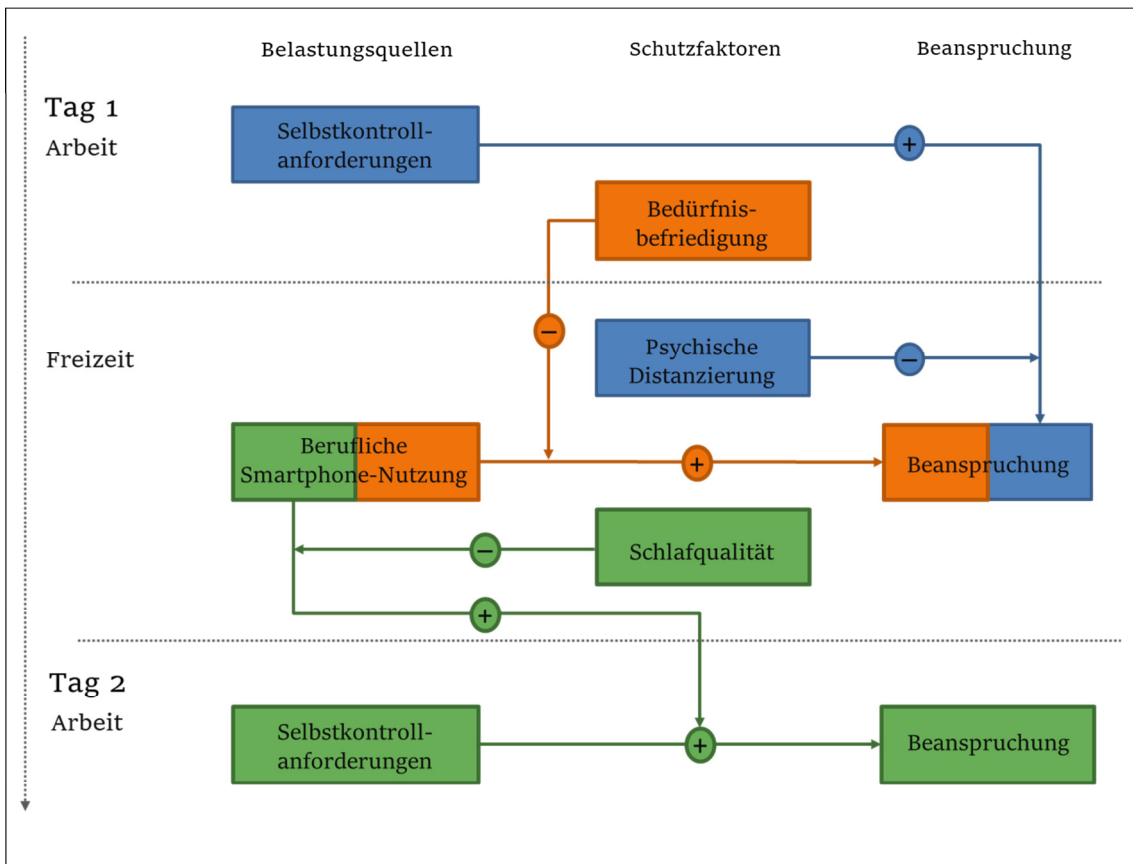


Abbildung 12: Grafische Zusammenfassung der Studienergebnisse

Theoretische Implikationen

Die durchgeführten Studien können sowohl auf methodischer als auch auf inhaltlicher Ebene einen Beitrag zur Forschung über Arbeitsbelastungen und die psychische Gesundheit von Beschäftigten leisten.

Während bislang vorwiegend chronische Arbeitsbelastungen und ihre Folgen im Rahmen von Querschnitts- oder Längsschnitts-Studien untersucht wurden, verwenden die durchgeführten Studien Tagebuch-Designs mit dem Ziel, anhand verschiedener statistischer Mehrebenen-Verfahren intraindividuelle Zusammenhänge zwischen Belastungen, psychischer Beanspruchung und Schutzfaktoren zu modellieren. Die Ergebnisse unterstreichen die Relevanz eines solchen Ansatzes: Sie offenbaren dynamische Schwankungen in Selbstkontrollanforderungen bei der Arbeit und der beruflichen Smartphone-Nutzung in der Freizeit. Bei Selbstkontrollanforderungen lag der Anteil der intraindividuellen Varianz an der Gesamtvarianz bei 45% in Studie I und bei 27 % in Studie III. Berufliche Smartphone-Nutzung wies 41% intraindividuelle Varianz in Studie II sowie 34% in Studie III auf. Das Maß an Selbstkontrollanforderungen und beruflicher Smartphone-Nutzung einer Person variiert demnach stark zwischen verschiedenen Arbeitstagen.

