



Recharged and Ready: A Week-Level Diary Study Exploring an Integrated Model of Weekend Recovery, Incorporating Circadian and Boundary Perspectives, and their Relationship with Weekly Performance

Callum Schroeder (SCHCAL007)

A dissertation submitted in partial fulfilment of the requirements for the award of the degree of Master of Commerce in Organisational Psychology

University of Cape Town

Supervisor: Professor Jeffrey Bagraim

February 12, 2024

DECLARATIONS:

1. I am presenting this dissertation in partial fulfilment of the requirements for my degree.
2. I know the meaning of plagiarism and declare that all of the work in the dissertation, save for that which is properly acknowledged, is my own.
3. This dissertation has been submitted to the Turnitin module, and I confirm that my supervisor has seen my report and any concerns revealed by such have been resolved with my supervisor.
4. I hereby grant the University of Cape Town free licence to reproduce for the purpose of research either the whole or any portion of the contents in any manner whatsoever of the above dissertation.

Signature:

Signed by candidate

Date: 12/02/2025

The copyright of this thesis vests in the author. No quotation from it or information derived from it is to be published without full acknowledgement of the source. The thesis is to be used for private study or non-commercial research purposes only.

Published by the University of Cape Town (UCT) in terms of the non-exclusive license granted to UCT by the author.

Acknowledgements

I would like to express my deepest gratitude to my supervisor, Professor Jeffrey Bagraim, for his invaluable support and insight provided throughout this research endeavour. I am extremely thankful for his patience in allowing me the time to prepare a research paper of which I am truly proud.

Special thanks to my mother, Glenda, whose invaluable assistance was instrumental in facilitating the data collection process for this study. I am especially grateful for her commitment to taking out the time and effort from her busy schedule to extend a generous hand, on my behalf, to help gather the invaluable support for my study from reputable companies.

I would be remiss in not mentioning my cat, Ella, who provided a great source of emotional support and solace throughout this endeavour. If not for her entertainment and her preference for sleeping beside and on my laptop during every day of writing this paper, I would not have been able to complete it.

Abstract

The ability to effectively recover from work-related stressors during weekends is increasingly recognised as vital for the well-being and performance of employees. Given their theoretical alignment with recovery, this study extends an integrated model of weekend recovery by incorporating a boundary perspective (i.e., psychological reattachment to work) and a circadian perspective (i.e., sleep characteristics), offering a more comprehensive understanding of how these components interact with employees' recovery and ultimately influence their weekly job performance. In addition, positioning the weekend as the recovery context provided the opportunity to examine the impact of culture, religion, and spirituality on recovery, particularly as they relate to activities performed during leisure time. Using a longitudinal research design with repeated measures, quantitative data was collected from employees ($N = 88$) across various companies in South Africa over the course of three weeks before and after weekends. Multilevel model results, primarily at the person level ($n = 57$), indicated that low-duty activities positively predicted weekend recovery experiences (including psychological detachment, relaxation, and mastery experiences), with physical activities and cultural activities being the most conducive to the recovery experiences. Conversely, high-duty activities were not found to be significant negative predictors of weekend recovery experiences. It was also found that religious and spiritual activities, while not conducive to overall recovery experiences, were positively predictive of psychological detachment from work. Interestingly, inspection of the results for sleep quality and weekend catch-up sleep revealed that sleep quality positively predicted weekend recovery experiences only when high-duty and low-duty activities were removed from the model. Weekend catch-up sleep was not found to be a significant predictor of weekend recovery experiences among the current sample. Week-level findings ($n = 102$) indicated that weekend recovery experiences positively predicted the state of being recovered on Monday; however, they did not promote psychological reattachment. Nevertheless, it was found that psychological reattachment to work on Monday was found to be the most beneficial recovery-related outcome for optimal weekly job performance (i.e., task performance and work engagement), as opposed to the state of being recovered, which solely promoted employees' task performance for the remainder of the workweek. Ultimately, the relevant implications, limitations, and suggestions for future research are presented.

Keywords: weekend recovery, recovery experiences, culture, religion, spirituality, sleep, the state of being recovered, psychological reattachment, task performance, work engagement, multilevel modelling

Table of Contents

Acknowledgements.....	2
Abstract.....	3
Literature Review.....	10
Literature Search Strategy.....	10
Conceptual Model.....	11
Theoretical Basis of Recovery.....	12
An Overview of the Recovery Literature.....	14
Conceptualising Recovery.....	17
Conceptualising Performance.....	24
Recovery Activities and Weekend Recovery Experiences.....	25
Sleep Quality and Weekend Recovery Experiences.....	28
Weekend Catch-Up Sleep and Recovery Experiences.....	29
Weekend Recovery Experiences and the State of Being Recovered on Monday.....	29
Weekend Recovery Experiences and Psychological Reattachment on Monday.....	30
The Recovery-Related Outcomes on Monday and Weekly Task Performance.....	31
The Recovery-Related Outcomes on Monday and Weekly Work Engagement.....	32
Proposed Hypotheses.....	33
Method.....	34
Research Design.....	34
Sampling.....	35
Procedure.....	35
Participants.....	36
Measures.....	38
Data Analysis.....	41
Ethical Considerations.....	41
Results.....	42
Psychometric Analyses.....	42
Descriptive Statistics.....	47
Correlation Analyses.....	48
Multilevel Model Analyses.....	51
Results from Multilevel Model Analyses.....	53

Supplementary Analyses	72
Discussion	77
Psychometric Properties of the Scales	78
Low-Duty Activities and Weekend Recovery Experiences	78
Cultural Activities and Weekend Recovery Experiences	79
High-Duty Activities and Weekend Recovery Experiences.....	81
Sleep Quality and Weekend Recovery Experiences.....	81
Weekend Catch-Up Sleep and Recovery Experiences	82
Weekend Recovery Experiences and the State of Being Recovered on Monday	83
Weekend Recovery Experiences and Psychological Reattachment on Monday.....	84
The Recovery-Related Outcomes on Monday and Weekly Task Performance.....	86
The Recovery-Related Outcomes on Monday and Weekly Work Engagement.....	87
Theoretical Implications.....	88
Practical Implications.....	90
Limitations and Suggestions for Future Research.....	92
Conclusion	96
References.....	99
Appendix A: Survey Cover Page	118
Appendix B: Contacts Survey.....	119
Appendix C: Psychometric Analyses.....	120
Appendix D: Descriptive Analyses	134
Appendix E: Syntaxes.....	146
Appendix F: Assumptions of Multilevel Models.....	150
Appendix G: Assumption Violations	160
Appendix H: Statistical Power Analyses	164
Appendix I: Supplementary Analyses.....	166

List of Tables and Figures

Tables

Table 1: Sample Size Per Week	36
Table 2: Demographic Characteristics of the Participants	37
Table 3: Person-Level and Week-Level Zero-Order Correlations	50
Table 4: Multilevel Estimates for Models Predicting Recovery Experiences	55
Table 5: Multilevel Estimates for Models Predicting Recovery Experiences	58
Table 6: Multilevel Estimates for Models Predicting the State of Being Recovered	61
Table 7: Multilevel Estimates for Models Predicting Psychological Reattachment	64
Table 8: Multilevel Estimates for Models Predicting Task Performance	67
Table 9: Multilevel Estimates for Models Predicting Work Engagement.....	70
Table 10: Summary of the Results	77

Figures

Figure 1: Conceptual Model	12
Figure 2: Proposed Hypotheses	34

The inability to effectively recover from work-related stressors during the weekend is increasingly associated with diminished physical and psychological health (Eden, 1990; Geurts & Sonnentag, 2006; Steed et al., 2021). Research indicates that insufficient weekend *recovery* can not only impede workplace performance (de Bloom et al., 2018) but may also contribute to the development of chronic health issues over time (Geurts & Sonnentag, 2006; Sonnentag et al., 2022). Craig (1992) defined recovery as the restorative process whereby one's elevated strain levels are returned to their pre-stressor state. Accordingly, a successful *recovery process* has been shown to foster a sense of rejuvenation, both physically and mentally, which, in turn, enhances performance levels (Binnewies et al., 2010). To arrive at this, the recovery literature had transitioned from a focus on the optimal work-break schedule (Amberg, 1895; Graf, 1922; Kraepelin, 1902) to a more comprehensive examination of the fundamental components of recovery, encompassing recovery as a process and *recovery as an outcome* (Sonnentag, 2001; Sonnentag & Geurts, 2009).

The recovery process consists of two primary mechanisms, including *recovery activities* and *recovery experiences*. The former consists of the sets of behaviours that may either provide or consume *resources* (i.e., personal, objectual, conditional, and energetic assets that may promote stress management and maintain well-being; Hobfoll, 1989) during one's leisure time (Demerouti et al., 2009; Sonnentag, 2001). Furthermore, these activities can be separated into those with a *high-duty* and *low-duty profile*. Alternatively, recovery experiences pertain to the psychological occurrences underlying the recovery process (Etzion et al., 1998), including *psychological detachment* from work, *relaxation*, *mastery*, and *control experiences*, all of which may play a crucial role in moderating the replenishment of resources (Sonnentag & Fritz, 2007).

The focus of recovery research has been predominantly on the role of various activities (e.g., physical, social, and work-related activities) in the recovery process (Sonnentag et al., 2022; Steed et al., 2021). However, the impact of cultural, religious, and spiritual activities has remained largely unexplored (Alameer et al., 2023; de Bloom et al., 2018; Tuisku et al., 2016). Moreover, the extant research in this domain has been primarily conducted in Western contexts, employing samples that were largely culturally inactive. Consequently, there have been calls to explore this role more extensively, particularly in the Global South, to enable the exploration of possible cross-cultural differences in the recovery process, as well as the significance of the activities in question for recovery (Sonnentag et al., 2022). In addition to its rich, culturally diverse history (Mavuru & Ramnarain, 2020), it is estimated that approximately 97.1% of the total South African population is affiliated with a

religion (StatsSA, 2023). Crucially, this suggests that the South African population can yield a relatively culturally, religiously, and spiritually active sample and, therefore, precisely reflect the recovery potential of cultural, religious, and spiritual leisure activities. As such, South Africa could offer a valuable context for advancing theoretical insights into workplace recovery.

In consideration of its restorative properties (Leong & Chee, 2023), the recovery literature has increasingly employed a *circadian* perspective to further the understanding of the recovery process (Hülshager et al., 2015; Hülshager et al., 2014; Schleupner et al., 2023; Völker et al., 2024a; Völker et al., 2024b). However, while research continues to depict sleep as a core component of the recovery process, its nuanced role, particularly within this recovery mechanism, remains relatively unexplored in the recovery literature. Furthermore, its role has often been examined interchangeably, whether as a direct precursor for work-related outcomes, a recovery-related outcome, or a mediator of recovery. This examination is comparable to a particular trend in the recovery research where various components of recovery (including recovery activities, recovery experiences, and *the state of being recovered*) were examined interchangeably to constitute ‘recovery’ (Steed et al., 2021). Nevertheless, in accordance with Steed et al.’s (2021) recommendations, this study examines the aforementioned components in combination, forming the foundation of the integrated model of recovery. In line with this, sleep could therefore also be treated as a core component of the recovery process and thus a predictor of this process. However, it is also important to acknowledge its complexity when launching an empirical investigation into sleep, as various components of sleep can uniquely influence various phenomena of interest (Chaput et al., 2020; Wiegmann et al., 2023). Therefore, to encapsulate the multidimensional experience that is sleep (Borbély et al., 2016; Roenneberg et al., 2003; Wittmann et al., 2006), and to explore its relationship with recovery, the present study investigates the impact of two sleep characteristics (*viz., sleep quality and weekend catch-up sleep*) on the recovery process.

Sonnentag and Geurts (2009) suggested that an individual’s physiological state *following* the recovery process could serve as a proxy indicator of the successfulness of the recovery process. Previous recovery research has measured this via the state of being of recovered (Binnewies et al., 2010). While the recovery literature has predominantly focused on the recovery of employees working traditional 9 to 5 shifts (Sonnentag et al., 2022), few studies have empirically examined employees’ state of being recovered as an outcome of the recovery process, thus making it difficult to detect possible between-person differences in recovery (Steed et al., 2021). For instance, certain activities may offer a form of relaxation or

detachment from work; however, their resource-replenishing effects can vary (Sonnentag et al., 2022; Steed et al., 2021). Consequently, given the volatility of recovery, individuals' capacity to fully replenish their resources may vary on a weekly basis (Binnewies et al., 2010; Sonnentag & Geurts, 2009), potentially influencing their ability to reengage with work effectively (Sonnentag & Kühnel, 2016).

Hobfoll's (2001) concept of *resource investment*, a core principle of the conservation of resources (COR) theory, posits that in order to obtain resources, preparatory resources must be invested. Accordingly, the present study adopts a *boundary* perspective (Ashforth et al., 2000), proposing that the successfulness of the recovery process can influence an individual's ability to seamlessly reestablish a mental connection with work (i.e., *psychological reattachment* to work; Sonnentag & Kühnel, 2016). Furthermore, if individuals do have the capacity to effectively reattach to work, they should be better positioned to mobilise their resources towards work-related matters (Sonnentag & Kühnel, 2016; Völker et al., 2024b). Crucially, however, the recovery literature has yet to examine the role of psychological reattachment as an outcome of the recovery process. Therefore, the current study examines both psychological reattachment and the state of being recovered on Monday as recovery-related outcomes, with the former purposed at examining the role of the recovery process in replenishing the resources required to reattach to work. Moreover, in terms of the context for which recovery is to occur, employees are generally not required to work during weekends. Therefore, the weekend can be regarded as an opportune recovery period, facilitating the replenishment of resources necessary to enhance workplace performance (Binnewies et al., 2010; Ragsdale et al., 2011).

The extant literature on recovery has demonstrated that employees who are highly recovered at the start of the week also report relatively improved job performance for the rest of the week (Sonnentag et al., 2022). While these findings have appeared largely consistent for several performance indicators, including task performance (Binnewies et al., 2010) and work engagement (ten Brummelhuis & Bakker, 2012), the current study reexamines this relationship to further investigate whether the presumed fluctuations in resource capacity and mobilisation uniformly accompany week-level fluctuations in work-related outcomes (Beal et al., 2005), including task performance and work engagement.

The purpose of the present study is threefold. First, this study aims to investigate the role of leisure activities and sleep in weekend recovery experiences. Second, this study aims to examine weekend recovery experiences as a precursor for the recovery-related outcomes (including the state of being recovered and psychological reattachment to work) on Monday.

Third, this study aims to explore the nuanced role of recovery-related outcomes on Monday as predictors of weekly job performance (including task performance and work engagement). As such, the following research questions are proposed:

1. What roles do leisure activities and sleep play in weekend recovery experiences?
2. To what extent do weekend recovery experiences predict the state of being recovered and psychological reattachment to work on Monday?
3. To what extent does the state of being recovered and psychological reattachment to work on Monday predict weekly task performance and work engagement?

Literature Review

The purpose of this section is to undertake a review of the literature pertaining to recovery, including both the recovery process itself and the possible outcomes thereof. Moreover, a conceptual model is provided to present and introduce the hypothesised relationships between the variables of interest. Proceeding the model, the strategy employed in the literature search is delineated, followed by a formal review of the literature, separated further into a number of subsections. These subsections include the theoretical framework underlying this study, the conceptualisations of the variables of interest, and the evaluation of the empirical studies informing the possible relationships between the respective variables. Thereafter, the hypotheses of the study are presented.

Literature Search Strategy

The following literature search procedure was conducted between February 2024 and May 2024. An initial broad search was conducted to examine the job performance-related benefits of weekend recovery. This search was followed by a more detailed investigation into the distinct components of recovery, including the recovery process and the possible outcomes. In addition, various performance indicators associated with recovery were examined and compared. Subsequently, a more thorough examination of the more recent contributions to the recovery literature was conducted to identify possible gaps and avenues for further exploration.

To conduct the search outlined above, various online databases were leveraged (including Google Scholar, the Academic Search Premier, EBSCOhost, JSTOR, PsychINFO, and Business Source Premier) using the following keywords: *weekend rest, weekend recovery, workplace performance, recovery activities, leisure activities, cultural activities, religious activities, spiritual activities, recovery experiences, state of being recovered, psychological reattachment, sleep, sleep characteristics, sleep quality, catch-up sleep,*

personal resources, employees, workplace, performance indicators, task performance, work engagement.

Conceptual Model

As illustrated in Figure 1, the current study focuses on specific variables and the hypothesised relationships between them. Fundamentally, this model manifests as an integrated model of weekend recovery, proposing that in order to replenish depleted resources and thus effectively recover from work-related stressors, it is necessary to engage in two mechanisms for recovery: namely, recovery activities and recovery experiences. The model further posits that the former are comprised of low-duty and high-duty leisure activities, which are presumed to have distinct roles in the weekend recovery process (Sonnentag, 2001; Sonnentag et al., 2022). Essentially, regular engagement in low-duty activities are expected to promote recovery experiences, whereas high-duty activities are hypothesised to hinder recovery experiences on weekends (Sonnentag et al., 2022).

Furthermore, distinct sleep characteristics, including sleep quality and weekend catch-up sleep, are incorporated into the model as a core recovery process. Specifically, it is hypothesised that sleep quality exerts a positive influence on recovery experiences, while weekend catch-up sleep also has a considerable effect on weekend recovery experiences. Thereafter, the model considers how these components, as well as high-duty and low-duty activities, may influence the outcomes of the recovery process. Particularly, enhanced psychological detachment, relaxation, and mastery experiences on weekends are expected to be significantly related to the state of being of recovered (Binnewies et al., 2010; Sonnentag et al., 2022) and psychological reattachment to work on Monday. Subsequently, the model postulates that individuals who are more recovered and possess a stronger capability to reengage with work at the start of the workweek demonstrate an enhanced ability to engage with (Sonnentag et al., 2020; ten Brummelhuis & Bakker, 2012) and perform work-related tasks (Binnewies et al., 2010; Sonnentag et al., 2022) for the remainder of the workweek.

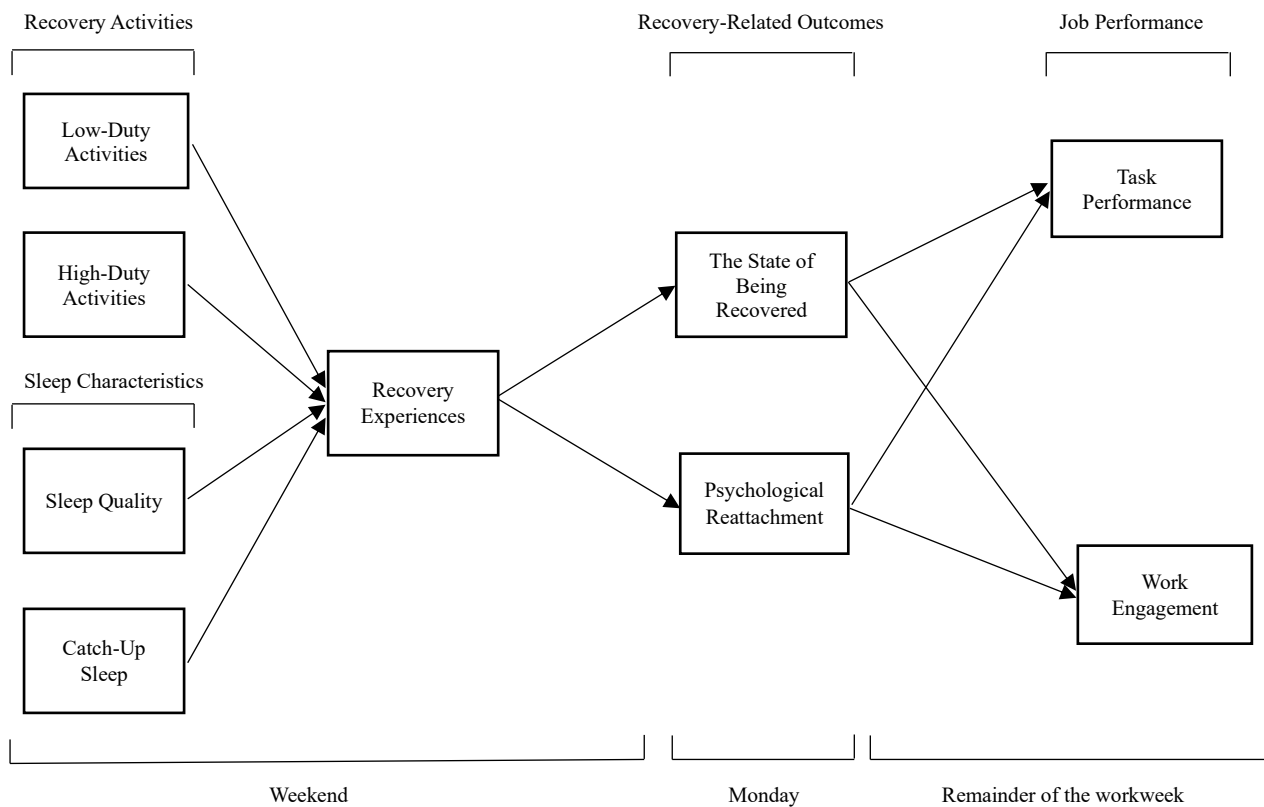


Figure 1. Conceptual Model

Theoretical Basis of Recovery

The recovery literature is predominantly grounded in a set of job-stress theories, providing a comprehensive understanding of how individuals recover from work-related demands. Notable frameworks include the COR (Hobfoll, 1989) and the effort-recovery model (ERM; Meijman & Mulder, 1998), which have crucially provided a conceptual lens to examine the implications of work-related demands on individuals' health and resources, as well as the available mechanisms that individuals can leverage to effectively replenish depleted resources. Additionally, an increased consideration of boundary theory has also more recently emerged in the recovery literature, enabling a complementary perspective into recovery (Sonnentag et al., 2020; Sonnentag & Kühnel, 2016; Völker et al., 2024b). In a manner analogous to the influence of weekend leisure activities and recovery experiences on subsequent day recovery and performance (Sonnentag et al., 2022), the replenishment of resources can influence the efficacy with which these resources are mobilised towards work and may influence the ability to effectively mobilise replenished resources towards work-related matters (Ashforth et al., 2000; Sonnentag & Kühnel, 2016). Moreover, the dynamic interplay between work-related demands and the replenishment of resources can thus have

the potential to influence fluctuations in job performance on a weekly basis (Beal et al., 2005).

The Conservation of Resources Theory

According to the COR theory, individuals possess an innate desire to replenish, accumulate, and preserve their resources (Hobfoll, 1989). These resources include objects (e.g., a house), conditions (i.e., the extent to which resources are valued), personal resources (e.g., self-regulatory capacity), and energies (e.g., vigour; Hobfoll, 1989). Essentially, through the pursuit of resource acquisition and preservation, individuals are able to cope with the threats posed by work-related demands, including the depletion of valuable resources and relevant health-related implications (Geurts & Sonnentag, 2006; Hobfoll et al., 2018). Therefore, recovery plays a pivotal role in the replenishment of resources and the acquisition of new resources by recovered individuals. In accordance with the recovery literature, the fundamental manifestation of resource acquisition and replenishment occurs during periods conducive to recovery, such as leisure time (Sonnentag et al., 2008) and weekends (Fritz & Sonnentag, 2005). Vitaly, these recovery opportunities can be utilised by individuals to engage in various recovery activities, thereby facilitating recovery from work-related stress (Hobfoll et al., 2018; Sonnentag et al., 2022).

The Effort-Recovery Model

The ERM encapsulates individuals' physiological responses to the effort expended in work-related demands. In essence, high-demand work-related efforts can activate acute stress responses manifesting via physiological (e.g., fatigue; Meijman & Mulder, 1998) and psychological stress symptoms (e.g., increased cortisol levels; Geurts & Sonnentag, 2006). Duly, these adverse effects can accumulate, resulting in chronic health-related issues, including burnout, chronic fatigue, and depressive complaints (Sluiter et al., 2001; van Hooff et al., 2005). However, Meijman and Mulder (1998) argued that the stressor-strain process is reversible, particularly through engaging in various recovery mechanisms. Centrally, the amount of time spent engaging with these mechanisms should match the demanding nature of the work. Therefore, as the ERM is predominantly concerned with demands, the periods involving the absence of these demands become essential for recovery (Geurts & Sonnentag, 2006; Meijman & Mulder, 1998). Similar to the resource-providing mechanisms that are activated during the acquisition and protection of resources (i.e., COR theory; Hobfoll, 1989), individuals have the capacity to utilise their leisure time to engage in activities that may stimulate the underlying psychological experiences purposed at promoting recovery (Sonnentag & Fritz, 2007).

Boundary Theory

Ashford et al. (2000) proposed that boundaries, whether physical, emotional, cognitive, or relational, are established around various roles an individual may assume in life, including work and nonwork roles. Within the context of the workplace, for instance, the professional role of a team leader may be distinct from the private role of a parent, primarily due to the situational difference between one's workplace and residence (Ashforth et al., 2000). Despite this division, work-life boundaries have been portrayed as a volatile construction (Sonnetag et al., 2020), predominantly as a result of the variability (e.g., amount of resources) involved with boundary crossing (i.e., *micro-role transitions*). Consequently, as employees are expected to engage with nonwork-work boundary crossing on a regular basis, examining the effectiveness with which individuals can conserve and reallocate their resources to their work domain could provide valuable insight into recovery and work-related outcomes (Fritz et al., 2021; Sonnetag & Kühnel, 2016). While there is a paucity of research in this area, the extant research on the subject has examined this process as psychological reattachment, which can facilitate this process by mentally preparing one for the upcoming workweek (Fritz et al., 2021; Völker et al., 2024b).

The Process Model of Episodic Performance

Whilst the general performance levels of individuals have traditionally been the primary concern in performance evaluation, Beal et al. (2005) proposed that within-person differences are fundamental to this process. Crucially, individual variability in performance provides a more comprehensive understanding of individuals' performance over time (Beal et al., 2005). Therefore, performance can be conceptualised as a dynamic construct, influenced considerably by the situational factors under which individuals are performing at a particular moment in time relative to their average performance levels. To ensure that individuals exceed their average performance capabilities, Beal et al. (2005) further postulate that individuals should be equipped with the requisite resources to fulfil the task at hand. As a result, recovery serves as a pivotal opportunity to replenish the resources necessary to effectively engage in occupational demands.