Darüber hinaus zeigen die Studienergebnisse, dass tagesspezifisch erhöhte Belastungen bereits am selben bzw. am Folgetag psychische Beanspruchungssymptome hervorrufen. Diese Effekte werden nicht durch das stabile Belastungs-Level der Beschäftigten oder deren generelle gesundheitliche Verfassung beeinflusst (diese Werte werden in den Analysen kontrolliert) – sie sind vielmehr auf tagesspezifische Schwankungen um die stabilen Level herum zurückzuführen. Die in der dritten Studie nachgewiesenen intraindividuellen Wechselwirkungen zwischen beruflicher Smartphone-Nutzung und Selbstkontrollanforderungen unterstützen außerdem die bislang nur in Querschnitts-Analysen untersuchte Annahme, dass das psychische Beanspruchungserleben überproportional ansteigt, wenn mehrere Belastungen, die die Ausübung von Selbstkontrolle erfordern, gemeinsam oder kurz nacheinander auftreten (Diestel & Schmidt, 2011; Schmidt, 2010).

Des Weiteren offenbaren die durchgeführten Studien tagesspezifische Übertragungseffekte von der Arbeit auf die Freizeit (Studie I), direkte Effekte innerhalb der Freizeit (Studie II) sowie Übertragungseffekte von der Freizeit auf den folgenden Arbeitstag (Studie III): So können hohe Selbstkontrollanforderungen bei der Arbeit taggleich mit einem Anstieg psychischer Beanspruchung in der Freizeit einhergehen. Berufliche

Smartphone-Nutzung in der Freizeit beeinträchtigt nicht nur direkt das Wohlbefinden in der Freizeit, sondern beeinflusst auch den folgenden Arbeitstag. Diese Befunde veranschaulichen – in Übereinstimmung mit weiteren aktuellen Studien (Du, Derks, & Bakker, 2018; Hewett et al., 2017; Rodríguez-Muñoz et al., 2014; Sanz-Vergel et al., 2015) –, dass sich durch die Aufweichung und Verschiebung der Grenzen zwischen den Lebensbereichen beide Bereiche stärker durchdringen und auf Tagesebene *wechselseitig* beeinflussen. Für ein differenziertes Verständnis der akuten Belastungssituation von Beschäftigten sollten demnach beide Lebensbereiche einbezogen werden.

Nicht zuletzt konnten in allen drei Studien tagesspezifische Moderator-Wirkungen verschiedener Schutzfaktoren nachgewiesen werden: Die psychische Distanzierung von der Arbeit, die Schlafqualität und die Befriedigung psychologischer Grundbedürfnisse können dazu beitragen, akute Beanspruchungswirkungen durch Selbstkontrollanforderungen und berufliche Smartphone-Nutzung zu mildern und deren Übertragung zwischen den Lebensbereichen abzuwenden. Damit unterstützen die Ergebnisse der durchgeführten Studien die Annahme, dass diese drei Schutzfaktoren zur Entlastung und Regeneration erschöpfter Regulationsressourcen beitragen (Diestel et al., 2015; Rivkin et al., 2015b; Tice et al., 2007). Darüber hinaus offenbaren sie kurzfristig wirksame Ansätze für den betrieblichen Gesundheitsschutz sowie Strategien für Beschäftigte, wie sie sich an Tagen mit hohen Belastungen schützen können.

Zusammenfassend unterstreichen die Studienergebnisse die Bedeutung eines dynamischen Modells von Belastungs-Beanspruchungs-Verläufen, das auch die Wechselwirkungen zwischen den Lebensbereichen Arbeit und Freizeit miteinbezieht.

Praktische Implikationen

Aus den Ergebnissen der durchgeführten Studien lassen sich ferner verschiedene praktische Handlungsimplicationen für den Gesundheitsschutz ableiten. Es kann einerseits an der Reduktion von Belastungen und andererseits an der Stärkung von Schutzfaktoren angesetzt werden.