An Overview of the Recovery Literature

Research concerning recovery was initially brought to the fore by Sonnetag's (2001) seminal examination of the recovery process, which highlighted the critical role of recovery for overall well-being. Duly, subsequent contributions to the recovery literature adopted various research designs, including day-level (Binnewies et al., 2009; Sonnetag et al., 2008) and week-level approaches (Ragsdale & Beehr, 2016; ten Brummelhuis & Bakker, 2012).

These contributions facilitated a more profound examination of the variability of the recovery process, as well as the potential antecedents and psychological and work-related outcomes thereof (Sonnentag et al., 2022).

The Early Recovery Literature

Interestingly, the earliest contributions to the extensive recovery literature can be traced back over a century. Experimental studies dating back to the late 1800s (Amberg, 1895) and early 1900s (Graf, 1922; Graf, 1928; Kraepelin, 1902; Manzer, 1927) aimed to design a rest-break schedule for which the restorative benefits of breaks can serve as compensation for the loss of task performance during the break. Notably, Kraepelin (1902) found that increasing the frequency of rest breaks uniformly increased overall task performance, with a considerable increase especially observed at the end of employees' shifts, possibly due to the accumulated effects of the rest breaks. Subsequent contributions further refined this understanding by establishing that a 3-min break after a 60-min bout of work optimised rest-work ratio (Graf, 1922; Graf, 1928). Collectively, these studies highlighted the motivational benefits that meaningful breaks can have on work that is either physically or mentally demanding. Moreover, these seminal contributions laid the foundation for subsequent researchers to broaden the scope of recovery research, particularly through the exploration of alternative recovery settings.

Vacations as Recovery Opportunities. Given the extended respite period from work, late researchers in the late 20th century proposed that vacations can serve as the ideal context for investigating the psychological effects of recovery (Sonntag et al., 2017). Fundamentally, these contributions provided valuable insight into the stressor-strain process, including how work-related stressors cause strain (Horan et al., 2021). Research has indicated that prolonged periods away from work can facilitate a heightened sense of work-related-stress relief (Eden, 1990; Etzion et al., 1998), in addition to enhancing life satisfaction, job satisfaction, and job involvement (Lounsbury & Hoopes, 1986). While research suggests that recovery during vacations occurs passively through the temporary removal of work-related demands (Horan et al., 2021), the transition into the new millennium saw the recovery literature investigate how individuals can actively reverse the stressor-strain process (Sonntag et al., 2022).

The Contemporary Recovery Literature

Drawing upon the extant literature on the stressor-strain process, as well as the seminal contributions of the COR theory (Hobfoll, 1989) and the ERM (Meijman & Mulder, 1998), Sonntag (2001) embarked on an investigation into the recovery processes of

employees. The study found that the regular engagement in various low-duty activities (including low-effort, social, and physical activities) during evenings after work provided employees with an improved sense of well-being throughout the course of the evening. Conversely, high-duty activities (including work-related activities) during leisure time resulted in a negative impact on well-being (Sonnentag, 2001). Ultimately, this study's contribution to the recovery literature has been substantial, inspiring decades of research. To this end, Sonnentag (2017) delineated the necessary steps that recovery research had to follow to attract significant attention, particularly in the *Journal of Occupational Health*.

First, it was crucial to explore the enduring restorative effects observed during the recovery process (Sonnentag et al., 2017). Accordingly, Sonnentag (2003) examined the function of employees' morning level of recovery in relation to their job performance throughout the day. Notably, the study found that recovery was a significant predictor of work engagement and proactive behaviour, underscoring the importance of evening recovery not only for day-level recovery but also for subsequent-day job performance. Furthermore, the findings of the study have been replicated in subsequent research, yielding similar results (ten Brummelhuis & Bakker, 2012).

Second, the underlying theories of recovery had to be rendered more comprehensible (Sonnentag et al., 2017). The ERM, for instance, which is a fundamental framework for research in recovery, was initially only described in brief (Meijman & Mulder, 1998). Moreover, the more detailed presentation of the theory was only accessible in Dutch. It was not only until nearly a decade later that Geurts and Sonnentag (2006) employed the ERM in their study to inform research examining the recovery processes, thereby enhancing its accessibility to the general public.

Third, it was imperative to develop a more profound understanding of the psychological mechanisms influencing the recovery process in order to ascertain how leisure activities influence one's well-being (Sonnentag et al., 2017). Building on Parkinson and Totterdel's (1999) contribution to research on mood regulation, Sonnentag and Fritz (2007) investigated the role of recovery experiences, including psychological detachment from work, relaxation, mastery, and control experiences, in the recovery process. Consequently, the Recovery Experiences Questionnaire (REQ) was developed and subsequently validated (Sonnentag & Fritz, 2007). The REQ has since been translated into several other languages (Molino et al., 2015; Sanz-Vergel et al., 2010; Shimazu et al., 2012).

Conceptualising Recovery

As previously mentioned, Craig (1992) defined recovery as the process of restoration during which a person's increased strain levels, caused by a stressor, are returned to their pre-stressor level. In consideration of the stressor-strain process (Eden, 1990) as well as seminal research into diverse recovery contexts, including vacations (Eden, 2001) and leisure time (Sonnentag, 2001), the recovery literature has identified two distinct facets of the recovery phenomenon: recovery as a process and recovery as an outcome (Sonnentag & Geurts, 2009). While the foundational work on recovery focused on individuals' involvement in various leisure activities (Sonnentag, 2001; Sonnentag & Natter, 2004), the recovery literature also suggests that the efficacy of these activities in reversing the stressor-strain process is contingent upon their psychological experiences during engagement with these activities (Sonnentag & Fritz, 2007). Consequently, it is vital to assess these experiences in order to ascertain the success of their recovery process (Sonnentag & Geurts, 2009; Sonnentag & Krueger, 2006) and its implications for health and work-related outcomes (Binnewies et al., 2009; de Bloom et al., 2015).

Recovery as a Process

In accordance with the COR theory (Hobfoll, 1989) and the ERM (Meijman & Mulder, 1998), the recovery literature has depicted the recovery process as an encompassment of the specific mechanisms, namely active and passive mechanisms, for recovery (Sonnentag & Geurts, 2009). The active mechanisms entail the direct pursuit of acquiring or replenishing depleted resources (Hobfoll, 1989) through engaging in various recovery activities during leisure time (Demerouti et al., 2009). Conversely, the passive mechanisms encompass the psychological state or experiences that reduce strain symptoms (Meijman & Mulder, 1998) while engaging in leisure activities or in the absence of work-related demands (Geurts & Sonnentag, 2006).

Recovery Activities. Sonnentag (2001) conceptualised recovery activities as the set of resource-providing and resource-consuming behaviours that individuals engage in during their leisure time. Recognising the potential of diverse activities to influence recovery in distinct ways (Sonnentag et al., 2022), the recovery literature has further developed into a more nuanced understanding of recovery activities through the identification of two distinct categories: namely, leisure activities with a high-duty and low-duty profile (Sonnentag, 2001). Crucially, these activities can be distinguished between their 'nature' or the extent to which they are obligatory.

High-Duty Activities. Activities with a high-duty profile are defined as a set of leisure behaviours that are perceived as obligatory (Sonnetag, 2001). Such activities include work-related (e.g., completing a task at home), household (e.g., cooking), and childcare activities (e.g., assisting with homework; Sonnetag, 2001). While these activities may not inherently manifest as work-related demands, their aforementioned obligatory nature suggests that they can require a considerable amount of effort to fulfil (Demerouti et al., 2009; Sonnetag, 2001).

Low-Duty Activities. Leisure activities with a low-duty profile are defined as a set of voluntary, nonobligatory behaviours that occupy individuals' nonwork time (Sonnetag, 2001). Such activities include low-effort (e.g., watching TV), social (e.g., meeting with friends or family), and physical activities (e.g., exercising; Sonnetag, 2001). Moreover, as previously mentioned, the present study examines cultural, religious, and spiritual leisure activities as additional weekend recovery activities.

Cultural Activities. During leisure time, cultural activities can be defined as the active expression of the self through creative production and the passive recreational pursuits that involve engaging with the arts or tradition (Bygren et al., 2009; Tuisku et al., 2012). In practice, these may include musical expression and attending a museum. Despite the dearth of attention in the recovery literature, research suggests that cultural activities, whether through active or passive consumption, can reduce work-related strain, anxiety, and depressive symptoms (Cuypers et al., 2012; Iwasaki et al., 2005; Väänänen et al., 2009). Furthermore, regular engagement in cultural activities has been demonstrated to improve various health-related outcomes, including motivation (Tuisku et al., 2016), well-being (Tuisku et al., 2012; Tuisku et al., 2016), and life satisfaction (Cuypers et al., 2012).

Religious and Spiritual Activities. Creighton-Smith et al. (2017) argued that religion and spirituality are often used interchangeably. To distinguish between the two, religion can be defined as a system of beliefs that are analogous to a distinct system of faith, which is ritualised among a community that collectively identifies as members of the respective system (Creighton-Smith et al., 2017). Alternatively, spirituality can be defined as the pursuit of a sense of meaning, purpose, and connection with something greater than oneself (Creighton-Smith et al., 2017; Hill & Pargament, 2003). While both concepts are distinct, particularly as the latter does not require the direct affiliation with an organised system of faith, empirical evidence examining the engagement with either religion or spirituality has drawn similar conclusions. Similar to the effects of cultural activities, frequent engagement in religious and spiritual activities has been found to be conducive to resource replenishment

through fostering positive affect (Kim et al., 2004), well-being (Lawler-Row & Elliott, 2009), stress reduction (Maltby & Day, 2003; Ross, 1990), and social connectivity (Creighton-Smith et al., 2017).

Additionally, it is important to note that these activities are typically voluntary (Alameer et al., 2023; de Bloom et al., 2018) and are, therefore, not a requirement for employees as part of their job description or as a parental figure. Therefore, the current study examines religious and spiritual activities as well as cultural activities as low-duty, voluntary components of the recovery process.

Sleep as Part of the Recovery Process. Sleep can be defined as the state in which the body experiences a temporary loss of consciousness to facilitate several restorative processes (Siegel, 2005). Significantly, the importance of sleep for adequate recovery is well established in the circadian literature. These include benefits for physical health (Strine & Chapman, 2005), mental health (Benca et al., 1992), and cognitive function (Leong & Chee, 2023). However, the complexity of sleep, as elucidated by Borberly's (1982) dual process model of sleep, and the influence of individual differences, such as sleep habits (Daskalova et al., 2018) and age (Krauss et al., 2003), pose challenges in the empirical encapsulation of sleep. Therefore, to comprehensively capture the multifaceted nature of sleep, the circadian literature has distinguished between two distinct characteristics, namely transitory and chronic sleep characteristics.

Transitory Sleep Characteristics. Kühnel et al. (2018) defined transitory sleep characteristics as short-term sleep patterns or habits, including sleep quality and duration, which may fluctuate on a daily basis. The former refers to one's general assessment of how well one slept (Buysse, 2014), whereas sleep duration can be understood as a more quantitative measure of the number of hours spent asleep on a particular night (Barnes, 2012). Despite its subjective evaluation, sleep quality has been empirically linked to several health-related and mood-related outcomes, including exhaustion (Chawla et al., 2020) and affect (Sonntag et al., 2008), respectively. Furthermore, high-quality sleep has been shown to have a beneficial effect on various work-related outcomes, including task performance (Liu et al., 2021), work engagement (Diestel et al., 2015), work-related fatigue (Querstret & Cropley, 2012), and job satisfaction (Barton et al., 1995).

Notwithstanding the extensive research conducted on sleep quality, Leong and Chee (2023) suggested that sleep duration remains the most studied sleep parameter for cognition (Leong & Chee, 2023). Particularly, researchers sought to examine the ideal amount of sleep that adults should obtain in order to optimise cognitive function (Smevik et al., 2023).

Ultimately, the recommended amount of sleep has been found to range between seven and nine hours per night (Althoff et al., 2017; Wild et al., 2018). Furthermore, a sleep duration of seven to eight hours per night has been associated with favourable work-related outcomes, including enhanced organisational citizenship behaviour (OCB; Barnes et al., 2013) and task performance (Smevik et al., 2023). Notably, researchers have also begun to investigate the practical implications of inconsistent sleep durations for employee recovery.

Chronic Sleep Characteristics. Kühnel et al. (2018) defined chronic sleep characteristics as long-term sleep patterns or habits that persist over time. While the maintenance of a consistent schedule is recommended to support cognitive function in the long term (Zhang et al., 2020), employees often experience work-related sleep loss, especially during the workweek. This has been shown to have detrimental effects on cognitive function, affective states, and learning (Krause et al., 2017). To cope with this sleep deficit, employees often engage in weekend catch-up sleep, which involves the deliberate extension of sleep duration on weekends (Leger et al., 2020). While this may seem counterintuitive, given the association found with sleep inconsistency and reduced attentional performance (Zhang et al., 2020), the results of studies investigating the effects of catch-up sleep have been mixed nonetheless (Chaput et al., 2020). Notably, research has identified that individuals who engage in weekend catch-up sleep can also experience favourable health-related, including reduced cardiometabolic risk and enhanced health-related quality of life (Chaput et al., 2020), and work-related outcomes, including sustained attention and work-related fatigue (Kubo et al., 2011). However, additional findings also suggest that the implications of the deliberate extension of sleep duration on weekends may be contingent on individual differences relating to factors such as sleep preferences and physical health (Depner et al., 2019; Leger et al., 2020; Wittmann et al., 2006).

Recovery Experiences. Sonnentag and Fritz (2007) defined recovery experiences as the psychological occurrences that underlie the recovery process, which typically emerge during various recovery contexts (Eden, 1990; Sonnentag, 2001), primarily when engaging in different leisure activities (Sonnentag et al., 2022). Fundamentally, these experiences can be distinguished into four complex perceptual states, including psychological detachment from work, relaxation, mastery, and control experiences (Sonnentag & Fritz, 2007).

Psychological Detachment. Etzion et al. (1998) defined psychological detachment as the extent to which an individual is able to mentally disengage from work-related matters during periods of absence from their professional environment. While physical separation from the workplace can facilitate recovery (Hartig et al., 2007), Sonnentag and Fritz (2007)

argued that mental separation from work is equally crucial for successfully recovering from work-related demands. Accordingly, psychological detachment is conceptualised as going beyond the mere physical separation from professional obligations and towards a mental state independent from work-related thoughts (Sonnentag & Fritz, 2007). From a boundary perspective, psychological detachment can be understood as the psychological compartmentalisation of the work and nonwork domains (Ashforth et al., 2000; Sonnentag & Kühnel, 2016). Consequently, the inability to effectively differentiate between these domains and detach from work-related thoughts, particularly during leisure time, has been shown to induce day-level negative affect (Feuerhahn et al., 2014; Hahn et al., 2014) and exhaustion over time (Sonnentag et al., 2014). Conversely, those who are able to mentally detach from work during leisure time may also enjoy improvements in well-being both the following day (Sonnentag et al., 2008) and throughout the subsequent week (Sonnentag & Fritz, 2015).

Relaxation. Stone et al. (1995) defined relaxation as the state of low sympathetic activation and the accompanying feelings of tranquillity. When one is in a relaxed state, no additional demands are placed on the self, thereby stimulating the parasympathetic nervous system (PNS), which enables the regulation of accumulated stress responses (Sonnentag & Fritz, 2007; Stone et al., 1995). The ERM posits that the accumulation of stress and the exertion of effort into demanding tasks render individuals more susceptible to physical and mental health complications (Geurts & Sonnentag, 2006; Meijman & Mulder, 1998). Consequently, the stimulation of the PNS assumes importance, particularly through relaxation experiences (Geurts & Sonnentag, 2006; Sonnentag & Fritz, 2007). The benefits derived at both the physical level, such as increased vigour (Hoover et al., 2022), and psychological level, such as improved well-being (Steed et al., 2021), can be enjoyed as a result.

Mastery. Sonnentag and Fritz (2007) defined mastery as the psychological experiences typically associated with a sense of accomplishment, derived from engaging in challenging activities or learning opportunities during leisure time. Such engagement may typically manifest as the acquisition of a new language or skill (Sonnentag & Fritz, 2007). While these experiences may arise from intellectually demanding activities, Sonnentag and Fritz (2007) argued that these challenges do not impose the same level of resource demands as work-related obligations. Therefore, the context in which these experiences occur is of utmost importance. Research suggests that the voluntary pursuit of intellectually challenging tasks outside of work can be conducive for one's recovery, primarily due to possible feelings of personal growth and achievement (Sonnentag et al., 2017). However, given the required exertion of effort, individuals with preexisting fatigue or job-related stress might find it

difficult to effectively engage with challenging activities (Sonnentag & Fritz, 2007). Consequently, the role of mastery experiences in recovery may vary between individuals.

Control. Sonnentag and Fritz (2007) defined control experiences on the basis of choice, that is, the extent to which individuals are able to decide freely how they choose to spend their leisure time. Critically, as the need for autonomy (which may not necessarily be satisfied in the workplace context) can be fulfilled during this time, the opportunity is presented to engage in low-duty activities (Sonnentag & Fritz, 2007). Research indicates that individuals who experience high levels of autonomy in their leisure activities also enjoy enhanced well-being (de Bloom et al., 2015), positive affect (Newman et al., 2014), and life satisfaction (Lee et al., 2016). Moreover, individuals also reported reduced physical complaints (Shimazu et al., 2012) and improved proactive behaviour at work (Ouyang et al., 2019). However, with regard to the scope of control experiences, Ragsdale et al. (2016) argued that these experiences could also be considered as an indicator of the amount of time individuals are able to dedicate to leisure activities, rather than an underlying psychological reaction to the activities. Therefore, control experiences were excluded from the scope of the present study, as they may be better placed as a predictor of recovery activities on weekends or during leisure time in general (Ragsdale et al., 2016).

The Weekend as a Recovery Opportunity. As previously mentioned, the recovery phenomenon often occurs in the absence of work-related demands; therefore, research on recovery is commonly conducted in a variety of respite contexts, including work breaks, vacations, weekends, and evenings after work (Sonntag et al., 2017). While the activities in which individuals engage during these periods are important for recovery (Sonntag et al., 2022), the context itself is also significant due to the passive occurrences of resource replenishment observed during these periods (Horan et al., 2021). Research indicates that both brief and extended periods away from work can facilitate resource replenishment and, thus, reverse the stressor-strain process (Horan et al., 2021; Meijman & Mulder, 1998; Sonntag et al., 2017). Despite its relatively shorter duration, the weekend has been shown to enable a restorative effect similar to that of vacations through facilitating the alleviation of stress that may accumulate throughout the working week (Sonntag et al., 2017). Therefore, weekends, in particular, offer a more frequent opportunity for employees to recover from the demands of work (Binnewies et al., 2010; Ragsdale et al., 2011).

Recovery as an Outcome. As previously mentioned, the physiological state of individuals' following the recovery process can be indicative of their overall level of recovery (Sonntag & Geurts, 2009). Essentially, this state can be measured by assessing and

comparing individuals' personal resources and affect before and after various recovery contexts (Eden, 1990; Ragsdale & Beehr, 2016; Sonnentag & Geurts, 2009) or individuals' state of being recovered at the start of the workweek (Binnewies et al., 2010).

The State of Being Recovered. The ERM assumes that valuable resources are consumed during effortful work (Meijman & Mulder, 1998). Therefore, as previously mentioned, the amount of resources that individuals are able to effectively replenish during leisure time may serve as an indicator of their overall level of recovery (Hobfoll, 1989; Sonnentag & Krueger, 2006). Sonnentag and Krueger (2006) defined the state of being recovered as the extent to which one feels physically and mentally refreshed. Following a successful recovery process, employees have also reported improvements in various work-related outcomes, including compensatory work effort (Binnewies et al., 2009) and vigour (Sianoja et al., 2016). Nevertheless, while this state falls within the scope of the current study, psychological reattachment is also examined as a recovery-related outcome to evaluate the extent to which the successfulness of the recovery process influences individuals' ability to mentally reconnect with work on Monday.

Psychological Reattachment to Work. Sonnentag and Kühnel (2016) defined psychological reattachment as an individuals' capacity to seamlessly reestablish a mental connection to work prior to the commencement of their workday. Similar to the volatility of recovery (Binnewies et al., 2010; Sonnentag & Geurts, 2009), the micro-role transitions (i.e., the mental boundary crossing from nonwork to work domains; Ashforth et al., 2000) involved in this mental preparation also require a degree of effort and thus personal resources (Ashforth et al., 2000; Hobfoll, 2001). Consequently, an individual's capacity to effectively reattach to their work may not only fluctuate on a daily basis but could also be dependent on their ability to direct resources towards work-related tasks (Sonnentag & Kühnel, 2016). Critically, Baumeister et al. (1998) referred to this as self-regulation, which involves directing attentional resources to effectively focus one's attention on a task. Although this role may share similarities to that of psychological reattachment, the fundamental distinction may lie in their role in facilitating transitions between different domains. Notably, while psychological reattachment primarily facilitates the transition back into a work-oriented state, self-regulatory capacity governs how resources are managed when engaging with tasks (Beal et al., 2005). However, the nuanced role of self-regulatory resources in recovery has also been shown to be subject to within-person differences. Notably, Kanfer and Ackerman (2004) suggested that older individuals may have a relatively lower self-regulatory capacity. Furthermore, in a week-level study design, an individual's accumulated self-regulatory

resources, or the lack thereof, prior to the study may influence their recovery process differently (Binnewies et al., 2010). As a result, self-regulatory resources were controlled for in the current study (Motowildo et al., 1997)

Conceptualising Performance

Within the context of the workplace, performance can be conceived as a multifaceted phenomenon involving the work-related behaviours that contribute to organisational goals (Campbell, 1990; Motowildo et al., 1997). Furthermore, research distinguishes between the manner in which these behaviours contribute to organisational goals, including direct contributions (e.g., task performance) and indirect contributions (e.g., contextual performance; Motowildo et al., 1997; Williams & Anderson, 1991).

Job Performance as a Multifaceted Concept

Borman and Motowidlo (1993) defined task performance as the degree of effort that individuals expend into the completion of tasks that are required of them to fulfil. In practice, these behaviours may involve the execution of the organisation's technical processes (e.g., the sale of retail goods) or the maintenance of its technical requirements (e.g., the distribution of finished products; Borman & Motowidlo, 1993). Additionally, given the obligatory nature of these tasks, as stipulated in the job description, the behaviours involved can be recognised by the organisation's formal reward systems, as they contribute directly to the achievement of organisational goals (Williams & Anderson, 1991).

Alternatively, contextual performance can be defined as the degree of effort expended in completing nonobligatory tasks (Borman & Motowidlo, 1993). As these behaviours are not stipulated by the job description, they may manifest in the workplace by individuals acting in advance of the requirement of the job (i.e., proactive behaviour; Frese et al., 1996) and assisting colleagues with heavy workloads (i.e., OCB; Williams & Anderson, 1991). Ultimately, these behaviours are perceived as desirable for employers, as they have been shown to drive organisational effectiveness (Bindl & Parker, 2011; Cangiano & Parker, 2015). Beyond task performance and contextual performance, motivational constructs like work engagement have also emerged as a valuable indicator of workplace effectiveness (Christian et al., 2011; Rich et al., 2010).

Work Engagement as a Performance Indicator

Kahn (1990) conceptualised work engagement as a motivational construct concerning an individual's ability to direct their personal resources towards a work-related task. Given its potential role in fostering positive affective-cognitive states (viz., vigour, dedication, and absorption; Schaufeli et al., 2002), work engagement has also been found to be a crucial

precursor to effective task and contextual performance (Christian et al., 2011). Additionally, research has demonstrated that the ability to consistently engage with work can contribute to long-term improvements in physical and mental health (Leijten et al., 2015; Reis et al., 2015). Despite its portrayal as a relatively stable trait (Bakker & Schaufeli, 2008; Schaufeli et al., 2002), research suggests that work engagement can also reflect as a temporally dynamic state (Bakker, 2014; Sonnentag, 2003; Sonnentag et al., 2012), analogous to that of task performance and contextual performance. Therefore, work engagement can serve as a valuable lens through which to assess employees' readiness to perform, based on their resource capacity, on a weekly basis (Beal et al., 2005; Demerouti et al., 2009; Sonnentag & Kühnel, 2016). As such, this study incorporates work engagement, alongside task performance, as essential work-related outcomes, with a view to examining weekly performance.

Recovery Activities and Weekend Recovery Experiences

The extant literature on recovery assumes that individuals' recovery experiences on weekends are influenced by their engagement in various activities during leisure time (Sonnentag et al., 2022; Steed et al., 2021). Fundamentally, the manner in which individuals' recovery experiences are influenced can be determined by the extent to which these activities are voluntary and effortful in nature (Meijman & Mulder, 1998; Sonnentag, 2001; Sonnentag et al., 2022). Therefore, given that recovery activities are presumed to be distinct in nature, as previously mentioned, the recovery literature distinguishes between leisure activities with a low-duty and high-duty profile (Sonnentag, 2001).

Low-Duty Activities and Recovery Experiences

Given its voluntary and effortless nature (Sonnentag, 2001), the recovery literature postulates that low-duty activities serve as crucial mechanisms for the replenishment of depleted resources (Hobfoll, 1989; Meijman & Mulder, 1998; Sonnentag et al., 2022). Empirically, research examining the role of low-duty activities in the recovery process has identified positive associations between engagement with these activities and recovery experiences during leisure time (de Bloom et al., 2018; Ginoux et al., 2021; Ragsdale et al., 2011; Ragsdale et al., 2016; Steed et al., 2021; ten Brummelhuis & Bakker, 2012). These findings suggest that low-duty activities may facilitate recovery by enabling individuals to mentally disengage from work-related demands, relax, and acquire or develop skills. Furthermore, diary studies have demonstrated that low-duty activities may be conducive to recovery experiences at both the day level (ten Brummelhuis & Bakker, 2012) and week level (de Bloom et al., 2018; Ginoux et al., 2021; Ragsdale & Beehr, 2016; Ragsdale et al., 2011),

indicating that low-duty activities may not only facilitate recovery for the following day but can also be sustained for the following workweek.

H1a: Low-duty activities positively predict weekend recovery experiences.

Cultural Activities and Recovery Experiences. As previously mentioned, research exploring the role of cultural leisure activities in recovery experiences is still in its infancy. Furthermore, the couple of studies that have empirically examined this role have measured cultural leisure activities in distinct ways. For instance, Tuisku et al. (2016) distinguished between receptive cultural activities (i.e., “the *passive* consumption of culture”; Tuisku et al., 2016, p. 256) and creative activities (i.e., “*active* art-making or creative expression”; Tuisku et al., 2016, p. 256). In essence, the study found that both sets of activities promoted relaxation, mastery, and control experiences on a weekly basis. Alternatively, De Bloom et al. (2018) distinguished between traditional cultural activities (e.g., visiting a museum) and creative activities (e.g., painting) and found that individuals who included creative and cultural activities in their leisure profile also enjoyed higher levels of psychological detachment from work and mastery experiences. However, while these studies did not examine its effect on recovery experiences overall, research suggests that these feelings can be conducive to recovery, nonetheless (Steed et al., 2021).

In addition, to simplify the scope concerning cultural activities in the recovery process, the current study examines cultural activities as the set of activities that are explicitly aimed at cultural engagement. As a result, both active and passive forms are recognised as being grounded in a shared foundation that may foster recovery experiences through engagement with culture during leisure time.

H1b: Cultural activities positively predict weekend recovery experiences.

Religious and Spiritual Activities and Recovery Experiences. Similar to Sonnentag and Fritz’s (2007) taxonomy of recovery experiences, Newman et al. (2014) proposed a more extensive framework of recovery experiences encompassing detachment-recovery, autonomy, mastery, meaning, and affiliation (DRAMMA). This framework encapsulates fundamental leisure experiences that may foster recovery through promoting well-being and meaningful participation (Newman et al., 2014). Iwasaki (2008) positioned meaningful experiences as those that can be derived from leisure activities that foster a sense of purpose or significance

in one's life. These may include hobbies, physical activities, religious activities, and spiritual activities (Newman et al., 2014). As previously discussed, the regular engagement in religious and spiritual activities has been positively related with various personal resources and affective states (Creighton-Smith et al., 2017; Kim et al., 2004; Maltby & Day, 2003; Ross, 1990), all of which are associated with enhanced levels of recovery (Bennett et al., 2018; Sonnentag et al., 2022). However, research examining the direct influence of these activities on recovery experiences has not only focused primarily on the role of spiritual activities but also yielded mixed results. For instance, Hülshager et al. (2014) found that individuals who regularly engaged in mindfulness-based practices were better positioned to mentally detach from work-related demands; however, they later found no relationship between the two (Hülshager et al., 2015). Alternatively, Alameer et al. (2023) found a positive association between spiritual activities and evening relaxation, suggesting that day-level engagement with spiritual activities allowed individuals to feel more relaxed during evenings.

Principally, the presumed restorative effects of religious and spiritual activities can also be explained by those of social leisure activities. In line with affiliation experiences, the enhanced level of social interconnectedness and support that may accompany the association with a particular religion or spiritual group can be instrumental in reducing stress and promoting well-being (Bostock et al., 2019; Newman et al., 2014) and thus enhance recovery experiences (Bennett et al., 2018; Sonnentag et al., 2022).

H1c: Religious and spiritual activities positively predict weekend recovery experiences.

High-Duty Activities and Recovery Experiences

Contrary to those with a low-duty profile, high-duty leisure activities are typically associated with a sense of obligation and may require relatively more effort to fulfil (Sonnentag, 2001). Consequently, in accordance with the COR theory (Hobfoll, 1989), the recovery literature proposes that the engagement in such resource-demanding activities during opportunities for recovery may adversely influence the recovery process, as it places existing resources under threat (Demerouti et al., 2009; Sonnentag, 2001). Moreover, research has identified a number of high-duty activities (i.e., work-related, household, and childcare activities) that may impede recovery experiences by hindering individuals from adequately detaching from work-related matters, relaxing, and deriving a sense of accomplishment (Sonnentag et al., 2022; Steed et al., 2021). The findings from this research

have also been consistent at both the day level (Bakker et al., 2013; ten Brummelhuis & Bakker, 2012) and week level (Ginoux et al., 2021; Ragsdale et al., 2016), indicating that high-duty activities may not only inhibit recovery experiences the following day but can also accumulate for the following workweek.

H1d: High-duty activities negatively predict weekend recovery experiences.

Sleep Quality and Weekend Recovery Experiences

The existing literature offers limited examination of the nuanced roles of sleep quality in recovery experiences. While the current study investigates sleep quality as a direct precursor of weekend recovery experiences, prior research has predominantly examined sleep quality either as an outcome (Barber & Jenkins, 2014) or a mediator of psychological detachment, in particular (Hülshager et al., 2015; Hülshager et al., 2014; Hur & Shin, 2023). Notably, several studies have indicated that sleep quality may act as a mediator in the relationship between mindfulness interventions (Hülshager et al., 2015; Hülshager et al., 2014; Hülshager et al., 2018) or affective states (Sonnentag et al., 2008; van Wijhe et al., 2013) and recovery experiences. Although the association can be indirect, these studies imply that sleep quality can play a pivotal role in the provision of the resources necessary for a successful recovery process, as well as its overall influence in the broader framework of recovery experiences.

Given that sleep involves a temporary mental disconnect from work-related matters, Hülshager et al. (2015) positioned sleep as the antithetical state to working. Therefore, when investigating the direct relationship between sleep quality and recovery experiences, the restorative properties of sleep may be similar to that of psychological detachment. As illustrated in prior research, sleep quality has been found to be positively related to psychological detachment (Bennett et al., 2023; Headrick et al., 2023). This suggests that individuals who report higher quality of sleep the previous night were also able to mentally detach from work-related demands the following day. In addition, the aforementioned restorative properties of high-quality sleep suggest the presence of additional benefits for experiences of recovery beyond those related to detachment (Headrick et al., 2023; Rhee et al., 2024; Sonnentag et al., 2008). Therefore, the present study proposes that high-quality sleep enables individuals to be more relaxed and derive more meaningful experiences during weekend activities.

H1e: Sleep quality positively predicts weekend recovery experiences.

Weekend Catch-Up Sleep and Recovery Experiences

To date, research has yet to examine the role of weekend catch-up sleep in recovery experiences. Although the effects of catch-up sleep have been explored in prior studies, primarily via sleep inconsistency, the mixed findings do make it difficult to concretely speculate on its nuanced implications for the recovery experiences on weekends (Chaput et al., 2020; Kubo et al., 2011; Lo et al., 2020; Zhang et al., 2020). To demonstrate, researchers have found that deliberately extending the duration of sleep on weekends may yield positive health-related (Chaput et al., 2020; Depner et al., 2019) and work-related outcomes (Kubo et al., 2011). However, as the majority of these benefits were observed in individuals with preexisting sleep debt, notable studies have indicated that these benefits may only be contingent on the short term. Significantly, habitual weekend catch-up sleep may, over time, render individuals susceptible to the detrimental effects, particularly pertinent to cognitive and metabolic health, which are associated with circadian misalignment (i.e., the disparity between individuals' biological preferred sleep times and their actual sleep times; Wittmann et al., 2006) by impairing metabolic processes in the body (Depner et al., 2019; Leger et al., 2020). Therefore, weekend catch-up sleep may not be an ideal strategy to compensate for severely sleep-deprived individuals. Instead, it is recommended that the optimal regulation of resources over time predominantly stems from consistently getting similar amounts of sleep every night (Depner et al., 2019; Kubo et al., 2011; Leger et al., 2020).

H1f: Weekend catch-up sleep negatively predicts recovery experiences.

Weekend Recovery Experiences and the State of Being Recovered on Monday

In accordance with the COR theory (Hobfoll, 1989), the recovery literature suggests that individuals feel recovered if they have sufficiently replenished depleted resources, typically during a recovery context (Sonntag et al., 2022; Steed et al., 2021). Therefore, one's level of recovery may be indicative of the successfulness of the recovery process. Despite this assumption, few studies have empirically tested this (Steed et al., 2021). Binnewies et al. (2010), for instance, found a positive relationship between recovery experiences (including psychological detachment, relaxation, and mastery experiences) and the state of being recovered at the week level. These findings imply that individuals who are better able to disengage from work, relax, and acquire or develop skills on weekends report

higher levels of recovery on Monday. Similarly, Steed et al. (2019) found that psychological detachment and relaxation experiences were significantly conducive to the state of being recovered. Crucially, while recovery experiences and the state of being recovered are fundamental components of the recovery process, this study also recommends that they be examined in conjunction in order to gauge a comprehensive understanding of the components influencing the recovery process (Steed et al., 2021).

Importantly, it should be noted that, given the reliance on self-report responses in the present study, the possibility that individuals' responses may have been influenced by dispositional negativity, particularly due to nonwork experiences, was not ruled out. Notably, Binnewies et al. (2010) found that individuals' negative affective states did play a significant role in negatively influencing their accounts of their level of recovery. As a result, negative affect was controlled for in the current study.

H2a: Weekend recovery experiences positively predict the state of being recovered on Monday.

Weekend Recovery Experiences and Psychological Reattachment on Monday

The present study has thus far conceptualised one's ability to effectively reattach to work as an extension of boundary theory (Ashforth et al., 2000; Sonnentag & Kühnel, 2016). Furthermore, through its presumed role as an outcome and, therefore, indicator of the successfulness of the recovery process, this study considers COR theory's postulate of resource investment (Hobfoll, 2001). Fundamentally, the transition from nonwork to work domains necessitates a certain degree of effort, which can be derived as resources from recovery experiences during the weekend (Ashforth et al., 2000; Hobfoll, 2001). However, no research were found that examined the role of weekend recovery experiences as a prerequisite for the ability to psychologically reattach to work at the start of the workweek. In the preceding discussion, the theoretical benefits of weekend recovery for psychological reattachment have been posited. However, Völker et al. (2024) have proposed that specific recovery experiences may influence reattachment in a divergent manner. To exemplify, relaxation experiences can be inducive for the resources required to observe micro-role transition, thereby promoting reattachment. Conversely, the increased role separation that is observed during psychological detachment from work might impede individuals' ability to seamlessly transition back to their work domain on Monday.

H2b: Weekend recovery experiences positively predict psychological reattachment to work on Monday.

The Recovery-Related Outcomes on Monday and Weekly Task Performance

In accordance with the process model of episodic performance (Beal et al., 2005), the recovery literature suggests that optimal job performance is dependent on the amount of resources that an individual has in their capacity to allocate towards work-related tasks (Sonnentag et al., 2022). Conversely, in the event of an unsuccessful recovery process being observed, said individuals may therefore have fewer resources (Hobfoll, 1989), which may have a negative effect on their job performance (Crawford et al., 2010; Muraven & Baumeister, 2000).

The State of Being Recovered and Task Performance

Research indicates that the state of being recovered at the start of the workweek positively predicts task performance (Binnewies et al., 2009, 2010). Essentially, these findings suggest that individuals who have sufficiently recovered from work-related demands during the previous evening or weekend perceivably have a greater amount of resources available to optimally perform with their tasks. Furthermore, the consistency of these findings at both the day level (Binnewies et al., 2009) and week level (Binnewies et al., 2010) lends further credence to the proposition that employees who report higher levels of recovery in the morning also exhibit enhanced task efficiency, both throughout the day and for the remainder of the workweek.

Psychological Reattachment and Task Performance

Interestingly, extant research examining the role of psychological reattachment in task performance has found no direct association between the two. Notably, Völker et al. (2024) only found that psychological reattachment was indirectly related to task performance via decreased levels of exhaustion. Whereas Fritz et al. (2021) found no association between psychological reattachment and task performance even when moderated by positive affect and anticipated task focus. While these findings may be inconsistent with prior studies particularly interested in reattachment as a prerequisite for work engagement (Schleupner et al., 2024; Sonnentag et al., 2020; Sonnentag & Kühnel, 2016), reattachment may instead serve as more of a proximal outcome of task performance, through the predominant facilitation of the mobilisation of resources.

H3a: The recovery-related outcomes on Monday positively predict weekly task performance.

The Recovery-Related Outcomes on Monday and Weekly Work Engagement

As previously mentioned, work engagement can be characterised by a perceived state encompassing vigour, dedication, and absorption (Schaufeli et al., 2002). However, research also suggests that this state necessitates a high degree of cognitive and energetic resources in order to maintain a high degree of willingness to persevere through the possible difficulties associated with demanding work-related tasks, as well as to become fully immersed in one's work (Bakker, 2014; Schaufeli & Bakker, 2004). Therefore, it is crucial that individuals observe a successful recovery process.

The State of Being Recovered and Work Engagement

In accordance with the seminal theoretical frameworks of the COR theory (Hobfoll, 1989) and the process model of episodic performance (Beal et al., 2005), research posits that work engagement can be positioned as an indicator of an individual's capacity to become adequately immersed in their work (Sonnetag et al., 2012). Accordingly, research examining work engagement in this respect has found a positive relationship with perceived recovery (Bosch et al., 2018; Sonnetag, 2003; Sonnetag et al., 2012). Fundamentally, these findings suggest that individuals who are relatively more recovered in the mornings are better equipped with the necessary resources required to become sufficiently engaged with their work.

Psychological Reattachment to Work and Weekly Work Engagement

Through the lens of boundary-crossing (Ashforth et al., 2000) and resource investment perspectives (Hobfoll, 2001), research indicates that effective micro-role transition can also be indicative of the ability to become fully immersed in one's work via the mobilisation of resources towards work-related demands (Beal et al., 2005; Sonnetag & Kühnel, 2016). While the direct associations were not examined, Sonnetag et al. (2020) found that psychological reattachment to work was positively related to work engagement via enhanced goal activation. This, in turn, was positively related to anticipated task focus, positive activated affect, social support, and job control. Furthermore, these findings have been recently corroborated by Schleupner et al. (2024), who indicated that the underlying mechanisms for psychological reattachment involve cognitive resources, affective resources, and motivational shifts. However, it should also be noted that, in this study, some individuals reported several detriments during mental connection with work, including increased mental

strain and resource expenditure. Conversely, research has identified a direct correlation between reattachment and work engagement, suggesting that individuals become more involved with their work when their ability to mobilise their resources towards work-related matters is enhanced (Sonnentag et al., 2020).

H3b: The recovery-related outcomes on Monday positively predict weekly work engagement.

Proposed Hypotheses

H1a: Low-duty activities positively predict weekend recovery experiences.

H1b: Cultural activities positively predict weekend recovery experiences.

H1c: Religious and spiritual activities positively predict weekend recovery experiences.

H1d: High-duty activities negatively predict weekend recovery experiences.

H1e: Sleep quality positively predicts weekend recovery experiences.

H1f: Weekend catch-up sleep positively predicts recovery experiences.

H2a: Weekend recovery experiences positively predict the state of being recovered on Monday.

H2b: Weekend recovery experiences positively predict psychological reattachment to work on Monday.

H3a: The recovery-related outcomes on Monday positively predict weekly task performance.

H3b: The recovery-related outcomes on Monday positively predict weekly work engagement.

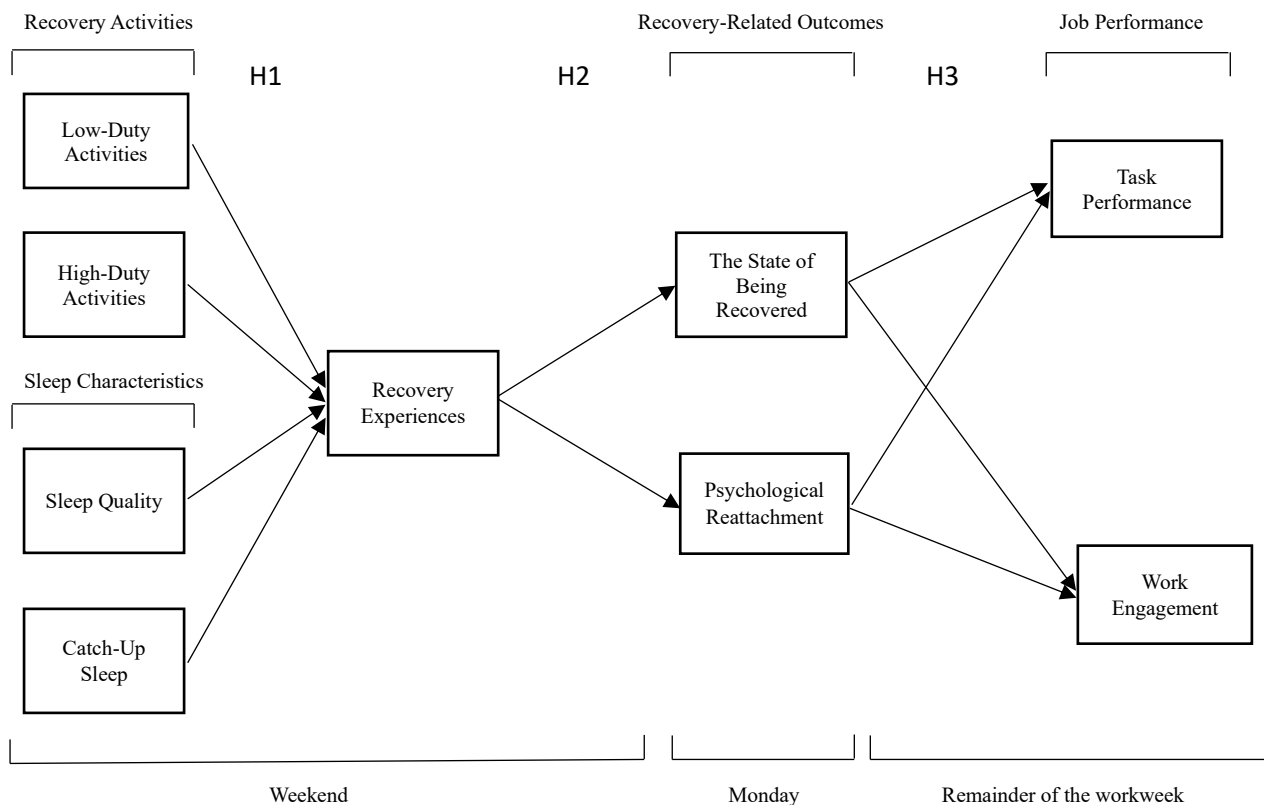


Figure 2. Proposed Hypotheses

Method

The following section details the methodology employed in conducting the current study and examining the hypothesised relationships between the variables of interest. Furthermore, this section is divided into several subsections, including the research design, sampling approach, procedure, participants, measures, data analysis, and ethical considerations.

Research Design

The present study utilised three research designs, which served as the methodological framework for the study. These included a longitudinal, descriptive, and multilevel research design.

First, this study employed a longitudinal research design with repeated measures, a decision primarily motivated by the central role of the weekend in the study's aims. Essentially, this design was used to address the inherent variability in individuals' leisure preferences and sleep patterns on weekends, enabling the examination of potential fluctuations in recovery and performance over time (Binnewies et al., 2010). Accordingly, participants were required to complete seven surveys, including the General Survey (completed once), the Pre-Weekend Survey (completed three times), and the Post-Weekend

Survey (completed three times), over the course of three weeks. All of which were administered in English.

Second, the current study adopted a descriptive research design to identify observable trends in recovery and performance across measurements (Blanche et al., 2006).

Third, a multilevel research design was adopted for the present study, which proved to be pivotal in the analysis of the data. In studies involving repeated measurements, multilevel analysis is considered ideal, particularly for analysing data with hierarchical structures (Heck et al., 2014; Peugh, 2010). Given that observations are nested within individuals, this method allowed me to capture stable characteristics and performance and recovery-related trends at the person level (Level 2; Heck et al., 2024). Furthermore, observations could also be grouped at the week level (Level 1), which enabled the examination of fluctuations in week-level variables over time (Heck et al., 2014).

Sampling

As employees were of interest in this study, non-probability convenience sampling was utilised to recruit participating companies. Initial contacts were established through individuals in management positions, including human resources managers and corporate executive officers. This method was deemed to be convenient as it allowed for a quick and inexpensive method for data collection (Daniel, 2011). Following the acquisition of institutional consent, the management of the respective companies was requested to distribute the General Survey to the employees under their purview. This approach was employed to utilise management's extensive network within the companies whilst ensuring the safeguarding of the participants' rights to anonymity (Daniel, 2011).

Procedure

Upon the ethical approval of the study by the Commerce Faculty Ethics in Research Committee at the University of Cape Town (reference number: COM/00914/2024), a number of companies in South Africa were approached via email with a research invitation. The invitation included a cover page with the following information: the purpose of the study; possible risks and benefits associated with participation; and my contact details (see Appendix A). Following the provision of written informed consent by the managers, they were provided with the link to the General Survey, which they were asked to distribute to their colleagues, preferably prior to the distribution of the first Pre-Weekend Survey (on Friday). The General Survey was to be completed once, and, upon completion, the employees' permission to participate in the study further was requested. While this did require participants to provide their contact details, all of the appropriate precautionary

measures were taken to ensure that participants' right to anonymity was not compromised. These measures are outlined in the Ethical Consideration section discernible below.

Participants

As previously stated, the target population of this study comprised employees in the South African context. This included those engaged in full-time, part-time, or contractual capacities. Furthermore, the study did not impose restrictions on industry or other demographic characteristics. Therefore, all employees were granted the opportunity to participate, irrespective of age, gender, and ethnicity.

Of the total 104 employees who completed the General Survey, 88 employees provided their consent to participate in the study further. However, given that only the Pre-Weekend and Post-Weekend Surveys were purposed at exclusively gathering data relevant to the study's aims, the General Survey responses from the 16 individuals who did not wish to participate in the study further were removed. As previously mentioned, participation in the current study was voluntary; therefore, not all of the 88 participants completed all seven surveys. Furthermore, given the multilevel design of the study, the current sample was composed of observations made at the person level (Level 2) and week level (Level 1). Among the 88 participants, 57 participants completed one full cycle of surveys (defined here as completing both the Pre-Weekend and Post-Weekend Survey for a respective week). Therefore, $n = 57$ participants were included at the person level. Alternatively, the week-level sample was estimated via the sum of observations made at each week. As illustrated in Table 1: $n = 43$; $n = 34$; and $n = 25$ observations were respectively recorded across the three-week duration. Therefore, $n = 102$ observations were included in this study at the week level.

Table 1

Sample Size Per Week

Week	Pre-Weekend Survey	Post-Weekend Survey
1	43	43
2	36	34
3	26	25

The recognised person-level sample ($n = 57$) comprised 11 males (19.3%) and 46 females (80.7%), with the majority of participants ($n = 21$) falling into the 45–55 (36.8%) age

group (see Table 2). Furthermore, the frequency table revealed that 18 participants had no children (31.6%), 13 participants had two children (22.8%), and 13 participants had three children (22.8%). The majority of participants ($n = 44$) were employed full-time at their respective companies (77.2%), with only 13 participants being employed on a contractual basis (22.8%). Furthermore, none of the participants were reportedly self-employed or employed part-time. With regards to the highest level of education attained by the participants, 15 participants held a bachelor's honours degree (26.3%), 11 participants held a doctoral degree (19.3%), 10 participants held a master's degree (17.5%), six participants held a bachelor's degree (10.5%) or national diploma (10.5%), five participants held a national senior certificate (8.8%), and four participants held a higher certificate (7%).

Table 2*Demographic Characteristics of the Participants*

Sample Characteristic	<i>n</i>	%
Gender		
Male	11	19.3
Female	46	80.7
Other	0	0
Age Group		
18–24	1	1.8
25–34	12	21.1
35–44	12	21.1
45–54	21	36.8
55–64	10	17.5
65 or older	1	1.8
Number of Children		
0	18	31.6
1	11	19.3
2	13	22.8
3	13	22.8
4 or more	2	3.5
Sample Characteristic	<i>n</i>	%

Status of Employment		
Full-time	44	77.2
Part-time	0	0
Contract	13	22.8
Self-employed	0	0
Level of Education		
National senior certificate	5	8.8
National diploma or equivalent	6	10.5
Higher certificate or equivalent	4	7
Bachelor's degree or equivalent	6	10.5
Bachelor's honours degree or equivalent	15	26.3
Master's degree	10	17.5
Doctoral degree	11	19.3

Note. $N = 57$. n = frequency; % = percentage.

Measures

As previously mentioned, the present utilised three surveys, including the General Survey (completed during the week before the first Pre-Weekend Survey), the Pre-Weekend Survey (completed on Fridays), and the Post-Weekend Survey (completed on Mondays). All measures included in each of the surveys were primarily tasked with gathering self-report data from participants. Furthermore, each item was assessed using a Likert scale, unless stated otherwise.

General Survey

The General Survey was purposed at collecting data relating to participants' demographic information (viz., gender, age group, number of children, status of employment, and level of education) and control variables (viz., self-regulatory resources and negative affect).

Self-Regulatory Resources. Perceived self-regulatory resources were measured using the 10-item self-regulation scale (SRS), e.g., "I can concentrate on one activity for a long time, if necessary" (Schwarzer et al., 1999). Responses were recorded on a 4-point Likert scale, ranging from (1) *Not at all true* to (4) *Exactly true* (Schwarzer et al., 1999). The scale was also found to be reliable in the original validation study ($\alpha = .76$; Schwarzer et al., 1999).

Negative Affect. Negative affect was measured using the negative items of the Positive and Negative Affect Schedule (PANAS; Watson et al., 1988). On a 5-point Likert scale, ranging from (1) *Very slightly or not at all* to (5) *Extremely*, participants were required to indicate the extent to which they felt “irritable,” for example, over the past week (Watson et al., 1988). Additionally, the six-item measure was found to be reliable in the original validation study ($\alpha = .88$) as well as in the South African context ($\alpha = .8$; Nell, 2016; Watson et al., 1988).

Pre-Weekend Survey

The Pre-Weekend Survey was purposed at gathering data on participants’ accounts of their weekly job performance, including task performance and work engagement.

Task Performance. Weekly task performance was measured using William and Anderson’s (1991) in-role-behaviour scale. The scale is comprised of seven items (e.g., “I adequately complete the duties that I am assigned to”), to which participants responded using a 5-point Likert scale, ranging from (1) *Strongly disagree* to (5) *Strongly agree*. The scale demonstrated excellent internal consistency in both the Western ($\alpha = .91$) and South African ($\alpha = .91$) contexts (Redelinghuys et al., 2019; Williams & Anderson, 1991).