Belastungen bei der Arbeit gänzlich zu verhindern, ist eigentlich kaum möglich. So sind Selbstkontrollanforderungen, insbesondere Impulskontrollanforderungen, in vielen Berufen ein fester Bestandteil der Arbeitsrolle. Nichtsdestotrotz können sich sowohl Arbeitgeber als auch Beschäftigte um eine Begrenzung der Belastungsintensität bemühen:

Um beispielsweise Anforderungen an die Aufmerksamkeitskontrolle (Ablenkungen widerstehen) bei der Arbeit zu reduzieren, sollten Beschäftigte ablenkende Gegenstände wie private Smartphones vom Arbeitsplatz entfernen. Auch ein sich nur in bestimmten Zeitabständen aktualisierender Posteingang für berufliche E-Mails könnte die permanente Einwirkung von Außenreizen und die daraus resultierende Ablenkung verringern. Die Eingliederung monotoner Arbeitsaufgaben in andere, reizvollere Aufgaben kann zu geringeren Anforderungen an die Motivationskontrolle (Überwinden innerer Widerstände) beitragen. An dieser Stelle erscheint eine genaue Absprache zwischen Arbeitgeber und Beschäftigtem sinnvoll, um eine Aneinanderreihung unattraktiver Arbeitsaufgaben zu vermeiden. Um die berufliche Smartphone-Nutzung während der Freizeit zu begrenzen, sind nachvollziehbare Regeln auf Unternehmensebene unerlässlich. Einige große Konzerne schränken die Erreichbarkeit der Beschäftigten nach Feierabend sogar vollständig ein: So werden etwa bei der Volkswagen AG grundsätzlich nach Dienstschluss keine E-Mails mehr auf das Diensthandy zugestellt. Für die Umsetzung weniger strikter Richtlinien spielen vor allem Führungskräfte eine entscheidende Rolle, die Empfehlungen und Erwartungen für die Erreichbarkeit nach Feierabend kommunizieren, aktiv mittragen – und selbst einhalten.

Nichtsdestotrotz sind in nahezu allen Tätigkeiten tagesspezifische Belastungsspitzen unvermeidlich. Die Ergebnisse der durchgeführten Studien verdeutlichen, dass an solchen Tagen mit höheren Arbeitsbelastungen als üblich Schutzfaktoren eine wichtige Rolle spielen: Die psychische Distanzierung von der Arbeit, eine hohe Schlafqualität und die Befriedigung psychologischer Grundbedürfnisse können unmittelbar zur Entschärfung von Beanspruchungsfolgen und Übertragungseffekten zwischen den Lebensbereichen beitragen.

Die beiden erst genannten Schutzfaktoren können die Beschäftigten selbst aktiv beeinflussen. Eine psychische Distanzierung von Arbeit gelingt zum Beispiel am besten über Freizeitaktivitäten, die die volle Aufmerksamkeit erfordern, wie Sport oder Entspannungsübungen (Sonntag & Bayer, 2005). Auch persönliche Verabredungen unterstützen die mentale Abgrenzung von beruflichen Themen nach Dienstschluss. Zur Verbesserung der Schlafqualität sollten Beschäftigte auf ihre „Schlafhygiene“ achten. Dazu gehören beispielsweise feste Schlafrouninen und -zeiten (Brown, 2004), der Verzicht auf koffeinhaltigen Getränke am Abend und die Nutzung des Schlafzimmers ausschließlich für die Nachtruhe (Mastin et al., 2006).

Die Bedürfnisse der Mitarbeiter nach Kompetenz, Autonomie und Zugehörigkeit im Beruf zu erfüllen, liegt in erster Linie in der Verantwortung des Arbeitgebers. Ein Ansatzpunkt für die Kompetenzerfüllung ist ein genauer Abgleich von Mitarbeiterfähigkeiten und Arbeitsaufgaben. Eine fehlende Passung kann beispielsweise durch individuelle Weiterbildungsmaßnahmen ausgeglichen werden. Um das Autonomie-Empfinden der Beschäftigten zu stärken, sollten Arbeitgeber Freiräume, zum Beispiel durch Home-Office-Tage oder Gleitzeitvereinbarungen, schaffen. Auch Selbstbestimmung in der Art und Weise der Aufgabenbearbeitung ist ein wichtiger Bestandteil von Autonomie am Arbeitsplatz. Die soziale Einbindung am Arbeitsplatz sollte mit Maßnahmen zur Förderung des Betriebsklimas wie etwa Mitarbeiter-Events oder Feedback-Systemen gefördert werden. Nicht zuletzt zeigen aktuelle Studienergebnisse, dass ein ethischer Führungsstil (englisch: servant leadership) die Erfüllung psychologischer Grundbedürfnisse von Mitarbeitern positiv beeinflusst (Chiniara & Bentein, 2016).

Grenzen der Studien

Bei der Interpretation der Studienergebnisse sollten mehrere methodische sowie inhaltliche Grenzen berücksichtigt werden, aus denen sich Ansätze für zukünftige Forschungsvorhaben ableiten lassen.

Zuerst ist zu betonen, dass sich die Ergebnisse der Studien auf tagesspezifische Zusammenhänge zwischen den interessierenden Belastungsquellen, Schutzfaktoren und Beanspruchungssymptomen beziehen. Ob diese Wirkungszusammenhänge auch längerfristig auftreten, geht aus den vorliegenden Ergebnissen nicht hervor. Insbesondere die Überprüfung von Langzeitfolgen beruflicher Smartphone-Nutzung steht bislang noch aus: So wäre denkbar, dass eine hohe Schlafqualität und die Befriedigung psychologischer Grundbedürfnisse zwar kurzfristig vor ungewünschten Beanspruchungswirkungen durch berufliche Smartphone-Nutzung schützen, langfristig aber dennoch die Gefahr von Gesundheitsbeeinträchtigungen besteht. Dies gilt es in weiterer Forschung zu überprüfen. Außerdem sollte im Rahmen weiterer Studien die Entwicklung von psychischen Beanspruchungssymptomen *innerhalb* eines Tages untersucht werden, zum Beispiel anhand von Wachstumsmodellen.

Außerdem ist anzumerken, dass alle in den Studien integrierten Konzepte über Selbstberichte der Teilnehmer erfasst wurden. Daher besteht grundsätzlich das Risiko, dass die Ergebnisse dem Einfluss gemeinsamer Methodenvarianz unterliegen (Podsakoff et al., 2003). Dagegen spricht jedoch, dass – obwohl eine hohe Methodenvarianz zur *Unterschätzung* von Interaktionseffekten führen würde – in allen drei Studien signifikante Interaktionseffekte gezeigt werden konnten. Es ist somit wahrscheinlich, dass die Befunde nicht nur Methodenartefakte darstellen, sondern auf valide Zusammenhänge zwischen den untersuchten Konzepten zurückzuführen sind (Siemsen et al., 2010). In zukünftigen Forschungsarbeiten sollten dennoch auch andere Messmethoden zum Einsatz kommen, um die Validität der Befunde zu untermauern. So wäre vorstellbar, Selbstkontrollanforderungen bei der Arbeit durch Kollegen oder Vorgesetzte berichten zu lassen. Berufliche Smartphone-Nutzung könnte anhand von quantitativen Maßen abgebildet werden – zum Beispiel via Apps, die Zeitpunkt, Dauer und Häufigkeit der Smartphone-Nutzung automatisch aufzeichnen. Auch für die Messung der Schlafqualität wäre ein solcher Ansatz denkbar. Hierfür gibt es spezielle „Schlaf-Tracker“, die objektive Daten über Dauer und Tiefe des Schlafes sowie die Häufigkeit der Schlafunterbrechungen erfassen.

Eine weitere Einschränkung der durchgeführten Studien betrifft die den statistischen Befunden zugrundeliegende Kausalität: Wie bei allen nicht-experimentellen Studien sind keine kausalen Rückschlüsse auf die tatsächlichen Zusammenhänge zwischen Belastungen, Schutzfaktoren und Beanspruchungssymptomen möglich. So wäre im Umkehrschluss ebenfalls denkbar, dass bereits beanspruchte Personen Arbeitsbelastungen stärker wahrnehmen. Grundsätzlich liefern Tagebuchstudien jedoch präzisere Hinweise auf die tatsächliche Wirkrichtung der Variablen als Querschnittsstudien, da sie mithilfe versetzter Messzeitpunkte die zeitliche Abfolge der Variablen berücksichtigen. Auch in den durchgeführten Studien wurde, wenn möglich, die Messung der Belastungsquellen zeitlich von der Messung der Beanspruchungssymptome separiert (z.B. Selbstkontrollanforderungen mittags, Ich-Erschöpfung abends in Studie I). Nichtsdestotrotz sollte im Rahmen weiterer Forschung eine genauere Prüfung der Kausalität zwischen den untersuchten Konzepten erfolgen. Hierfür wäre eine experimentelle Manipulation von Selbstkontrollanforderungen oder beruflicher Smartphone-Nutzung vorstellbar.