Work Engagement. Weekly work engagement was measured using the ultra-short version of the Utrecht Work Engagement Scale (UWES-3; Schaufeli et al., 2019). The scale comprises three items (e.g., “I am immersed in my work”) to which participants responded using a 7-point Likert scale, ranging from (1) *Never* to (6) *Daily* (Schaufeli et al., 2019). The scale was found to be reliable in several countries, including South Africa, with internal consistency values (α) ranging from .77 to .85 (Schaufeli et al., 2019).

Post-Weekend Survey

The Post-Weekend Survey **was** purposed at gathering data on participants’ accounts of their weekend recovery (including recovery activities, recovery experiences) and the outcomes thereof (including the state of being recovered and psychological reattachment) and sleep (including sleep quality and weekend catch-up sleep). Unless stated otherwise, all items included in this survey was be measured on a 5-point Likert scale for agreement.

Recovery Activities. Weekend recovery activities were measured using Sonnentag’s (2001) daily procedure. The measure is categorised into two subscales, measuring low-duty profile activities, including low-effort (e.g., “watched television”), social (e.g., “met up with friends or family”), and physical activities (e.g., “exercised”). Furthermore, as mentioned above, the current study also integrated cultural (e.g., “visited a museum”) and religious or spiritual activities (e.g., “prayer and worship”) into the daily procedure. Additionally, the

subscale measuring high-duty profile activities included work-related (e.g., “prepared for work”), household (e.g., “cooked”), and childcare activities (e.g., “assisted with homework”). To complete the modified 23-item daily procedure, participants were required to record the number of hours they spent engaging in each activity over the weekend using a 7-point Likert scale, ranging from (1) *No time spent* to (7) *More than five hours* (Sonnentag, 2001).

Recovery Experiences. Excluding control experiences, weekend recovery experiences were measured using the reduced 12-item Recovery Experiences Questionnaire (REQ; Sonnentag & Fritz, 2007). This measure comprises three, four-item subscales measuring psychological detachment from work (e.g., “I forget about work”), relaxation (e.g., “I kick back and relax”), and mastery experiences (e.g., “I learn new things”; Sonnentag & Fritz, 2007). This measure was found to be reliable in the original validation study, as per the internal consistency for each subscale: psychological detachment ($\alpha = .87$); relaxation ($\alpha = .89$); and mastery ($\alpha = .82$), as well as in the South Africa context: psychological detachment ($\alpha = .84$); relaxation ($\alpha = .86$); mastery ($\alpha = .88$; Els et al., 2015; Sonnentag & Fritz, 2007).

Sleep Quality. Weekend sleep quality was measured using a single item from the Pittsburgh Sleep Quality Index (PSQI), namely, “How do you evaluate the overall quality of your sleep during the weekend?” (Buysse et al., 1989).

Catch-Up Sleep. Weekend catch-up sleep was measured using a single item from the PSQI, namely, “On average, how many hours of actual sleep do you get at night?” (Buysse et al., 1989). To estimate the amount of catch-up sleep that individuals received on weekends, the mean weekend sleep duration (recorded in hours) was subtracted from the mean workday sleep duration. The discrepancy between these amounts thus equated to the amount of weekend catch-up sleep. Accordingly, this item was also included in the Pre-Weekend Survey so that the discrepancy could be calculated.

The State of Being Recovered. The state of being recovered on Monday was measured using Sonnentag and Krueel’s (2006) four-item measure (e.g., “I feel mentally recovered”). The scale was also validated in previous studies with good levels of internal consistency ($\alpha = .87$; $\alpha = .82$; Binnewies et al., 2010; Sonnentag & Krueel, 2006).

Psychological Reattachment. Psychological reattachment to work on Monday was measured using the Sonnentag and Kühnel’s (2016) five-item measure (e.g., “Before I started my work this morning, I prepared mentally for the upcoming workweek”). The measure was also found to be reliable in the original validation study, with excellent levels of internal consistency ($\alpha = .94$; Sonnentag & Kühnel, 2016).

Data Analysis

Quantitative data was analysed using the Statistical Package for Social Sciences (SPSS) version 29 and RStudio version 2024.09.1. SPSS was predominantly used for preliminary analyses due to its user-friendly interface, which allowed simple and efficient analysis of relevant statistics, including descriptive statistics and psychometric analyses. Alternatively, RStudio was primarily used for the multilevel model analyses, as it offered greater flexibility and customisability, allowing for more complex modelling and detailed outputs required for the interpretation of the results. Nevertheless, due to the online format, the surveys were first constructed using Qualtrics (2019) to create the questionnaires and generate reports necessary for data analysis. Upon importing the data from Qualtrics, each survey's data was merged into one dataset and cleaned by removing incomplete data from the dataset. Participants were assigned a unique code, serving as a person-level identifier, thus enabling the matching of their responses across surveys. Moreover, the data was restructured into a long format to prepare it for multilevel analysis. In essence, this allowed the scores to be organised into single rows, with each row representing the respective scores recorded at the corresponding week (Field, 2017).

To evaluate the initial psychometric properties of the scales, the validity of the respective scores was assessed via an exploratory factor analysis (EFA). Furthermore, the internal consistency of each scale was measured via Cronbach's alpha coefficient (α). Descriptive statistics were also extracted in order to examine the characteristics of the dataset, as well as possible trends that might have emerged across measurements (Field, 2017). Prior to the hypothesis testing, the data underwent mean centring, a process that involved transforming the predictor variables around a fixed point (i.e., zero; Field, 2017). Consequently, each predictor variable comprised a mean score of zero, with the observed scores being approximated around this score relative to their original value. Person-level (Level 2) data was centred around the grand mean, whereas data at the week level (Level 1) was centred around the group mean. In multilevel model analysis, mean centring could particularly be a practical method for addressing concerns relating to multicollinearity (Field, 2017). Furthermore, estimates derived from centred predictor variables may also be relatively more stable and independent from each other (Field, 2017).

Ethical Considerations

The participants were assured that their involvement in the study was entirely voluntary and that they had the right to withdraw from the study at any point. Furthermore, no risks were associated with participation, as the participants' identities remained

anonymous. As previously mentioned, upon completion of the General Survey, employees were required to provide their email address should they wish to participate in the study further. By consenting, employees acknowledged the importance of providing their contact details for the study's aims and that they would be receiving subsequent surveys. Essentially, consenting employees were redirected to the Contacts Survey, where they were prompted to provide their email address (see Appendix B). This enabled Qualtrics to temporarily store the email addresses in a separate database, thereby facilitating the automated survey process. Accordingly, Qualtrics then scheduled automated emails for the distribution of the subsequent Pre-Weekend and Post-Weekend surveys at preset times over a period of three weeks. Moreover, this also allowed Qualtrics to link person-level responses across surveys, which was crucial for the longitudinal design of the study. Following the conclusion of data collection, the contact database was deleted. In addition, participants were informed of their right for their responses to remain confidential. Duly, responses were not freely distributed to third parties, including the management of the respective companies, as all data was used exclusively for study purposes only. Furthermore, all data was stored on my password-protected laptop.

Results

This section presents the statistical findings of the study. In essence, preliminary analyses primarily included psychometric, descriptive statistics, and correlation analyses. Moreover, multilevel model analyses were conducted in order to test the hypotheses.

Psychometric Analyses

The preliminary psychometric analyses of the measures employed in this study consisted of two sets of analyses. First, an EFA was conducted to assess the extent to which the scales measured what they claimed to measure, i.e., validity (Field, 2017). Second, the reliability of the scales was assessed to examine the extent to which the individual items of each scale measured the same constructs (Field, 2017).

Exploratory Factor Analysis

An EFA was conducted to assess the underlying factor structure of the measures (Field, 2017). Accordingly, the principal axis factoring (PAF) extraction method was utilised to extract the factors underlying each scale (Tabachnick & Fidell, 2013). The orthogonal (varimax with Kaiser Normalisation) rotational technique was also chosen to minimise the potential of high factor loadings (de Winter & Dodou, 2012). However, it is recommended that two assumptions be met prior to analysis in order to assess the suitability of the data for

factor analysis (Pallant, 2016; Tabachnick & Fidell, 2013). Primarily, these assumptions concern sampling adequacy and the factorability of the data.

Sampling Adequacy. In multilevel modelling, it is imperative to ensure adequate sample sizes at both the higher level (Level 2) and lower level (Level 1) of the data structure. Centrally, this is to ensure reliable estimation of the parameters as well as sufficient statistical power (Scherbaum & Ferreter, 2009). A commonly proposed guideline is Kreft's (1996) 30/30 rule of thumb, which recommends a minimum of 30 groups at the higher level with 30 observations. As mentioned above, the current study comprised a Level 2 sample $n = 57$, with a total of $n = 102$ week-level observations at Level 1. Consequently, an average of 1.79 observations were recorded per individual. While this fell below the group size threshold ($n = 30$), 1710 Level 1 observations were considered an unrealistic group size to obtain, particularly given the longitudinal design of the study. As such, small group sizes are especially common in longitudinal studies, as the number of repeated measures typically represents the group size estimate (Hox & McNeish, 2020). However, research suggests that the number of groups (Level 2 observations) plays a significantly more prominent role in ensuring optimal statistical power and overall sampling adequacy in hierarchical data structures (Maas & Hox, 2005; Scherbaum & Ferreter, 2009). Fundamentally, multilevel models with person-level observations greater than 30 are generally expected to have high intraclass correlation (*ICC*) values. Therefore, the current sample was deemed sufficient to not only detect variability between groups but also to identify effects among the groups (Maas & Hox, 2005). However, it should be noted that the *ICC* and statistical power estimates were calculated only during model fitting; thus, these were reported and interpreted once the respective values were generated during analysis.

In addition, the Kaiser-Meyer-Olkin (*KMO*) measure of sampling adequacy was also utilised to further evaluate the suitability of the data for factor analysis (Tabachnick & Fidell, 2013). Essentially, each scale should yield a *KMO* value greater than .50 (Kaiser & Rice, 1974). As demonstrated in Table C1, each scale was accompanied by *KMO* values greater than this threshold, thereby confirming the sampling adequacy for the analysis.

Factorability of the Correlation Matrix. To assess the factorability of the data, Bartlett's Test of Sphericity was employed. Each scale yielded a statistically significant value ($p < .001$), thus suggesting that the correlations in the dataset were suitable for factor analysis (see Table C1). Therefore, it was concluded that all measures used in this study met this assumption (Bartlett, 1954).

Dimensionality of the Scales. Given the suitability of the data for factor analysis, the underlying factor structure of the scales was assessed via an EFA. Utilising the PAF extraction method, as well as the varimax rotational technique, the factor analysis revealed a unidimensional factor structure underlying most measures employed in this study, including the UWES-3 (Schaufeli et al., 2019), REQ (Sonnentag & Fritz, 2007), Sonnentag and Krueger's (2006) measure of the state of being recovered, and Sonnentag and Kühnel's (2016) measure of psychological reattachment (see Appendix C). However, the factor structures underlying the SRS (Schwarzer et al., 1999), the negative affect scale (Watson et al., 1988), and William and Anderson's (1991) in-role behaviour scale are discussed below.

Self-Regulation Scale. The EFA revealed a bidimensional structure underlying the 10-item SRS, with item five ("It is difficult for me to suppress thoughts that interfere with what I need to do"), item seven ("When I worry about something, I cannot concentrate on an activity"), and item nine ("I have a whole bunch of thoughts and feelings that interfere with my ability to work in a focused way") loading onto a different factor (see Table C2). Notably, these items were negatively worded; consequently, it is possible that they may have been confusing to some participants, leading to varying interpretations and, thus, responses. Interestingly, through its conceptualisation, self-regulation can be understood as a complex set of processes, comprising dispositional attention control and regulation components (Diehl et al., 2006). Ultimately, while this theoretical framework could potentially have explained the two-factor structure observed in the factor analysis of this study, the SRS is expected to be a unidimensional scale, nonetheless, specifically measuring attention control in goal pursuit (Diehl et al., 2006; Schwarzer et al., 1999). Therefore, the items in question were removed.

Negative Affect Scale. The EFA, conducted on the six negative items of the PANAS, revealed a bidimensional structure, with item one ("Irritable"), item two ("Upset"), and item three ("Distressed") loading onto a second factor (see Table C3). While the subscale was expected to have one dimension, it is important to note that each item is derived from up to seven distinct emotional categories, including distressed, angry, and contempt (Watson et al., 1988). Therefore, while all items share an overarching similarity with respect to the measure of dispositional negativity, each item captures unique aspects of negative affect. Consequently, all six items were retained, nonetheless.

In-Role Behaviour Scale. The EFA revealed a bidimensional structure underlying the 6-item scale measuring in-role behaviour, or task performance. In essence, item six ("I neglect aspects of the job that I am obligated to perform") and item seven ("I fail to perform

essential duties”) loaded on a different factor (see Table C4). Similar to the SRS, these items were negatively worded, and, thus, the possibility that these items may have been confusing to some participants was not ruled out. In addition, given that these factor loadings were consistent at all three weeks, these items were thus removed.

Round 2. The EFA, performed on the reduced five-item in-role behaviour scale (Williams & Anderson, 1991), revealed another two-factor structure underlying the scale. For Week 1, in particular, item four (“I meet the formal performance requirements of the job”) cross-loaded onto two factors, whereas item five (“I engage in activities that will directly affect my performance evaluation”) loaded onto a second factor (see Table C5). However, this observation was not consistent at the subsequent measurements, as, interestingly, all items loaded onto one factor at Weeks 2 and 3. Despite the initial two-factor structure, all items were retained for analysis for all weeks, nonetheless. Crucially, research suggests that changes in factor structure are particularly common in studies with longitudinal research designs (Chan, 1998; Golembiewski et al., 1976). In the present study, this change could have been due to an adaptation period in Week 1, which might have reflected participants’ initial adjustments and subsequent familiarity with the survey over time (Golembiewski et al., 1976). Alternatively, possible fluctuations in participants’ recovery levels could have stimulated an intervention effect in performance, triggering a different understanding of task performance (Golembiewski et al., 1976).

Reliability Analyses

To determine the extent to which each item of the respective scales measured the same constructs, the internal consistency of each scale was assessed (Field, 2017). Accordingly, two measures of internal consistency, namely the Cronbach’s alpha (α) coefficient and the corrected-item total correlation, were examined.

Nunnally (1978) proposed that Cronbach’s alpha coefficient values greater than .70 are indicative of good internal consistency. Additionally, the corrected-item total correlation values can be used to determine the extent to which each scale item is correlated with the total scale score (Field, 2017). Field (2017) further suggested that items with values less than .30 may suggest that the item in question may be measuring something different from that of the rest of the scale; therefore, these items should be removed.

Overall, inspection of the internal consistency and corrected item-total correlation values indicated that the majority of the measures employed in this study exhibited adequate reliability. These included the SRS (Schwarzer et al., 1999), the negative affect scale (Watson

et al., 1988), Sonnentag and Krueger's (2006) measure of the state of being recovered, and Sonnentag and Kühnel's (2016) measure of psychological reattachment (see Table C10). However, the reliability estimates for William and Anderson's (1991) in-role behaviour scale, the UWES-3 (Schaufeli et al., 2019), and the REQ (Sonnentag & Fritz, 2007) are discussed below.

In-Role Behaviour Scale. The reduced five-item in-role behaviour scale demonstrated a satisfactory degree of internal consistency across all weeks (Week 1: $\alpha = .79$; Week 2: $\alpha = .90$; Week 3: $\alpha = .81$). However, further inspection of the corrected item-total correlation values did give rise to some concerns. Notably, the corrected item-total correlation estimates for item five ("I engage in activities that will directly affect my performance evaluation"), particularly in Week 1 (.29) and Week 3 (-.29), were below the recommended threshold (.30). This finding suggests that this item may have measured something different from that of the overall scale (Field, 2017). Therefore, it was decided that this item was to be removed.

The Ultra-Short Utrecht Work Engagement Scale. The UWES-3 demonstrated satisfactory internal consistency in Week 1 ($\alpha = .79$) and Week 2 ($\alpha = .72$) and moderate internal consistency in Week 3 ($\alpha = .67$). However, the item-total statistics table indicated a low corrected item-total correlation value (.29) associated with item three ("I am immersed in my work"), in Week 3, particularly. Nevertheless, this item was retained for two reasons. First, the internal consistency of the scale at Week 3 fell marginally short of a satisfactory internal consistency value ($\alpha = .67$) with the item included, nonetheless. Second, given that the scale comprised only three items, each measuring a distinct component of work engagement (viz., vigour, dedication, and absorption; Schaufeli et al., 2002), the removal of this item may have hindered the comparability of the findings obtained from this scale in this study with those of previous studies using the same scale (Borsboom, 2006). Therefore, the third was retained also to preserve its theoretical integrity, thereby ensuring consistent measurement across time points (Little et al., 1999).

The Recovery Experiences Questionnaire. The 12-item REQ demonstrated adequate internal consistency in Week 1 ($\alpha = .80$), Week 2 ($\alpha = .89$), and Week 3 ($\alpha = .78$). However, further inspection of the item-total statistics revealed low corrected item-total correlation values for item 11 ("I do things that challenge me"), particularly in Week 1 (.29) and Week 3 (.19). Notwithstanding, for reasons analogous to those previously outlined in the context of the UWES-3, the decision was taken to retain this item across all three weeks. In essence, the decision to retain this item was partly made to preserve the theoretical integrity

of the scale, especially across measurements (Borsboom, 2006; Little et al., 1999). Moreover, apart from the overall satisfactory level of internal consistency observed at each measurement, further examination of internal consistency values of item 11, in particular, revealed that the removal of this item would not result in considerable improvements in the reliability of the scale, as the internal consistency would have remained largely unchanged, nonetheless.

Descriptive Statistics

The following section provides an overview of the data and identifies trends that emerged from the data. The overarching characteristics of the data are outlined below, including their measures of central tendency, variability, and distribution. Furthermore, the mean scores of each scale were analysed in relation to their respective midpoints. In essence, a mean score that exceeds the midpoint indicates higher levels of the variable of interest at the corresponding level, whereas a mean score that is below the midpoint indicates lower levels of the variable of interest. The person-level, week-level, and the descriptive statistics for the overall dataset are provided in Appendix D.

Notably, the following variables demonstrated mean scores that were above their respective midpoints: self-regulatory resources, task performance, work engagement, recovery experiences, the state of being recovered, and psychological reattachment. On weekends, individuals reportedly engaged in 8 hr of high-duty activities during their leisure time, with household activities being the most popular activity of choice (approximately 4 hr), followed by childcare activities (approximately 2 hr) and work-related activities (approximately 1 hr; see Table D2). Conversely, approximately 11 hr were reportedly spent engaging in low-duty activities, with low-effort activities being the most popular activities of choice (approximately 3 hr), followed by social activities (approximately 2 hr) and cultural activities (approximately 2 hr). The current sample was found to be predominantly culturally and religiously or spiritually active. As illustrated in Table D4, 87.7% of the sample were presumably culturally active, and 78.9% of the sample were presumably religiously or spiritually active.

During working weeks, the mean duration of sleep per night was approximately 6.52 hr, whereas an average of 6.68 hr of sleep was recorded at weekends (see Table D2). This resulted in an approximate weekend catch-up sleep duration of .15 hr. Interestingly, as shown in Table D3, Week 1 exhibited the highest weekend catch-up sleep duration ($M = .45$), which gradually decreased in Week 2 ($M = .10$) and Week 3 ($M = -.24$). Concurrently, there was a

gradual decline in the quality of weekend sleep over the three-week period (Week 1: $M = 2.91$; Week 2: $M = 2.72$; Week 3: $M = 2.72$).

Inspection of the descriptive statistics concerning recovery experiences indicated that, on average, participants reported the relatively highest levels of relaxation on weekends ($M = 3.56$), followed by mastery ($M = 3.52$) and psychological detachment ($M = 2.80$; see Table D1). Furthermore, the week-level variability in mean recovery experiences scores (see Table D3) exhibited an increase from Week 1, standard deviation ($SD = .66$) to Week 2 ($SD = .86$), followed by a decrease during Week 3 ($SD = .67$). Interestingly, this trend was found to be consistent with several other variables, including psychological reattachment (Week 1: $SD = .82$; Week 2: $SD = 1.08$; Week 3: $SD = 1.02$); however, it was inconsistent with, for instance, the state of being recovered, which exhibited a more stable, gradual increase in variability over the three weeks (Week 1: $SD = .88$; Week 2: $SD = 1.15$; Week 3: $SD = 1.19$).

Significantly, these findings are indicative of the volatility of recovery, particularly regarding its variation between persons. The findings further elucidate the most suitable model fit procedure for the current study, with particular reference to the selected covariance structure, a topic that is addressed in the subsequent section.

In relation to the work-related outcomes of recovery, a notable trend emerged during the inspection of the mean scores for work engagement ($M = 4.24$) and task performance ($M = 4.35$), in particular (see Table D1). Given that these scores were noticeably higher than their respective midpoints, it was concluded that ceiling effects were present among the dataset. In the context of self-report surveys, ceiling effects emerge when a substantial portion of respondents report the highest possible scores within the provided range (Austin & Brunner, 2003). While this trend was not a cause for particular concern, it was nevertheless noteworthy, given its implication for the distributional trend of the data obtained by the scales in question, as well as the potential impact on the overall results.

Correlation Analyses

Table 3 presents the strength and direction of the relationships between the variables of interest. Given that a total of 27 variables were examined throughout the duration of the study, only the variables that were core to the study's primary hypotheses were included in the table below. Fundamentally, the directions of the correlation are illustrated via positive or negative estimates associated with the respective relationships. Moreover, the strengths of the correlation were evaluated in accordance with Cohen's (1998) indices for effect size (refer to Table 3 for guidelines).

As demonstrated in Table 3 below, high-duty activities exhibited a moderate negative correlation with psychological reattachment and self-regulatory resources at the person level, and a weak negative correlation with task performance. Furthermore, significant person-level correlations were identified for low-duty activities, which demonstrated a strong positive correlation with cultural activities and moderately positive correlations with religious and spiritual activities, catch-up sleep, recovery experiences, the state of being recovered, psychological reattachment, and task performance. Alternatively, low-duty activities were also found to be strongly positively correlated with psychological reattachment and work engagement at the week level.

Further inspection of the individual activities indicated that cultural activities exhibited a significant, moderately positive correlation with recovery experiences, the state of being recovered, and psychological reattachment, all of which were observed at the person level. Moreover, religious and spiritual activities demonstrated a weak and strong positive correlation with psychological reattachment at the person level and week level, respectively. Inspection of the correlation estimates for sleep characteristics revealed that sleep quality was strongly positively correlated with the state of being recovered and task performance at the person level, moderately positively correlated with catch-up sleep and recovery experiences, and demonstrated a weak positive correlation with psychological reattachment.

Person-level correlations further indicated that recovery experiences were positively correlated with the state of being recovered and work engagement via strong and moderate effects, respectively. Furthermore, task performance exhibited strong positive correlations with the state of being recovered at both the person level and the week level, whereas a strong positive correlation with psychological reattachment was only observed at the person level.

Table 3*Person-Level and Week-Level Zero-Order Correlations*

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. High-Duty Activities	–	-.40	-.19	-.29	-.92	-.99	-.86	-.75	-.35	-.72	-.45		
2. Low-Duty Activities	-.22	–	.83	.99	.73	.50	.81	.91	.99*	.93	.99*		
3. Cultural Activities	-.15	.68**	–	.89	.21	.07	.34	.51	.86	.55	.79		
4. Religious and Spiritual Activities	-.13	.47**	.15	–	.64	-.39	.73	.85	.99*	.87	.98		
5. Sleep Quality	-.16	.21	.13	.16	–	.96	.99	.95	.69	.93	.77		
6. Weekend Catch-Up Sleep	-.01	.31*	.04	-.02	.30*	–	.91	.82	-.45	-.79	-.55		
7. Recovery Experiences	-.16	.48**	.34**	.17	.40**	.17	–	.98	.78	.97	.84		
8. The State of Being Recovered	-.01	.32*	.40**	.21	.65**	.16	.56**	–	.88	.99*	.93		
9. Psychological Reattachment	-.38**	.37**	.37**	.28*	.26*	-.02	.15	.33*	–	.90	.99		
10. Task Performance	-.27*	.30*	.22	.23	.55**	-.12	.19	.52**	.55**	–	.95		
11. Work Engagement	-.01	.03	.02	.13	.08	-.01	.36**	.36**	.21	.10	–		
12. Self-Regulation	-.34**	.07	.04	.01	.07	-.04	.01	.11	.25	.32*	.11	–	
13. Negative Affect	.10	-.05	-.03	-.11	-.06	.05	-.07	-.00	-.09	-.08	-.14	-.56**	–

Note. Correlations below the diagonal are person-level correlations ($n = 57$), with correlations $|r| \geq .22$ being significant at $p < .05$ and correlations of $|r| \geq .31$ being significant at $p < .01$. Correlations above the diagonal are week-level correlations ($n = 102$), with correlations $|r| \geq .16$ being significant at $p < .05$ and correlations of $|r| \geq .23$ being significant at $p < .01$. * $p < .05$; ** $p < .01$; *** $p < .001$. Weak correlation = $.10 < r < .29$ (small effect); moderate correlation = $.30 < r < .49$ (medium effect); strong correlation = $.50 < r < 1.00$ (large effect).

Multilevel Model Analyses

To test the hypotheses and thereby examine the relationships between the variables of interest at different hierarchical levels, a multilevel model analysis was conducted (Hox et al., 2017). Fundamentally, the hypothesised relationships concerned the amount of time spent engaging in low-duty and high-duty leisure activities and weekend recovery experiences, as well as sleep characteristics and how they related to these experiences (hypotheses 1a–1f); weekend recovery experiences and the recovery-related outcomes (including the state of being recovered and psychological reattachment to work) on Monday (hypotheses 2a and 2b); and the recovery-related outcomes on Monday and weekly job performance, including task performance and work engagement (hypotheses 3a and 3b).

Model Development Procedure

To test the hypotheses, three models were compared: the Null Model, which only included the intercept as the predictor; Model 1, which included all person-level control variables (including self-regulatory resources and negative affect) as well as demographic variable data (including gender, age group, number of children, employment status, and level of education); and Model 2, which included all person-level data, as well as the relevant week-level predictors.

In multilevel model analysis, it is vital that models are fitted with the appropriate covariance structure (Luo et al., 2021). This ensures that models are able to account for the level of dependency between repeated measures of the same variables (Field, 2017). However, in longitudinal studies, error structures are often assumed to be independent or have constant variance at each measure (Luo et al., 2021). Consequently, this may result in model bias at both the random and fixed effects, leading to increased Type I error and a reduction in statistical power (LeBeau et al., 2018; Luo et al., 2021). Given the longitudinal design, with repeated measures, employed in this study, it is recommended that the first-order autoregressive covariance structure (AR[1]) be utilised, as this structure assumes that the correlations between scores decrease over time (Field, 2017). Research has shown that, irrespective of the model's underlying error structure, an AR(1) structure generates the smallest amounts of bias in longitudinal research designs (Kwok et al., 2007; LeBeau et al., 2018; Luo et al., 2021). Nevertheless, the correlation values between the time points for each outcome variable were compared to determine whether this trend was, in fact, evident in the current dataset. As illustrated in Appendix D, the strength of the correlations clearly exhibited a progressive decline between time points. In essence, these trends were indicative of temporal stability across weeks, supporting the use of an AR(1) covariance structure.

However, as illustrated in Table D8, this trend was not consistent with bivariate correlation scores for task performance. Crucially, the low, non-significant correlations observed in this table indicated weak temporal dependency across weeks. Therefore, a variance components (VC) structure was selected for this variable.

Model Estimation Procedure

The models were fit using the *nlme* package in RStudio, version 2024.09.1. The *nlme* package (short for non-linear and mixed-effects) is a widely used package that estimates a variety of models with data that is both nested in groups and gathered over time (Pinheiro & Bates, 2006). Given the longitudinal research design employed in this study, the utilisation of this packages was therefore deemed appropriate for the estimation of the models. Moreover, linear mixed-effects models were fit using the *lme* function, as provided by the *nlme* package, which allowed the inclusion of fixed effects and random effects in the model structure. Essentially, this enabled the capturing of week-level trends and between-person variance, which, in turn, provided a more nuanced perspective of the data (Pinheiro et al., 2025). By default, models were fit via restricted maximum likelihood (REML) estimation. Nevertheless, REML is generally considered the preferred approach, particularly in models with nested data structures, as it often yields estimates of variance and fixed effects that are less biased (Snijders & Bosker, 2011; Twisk, 2006). However, given the total number of dependent variables (i.e., 20 dependent variables, excluding categorical demographic data) examined in this study, it was possible for non-convergence to arise during model estimation (Field, 2017).

Essentially, convergence issues arise when the model estimation instrument reaches its maximum number of iterations without managing to find a solution to the model or effect between variables (Finch et al., 2019). Therefore, to circumvent potential convergence issues that might have arisen due to model complexity, the maximum number of iterations for the REML estimation was increased from 100 to 1000, using the *lmeControl* function (Finch et al., 2019; Pinheiro et al., 2025). Nevertheless, no convergence issues were encountered during model estimation, which may have indicated model stability and the suitability of both the selected estimation method (viz., REML) and covariance structures (viz., AR[1] and VC; Field, 2017; Heck et al., 2014). See Appendix E for the multilevel model fit syntaxes.

Fixed effects were examined using the regression coefficient (β) and standard error (*SE*) to compute the t-statistic (*t*). Additionally, *t* was associated with a p-value (*p*) in order to ascertain the statistical significance of the explained variance in each model (Field, 2017). Alternatively, random effects were assessed via variance estimation (including within-person

[σ^2] variance, between-person [τ_{00}] variance, the *ICC*, and marginal R^2) and variation estimation (including the *SD*). Furthermore, model fit indices, including Akaike's Information Criterion (*AIC*), Bayesian Information Criterion (*BIC*), and model deviance ($-2LL$), were examined for model fit comparisons across nested models (Heck et al., 2014). In essence, the lower the model deviance, the better the model is able to fit the data (Heck et al., 2014). It should also be noted that, unless stated otherwise, all multilevel model tables were generated using the *sjPlot* package in RStudio (see Figure E6 for model fit procedure).

Prior to the analyses of the models, however, the assumptions of multilevel model analyses were tested to evaluate the appropriateness of the analysis for the current dataset.

Assumptions of Multilevel Models

The majority of the outcome variables (namely, recovery experiences, the state of being recovered, and work engagement) demonstrated compliance with the assumptions of multilevel models (including normality, linearity, and homogeneity of variances). However, minor assumption violations were observed in psychological reattachment and task performance (see Appendix F). These included violations of the assumptions of normality and homoscedasticity of variances. Despite the robustness of multilevel models to assumption violations, particularly those employing the REML estimation method (Field, 2017; Finch, 2017), a systematic approach was adopted to address these violations, thereby ensuring the accuracy of parameter estimates for these models. To this end, these violations were addressed through the screening of potential outliers in the models, as well as data transformations (see Appendix G).

Results from Multilevel Model Analyses

Following the procedure for rectifying assumption violations, it was determined that minor residual violations persisted for the variables in question, namely, psychological reattachment and task performance. Nevertheless, given the substantial improvements observed in the stability of the models, it was concluded that the overall robustness of multilevel models to these deviations was sufficient to proceed with the analyses. This decision was also made in consideration of the notably high statistical power estimates observed in each model (see Appendix H). In addition, given the limitations of conducting multilevel model analyses in RStudio, particularly pertaining to the exclusion of crucial parameter estimates (such as *ICC*, variance, and model deviance estimates), these values were calculated separately in RStudio and exported to the models.

As previously mentioned, each hypothesis was tested using three models (*viz.*, the Null Model, Model 1, and Model 2). However, it should also be noted that the interpretations

of the results below focus exclusively on Model 2. While the Null Model and Model 1 estimates provided valuable insight into variance components and baseline effects of the intercepts and person-level variables, Model 2 served as the best representation of the hypothesised relationships, given the inclusion of the week-level predictors particularly in this model.

Hypothesis 1: Recovery Activities and Sleep and Weekend Recovery Experiences

Table 4 presents the parameter estimates of the multilevel model analysis with weekend recovery experiences as the outcome variable. Results indicated that low-duty activities were the only significant positive predictor of recovery experiences, $\beta = .06$, 95% CI [.03, .08], $SE = .01$, $t(37) = 4.07$, $p < .001$. Further inspection of the fixed effects estimates revealed that neither of the person-level variables (including gender, age group, number of children, employment status, level of education, self-regulation, and negative effect) significantly predicted recovery experience ($p > .05$). Variance estimates for Level 1 and 2 were .07 and .40, respectively, indicating that recovery experiences explained a large amount of variance at the person level, in particular, with 85% of the variance being attributable to between-person differences. Furthermore, model fit estimates revealed that the inclusion of these predictors further improved model fit ($AIC = 293.02$, $BIC = 293.02$, $-2LL = 175.38$). The marginal R^2 estimate was .31, indicating that 31% of the variance was explained by the fixed effects. In addition, the effect size for the model was .45, representing a medium effect.

As reflected in the findings above, Hypothesis 1a (*low-duty activities positively predict weekend recovery experiences*) was supported. however, Hypothesis 1d (*high-duty activities negatively predict weekend recovery experiences*), Hypothesis 1e (*sleep quality positively predicts weekend recovery experiences*), and Hypothesis 1f (*weekend catch-up sleep positively predicts recovery experiences*) were not supported.

Table 4

Multilevel Estimates for Models Predicting Recovery Experiences

	Null Model					Model 1					Model 2				
	Estimate	SE	95% CI		t	Estimate	SE	95% CI		t	Estimate	SE	95% CI		t
			LL	UL				LL	UL				LL	UL	
Fixed Effects															
(Intercept)	3.27	.10	3.07	3.46	33.2***	3.11	.36	2.39	3.84	8.61***	3.29	.32	2.65	3.93	10.41***
Gender ^a						.38	.34	-.30	1.07	1.13	.18	.29	-.42	.78	.61
Age						.29	.85	-1.42	2.01	.35	-.24	.74	-1.74	1.26	-.32
Number of Children						.08	.44	-.80	.97	.19	.04	.38	-.72	.80	.10
Status of Employment ^b						-.06	.31	-.68	.56	-.19	-.02	.26	-.55	.52	-.07
Level of Education						.24	.35	-.46	.95	.70	.28	.30	-.33	.89	.93
Self-Regulation						.14	.26	-.39	.67	.55	.10	.23	-.37	.57	.44
Negative Affect						.05	.17	-.29	.39	.31	.00	.14	-.30	.29	-.02
Low-Duty Activities											.06	.01	.03	.08	4.07***
High-Duty Activities											-.02	.02	-.05	.01	-1.05
Sleep Quality											.13	.09	-.05	.32	1.43
Catch-Up Sleep											.03	.04	-.05	.10	.72
Random Effects															
σ^2			.12					.11					.07		
τ_{00}			.47					.53					.40		
ICC			.80					.83					.85		

	Null Model	Model 1	Model 2
	Estimate	Estimate	Estimate
Model Fit			
-2LL	183.52	179.66	175.38
AIC	191.52	225.66	293.02
BIC	201.98	281.02	293.02
R ²	0	.20	.31
f ²	0	.26	.45
df	57	37	37

Note. *SE* = standard error; *CI* = confidence interval; *LL* = lower level; *UL* = upper level; *t* = t-statistic; σ^2 = Level 1 variance; τ_{00} = Level 2 variance; *ICC* = interclass correlation; -2LL = model deviance; *AIC* = Akaike's Information Criterion; *BIC* = Bayesian Information Criterion; *R*² = coefficient of determination; *f*² = effect size; *df* = degrees of freedom.

Person-level *N* = 57; week-level *N* = 102.

^a 0 = female; 1 = male.

^c 0 = full-time; 1 = part-time; 3 = contract.

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

As illustrated in Table 4, the individual weekend recovery activities were not explicitly included in the model. Instead, high-duty activities were presented as the sum of the number of hours spent engaging in work-related, household, and childcare activities. Moreover, low-duty activities were presented as the sum of the number of hours spent engaging in low-effort, social, physical, cultural, and religious and spiritual activities. Essentially, this ensured that the model was not overcomplicated, thereby compromising model fit, convergence, and multicollinearity.

To test Hypothesis 1b (*cultural activities positively predict weekend recovery experiences*) and Hypothesis 1c (*religious and spiritual activities positively predict weekend recovery experiences*), a multilevel model analysis was conducted with each of the leisure activities as predictors of weekend recovery experiences. As illustrated in Table 5, results indicated that work-related activities were found significant negative predictors of recovery experiences, $\beta = -.07$, 95% CI [-.13, -.01], $SE = .03$, $t(37) = -2.53$, $p < .05$. Conversely, physical activities were found to be the most robust positive predictor of recovery experiences, $\beta = .08$, 95% CI [.01, .15], $SE = .03$, $t(37) = 2.43$, $p < .05$, which was followed closely by cultural activities, $\beta = .09$, 95% CI [.01, .16], $SE = .04$, $t(37) = 2.40$, $p < .05$. Further inspection of the fixed effects estimates revealed that neither of the person-level variables (including gender, age group, number of children, employment status, level of education, self-regulation, and negative effect) significantly predicted recovery experience ($p > .05$). Variance estimates for Level 1 and 2 were .07 and .44, respectively, indicating that recovery experiences explained a large amount of variance at the person level, in particular, with 87% of the variance being attributable to between-person differences. Furthermore, model fit estimates revealed that the inclusion of these predictors further improved model fit ($AIC = 251.22$, $BIC = 322.64$, $-2LL = 189.22$). The marginal R^2 estimate was .31, indicating that 31% of the variance was explained by the fixed effects. In addition, the effect size for the model was .44, representing a medium effect.

As reflected in the findings above, Hypothesis 1b (*cultural activities positively predict weekend recovery experiences*) was supported. However, Hypothesis 1c (*religious and spiritual activities positively predict weekend recovery experiences*) was not supported.

Table 5

Multilevel Estimates for Models Predicting Recovery Experiences

	Null Model					Model 1					Model 2				
	Estimate	SE	95% CI		t	Estimate	SE	95% CI		t	Estimate	SE	95% CI		t
			LL	UL				LL	UL				LL	UL	
Fixed Effects															
(Intercept)	3.27	.10	3.07	3.46	33.2***	3.11	.36	2.39	3.84	8.61***	3.29	.32	2.65	3.93	10.41***
Gender ^a						.38	.34	-.30	1.07	1.13	.18	.29	-.42	.78	.61
Age						.29	.85	-1.42	2.01	.35	-.24	.74	-1.74	1.26	-.32
Number of Children						.08	.44	-.80	.97	.19	.04	.38	-.72	.80	.10
Status of Employment ^b						-.06	.31	-.68	.56	-.19	-.02	.26	-.55	.52	-.07
Level of Education						.24	.35	-.46	.95	.70	.28	.30	-.33	.89	.93
Self-Regulation						.14	.26	-.39	.67	.55	.10	.23	-.37	.57	.44
Negative Affect						.05	.17	-.29	.39	.31	.00	.14	-.30	.29	-.02
Work-Related											-.07	.03	-.13	-.01	-2.53*
Household											-.01	.03	-.07	.06	-.28
Childcare											.02	.04	-.06	.10	.47
Low-Effort											.05	.04	-.03	.12	1.29
Social											.03	.03	-.03	.09	.93
Physical											.08	.03	.01	.15	2.43*
Cultural											.09	.04	.01	.16	2.40*
Religious and Spiritual											.08	.05	-.03	.18	1.43

	Null Model	Model 1	Model 2
	Estimate	Estimate	Estimate
Random Effects			
σ^2	.12	.11	.07
τ_{00}	.47	.53	.44
<i>ICC</i>	.80	.83	.87
Model Fit			
<i>-2LL</i>	183.52	179.66	189.22
<i>AIC</i>	191.52	225.66	251.22
<i>BIC</i>	201.98	281.02	322.64
R^2	0	.20	.31
f^2	0	.26	.44
<i>df</i>	57	37	37

Note. *SE* = standard error; *CI* = confidence interval; *LL* = lower level; *UL* = upper level; *t* = t-statistic; σ^2 = Level 1 variance; τ_{00} = Level 2 variance; *ICC* = interclass correlation; *-2LL* = model deviance; *AIC* = Akaike's Information Criterion; *BIC* = Bayesian Information Criterion; R^2 = coefficient of determination; f^2 = effect size; *df* = degrees of freedom.

Person-level $N = 57$; week-level $N = 102$.

^a 0 = female; 1 = male.

^b 0 = full-time; 1 = part-time; 3 = contract.

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

Hypothesis 2a: Weekend Recovery Experiences and the State of Being Recovered on Monday

Table 6 presents the parameter estimates of the multilevel model analysis with the state of being recovered as the outcome variable. Results indicated that weekend recovery experiences were significant predictors of the state of being recovered, $\beta = .75$, 95% CI [.44, 1.07], $SE = .15$, $t(37) = 4.88$, $p < .001$. Further inspection of the fixed effects estimates revealed that neither of the person-level variables (including gender, age group, number of children, employment status, level of education, self-regulation, and negative effect) significantly predicted the state of being recovered ($p > .05$). Variance estimates for Level 1 and 2 were .47 and .40, respectively, indicating that recovery experiences explained a large amount of variance at both the week level and person level, with 54% of the variance being attributable to between-person differences. Furthermore, model fit estimates revealed that the inclusion of this predictor variable further improved model fit ($AIC = 294.02$, $BIC = 349.10$, $-2LL = 248.02$). The marginal R^2 estimate was .34, indicating that 34% of the variance was explained by the fixed effects. In addition, the effect size for the model was .50, representing a large effect.

As reflected in the findings above, Hypothesis 2a (*weekend recovery experiences positively predict the state of being recovered on Monday*) was supported.

Table 6

Multilevel Estimates for Models Predicting the State of Being Recovered

	Null Model					Model 1					Model 2					
	Estimate	SE	95% CI		t	Estimate	SE	95% CI		t	Estimate	SE	95% CI		t	
			LL	UL				LL	UL				LL	UL		
Fixed Effects																
(Intercept)	3.05	0.13	2.78	3.31	23.31***	2.65	.51	1.63	3.67	5.24***	2.76	.41	1.94	3.58	6.79***	
Gender ^a						-.43	.47	-1.39	.52	-.92	-.15	.38	-.93	.63	-.39	
Age						-.97	1.19	-3.39	1.45	-.81	-.77	.97	-2.73	1.19	-.79	
Number of Children						.14	.61	-1.09	1.37	.24	.20	.48	-.77	1.17	.42	
Status of Employment ^b						.29	.42	-.56	1.15	.70	.21	.33	-.46	.88	.64	
Level of Education						.04	.48	-.94	1.02	.09	.24	.39	-.54	1.02	.61	
Self-Regulation						.41	.36	-.32	1.14	1.13	.28	.29	-.30	.86	.98	
Negative Affect						-.08	.23	-.54	.39	-.32	-.03	.19	-.40	.35	-.14	
Recovery Experiences											.75	.15	.44	1.07	4.88***	
Random Effects																
σ^2			.42					.41					.40			
τ_{00}			.71					.88					.47			
ICC			.63					.68					.54			
Model Fit																
-2LL			183.52					179.66					175.38			
AIC			191.52					225.66					293.02			
BIC			201.98					281.02					293.02			

	Null Model	Model 1	Model 2
	Estimate	Estimate	Estimate
R^2	0	.20	.31
f^2	0	.16	.50
df	57	37	37

Note. SE = standard error; CI = confidence interval; LL = lower level; UL = upper level; t = t-statistic; σ^2 = Level 1 variance; $\tau00$ = Level 2 variance; ICC = interclass correlation; $-2LL$ = model deviance; AIC = Akaike's Information Criterion; BIC = Bayesian Information Criterion; R^2 = coefficient of determination; f^2 = effect size; df = degrees of freedom.

Person-level $N = 57$; week-level $N = 102$.

^a 0 = female; 1 = male.

^b 0 = full-time; 1 = part-time; 3 = contract.

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

Hypothesis 2b: Weekend Recovery Experiences and Psychological Reattachment on Monday

Table 7 presents the parameter estimates of the multilevel model analysis with psychological reattachment as the outcome variable. Results indicated that weekend recovery experiences were not significant predictors of psychological reattachment, $\beta = .12$, 95% CI [-.02, .27], $SE = .07$, $t(37) = 1.71$, $p = .09$. Further inspection of the fixed effects estimates revealed that age was the only person-level variable that significantly negatively predicted psychological reattachment, $\beta = -.93$, 95% CI [-1.88, 0], $SE = .46$, $t(37) = -2.03$, $p < .05$. Variance estimates for Level 1 and 2 were .07 and .13, respectively, indicating that recovery experiences explained a large amount of variance at both the week level and person level, with 65% of the variance being attributable to between-person differences. Furthermore, model fit estimates revealed that the inclusion of this predictor improved model fit ($AIC = 163.22$, $BIC = 218.29$, $-2LL = 117.22$). The marginal R^2 estimate was .22, indicating that 22% of the variance was explained by the fixed effects. In addition, the effect size for the model was .29, representing a small effect.

As reflected in the findings above, Hypothesis 2b (*weekend recovery experiences positively predict psychological reattachment to work on Monday*) was not supported.

Table 7

Multilevel Estimates for Models Predicting Psychological Reattachment

	Null Model					Model 1					Model 2				
	Estimate	SE	95% CI		t	Estimate	SE	95% CI		t	Estimate	SE	95% CI		t
			LL	UL				LL	UL				LL	UL	
Fixed Effects															
(Intercept)	2.05	0.06	1.93	2.16	37.09***	2.16	.20	1.75	2.56	10.72***	2.18	.20	1.78	2.57	11.06***
Gender ^a						.09	.19	-.29	.47	.46	.13	.19	-.24	.51	.72
Age						-.98	.47	-1.94	-.02	-2.07*	-.94	.46	-1.88	.00	-2.03*
Number of Children						-.40	.24	-.89	.09	-1.67	-.39	.23	-.87	.08	-1.67
Status of Employment ^b						.15	.17	-.18	.49	.92	.15	.16	-.18	.47	.89
Level of Education						.20	.19	-.19	.59	1.03	.23	.19	-.15	.61	1.20
Self-Regulation						.12	.14	-.17	.41	.87	.11	.14	-.18	.39	.76
Negative Affect						-.13	.09	-.31	.06	-1.40	-.12	.09	-.30	.06	-1.35
Recovery Experiences											.12	.07	-.02	.27	1.71
Random Effects															
σ^2			.07					.07					.07		
τ_{00}			.13					.14					.13		
ICC			.63					.66					.65		
Model Fit															
-2LL			101.85					116.64					117.22		
AIC			107.85					160.64					163.22		
BIC			115.69					213.59					218.29		

	Null Model	Model 1	Model 2
	Estimate	Estimate	Estimate
R^2	0	.20	.22
f^2	0	.25	.29
df	57	37	37

Note. SE = standard error; CI = confidence interval; LL = lower level; UL = upper level; t = t-statistic; σ^2 = Level 1 variance; $\tau00$ = Level 2 variance; ICC = interclass correlation; $-2LL$ = model deviance; AIC = Akaike's Information Criterion; BIC = Bayesian Information Criterion; R^2 = coefficient of determination; f^2 = effect size; df = degrees of freedom.

Person-level $N = 57$; week-level $N = 102$.

^a 0 = female; 1 = male.

^b 0 = full-time; 1 = part-time; 3 = contract.

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

Hypothesis 3a: The Recovery-Related Outcomes on Monday and Weekly Task Performance

Table 8 presents the parameter estimates of the multilevel model analysis with task performance as the outcome variable. Results indicated that the state of being recovered ($\beta = .12$, 95% CI [.03, .21], $SE = .04$, $t[37] = 2.74$, $p < .01$) and psychological reattachment ($\beta = .32$, 95% CI [.10, .54], $SE = .11$, $t[37] = 2.93$, $p < .01$) significantly predicted task performance. Further inspection of the fixed effects estimates revealed that the number of children ($\beta = .43$, 95% CI [.08, .79], $SE = .18$, $t[37] = 2.46$, $p < .05$) and self-regulation ($\beta = .22$, 95% CI [.01, .43], $SE = .10$, $t[37] = 2.16$, $p < .05$) were among the person-level variables that significantly predicted task performance. Variance estimates for Level 1 and 2 were .16 and 0, respectively, indicating that task performance only explained a large amount of variance at the week level, with 0% of the variance being attributable to between-person differences. Furthermore, model fit estimates revealed that the inclusion of the week-level predictors further improved model fit ($AIC = 184.18$, $BIC = 241.35$, $-2LL = 136.18$). The marginal R^2 estimate was .34, indicating that 34% of the variance was explained by the fixed effects. In addition, the effect size for the model was .51, representing a large effect.

As reflected in the findings above, Hypothesis 3a (*the recovery-related outcomes on Monday positively predict weekly task performance*) was supported.

Table 8

Multilevel Estimates for Models Predicting Task Performance

	Null Model					Model 1					Model 2				
	Estimate	SE	95% CI		t	Estimate	SE	95% CI		t	Estimate	SE	95% CI		t
			LL	UL				LL	UL				LL	UL	
Fixed Effects															
(Intercept)	2.24	.05	2.14	2.34	46.32***	1.72	.18	1.36	2.08	9.63***	1.80	.16	1.48	2.11	11.45***
Gender ^a						-.37	.16	-.70	-.04	-2.29*	-.24	.14	-.53	.05	-1.67
Age						-1.01	.45	-1.92	-.11	-2.26*	-.54	.40	-1.35	.27	-1.35
Number of Children						.31	.20	-.10	.72	1.55	.43	.18	.08	.79	2.46*
Status of Employment ^b						-.06	.14	-.34	.21	-.45	-.11	.11	-.34	.12	-1.00
Level of Education						-.11	.16	-.43	.22	-.66	-.22	.14	-.50	.06	-1.61
Self-Regulation						.30	.12	.07	.54	2.60**	.22	.10	.01	.43	2.16*
Negative Affect						-.03	.08	-.19	.12	-.43	.00	.07	-.13	.14	.07
State of Being Recovered											.12	.04	.03	.21	2.74**
Psychological Reattachment											.32	.11	.10	.54	2.93**
Random Effects															
σ^2			.19					.19					.16		
τ_{00}			.02					.02					0		
ICC			.11					.08					0		

	Null Model	Model 1	Model 2
	Estimate	Estimate	Estimate
Model Fit			
<i>-2LL</i>	138.62	116.64	117.22
<i>AIC</i>	144.62	160.64	163.22
<i>BIC</i>	152.53	213.59	218.29
<i>R</i> ²	0	.20	.22
<i>f</i> ²	0	.24	.51
<i>df</i>	57	37	37

Note. *SE* = standard error; *CI* = confidence interval; *LL* = lower level; *UL* = upper level; *t* = t-statistic; σ^2 = Level 1 variance; τ_{00} = Level 2 variance; *ICC* = interclass correlation; *-2LL* = model deviance; *AIC* = Akaike's Information Criterion; *BIC* = Bayesian Information Criterion; *R*² = coefficient of determination; *f*² = effect size; *df* = degrees of freedom.

Person-level *N* = 57; week-level *N* = 102.

^a 0 = female; 1 = male.

^b 0 = full-time; 1 = part-time; 3 = contract.

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

Hypothesis 3b: The Recovery-Related Outcomes on Monday and Weekly Work Engagement

Table 9 presents the parameter estimates of the multilevel model analysis with work engagement, as the outcome variables. Results indicated that psychological reattachment significantly predictor of work engagement, $\beta = .16$, 95% CI [-.04, .36], $SE = .10$, $t(37) = 1.59$, $p < .05$. Further inspection of the fixed effects estimates revealed that age significantly predicted work engagement, $\beta = 2.31$, 95% CI [-4.05, -.20], $SE = .95$, $t(37) = 2.24$, $p < .05$. Variance estimates for Level 1 and 2 were .47 and .34, respectively, indicating that work engagement explained a large amount of variance at both the week level and person level, with 42% of the variance being attributable to between-person differences. Furthermore, model fit estimates revealed that the inclusion of the week-level predictors further improved model fit ($AIC = 298.61$, $BIC = 355.78$, $-2LL = 250.61$). The marginal R^2 estimate was .21, indicating that 21% of the variance was explained by the fixed effects. In addition, the effect size for the model was .2, representing a small effect.

As reflected in the findings above, Hypothesis 3b (*the recovery-related outcomes on Monday positively predict weekly work engagement*) was partially supported.