Schließlich muss erwähnt werden, dass das Modell der begrenzten Selbstkontrollstärke, das der vorliegenden Dissertation als theoretische Basis dient, in der Grundlagenforschung derzeit kontrovers diskutiert wird: So stellen einige Wissenschaftler die

Replizierbarkeit der Experimentalbefunde in Frage, auf denen die Vorstellung von Selbstkontrolle als einer nur begrenzt verfügbare Regulationsressource maßgeblich basiert (Carter et al., 2015; Dang, 2018; Hagger et al., 2010). Die Forschungsergebnisse dieser Dissertation stützen jedoch mehrere Annahmen des Modells und tragen damit zu der großen Anzahl aktueller Studien bei, die seine Gültigkeit im angewandten Kontext bekräftigen (Lian et al., 2017; für einen Überblick siehe auch Schmidt & Diestel, 2015). Zum einen zeigen die Ergebnisse aus Studie I, dass die aus dem Umgang mit Selbstkontrollanforderungen resultierenden Vitalitätsbeeinträchtigungen vollständig über den Zustand der Ich-Erschöpfung vermittelt werden. Dies stimmt überein mit der theoretischen Annahme, dass sich Anforderungen an die Selbstkontrolle zunächst in der Erschöpfung einer begrenzten Selbstkontrollkapazität niederschlagen und erst danach in Beeinträchtigungen des Wohlbefindens manifestieren (Muraven & Baumeister, 2000). Darüber sprechen die vorliegenden Befunde dafür, dass nach Inanspruchnahme der Selbstkontrollressource Entlastungs- und Erholungsphasen notwendig sind, um Erschöpfungsfolgen auszugleichen (Muraven & Baumeister, 2000). Während diese Prozesse in der früheren Forschung vorwiegend in Querschnittsanalysen geprüft wurden, lassen die vorliegenden Studien darauf schließen, dass die Regenerationsprozesse bereits auf Tagesebene stattfinden können und resultierende kurzfristige Beanspruchungssymptome auf diese Weise reduziert werden.

Fazit

Die vorliegende Dissertation liefert aktuelle Einblicke und neue Erkenntnisse dazu, wie sich Belastungsquellen im Spannungsfeld zwischen Arbeit und Freizeit bereits kurzfristig auf die psychische Gesundheit von Beschäftigten auswirken. Der Wandel der Arbeitswelt wird auch in den kommenden Jahren weiter fortschreiten. Das Ziel muss sein, Arbeit mit nachhaltigen Maßnahmen so zu gestalten, dass die Risiken für die Gesundheit von Beschäftigten minimiert und die Chancen des Wandels optimal genutzt werden können. Die Ergebnisse der integrierten Studien bieten hierfür erste Impulse, die nicht nur Hinweise für den betrieblichen Gesundheitsschutz, sondern auch Strategien zum Umgang mit akuten Belastungserfahrungen für Beschäftigte miteinschließen.

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Eidesstattliche Erklärung

Hiermit versichere ich schriftlich und eidesstattlich gemäß § 11 Abs. 2 PromO v. 08.02.2011/08.05.2013:

1. Die vorgelegte Dissertation ist selbstständig verfasst und alle in Anspruch genommenen Quellen und Hilfen sind in der Dissertation vermerkt worden.
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Weiterhin erkläre ich schriftlich und eidesstattlich, dass mir der „Ratgeber zur Verhinderung von Plagiaten“ und die „Regeln guter wissenschaftlicher Praxis der Technischen Universität Dortmund“ bekannt und von mir in der vorgelegten Dissertation befolgt worden sind.

Dortmund, Juni 2019



Lilian Gombert