Table 9

Multilevel Estimates for Models Predicting Work Engagement

	Null Model					Model 1					Model 2				
	Estimate	SE	95% CI		t	Estimate	SE	95% CI		t	Estimate	SE	95% CI		t
			LL	UL				LL	UL				LL	UL	
Fixed Effects															
(Intercept)	4.24	.11	4.02	4.44	40.12***	4.64	.41	3.82	5.45	11.40***	4.76	.39	3.98	5.55	12.31***
Gender ^a						.17	.37	-.58	.93	.47	.38	.36	-.35	1.11	1.06
Age						-1.38	.98	-3.37	.61	-1.41	-2.13	.95	-4.05	-.20	-2.24*
Number of Children						-.55	.48	-1.52	.42	-1.14	-.38	.46	-1.31	.56	-.82
Status of Employment ^b						.30	.33	-.37	.97	.91	.21	.31	-.42	.84	.67
Level of Education						.20	.38	-.58	.97	.51	.01	.36	-.73	.74	.02
Self-Regulation						.03	.28	-.54	.60	.10	-.15	.38	-.93	.63	-.38
Negative Affect						.17	.18	-.20	.55	.95	.16	.27	-.39	.71	.59
State of Being Recovered											.21	.18	-.15	.57	1.20
Psychological Reattachment											.16	.10	-.04	.36	1.59*
Random Effects															
σ^2			.49					.52					.47		
τ_{00}			.33					.40					.34		
ICC			.40					.44					.42		

	Null Model	Model 1	Model 2
	Estimate	Estimate	Estimate
Model Fit			
<i>-2LL</i>	267.05	263.98	250.61
<i>AIC</i>	273.05	307.98	298.61
<i>BIC</i>	280.96	361.46	355.78
<i>R</i> ²	0	.12	.21
<i>f</i> ²	0	.14	.26
<i>df</i>	57	37	37

Note. *SE* = standard error; *CI* = confidence interval; *LL* = lower level; *UL* = upper level; *t* = t-statistic; σ^2 = Level 1 variance; τ_{00} = Level 2 variance; *ICC* = interclass correlation; *-2LL* = model deviance; *AIC* = Akaike's Information Criterion; *BIC* = Bayesian Information Criterion; *R*² = coefficient of determination; *f*² = effect size; *df* = degrees of freedom.

Person-level *N* = 57; week-level *N* = 102.

^a 0 = female; 1 = male.

^b 0 = full-time; 1 = part-time; 3 = contract.

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

Supplementary Analyses

This section details the statistical findings obtained from additional analyses purposed at providing supplementary insight into the hypothesised relationships. It should be noted that the following analyses were considered independently from the primary analyses used in hypothesis testing; therefore, the results were not considered in the decision to either accept or reject the proposed hypotheses. Furthermore, similar to the primary analyses, the interpretations of the results below are predominantly concerned with the hypothesised relationships of interest. Therefore, the highlighted estimates are derived exclusively from Model 2 (see Appendix I).

Recovery Activities and Weekend Psychological Detachment, Relaxation, Mastery Experiences

In the present study, a number of recovery experiences (including psychological detachment, relaxation, and mastery experiences) were predominantly examined in combination as a single predictor variable. While the recovery literature commonly examines the recovery experiences independently (Sonnetag et al., 2022; Steed et al., 2021), the decision to integrate recovery experiences was made on the basis of model complexity. Essentially, the aggregation of the recovery experiences scores enabled the circumvention of possible issues related to model fit and convergence (Finch et al., 2019), while concurrently facilitating a more streamlined interpretation of the effects of additional predictor variables (including cultural activities, religious and spiritual activities, sleep quality, and weekend catch-up sleep) that have remained largely unexplored in the recovery literature. However, in accordance with the recovery literature, the individual recovery experiences are examined further below, to determine which of the recovery experiences were best facilitated by the engagement in each leisure activity.

Recovery Activities and Weekend Psychological Detachment. Results indicated that religious and spiritual activities significant positively predicted psychological detachment, $\beta = .08$, 95% CI [-.03, .18], $SE = .05$, $t(37) = 2.72$, $p < .01$, whereas work-related activities significantly negatively predicted psychological detachment, $\beta = -.10$, 95% CI [-.13, -.01], $SE = .04$, $t(37) = -2.59$, $p < .01$ (see Table I1). Further inspection of the fixed effects estimates revealed that neither of the person-level variables (including gender, age group, number of children, employment status, level of education, self-regulation, and negative effect) significantly predicted psychological detachment ($p > .05$). Variance estimates for Level 1 and 2 were .12 and 1.03, respectively, indicating that leisure activities explained a large amount of variance at the person level, in particular, with 90% of the variance being

attributable to between-person differences. Furthermore, model fit estimates were relatively low ($AIC = 295.21$, $BIC = 364.34$, $-2LL = 235.21$), suggesting that the model fit the data well. The marginal R^2 estimate was .31, indicating that 31% of the variance was explained by the fixed effects. In addition, the effect size for the model was .44, representing a medium effect.

Recovery Activities and Weekend Relaxation Experiences. Results indicated that low-effort activities were the most robust predictor of relaxation, $\beta = .20$, 95% CI [.09, .32], $SE = .06$, $t(37) = 3.65$, $p < .001$, followed by physical activities, $\beta = .12$, 95% CI [.01, .22], $SE = .06$, $t(37) = 2.31$, $p < .05$ (see Table I1). Further inspection of the fixed effects estimates revealed that neither of the person-level variables (including gender, age group, number of children, employment status, level of education, self-regulation, and negative effect) significantly predicted relaxation ($p > .05$). Variance estimates for Level 1 and 2 were .20 and .58, respectively, indicating that the leisure activities explained a large amount of variance at the person level, in particular, with 74% of the variance being attributable to between-person differences. Furthermore, model fit estimates were relatively low ($AIC = 300.60$, $BIC = 369.72$, $-2LL = 240.60$), suggesting that the model fit the data well. The marginal R^2 estimate was .38, indicating that 38% of the variance was explained by the fixed effects. In addition, the effect size for the model was .61, representing a large effect.

Recovery Activities and Weekend Mastery Experiences. Results indicated that cultural activities significantly positively predicted mastery, $\beta = .22$, 95% CI [.09, .34], $SE = .08$, $t(37) = 3.61$, $p < .001$ (see Table I1). Further inspection of the fixed effects estimates revealed that neither of the person-level variables (including gender, age group, number of children, employment status, level of education, self-regulation, and negative effect) significantly predicted mastery ($p > .05$). Variance estimates for Level 1 and 2 were .24 and .60, respectively, indicating that leisure activities explained a large amount of variance at the person level, in particular, with 72% of the variance being attributable to between-person differences. Furthermore, model fit estimates were relatively low ($AIC = 308.70$, $BIC = 377.83$, $-2LL = 248.70$), suggesting that the model fit the data well. The marginal R^2 estimate was .33, indicating that 33% of the variance was explained by the fixed effects. In addition, the effect size for the model was .49, representing a medium effect.

Sleep and Weekend Psychological Detachment, Relaxation, and Mastery Experiences

As illustrated in Table 3, a number of components encompassing recovery activities (viz., high-duty and low-duty activities) and sleep (viz., sleep quality and weekend catch-up sleep) were examined in unison as distinct predictors of recovery experiences.

Fundamentally, this approach was considered an appropriate strategy for the multilevel model analysis for two primary reasons. First, it facilitated the examination of the unique contribution of each predictor to the outcome variable. Second, it enabled the investigation of the variables in question in accordance with their shared theoretical alignment with recovery. However, given that the examination of the role of sleep characteristics in the recovery process is in its infancy, especially relative to recovery activities, isolating weekend sleep quality and catch-up sleep could provide a more focused lens through which to explore the role of sleep characteristics in recovery experiences.

Sleep and Weekend Psychological Detachment. Results indicated that sleep quality was a significant predictor of psychological detachment, $\beta = .37$, 95% CI [.35, .59], $SE = .11$, $t(43) = 3.36$, $p < .001$ (see Table I2). Further inspection of the fixed effects estimates revealed that neither of the person-level variables (including gender, age group, number of children, employment status, level of education, self-regulation, and negative effect) significantly predicted psychological detachment ($p > .05$). Variance estimates for Level 1 and 2 were .11 and 1.06, respectively, indicating that psychological detachment explained a large amount of variance at the person level, in particular, with 91% of the variance being attributable to between-person differences. Furthermore, model fit estimates were relatively low ($AIC = 258.45$, $BIC = 315.62$, $-2LL = 210.45$), suggesting that variables suited the data well. The marginal R^2 estimate was .26, indicating that 26% of the variance was explained by the fixed effects. In addition, the effect size for the model was .35, representing a medium effect.

Sleep and Weekend Relaxation Experiences. The fixed effects estimates indicated that neither sleep quality ($\beta = .22$, 95% CI [-.07, .51], $SE = .15$, $t[37] = 1.51$, $p = .14$) nor catch-up sleep ($\beta = .11$, 95% CI [-.02, .24], $SE = .07$, $t[37] = 1.66$, $p = .10$) significantly predicted relaxation (see Table I2). Further inspection of the fixed effects estimates revealed gender was the only person-level variable that significantly predicted relaxation, $\beta = 1.00$, 95% CI [.19, 1.81], $SE = .40$, $t(37) = 2.50$, $p < .05$. Variance estimates for Level 1 and 2 were .29 and .64, respectively, indicating that relaxation explained a large amount of variance at both the person level and week level, with 69% of the variance being attributable to between-person differences. Furthermore, model fit estimates were relatively low ($AIC = 287.74$, $BIC = 344.91$, $-2LL = 239.74$), suggesting that variables suited the data well. The marginal R^2

estimate was .29, indicating that 29% of the variance was explained by the fixed effects. In addition, the effect size for the model was .42, representing a medium effect.

Sleep and Weekend Mastery Experiences. The fixed effects estimates revealed that neither sleep quality ($\beta = .22$, 95% CI [-.09, .52], $SE = .15$, $t[37] = 1.45$, $p = .15$) nor catch-up sleep ($\beta = -.05$, 95% CI [-.18, .08], $SE = .06$, $t[37] = -.71$, $p = .48$) significantly predicted relaxation (see Table I2). Further inspection of the fixed effects estimates revealed that neither of the person-level variables (including gender, age group, number of children, employment status, level of education, self-regulation, and negative effect) significantly predicted mastery ($p > .05$). Variance estimates for Level 1 and 2 were .25 and 1.05, respectively, indicating that mastery explained a large amount of variance at the person level, in particular, with 81% of the variance being attributable to between-person differences. Furthermore, model fit estimates were relatively low ($AIC = 295.28$, $BIC = 352.45$, $-2LL = 247.28$), suggesting that variables suited the data well. The marginal R^2 estimate was .15, indicating that 15% of the variance was explained by the fixed effects. In addition, the effect size for the model was .18, representing a small effect.

Weekend Psychological Detachment, Relaxation, and Mastery Experiences and the Recovery-Related Outcomes on Monday

As mentioned above, the decision to examine recovery experiences in combination was made to minimise model complexity and to enable a more comprehensive understanding of the effects of recovery experiences on particular recovery-related outcomes (including the state of being recovered and psychological reattachment) that have received less attention in the recovery literature. However, given that research in the recovery literature commonly examines recovery experiences independently, the supplementary analyses below included the individual recovery experiences to examine which were relatively more conducive to recovery.

Psychological Detachment, Relaxation, and Mastery Experiences and the State of Being Recovered. Results indicated that psychological detachment was the most robust predictor of the state of being recovered, $\beta = .38$, 95% CI [.15, .62], $SE = .12$, $t(37) = 3.31$, $p < .001$, followed closely by mastery, $\beta = .32$, 95% CI [.11, .54], $SE = .11$, $t(37) = 3.01$, $p < .001$ (see Table I3). Moreover, further inspection of the fixed effects estimates revealed that neither of the person-level variables (including gender, age group, number of children, employment status, level of education, self-regulation, and negative effect) significantly predicted the state of being recovered ($p > .05$). Variance estimates for Level 1 and 2 were .40 and .41, respectively, indicating that recovery experiences explained a large amount of

variance at both the week level and person level, with 52% of the variance being attributable to between-person differences. Furthermore, model fit estimates were relatively low ($AIC = 299.38$, $BIC = 358.62$, $-2LL = 249.38$), indicating that the data suited the model well. The marginal R^2 estimate was .38, indicating that 38% of the variance was explained by the fixed effects. In addition, the effect size for the model was .60, representing a large effect.

Psychological Detachment, Relaxation, and Mastery Experiences and Psychological Reattachment. Results indicated that mastery was the only significant predictor of psychological reattachment, $\beta = .18$, 95% CI [.09, .23], $SE = .05$, $t(37) = 3.87$, $p < .001$ (see Table I3). Further inspection of the fixed effects estimates revealed that age was the only person-level variable that significantly negatively predicted psychological reattachment, $\beta = -.95$, 95% CI [-1.09, -0.81], $SE = .42$, $t(37) = -2.24$, $p < .05$. Variance estimates for Level 1 and 2 were .07 and .10, respectively, indicating that recovery experiences explained a large amount of variance at both the week level and person level, with 61% of the variance being attributable to between-person differences. Furthermore, model fit estimates were relatively low ($AIC = 164.47$, $BIC = 223.71$, $-2LL = 114.47$), indicating that the data suited the model well. The marginal R^2 estimate was .32, indicating that 32% of the variance was explained by the fixed effects. In addition, the effect size for the model was .47, representing a medium effect.

Table 10*Summary of the Results*

	Hypotheses	Outcome
H1a	Low-duty activities positively predict weekend recovery experiences.	Supported
H1b	Cultural activities positively predict weekend recovery experiences.	Supported
H1c	Religious and spiritual activities positively predict weekend recovery experiences.	Not supported
H1d	High-duty activities negatively predict weekend recovery experiences.	Not supported
H1e	Sleep quality positively predicts weekend recovery experiences.	Not supported
H1f	Weekend catch-up sleep positively predicts recovery experiences.	Not Supported
H2a	Weekend recovery experiences positively predict the state of being recovered on Monday.	Supported
H2b	Weekend recovery experiences positively predict psychological reattachment to work on Monday.	Not supported
H3a	The recovery-related outcomes on Monday positively predict weekly task performance.	Supported
H3b	The recovery-related outcomes on Monday positively predict weekly work engagement.	Partially Supported

Discussion

The aim of this study was threefold. Notably, this study aimed to investigate the role of recovery activities and sleep in weekend recovery experiences; the role of weekend recovery experiences as prerequisites for the recovery-related outcomes (including the state of being recovered and psychological reattachment to work) on Monday; and the role of the recovery-related outcomes on Monday in weekly job performance (including task performance and work engagement). To this end, multilevel model analyses were conducted using a longitudinal research design with repeated measures. Principally, the analyses were

used to evaluate the hypothesised relationships between the variables of interest at both the person level (Level 2; $n = 57$) and the week level (Level 1; $n = 102$). Ultimately, the analysis revealed the following findings: low-duty leisure activities significantly positively predicted recovery experiences on weekends; weekend recovery experiences significantly positively predicted the state of being recovered on Monday, which, in turn, positively predicted weekly task performance; and psychological reattachment on Monday significantly positively predicted both weekly task performance and work engagement.

This section discusses the psychometric properties of the scales utilised in this study, followed by a review of its main findings and limitations. Thereafter, the implications of the study, recommendations for future research, and concluding remarks are presented.

Psychometric Properties of the Scales

To evaluate the suitability of the scales and data for the analyses, a set of EFA and reliability analyses were conducted. With regards to the former, it was found that most of the scales had unidimensional factor structure, including the UWES-3 (Schaufeli et al., 2019), REQ (Sonnentag & Fritz, 2007), Sonnentag and Krueger's (2006) measure of the state of being recovered, and Sonnentag and Kühnel's (2016) measure of psychological reattachment (see Appendix C). However, the factor structures underlying the SRS (Schwarzer et al., 1999), negative affect scale (Watson et al., 1988), and the in-role behaviour scale (Williams & Anderson, 1991) loaded onto separate factors. Alternatively, the internal consistency and corrected item-total correlation estimates, derived from the reliability analyses, indicated that the majority of the measures employed in this study were reliable. These included the SRS, negative affect scale, the state of being recovered measure, and the measure of psychological detachment. However, the reliability of certain items was found to be questionable. This was particularly the case for the in-role behaviour scale, the UWES-3, and the REQ. Nevertheless, all concerns involving both the dimensionality and reliability of the scales were addressed accordingly, primarily via the removal of problematic items. However, in certain instances, arguments were made to retain items in question. Refer to the Method section for the detailed investigation into psychometric properties of the scales.

Low-Duty Activities and Weekend Recovery Experiences

Hypothesis 1a proposed that the regular engagement in low-duty leisure activities promotes recovery experiences on weekends. As a recovery context, the weekend was deemed suitable, as this period typically presents an appropriate time for recovery, given that employees are generally not expected to work during weekends (Binnewies et al., 2010; Ragsdale et al., 2011). In the present study, low-duty activities encompassed low-effort,

social, physical, cultural, and religious and spiritual activities. Consistent with previous studies (Sonnentag et al., 2022; Steed et al., 2021), a significant positive relationship was found between low-duty activities and recovery experiences, with a medium effect. The findings suggest that regular engagement in leisure activities that are relatively less demanding and have a more passive profile may foster restorative feelings associated with mentally disengaging from work-related demands, relaxation, and a sense of achievement. Crucially, this finding also supports the theoretical underpinnings of the COR theory (Hobfoll, 1989) and the ERM (Meijman & Mulder, 1998), which suggest that effort expenditure, particularly into these low-duty activities during leisure time, plays an instrumental role in the replenishment of the resources depleted by work-related demands. This, in turn, may promote the psychological experiences conducive to recovery (Meijman & Mulder, 1998).

Cultural Activities and Weekend Recovery Experiences

Hypothesis 1b proposed that regular engagement in cultural leisure activities positively predicts recovery experiences. The analysis revealed that cultural activities significantly positively predicted recovery experiences (with a medium effect), whilst physical activities were found to be the most robust predictor of recovery experiences. While the regular engagement in physical activities during leisure time is often depicted as the most conducive activity for recovery (Sonntag et al., 2017), the findings relating to cultural activities were particularly important to the aims of this study and therefore were unpacked in relatively more detail. In essence, results suggested that employees who often engaged in cultural activities on weekends also enjoyed higher levels of recovery experiences. Although not explicitly stipulated in the hypothesis, I speculate that the restorative effects of regular engagement in cultural activities may be similar to those of social activities, that is, via feelings of self-expression and social connectedness (Kuykendall et al., 2020). However, the non-significant relationship between social activities and recovery experiences suggests that engagement in cultural activities may have been conducive to recovery via alternative resource-building pathways.

To this end, a set of supplementary multilevel model analyses was conducted to ascertain which of the recovery experiences were most influenced by cultural activities. The analysis revealed a significant positive relationship between cultural activities and mastery experiences, consistent with previous research (de Bloom et al., 2018; Tuisku et al., 2016). Essentially, these findings suggest that the regular engagement in cultural leisure activities may promote feelings of self-growth and personal achievement. While cognitive and physical

resources can serve as the requisite resources for sufficiently promoting mastery experiences, Hobfoll (1989) also posited that recovery can be actively stimulated through the acquisition of new resources via the engagement in resource-providing activities. Accordingly, engagement in cultural activities may have promoted mastery experiences through the involvement of the element of learning and intellectual engagement (de Bloom et al., 2018; Tuisku et al., 2016). This, in turn, may have exposed individuals to new perspectives and knowledge, fostering intellectual growth.

Additionally, as previously mentioned, studies examining the role of culture in recovery were conducted in Western contexts, using samples that were not, for the most part, culturally active. Therefore, it is important to note that, as per the descriptive statistics, approximately 87.7% of the individuals in the sample in this study were presumably culturally active (see Table D4). Therefore, the findings of the current study may provide further valuable insights into the role of cultural activities in weekend recovery experiences.

Religious and Spiritual Activities and Weekend Recovery Experiences

Hypothesis 1c proposed that religious and spiritual leisure activities positively predict weekend recovery experiences. While the relationship did not reach statistical significance, supplementary analyses revealed that religious and spiritual activities were significantly positively related to psychological detachment from work, in particular, with a medium effect. Essentially, this finding suggests that employees who frequently engaged in spiritual and/or religious activities in their leisure time were better able to mentally separate themselves from work-related demands on weekends. Interestingly, this finding was inconsistent with previous findings, as Alameer et al. (2023) found that the engagement in the activities in question solely promoted relaxation experiences. However, it should be noted that the aforementioned study focused primarily on spiritual activities, potentially emphasising mindfulness-based activities, which have been shown to improve health and well-being (Bostock et al., 2019; Creighton-Smith et al., 2017; Dreyfus, 2011; Kim et al., 2004). Therefore, the incorporation of religious practices in the present study may have introduced an additional layer of complexity to the research scope.

Religious practices often require a dedicated time, which may be spread over several periods of the day (Creighton-Smith et al., 2017). This structured separation may, therefore, provide individuals with an opportunity for individuals to disengage from work, both physically and mentally. Moreover, similar to social activities, the collective engagement in spiritual and religious activities may have fostered psychological detachment in the current

sample by enabling individuals to divert their attention away from work to their community, relationships, and shared values.

Similar to cultural activities, I also identified participants' propensity to engage in religious and spiritual activities on weekends as a subject of particular interest, a tendency that had not been adequately addressed in previous studies concerned with the activities in question. Nevertheless, descriptive statistics revealed that approximately 78.9% of the individuals in the current sample were presumed to be religiously and/or spiritually active (see Table D4). Therefore, the findings of the current study may further offer valuable insights into the nuanced role of religion and spirituality in recovery experiences on weekends.

High-Duty Activities and Weekend Recovery Experiences

Contrary to Hypothesis 1d, which predicted a negative relationship between high-duty leisure activities and weekend recovery experiences, the results indicated that the regular engagement in leisure activities involving a relatively more demanding and obligatory profile did not have a significant impact on weekend recovery experiences. While this finding is inconsistent with previous studies (Sonnentag et al., 2022; Steed et al., 2021), the failure of this relationship to reach statistical significance in the current sample may have been attributable to the complexities inherent in the mechanisms underlying the recovery process. For instance, individuals who engaged in high-duty activities on weekends may also have spent a relatively greater amount of time engaging in low-duty activities, thereby mitigating the supposed resource-consuming effect of high-duty activities. To illustrate, person-level descriptive analysis showed that, on average, individuals spent a total of 8 hr and 11 hr engaging in high-duty and low-duty activities, respectively, on weekends (see Table D2). While this discrepancy was not significant, it is possible that the aforementioned mitigating effect was observed among the current sample, nonetheless.

Sleep Quality and Weekend Recovery Experiences

Hypothesis 1e proposed that sleep quality would positively predict weekend recovery experiences. However, the subsequent primary analyses revealed a nonsignificant relationship between the variables in question; therefore, this hypothesis was not supported. A review of the literature revealed no studies that have investigated the direct role of sleep quality in recovery experiences. However, previous studies incorporating a circadian perspective into recovery have consistently portrayed sleep as a crucial component of the recovery process (Völker et al., 2024b; Wiegmann et al., 2023). Moreover, from a theoretical perspective, sleep has been depicted as an intrinsic mechanism for inducing the replenishment of

resources required for adequate recovery and resource management (Beal et al., 2005; Meijman & Mulder, 1998; Schleupner et al., 2023). Therefore, despite the limited comparability to prior findings, the results of this study were considered largely inconsistent with prior knowledge.

While conceptually distinct, the original model included both recovery activities and sleep characteristics as predictors of recovery experiences, thereby providing a more holistic view of the factors influencing recovery experiences. However, it is noteworthy that sleep quality only demonstrated a significant positive relationship with recovery experiences (with a medium effect) when low-duty and high-duty activities were removed from the model. In particular, supplementary analysis further revealed a positive relationship with sleep quality and psychological detachment from work, with a medium effect. While these outcomes were not considered in the determination of the hypothesis, they do suggest that individuals who reported better sleep quality were also better able to mentally separate from work-related matters on weekends. Simply, this trend could be understood by comparing the nuanced properties that sleep may share with the psychological detachment phenomenon. Fundamentally, given that the temporary removal of work-related stressors is observed in both states (Hülshager et al., 2015), high-quality sleep may therefore facilitate resource replenishment in a manner similar to psychological detachment (Barber et al., 2013; Völker et al., 2024b). Moreover, I also propose that high-quality sleep may also facilitate individuals' ability to compartmentalise nonwork-work life domains, and thus serve as a prerequisite for the ability to adequately mentally detach from work.

Weekend Catch-Up Sleep and Recovery Experiences

Hypothesis 1f proposed that engaging in weekend catch-up sleep would negatively predict weekend recovery experiences. In the original model, analysis revealed a nonsignificant relationship between weekend catch-up sleep and recovery experiences. Moreover, upon removal of low-duty and high-duty activities from the model, supplementary analysis revealed a persistence in the failure for the relationship between catch-up sleep and recovery experiences to reach statistical significance. Fundamentally, these findings imply that individuals who deliberately extended their sleep duration on weekends did not report significant changes in their ability to mentally detach from work, relax, and develop skills on weekends. Nevertheless, I highlight two noteworthy factors (namely the amount of catch-up sleep reported on the weekends and the age of the sample) that could better position this trend.

Given that the role of weekend catch-up sleep in recovery experiences has not explicitly been examined in the recovery literature, Hypothesis 1f was formed primarily on the basis of the research in the circadian literature. However, these findings were mixed, nonetheless. Notably, despite the cognitive detriments associated with sleep inconsistency and, thus, weekend catch-up sleep (Krause et al., 2017; Zhang et al., 2020), research suggests that the engagement in weekend catch-up sleep may primarily be beneficial for sleep-deprived individuals (Leger et al., 2020; Zhang et al., 2020). Inspection of the person-level descriptive statistics revealed that, on average, participants recorded 6 hr and 31 min of sleep per night, whereas an average of 6 hr and 41 min of sleep was recorded on weekends. Fundamentally, the mean of 10 min of catch-up sleep observed on weekends suggests that the average participant might not have been sleep deprived to begin with, making it difficult to concretely determine the implications of weekend catch-up sleep and recovery experiences. Furthermore, while studies have recommended 7–9 hr of sleep per night to ensure optimal cognitive function in adults (Smevik et al., 2023; Wild et al., 2018), research also suggests that adults require less sleep as they get older (Wild et al., 2018). Therefore, as the average participant in this study belonged to the 34-45-year-old age group, individuals in the current sample might not have felt compelled to extend their sleep duration on weekends, nonetheless.

Weekend Recovery Experiences and the State of Being Recovered on Monday

Hypothesis 2a proposed that weekend recovery experiences would positively predict the state of being recovered on Monday. Multilevel model analysis revealed a significant positive relationship between recovery experiences and the state of being recovered, with a large effect. Whilst these results align with prior studies in the recovery literature (Binnewies et al., 2010; Steed et al., 2021), it should also be noted that the aggregation of the scores for psychological detachment, relaxation, and mastery experiences was utilised to obtain these scores. Therefore, supplementary analyses were conducted to examine the extent to which each recovery experience was conducive to the state of being recovered. The findings of this analysis indicated that psychological detachment was the most robust predictor of the state being recovered, which was followed closely by mastery experiences. Essentially, these findings suggested that individuals who were able to mentally detach from work and acquire or develop skills during their leisure time on weekends also experienced greater physical and mental refreshment on Mondays. Notably, variance estimates also revealed that the state of being recovered was influenced by both between-person and within-person differences,

suggesting that individuals' level of recovery may be a result of the interaction between stable individual characteristics and dynamic influences of recovery (Binnewies et al., 2010).

In relation to prior studies, the current findings were consistent with person-level findings (Cangiano et al., 2021), suggesting that between-person differences in the extent to which individuals can sufficiently psychologically detach from work or develop new skills may have a significant impact on recovery, regardless of week-to-week variation. Alternatively, on weekends, when individuals are able to successfully disengage from professional obligations and engage in skills development, their perceived recovery state on Monday can be relatively enhanced, regardless of their general abilities and tendencies to detach from work and develop skills (Binnewies et al., 2010).

In addition, these findings lend support to the fundamental concepts underpinning the COR theory (Hobfoll, 1989) and the ERM (Meijman & Mulder, 1998). Significantly, the temporary disengagement of the self from the demands of work can serve as a vital opportunity for the restoration of depleted resources. Correspondingly, this mental separation from work can also provide employees with the opportunity to acquire new resources and thus reverse the stressor-strain by, for instance, engaging in nonwork activities that challenge the self.

Weekend Recovery Experiences and Psychological Reattachment on Monday

Hypothesis 2b proposed that weekend recovery experiences would positively predict the ability to psychologically reattach to work on Monday. In addition to the degree of statistical significance of the relationship, the random effects estimates of the model were also of interest, especially given that psychological reattachment has not previously been examined as an outcome of the recovery process. Ultimately, multilevel model analysis revealed that while most variance in psychological reattachment was observed at the person level, a considerable proportion of this variance was also attributed to the week level. Therefore, as individuals' ability to psychologically reattach to work on Monday can be a result of both between-person and within-person differences, psychological reattachment was deemed a suitable indicator of the successfulness of the recovery process.

Nevertheless, further inspection of the findings revealed a nonsignificant relationship between recovery experiences and psychological reattachment, thereby suggesting that the perceived experiences of recovery observed during weekends may not necessarily serve as a prerequisite for the ability to reestablish a mental connection with work at the start of the workweek. However, given that the majority of the variance was observed at the person level, the nonsignificant relationship between recovery experiences and psychological reattachment

may not have accurately reflected the outcome of the hypothesised relationship but rather the influence of person-level characteristics. Notably, further inspection of the person-level variables revealed that age was significantly negatively related to psychological reattachment. Crucially, these findings suggest that older individuals may have experienced a diminished capacity to effectively mentally reconnect to work at the start of the workweek (Kanfer & Ackerman, 2004). Alternatively, the nonsignificant relationship could also have been attributable to individual differences that were not controlled for in the current study, such as transition styles (i.e., individuals' inclinations for anticipatory, discrete, and lagged transition styles; Hall & Richter, 1988).

A fundamental premise of boundary theory posits that individuals with robust boundaries between distinct life domains possess a superior capacity to seamlessly transition between various roles (Ashforth et al., 2000; Sonnentag & Kühnel, 2016). Critically, this suggests that the variability in individuals' ability or inclination to establish boundaries between nonwork-work roles may have exerted a considerable amount of influence on the model in the analysis of the current study. To illustrate, depending on personality differences or the demands of work, employees may exhibit relatively inconsistent tendencies to think about work, especially during their leisure time (Fritz & Taylor, 2020; Hall & Richter, 1988; Sonnentag et al., 2020). Alternatively, some individuals may even prefer to prioritise work over recovery on certain weekends (Fritz & Taylor, 2020). Ultimately, these potential variabilities in the individual preferences may serve to weaken the nonwork-work boundary, thereby hindering employees' ability to effectively reattach to work at the start of the workweek.

In addition, supplementary analyses were conducted to determine whether the aforementioned nonsignificant relationship was consistent with each recovery experience, namely psychological detachment, relaxation, and mastery. Interestingly, analysis revealed that mastery experiences were statistically positively related to psychological reattachment, with a medium effect. These findings suggest that the more individuals actively engage in mentally challenging activities that are unrelated to work on weekends, the greater their ability to mentally reconnect to work at the start of the workweek. Crucially, these findings may offer a novel perspective on the role of psychological reattachment in recovery, particularly regarding its resource-replenishing pathway. Given that mastery experiences are analogous to the active pursuit of replenishing depleted resources through the engagement in cognitively demanding nonwork activities (Sonnentag & Fritz, 2007), the nature of the resources replenished during mastery experiences, whether cognitive or personal, may

therefore play an instrumental role in individuals' ability to effectively navigate micro-role transitions.

The Recovery-Related Outcomes on Monday and Weekly Task Performance

Hypothesis 3a proposed that the recovery-related outcomes on Monday would positively predict weekly task performance. Multilevel model analysis revealed that both the state of being recovered and psychological reattachment were significantly positively related to task performance, with large effects. Essentially, these results indicated that employees who felt relatively more physically and mentally refreshed on Mondays and were able to effectively mentally reconnect with their work also reported more effective task performance during the workweek. Crucially, these findings were found to be consistent with previous week-level studies, suggesting that the success of the overall process of recovery played a crucial role in the effectiveness with which individuals performed work-related tasks (Binnewies et al., 2010).

Interestingly, random effects estimates revealed that all of the observed variance in task performance was attributable to the week-level variance, suggesting that task performance was solely influenced by week-to-week variability in the state of being recovered and psychological reattachment rather than by stable, person-level characteristics. Notably, this finding is consistent with the theoretical perspective that performance is a situationally dynamic construct, largely driven by fluctuations in the weekly circumstances (such as the state of being recovered and psychological reattachment, in this case; Beal et al. 2005). Nevertheless, additional trends also emerged from the analysis that seemed to contradict these results. Despite significant week-level variance, in addition to the satisfactory model fit estimates, fixed effects estimates indicated that particular person-level variables (including the number of children and self-regulatory resources) also significantly predicted task performance.

In relation to participants' number of children, the results indicated that employees with more children reported a stronger ability to fulfil work-related tasks. While the number of children is not a person-level variable that is commonly controlled for in the recovery literature, in instances where it is controlled, it is primarily controlled in order to evaluate their influence on recovery (de Bloom et al., 2018; Feuerhahn et al., 2014; Volman et al., 2013), as opposed to job performance. Nevertheless, this finding can be considered consistent with a previous study examining work ability (i.e., individuals' ability to effectively perform work-related tasks whilst maintaining their personal resources; Tuomi et al., 1991). While distinct from task performance, work ability can also be positioned as a work-related outcome

of recovery, which can be influenced by the mobilisation of resources relative to their resource capacity (Beal et al., 2005). However, given that individuals with relatively more children often report lower levels of recovery, its effect on task performance could be attributable to affect and motivation. For instance, the finding that individuals with more children reported greater levels of vitality and life satisfaction (Virtanen et al., 2020) suggests that, while at work, being a parental figure and having a family to support may indirectly energise employees and reinforce their overall level of happiness, the latter of which has been shown to positively influence task performance (Sonnentag et al., 2022).

In addition, the multilevel model analysis also revealed a statistically significant relationship between self-regulatory resources and task performance. Theoretically, this finding is consistent with a core assumption of the process model of episodic performance (Beal et al., 2005), which suggests that individuals require an appropriate amount of self-regulatory resources in order to effectively perform work-related tasks. Therefore, the more self-regulatory resources that employees were able to replenish during weekends, the better they were positioned to sufficiently complete prescribed tasks at work.

The Recovery-Related Outcomes on Monday and Weekly Work Engagement

Hypothesis 3b proposed that the recovery-related outcomes on Monday would positively predict weekly work engagement. Consistent with previous findings (Sonnentag & Kühnel, 2016), multilevel model analysis revealed that psychological reattachment was significantly positively related to work engagement, with, however, a small effect. Nevertheless, these results indicated that employees who were effectively able to mentally reconnect with their work on Mondays were also reportedly better positioned to direct their replenished resources towards work-related matters. Conversely, the relationship between the state of being recovered and work engagement did not reach statistical significance. Nevertheless, the theoretical underpinnings of this study can be used to provide a framework for explaining these results.

In accordance with the process model of episodic performance (Beal et al., 2005), the significance of psychological reattachment can be explained by its role in the mobilisation of resources back towards work. Therefore, the current findings lend further credence to the notion that the micro-role transitional process is a resource-dependent process (Hobfoll, 2001) facilitated by the capacity to mobilise resources to the relevant domain (Ashforth et al., 2000; Beal et al., 2005). However, the nonsignificant relationship between the state of being recovered and work engagement also suggests that the effectiveness with which individuals mobilise their resources towards becoming sufficiently engaged in their work is more

dependent on their resource-allocating capabilities, particularly during nonwork-to-work boundary crossing, rather than on the amount of resources they have successfully replenished over the weekend.

As previously mentioned, self-regulatory resources can uniquely serve as a rational means to facilitate this process, particularly, however, in a manner that is unrelated to micro-role transition (Beal et al., 2005; Sonnentag & Kühnel, 2016). However, in the current study, self-regulatory resources were not found to be significantly related to work engagement. Fundamentally, this finding serves to reinforce the notion that, while similar, the capacity to adequately reattach with work at the start of the workweek in a way that optimises engagement is distinct from the ability to direct personal resources towards work-related matters (Sonnentag & Kühnel, 2016). Notwithstanding, age was found to be a significant negative predictor of work engagement. Therefore, similar to self-regulation (Kanfer & Ackerman, 2004), results indicate that individuals' ability to effectively engage with their work also deteriorates as they age.

Theoretical Implications

Given that the recovery literature is primarily grounded in job-stress theories, this study contributes to the field by extending its fundamental theory, including the COR theory (Hobfoll, 1989) and ERM (Meijman & Mulder, 1998). Moreover, to facilitate a more comprehensive understanding of the mechanisms that underpin recovery and their impact on job performance, this study also examined recovery through a boundary perspective. Accordingly, the present study contributes to a number of the respective theories, including boundary theory (Ashforth et al., 2000) and the process model of episodic performance (Beal et al., 2005).

First, the current study contributes to the COR theory by demonstrating how cultural activities can function as supplementary sets of resource-providing activities, especially during weekends (Hobfoll, 1989). Furthermore, an examination of the distinct relationships between these activities and each recovery experience provided additional insight into their unique mechanisms for recovery. Notably, regular engagement in cultural activities could offer a resource-providing pathway for cognitive resources through actively mentally challenging the self (i.e., mastery) during leisure time (Hobfoll, 1989; Sonnentag & Fritz, 2007). Notably, the restorative effects of these activities were underexplored in the recovery literature. Therefore, the incorporation of these activities within the scope of this study provides further support for the perspectives pertaining to the multifaceted nature of resource conservation and gain (Hobfoll, 1989; Hobfoll et al., 2018).

Second, this study makes a contribution to the ERM through its demonstration of how religious and spiritual activities can uniquely reverse the stressor-strain process, which is often perpetuated by work-related demands (Meijman & Mulder, 1998). In contrast to the COR theory, the ERM is predominantly concerned with demands and their implications for recovery, particularly during various recovery contexts (Meijman & Mulder, 1998). Consequently, when work-related demands are temporarily removed from the self, individuals are provided the opportunity to engage in low-duty activities, which can therefore facilitate recovery (Geurts & Sonnentag, 2006; Meijman & Mulder, 1998). Crucially, the findings of this study suggest that religious and spiritual leisure activities may exemplify such activities. While they did not significantly promote overall recovery experiences, additional analysis indicated that engagement with these activities during leisure time may serve as recovery-inducing behaviours, as they may enable individuals to temporarily disengage from work-related demands (i.e., psychological detachment).

Third, the present study contributes to boundary theory primarily through the investigation of the implications of nonwork-to-work boundary crossing for recovery (Ashforth et al., 2000). Given its instrumental role in micro-role transition, it can be assumed that psychological reattachment is primarily grounded in boundary theory (Ashforth et al., 2000). However, given the centrality of the weekend recovery phenomenon to this study, I also examined psychological reattachment to work through the lens of the COR theory, positing that a sufficient recovery process observed during weekends would aid in the resource investment necessary to facilitate seamless nonwork-to-work role transition. However, the findings indicated that while weekend recovery experiences, overall, promoted the state of being recovered on Monday, they did not directly enhance psychological reattachment. Instead, mastery experiences were found to be the only significant contributor to psychological reattachment. Therefore, in consideration of the postulate of resource investment (Hobfoll, 2001), I propose that a possible resource-building pathway of psychological reattachment can be enabled through the active pursuit of obtaining new resources during leisure time. Additionally, the finding that psychological reattachment played a relatively more prominent role in enhancing weekly job performance, nonetheless, suggests that individuals' ability to seamlessly transition from the nonwork-to-work life domains in a way that optimises job performance can be contingent on inherent capabilities (Ashforth et al., 2000; Hall & Richter, 1988) beyond weekend resource replenishment (Schleupner et al., 2024).

Fourth, the current study contributes to the process model of episodic performance through its encapsulation of the volatility of performance over time (Beal et al., 2005). Notably, the examination into the role of the state of being recovered and psychological reattachment in weekly performance revealed that most of the variance observed in task performance and work engagement was attributed to the week-level variance. These findings supported the theoretical depiction of job performance being a dynamic construct, fluctuating on a weekly basis (Beal et al., 2005; Binnewies et al., 2009). Furthermore, findings also suggested that the manner in which performance fluctuates depends on the successfulness of both the recovery process (Binnewies et al., 2010) and nonwork-to-work role transition capabilities.

Practical Implications

It is acknowledged that recovery activities and sleep patterns are more susceptible to practical implications relative to psychological constructs, such as recovery experiences. Accordingly, the implications outlined in this subsection are derived from the study's findings concerning employees' nonwork behaviours, sleep, and additional practical recommendations that they can leverage to promote experiences associated with recovery.

Recovery Activities

The results of this study indicated that participating in high-duty leisure activities (comprising work-related, household, and childcare activities) generally did not exert a significantly detrimental effect on employees' recovery experiences on weekends. However, supplementary analysis revealed that frequent engagement, particularly in work-related activities (e.g., completing a task at home), may impede employees' recovery on weekends, nonetheless. Alternatively, the findings placed a greater emphasis on the restorative effects associated with the engagement in low-duty activities (including low-effort, social, physical, cultural, and religious/spiritual activities). Specifically, the results suggest that regular engagement in physical activities (e.g., exercise) and cultural activities (e.g., visiting a museum) can be most beneficial in the promotion of overall weekend recovery experiences.

Significantly, additional analysis indicated that regular engagement in the cultural activities, in particular, may promote employee recovery by stimulating intellectual engagement and fostering a sense of accomplishment (i.e., mastery). Moreover, while religious and spiritual activities did not significantly contribute to overall weekend recovery experiences, results did indicate that regular engagement in the activities in question may facilitate employees' ability to mentally separate from work-related demands (i.e., psychological detachment) on weekends, experiences often associated with recovery

(Sonnentag et al., 2022). In addition, it should also be noted that the findings above were gathered from a culturally and religiously or spiritually active sample in South Africa. Accordingly, this study contributes to the scarce recovery research conducted in the global South, demonstrating the recovery potential associated with the regular engagement with culture and religion or spirituality on weekends.

Sleep Characteristics

This study also applied a circadian perspective to the recovery process, expecting that weekend sleep quality and catch-up sleep would significantly influence weekend recovery experiences. While the hypotheses were not supported, it was found that sleep quality only emerged as a significant positive predictor of recovery experiences when high-duty and low-duty activities were removed from the model. Fundamentally, this suggests that high-quality sleep can be beneficial for weekend recovery, but only in contexts where individuals' nonwork tendencies or preferences cannot be changed. As such, employees should prioritise engaging in low-duty activities, particularly during their leisure time on weekends, should recovery be of concern.

Psychological Reattachment and the State of Being Recovered

The results of the present study underscored the considerable impact that an employee's level of recovery on Monday can have on their work performance for the rest of the week. Notably, sufficiently recovered employees may show improved weekly task performance, and individuals who are better positioned to reattach to work are likely to exhibit increased levels of both task performance and work engagement for the remainder of the week. More fundamentally, these findings emphasise the significance of weekend recovery not only for the health and well-being of employees (Geurts & Sonnentag, 2006; Sonnentag et al., 2022) but also for weekly performance (Binnewies et al., 2010). In relation to weekly performance, this may particularly be the case for psychological reattachment, as the ability to seamlessly reconnect with work on Monday was found to be most beneficial for both task performance and work engagement. However, it is important to note that weekend recovery experiences did not play a critical role in replenishing the necessary resources for effective psychological reattachment to work. From a micro-role transition perspective (Ashforth et al., 2000; Hall & Richter, 1988), these findings can be explained by research suggesting that the ability to psychologically reattach to work is a psychological process that often takes place before the commencement of work (Sonnentag & Kühnel, 2016). Therefore, this ability may be largely influenced by employees' transition styles or the manner in which they mentally prepare for work.

In practice, employees could actively reattach to work either at home in the morning or on arrival at work. To exemplify, psychological reattachment to work at home could manifest as exploring what one would like to achieve by the end of the workday, reviewing the foreseeable work schedule, or creating a checklist that includes the suitable sequential way to approach tasks. Additionally, supervisors could encourage employees' reattachment by allowing time for reflection before it begins and by encouraging teams to use checklists to identify daily or weekly goals.

Limitations and Suggestions for Future Research

Despite its theoretical contributions and practical implications, this study is not without its limitations. This section discusses the various limitations of the study, including those related to the sample size, self-report surveys, the timing of survey administration, and the broad examinations of particular variables of interest.

Sample Size

For hierarchical data structures, Kreft (1996) proposed that a minimum sample size of $n = 30$ at the highest level of the data hierarchy should yield reliable parameter estimation and sufficient statistical power. As the person-level sample size (Level 2) exceeded this threshold ($n = 57$), the sample size for this study was considered adequate. However, research on multilevel models emphasises the importance of having a sufficiently large sample to ensure the accuracy of results (Maas & Hox, 2005; Scherbaum & Ferrerter, 2009). And while small sample sizes are common in diary studies (Ohly et al., 2010), a number of notable concerns emerged in a preliminary set of analyses that could have been attributed to sampling concerns. Therefore, the current study may have benefitted from a larger sample size.

First, descriptive statistics analysis revealed that participation in the study gradually declined over the three weeks. Laurie et al. (1999) defined this phenomenon as survey attrition, which, while common in longitudinal studies (Hox & McNeish, 2020), may have influenced the results of the study, particularly in the final week. To demonstrate, the number of week-level observations recorded in each of the three weeks was $n = 43$, $n = 34$, and $n = 25$, respectively. Notably, the sample size at Week 3 was below the recommended threshold ($n = 30$; Kreft, 1996). Consequently, this may have explained the noticeable trend that emerged in the psychometric analysis of the scales, where certain items exhibited the tendency of being relatively less reliable and valid at Week 3. Furthermore, the recurrent violations of the assumption of normality could also have been attributed to a small sample size (Field, 2017).

Second, a reduced sample size may also have limited the generalisability of the results. Generally, samples should be as large as possible so that they can be a relatively accurate representation of the general population. However, given the female-dominated sample (80.7%), the sample that was recruited for this study may not accurately represent the broader population. Whilst the apparent recommendation address would therefore be that future studies recruit a more gender-diverse sample, I would also like to encourage future research to explore potential gender differences in recovery processes. Contemporarily, research exploring this topic has been limited to male-female differences in the experience of psychological detachment from work, in particular (Wendsche & Lohmann-Haislah, 2017). Essentially, research suggests that women may experience relatively more difficulty in mentally disengaging from work-related matters (Frankenhaeuser et al., 1989; Lundberg & Frankenhaeuser, 1999). It is possible that these findings may be related to the suggestions pertaining to women being relatively more likely to take on more demanding responsibilities (e.g., household-related and childcare-related tasks) around the house (Mojza et al., 2011; Sonnentag & Bayer, 2005; ten Brummelhuis & Bakker, 2012; Volman et al., 2013). Ultimately, a closer examination of gender differences in recovery could provide valuable insights into how couples and individuals of various genders could enhance recovery and balance high-duty responsibilities among members of the household (Podsakoff et al., 2003).

Self-Report Surveys

The current study relied heavily on the use of self-report data, which raises concerns about common method bias (Podsakoff et al., 2003). While self-report surveys are ideal for capturing psychological constructs (e.g., recovery experiences; Bennett et al., 2023), it is important to note that job performance is a work-related outcome that is typically measured using formal performance appraisal measures by managers, for example, to objectively capture employee performance levels. Therefore, asking employees to rate their own job performance, as was done in this study, may be of particular concern given the wide variety of sources from which common method biases, such as social desirability bias, may arise.

Social desirability bias refers to the tendency of individuals to respond to items in a way that is perceived as socially acceptable, rather than truly reflecting their own feelings and perceptions (Podsakoff et al., 2003). Given that the responses were anonymised and thus not subject to management evaluation, social desirability bias could have explained the observed ceiling effects in self-reported task performance and work engagement through a possible need to present oneself in a favourable light. Alternatively, performance may also have been rated highly for motivational purposes; that is, individuals may have rated their performance

as they wanted to see themselves, which may have given them the motivation they may have needed to perform more optimally at work.

Timing of Survey Administration

As this study examined the employees' recovery processes as they occurred over the weekend, surveys were administered before (on Fridays) and after the weekend (on Mondays). While this type of survey administration is preferred in diary studies centred around the weekend as the recovery context, the fact that the Pre-Weekend Survey (which collected data on employees' perceived performance levels) was administered on Fridays may also have contributed to the ceiling effect observed in weekly performance scores. Specifically, the overestimation of weekly performance can be explained by a particular source of common method bias, namely transient mood state bias.

Transient mood state bias can be defined as the propensity of respondents to respond to survey items in a way that reflects how they feel about the contextual environment or particular events (Podsakoff et al., 2003). In the current study, given that the Pre-Weekend Survey was administered just before the weekend, participants' affective states may have been positively influenced by anticipation of the weekend, resulting in the overestimation of weekly performance (Sonnentag & Geurts, 2009). Crucially, this provides valuable insight into how future studies could approach controlling variables. As with this study, research in the recovery literature has often controlled for negative affect, due to their influence on self-reported recovery (Binnewies et al., 2010; Feuerhahn et al., 2014; Fritz & Sonnentag, 2005). However, given the potential bias introduced in the current study via the positivity associated with weekend anticipation, future studies could also control for positive affect, especially when examining weekly performance.

Broad Examination of the Variables

In the present study, boundary-crossing and circadian perspectives were incorporated into the conceptual model to provide complementary perspectives on the recovery process. However, as demonstrated in the multilevel model analyses, certain variables (viz., sleep quality, weekend catch-up sleep, and psychological reattachment) were not examined in isolation but were integrated into an overall model of recovery that also encompassed recovery activities, recovery experiences, recovery state, and performance. Therefore, due to the complexity of the overall model, sleep characteristics and psychological reattachment were examined rather broadly, neglecting possible nuanced characteristics that may be critical in examining these constructs.

Sleep Characteristics. Despite its theoretical alignment with recovery (i.e., sleep serving as an intrinsic mechanism for recovery), sleep characteristics (including sleep quality and weekend catch-up sleep) were not found to be significant predictors of weekend recovery experiences. Instead, most of the variance observed in recovery experiences was influenced by recovery activities. While the recovery literature assumes that voluntary, nonwork behaviours are vital to the nature of resource replenishment (Hobfoll et al., 2018; Sonnentag et al., 2022), it also goes without saying that sleep is a quintessential mechanism not only for recovery (Siegel, 2005) but also for everyday function (Krause et al., 2017; Leong & Chee, 2023). Therefore, future research in recovery could further explore the circadian literature to investigate whether specific resources play a mediating role in the relationship between sleep and recovery experiences. Moreover, although self-regulatory resources were included in the scope of this study, they only served as a control variable, measured once at baseline (i.e., measured in the General Survey). As such, future studies could include self-regulation as well as other resources, such as vigour, as week-level mediators of the role of sleep in the recovery process.

An additional limitation of the study's examination of sleep relates to the method used to collect sleep-related data. Particularly, a single item from the PSQI was used to assess sleep quality. Although this item is considered to be a reliable measure of sleep quality (Buysse et al., 1989), it is possible that individuals may not have been concretely aware of their nocturnal habits (e.g., sleep efficiency, nocturnal awakenings, or the amount of time spent in bed vs. time spent asleep); consequently, the accuracy of the reports of sleep quality may have been limited. As such, future studies could use wrist actigraphy to obtain objective measures of participants' sleep quality.

With regard to weekend catch-up sleep, the results suggest that, on average, individuals only got about 10 min more sleep on weekends, compared to their typical weekday sleep duration. Therefore, the current sample may not have been appropriate to accurately assess the impact of that weekend catch-up sleep might have on recovery. However, it should also be noted that in order to estimate weekend catch-up sleep with as few surveys as possible, participants were asked to recall their average weekday and weekend sleep duration. Therefore, given that participants were not provided with a sleep diary, and that some participants may have included the amount of time spent awake in bed, the reported sleep durations may not have been entirely accurate. Whilst previous studies have provided participants with sleep diaries (Völker et al., 2024b), I felt that, due to the total of seven surveys that were administered in this study, the inclusion of a sleep diary may have

perpetuated survey fatigue to which participants may already have been predisposed. Therefore, future studies, perhaps with sleep more central to the study's aims, could utilise sleep diaries to obtain more accurate estimates of sleep, including sleep quality and duration.

Psychological Reattachment. Although research exploring the role of reattachment in recovery is still in its infancy, the literature on psychological reattachment suggests that it can be a multifaceted construct, encompassing a number of components that were not explicitly explored in this study (Hall & Richter, 1988; Sonnentag & Kühnel, 2016).

First, the process of reattachment to work may occur in a number of different locations, such as at home or upon the arrival at work (Hall & Richter, 1988). While acknowledged, the results of this study did not reveal where employees typically reattached to work. Therefore, future research could explore the role of the timing of reattachment to examine when reattachment is most beneficial.

Second, this study examined the reattachment-engagement relationship using Schaufeli and Bakker's (2004) definition of work engagement, which may not have been ideal. Crucially, this paper characterised psychological reattachment primarily through its role in mobilising resources during nonwork-to-work boundary crossing. Therefore, given its distinction between the allocation of physical, cognitive, and emotional resources involved in work engagement, Kahn et al.'s (1990) conceptualisation of work engagement may have been more appropriate in the examination of the reattachment-engagement relationship, as it encompasses these dimensions.

Finally, the direct examination of the reattachment-engagement relationship in this study neglected the potentially multifaceted nature of psychological reattachment. Research suggests that specific resources (e.g., activated positive affect, anticipated task focus, and goal activation) are mobilised during the reattachment process (Fritz et al., 2021; Schleupner et al., 2024). Therefore, studies examining reattachment as an outcome of the weekend recovery process could explore the mediating effect of these resources in more depth, not only enabling a more comprehensive understanding of the role of reattachment in recovery but also providing insight into how these resources can be replenished over the weekend.

Conclusion

This study assessed an integrated model of weekend recovery, encompassing core components of the recovery process, associated outcomes, and their influence on employees' weekly job performance. Moreover, by further incorporating perspectives grounded in boundary theory and the circadian literature, the research extended the integrated model to explore how these additional components interact with weekend recovery, offering a more

comprehensive approach to understanding recovery within a theoretical and applied context. Specifically, this research aimed to explore the role of leisure activities (including high-duty and low-duty activities) and sleep (including sleep quality and weekend catch-up sleep) in weekend recovery experiences (aggregated via psychological detachment from work, relaxation, and mastery experiences). Furthermore, the relationship between weekend recovery experiences and the recovery outcomes on Monday (including the state of being recovered and psychological reattachment to work) was explored. Ultimately, this study examined the role of recovery-related outcomes on Monday and weekly job performance (including task performance and work engagement).

The results of the present study were largely consistent with those of previous research in the recovery literature. Regarding the recovery process, for instance, multilevel model analysis revealed that regular engagement with low-duty activities (including low-effort, social, physical, cultural, and religious or spiritual activities) was most conducive to recovery experiences on weekends. In fact, the failure of high-duty activities to exert a significant negative influence on recovery experiences further underscores the importance of the regular engagement in physical (e.g., exercise) and cultural activities (e.g., visiting a museum), in particular, for weekend recovery. Similarly, the analyses utilising a circadian perspective of recovery revealed a similar trend, whereby sleep quality or weekend catch-up sleep did not influence weekend recovery experiences. However, further inspection of these findings revealed that high-quality sleep could enhance weekend recovery, but only for individuals with relatively fixed leisure tendencies or preferences.

The analysis delving into the recovery-related outcomes revealed that employees who reported high levels of recovery experiences on weekends were also relatively more recovered on Mondays. Crucially, these findings suggest that weekend recovery experiences can be treated as a proxy indicator for the successfulness of the recovery process. Interestingly, while recovery experiences did not explicitly influence the replenishment of resources necessary for effective reattachment to work, analyses utilising a boundary perspective identified psychological reattachment as the most effective outcome for enhancing weekly task performance and work engagement. Although sufficiently recovered employees also reported improved weekly task performance, the mechanism through which individuals optimise their ability to seamlessly reattach to work was unclear.

Ultimately, this study underscores the significance of regular engagement in low-demand, voluntary leisure activities on weekends for employee well-being and recovery, as

well as the weekly job performance-related benefits associated with being recovered on Monday and, more importantly, the ability to seamlessly mentally reattach to work.

References

- Alameer, K. M., Uitdewilligen, S., & Hülshager, U. R. (2023). What are the active ingredients in recovery activities? Introducing a dimensional approach. *Journal of Occupational Health Psychology, 28*(4), 239-262. <https://doi.org/10.1037/ocp0000354>
- Althoff, T., Horvitz, E., White, R. W., & Zeitzer, J. (2017). Harnessing the web for population-scale physiological sensing: A case study of sleep and performance. *Proceedings of the 26th International Conference on World Wide Web*,
- Amberg, E. (1895). *The impact of rest breaks on mental performance*. Wilhelm Engelmann.
- Ashforth, B. E., Kreiner, G. E., & Fugate, M. (2000). All in a day's work: Boundaries and micro role transitions. *The Academy of Management Review, 25*(3), 472-491. <https://doi.org/10.2307/259305>
- Austin, P. C., & Brunner, L. J. (2003). Type I error inflation in the presence of a ceiling effect. *The American Statistician, 57*(2), 97-104. <https://doi.org/10.1198/0003130031450>
- Bakker, A. B. (2014). Daily fluctuations in work engagement: An overview and current directions. *European Psychologist, 19*(4), 227-236. <https://doi.org/10.1027/1016-9040/a000160>
- Bakker, A. B., Demerouti, E., Oerlemans, W., & Sonnentag, S. (2013). Workaholism and daily recovery: A day reconstruction study of leisure activities. *Journal of Organizational Behavior, 34*(1), 87-107. <https://doi.org/https://doi.org/10.1002/job.1796>
- Bakker, A. B., & Schaufeli, W. (2008). Work engagement: An emerging psychological concept and its implications for organizations. *Work & Stress, 22*(3), 187-200.
- Barber, L., Grawitch, M. J., & Munz, D. C. (2013). Are better sleepers more engaged workers? A self-regulatory approach to sleep hygiene and work engagement. *Stress Health, 29*(4), 307-316. <https://doi.org/10.1002/smi.2468>
- Barber, L. K., & Jenkins, J. S. (2014). Creating technological boundaries to protect bedtime: examining work-home boundary management, psychological detachment and sleep. *Stress Health, 30*(3), 259-264. <https://doi.org/10.1002/smi.2536>

- Barnes, C. M. (2012). Working in our sleep: Sleep and self-regulation in organizations. *Organizational Psychology Review*, 2(3), 234-257. <https://doi.org/10.1177/2041386612450181>
- Bartlett, M. (1954). A note on the multiplying factors for various chi square approximations. *Journal of the Royal Statistical Society*, 16(1), 296-298. <https://doi.org/10.1111/j.2517-6161.1954.tb00174.x>
- Barton, J., Spelten, E., Totterdell, P., Smith, L., & Folkard, S. (1995). Is there an optimum number of night shifts? Relationship between sleep, health and well-being. *Work Stress*, 9(2-3), 109-123. <https://doi.org/10.1080/02678379508256545>
- Baumeister, R. F., Bratslavsky, E., Muraven, M., & Tice, D. M. (1998). Ego depletion: is the active self a limited resource? *J Pers Soc Psychol*, 74(5), 1252-1265. <https://doi.org/10.1037//0022-3514.74.5.1252>
- Beal, D. J., Weiss, H. M., Barros, E., & MacDermid, S. M. (2005). An episodic process model of affective influences on performance. *Journal of applied psychology*, 90(6), 1054-1068. <https://doi.org/10.1037/0021-9010.90.6.1054>
- Benca, R. M., Obermeyer, W. H., Thisted, R. A., & Gillin, J. C. (1992). Sleep and psychiatric disorders: A meta-analysis. *Archives of General Psychiatry*, 49(8), 651-668. <https://doi.org/10.1001/archpsyc.1992.01820080059010>
- Bennett, A. A., Bakker, A. B., & Field, J. G. (2018). Recovery from work-related effort: A meta-analysis. *Journal of Organizational Behavior*, 39(3), 262-275. <https://doi.org/https://doi.org/10.1002/job.2217>
- Bennett, A. A., Lanivich, S. E., Lyons, L. M., & Zhou, F. (2023). An effort-recovery model for early-stage entrepreneurs' work demands: the role of recovery experiences. *Journal of Small Business & Entrepreneurship*, 1-25. <https://doi.org/10.1080/08276331.2023.2293665>
- Bindl, U. K., & Parker, S. K. (2011). Proactive work behavior: Forward-thinking and change-oriented action in organizations. In *APA handbook of industrial and organizational psychology, Vol 2: Selecting and developing members for the organization*. (pp. 567-598). American Psychological Association. <https://doi.org/10.1037/12170-019>
- Binnewies, C., Sonnentag, S., & Mojza, E. J. (2009). Daily performance at work: Feeling recovered in the morning as a predictor of day-level job performance. *Journal of Organizational Behavior*, 30(1), 67-93. <https://doi.org/10.1002/job.541>

- Binnewies, C., Sonnentag, S., & Mojza, E. J. (2010). Recovery during the weekend and fluctuations in weekly job performance: A week-level study examining intra-individual relationships. *Journal of Occupational and Organizational Psychology*, 83(2), 419-441. <https://doi.org/https://doi.org/10.1348/096317909X418049>
- Blanche, M. T., Blanche, M. J. T., Durrheim, K., & Painter, D. (2006). *Research in practice: Applied methods for the social sciences*. Juta and Company Ltd.
- Borbély, A. A., Daan, S., Wirz-Justice, A., & Deboer, T. (2016). The two-process model of sleep regulation: a reappraisal. *Journal of Sleep Research*, 25(2), 131-143. <https://doi.org/https://doi.org/10.1111/jsr.12371>
- Borman, W. C., & Motowidlo, S. (1993). Expanding the criterion domain to include elements of contextual performance. In N. Schmitt & W. C. Borman (Eds.), *Personnel selection in organizations* (pp. 71-98). Jossey-Bass.
- Borsboom, D. (2006). When does measurement invariance matter? *Medical Care*, 44(11), 176-181.
- Bosch, C., Sonnentag, S., & Pinck, A. S. (2018). What makes for a good break? A diary study on recovery experiences during lunch break. *Journal of Occupational and Organizational Psychology*, 91(1), 134-157. <https://doi.org/10.1111/joop.12195>
- Bostock, S., Crosswell, A. D., Prather, A. A., & Steptoe, A. (2019). Mindfulness on-the-go: Effects of a mindfulness meditation app on work stress and well-being. *Journal of Occupational Health Psychology*, 24(1), 127-138. <https://doi.org/10.1037/ocp0000118>
- Buyse, D. J. (2014). Sleep health: Can we define it? Does it matter? *Sleep*, 37(1), 9-17. <https://doi.org/10.5665/sleep.3298>
- Buyse, D. J., Reynolds, C. F., 3rd, Monk, T. H., Berman, S. R., & Kupfer, D. J. (1989). The Pittsburgh Sleep Quality Index: A new instrument for psychiatric practice and research. *Psychiatry Research*, 28(2), 193-213. [https://doi.org/10.1016/0165-1781\(89\)90047-4](https://doi.org/10.1016/0165-1781(89)90047-4)
- Bygren, L. O., Weissglas, G., Wikström, B.-M., Konlaan, B. B., Grjibovski, A., Karlsson, A.-B., Andersson, S.-O., & Sjöström, M. (2009). Cultural participation and health: A randomized controlled trial among medical care staff. *Biopsychosocial Science and Medicine*, 71(4), 469-473. <https://doi.org/10.1097/PSY.0b013e31819e47d4>
- Campbell, J. P. (1990). Modeling the performance prediction problem in industrial and organizational psychology. In *Handbook of industrial and organizational psychology, Vol. 1, 2nd ed.* (pp. 687-732). Consulting Psychologists Press.

- Cangiano, F., & Parker, S. K. (2015). Proactivity for mental health and well-being. In *The Wiley Blackwell handbook of the psychology of occupational safety and workplace health* (pp. 228-250). <https://doi.org/https://doi.org/10.1002/9781118979013.ch11>
- Cangiano, F., Parker, S. K., & Ouyang, K. (2021). Too proactive to switch off: When taking charge drains resources and impairs detachment. *Journal of Occupational Health Psychology, 26*(2), 142-154. <https://doi.org/10.1037/ocp0000265>
- Chan, D. (1998). The conceptualization and analysis of change over time: An integrative approach incorporating longitudinal, mean, and covariance structures analysis (LMACS) and multiple indicator latent growth modeling (MLGM). *Organizational Research Methods, 1*(4), 421-483. <https://doi.org/10.1177/109442819814004>
- Chaput, J. P., Dutil, C., Featherstone, R., Ross, R., Giangregorio, L., Saunders, T. J., Janssen, I., Poitras, V. J., Kho, M. E., Ross-White, A., Zankar, S., & Carrier, J. (2020). Sleep timing, sleep consistency, and health in adults: a systematic review. *Appl Physiol Nutr Metab, 45*(10 (Suppl. 2)), S232-S247. <https://doi.org/10.1139/apnm-2020-0032>
- Chawla, N., MacGowan, R. L., Gabriel, A. S., & Podsakoff, N. P. (2020). Unplugging or staying connected? Examining the nature, antecedents, and consequences of profiles of daily recovery experiences. *J Appl Psychol, 105*(1), 19-39. <https://doi.org/10.1037/apl0000423>
- Christian, M. S., Garza, A. S., & Slaughter, J. E. (2011). Work engagement: A quantitative review and test of its relations with task and contextual performance. *Personnel Psychology, 64*(1), 89-136. <https://doi.org/10.1111/j.1744-6570.2010.01203.x>
- Crawford, E. R., LePine, J. A., & Rich, B. L. (2010). Linking job demands and resources to employee engagement and burnout: A theoretical extension and meta-analytic test. *Journal of applied psychology, 95*(5), 834-848. <https://doi.org/10.1037/a0019364>
- Creighton-Smith, B. A., Cook, M., & Edginton, C. R. (2017). Leisure, ethics, and spirituality. *Annals of Leisure Research, 20*(5), 546-562. <https://doi.org/10.1080/11745398.2017.1295873>
- Cuyppers, K., Krokstad, S., Holmen, T. L., Skjei Knudtsen, M., Bygren, L. O., & Holmen, J. (2012). Patterns of receptive and creative cultural activities and their association with perceived health, anxiety, depression and satisfaction with life among adults: The HUNT study, Norway. *J Epidemiol Community Health, 66*(8), 698-703. <https://doi.org/10.1136/jech.2010.113571>
- Daniel, J. (2011). *Sampling essentials: Practical guidelines for making sampling choices*. Sage.

- Daskalova, N., Lee, B., Huang, J., Ni, C., & Lundin, J. (2018). Investigating the effectiveness of cohort-based sleep recommendations. *Proc. ACM Interact. Mob. Wearable Ubiquitous Technol.*, 2(3), 1-19. <https://doi.org/10.1145/3264911>
- de Bloom, J., Kinnunen, U., & Korpela, K. (2015). Recovery processes during and after work: Associations with health, work engagement, and job performance. *J Occup Environ Med*, 57(7), 732-742. <https://doi.org/10.1097/jom.0000000000000475>
- de Bloom, J., Rantanen, J., Tement, S., & Kinnunen, U. (2018). Longitudinal leisure activity profiles and their associations with recovery experiences and job performance. *Leisure Sciences*, 40(3), 151-173. <https://doi.org/10.1080/01490400.2017.1356254>
- de Winter, J., & Dodou, D. (2012). Factor recovery by principal axis factoring and maximum likelihood factor analysis as a function of factor pattern and sample size. *Journal of Applied Statistics*, 39(4), 695-710. <https://doi.org/10.1080/02664763.2011.610445>
- Demerouti, E., Bakker, A. B., Geurts, S. A. E., & Taris, T. W. (2009). Daily recovery from work-related effort during non-work time. In S. Sonnentag, P. L. Perrewé, & D. C. Ganster (Eds.), *Current perspectives on job-stress recovery*. Emerald Group Publishing Limited. [https://doi.org/10.1108/S1479-3555\(2009\)0000007006](https://doi.org/10.1108/S1479-3555(2009)0000007006)
- Depner, C. M., Melanson, E. L., Eckel, R. H., Snell-Bergeon, J. K., Perreault, L., Bergman, B. C., Higgins, J. A., Guerin, M. K., Stothard, E. R., Morton, S. J., & Wright, K. P. (2019). Ad libitum weekend recovery sleep fails to prevent metabolic dysregulation during a repeating pattern of insufficient sleep and weekend recovery sleep. *Current Biology*, 29(6), 957-967. <https://doi.org/https://doi.org/10.1016/j.cub.2019.01.069>
- Diehl, M., Semegon, A. B., & Schwarzer, R. (2006). Assessing attention control in goal pursuit: a component of dispositional self-regulation. *J Pers Assess*, 86(3), 306-317. https://doi.org/10.1207/s15327752jpa8603_06
- Diestel, S., Rivkin, W., & Schmidt, K. H. (2015). Sleep quality and self-control capacity as protective resources in the daily emotional labor process: results from two diary studies. *J Appl Psychol*, 100(3), 809-827. <https://doi.org/10.1037/a0038373>
- Dreyfus, G. (2011). Is mindfulness present-centred and non-judgmental? A discussion of the cognitive dimensions of mindfulness. *Contemporary Buddhism*, 12(1), 41-54. <https://doi.org/10.1080/14639947.2011.564815>
- Eden, D. (1990). Acute and chronic job stress, strain, and vacation relief. *Organizational Behavior and Human Decision Processes*, 45(2), 175-193. [https://doi.org/https://doi.org/10.1016/0749-5978\(90\)90010-7](https://doi.org/https://doi.org/10.1016/0749-5978(90)90010-7)

- Eden, D. (2001). Vacations and other respites: Studying stress on and off the job. In C. L. Cooper & I. T. Robertson (Eds.), *International Review of Industrial and Organizational Psychology* (Vol. 16, pp. 121-146). Wiley.
- Etzion, D., Eden, D., & Lapidot, Y. (1998). Relief from job stressors and burnout: Reserve service as a respite. *J Appl Psychol*, 83(4), 577-585. <https://doi.org/10.1037/0021-9010.83.4.577>
- Feuerhahn, N., Sonnentag, S., & Woll, A. (2014). Exercise after work, psychological mediators, and affect: A day-level study. *European Journal of Work and Organizational Psychology*, 23(1), 62-79. <https://doi.org/10.1080/1359432X.2012.709965>
- Field, A. (2017). *Discovering statistics using IBM SPSS statistics*. SAGE Publications Ltd.
- Finch, H. (2017). Multilevel modeling in the presence of outliers: A comparison of robust estimation methods. 38, 57-92.
- Finch, W. H., Bolin, J. E., & Kelley, K. (2019). *Multilevel Modeling Using R*. Chapman and Hall/CRC. <https://doi.org/10.1201/9781351062268>
- Frankenhaeuser, M., Lundberg, U., Fredrikson, M., Melin, B., Tuomisto, M., Myrsten, A.-L., Hedman, M., Bergman-Losman, B., & Wallin, L. (1989). Stress on and off the job as related to sex and occupational status in white-collar workers. *Journal of Organizational Behavior*, 10(4), 321-346. <https://doi.org/https://doi.org/10.1002/job.4030100404>
- Frese, M., Kring, W., Soose, A., & Zempel, J. (1996). Personal Initiative at Work: Differences between East and West Germany. *The Academy of Management Journal*, 39(1), 37-63. <https://doi.org/10.2307/256630>
- Fritz, C., Auten, D., & Caughlin, D. (2021). Reattachment to work in the morning and day-level leader outcomes. *Journal of Vocational Behavior*, 129, 103617. <https://doi.org/https://doi.org/10.1016/j.jvb.2021.103617>
- Fritz, C., & Sonnentag, S. (2005). Recovery, health, and job performance: Effects of weekend experiences. *J Occup Health Psychol*, 10(3), 187-199. <https://doi.org/10.1037/1076-8998.10.3.187>
- Fritz, C., & Taylor, M. (2020). Detaching from and reattaching to work: The dance of work-nonwork balance. *Organizational Dynamics*, 49(4), 1-7. <https://doi.org/10.1016/j.orgdyn.2019.04.010>

- Geurts, S. A., & Sonnentag, S. (2006). Recovery as an explanatory mechanism in the relation between acute stress reactions and chronic health impairment. *Scand J Work Environ Health*, 32(6), 482-492. <https://doi.org/10.5271/sjweh.1053>
- Ginoux, C., Isoard-Gautheur, S., & Sarrazin, P. (2021). "What did you do this weekend?" Relationships between weekend activities, recovery experiences, and changes in work-related well-being. *Appl Psychol Health Well Being*, 13(4), 798-816. <https://doi.org/10.1111/aphw.12272>
- Golembiewski, R. T., Billingsley, K., & Yeager, S. (1976). Measuring Change and Persistence in Human Affairs: Types of Change Generated by OD Designs. *The Journal of Applied Behavioral Science*, 12(2), 133-157. <https://doi.org/10.1177/002188637601200201>
- Graf, O. (1922). *Worthwhile rest breaks for mental work*. Springer.
- Graf, O. (1928). The rest period in theory and practice. *Psychologische Arbeiten*, 9, 563-683.
- Hahn, V. C., Binnewies, C., & Dormann, C. (2014). The role of partners and children for employees' daily recovery. *Journal of Vocational Behavior*, 85(1), 39-48. <https://doi.org/10.1016/j.jvb.2014.03.005>
- Hall, D. T., & Richter, J. (1988). Balancing work life and home life: What can organizations do to help? *The Academy of Management Perspectives*, 2(3), 213-223.
- Hartig, T., Kylin, C., & Johansson, G. (2007). The telework tradeoff: Stress mitigation vs. constrained restoration. *Applied Psychology: An International Review*, 56(2), 231-253. <https://doi.org/10.1111/j.1464-0597.2006.00252.x>
- Headrick, L., Newman, D. A., Park, Y. A., & Liang, Y. (2023). Recovery experiences for work and health outcomes: A meta-analysis and recovery-engagement-exhaustion model. *Journal of Business and Psychology*, 38(4), 821-864. <https://doi.org/10.1007/s10869-022-09821-3>
- Heck, R. H., Thomas, S. L., & Tabata, L. N. (2014). *Multilevel and longitudinal modeling with IBM SPSS*, 2nd ed. Routledge/Taylor & Francis Group.
- Hill, P. C., & Pargament, K. I. (2003). Advances in the conceptualization and measurement of religion and spirituality. Implications for physical and mental health research. *Am Psychol*, 58(1), 64-74. <https://doi.org/10.1037/0003-066x.58.1.64>

- Hobfoll, S. E. (1989). Conservation of resources. A new attempt at conceptualizing stress. *Am Psychol*, 44(3), 513-524. <https://doi.org/10.1037//0003-066x.44.3.513>
- Hobfoll, S. E. (2001). The influence of culture, community, and the nested-self in the stress process: Advancing conservation of resources theory. *Applied Psychology*, 50(3), 337-421. <https://doi.org/10.1111/1464-0597.00062>
- Hobfoll, S. E., Halbesleben, J., Neveu, J.-P., & Westman, M. (2018). Conservation of resources in the organizational context: The reality of resources and their consequences. *Annual Review of Organizational Psychology and Organizational Behavior*, 5, 103-128. <https://doi.org/10.1146/annurev-orgpsych-032117-104640>
- Hoover, C. S., Ragsdale, J. M., & Ayres, T. B. (2022). An experimental test of resource recovery from physical and relaxation work break activities. *Stress Health*, 38(3), 477-489. <https://doi.org/10.1002/smi.3108>
- Horan, S., Flaxman, P. E., & Stride, C. B. (2021). The perfect recovery? Interactive influence of perfectionism and spillover work tasks on changes in exhaustion and mood around a vacation. *J Occup Health Psychol*, 26(2), 86-107. <https://doi.org/10.1037/ocp0000208>
- Hox, J., & McNeish, D. (2020). Small samples in multilevel modeling. In *Small sample size solutions* (pp. 215-225). <https://doi.org/10.4324/9780429273872-18>
- Hox, J., Moerbeek, M., & Van de Schoot, R. (2017). *Multilevel analysis: Techniques and applications*. Routledge.
- Hülshager, U. R., Feinholdt, A., & Nübold, A. (2015). A low-dose mindfulness intervention and recovery from work: Effects on psychological detachment, sleep quality, and sleep duration. *Journal of Occupational and Organizational Psychology*, 88(3), 464-489. <https://doi.org/10.1111/joop.12115>
- Hülshager, U. R., Lang, J. W., Depenbrock, F., Fehrmann, C., Zijlstra, F. R., & Alberts, H. J. (2014). The power of presence: the role of mindfulness at work for daily levels and change trajectories of psychological detachment and sleep quality. *J Appl Psychol*, 99(6), 1113-1128. <https://doi.org/10.1037/a0037702>
- Hülshager, U. R., Walkowiak, A., & Thommes, M. S. (2018). How can mindfulness be promoted? Workload and recovery experiences as antecedents of daily fluctuations in mindfulness. *J Occup Organ Psychol*, 91(2), 261-284. <https://doi.org/10.1111/joop.12206>

- Hur, W.-M., & Shin, Y. (2023). Is resting and sleeping well helpful to job crafting? Daily relationship between recovery experiences, sleep quality, feelings of recovery, and job crafting. *Applied Psychology*, 72(4), 1608-1623. <https://doi.org/https://doi.org/10.1111/apps.12454>
- Iwasaki, Y., Mannell, R. C., Smale, B. J., & Butcher, J. (2005). Contributions of leisure participation in predicting stress coping and health among police and emergency response services workers. *J Health Psychol*, 10(1), 79-99. <https://doi.org/10.1177/1359105305048557>
- Kahn, W. A. (1990). Psychological conditions of personal engagement and disengagement at work. *The Academy of Management Journal*, 33(4), 692-724. <https://doi.org/10.2307/256287>
- Kaiser, H. F., & Rice, J. (1974). Little jiffy, mark IV. *Educational and Psychological Measurement*, 34(1), 111-117. <https://doi.org/10.1177/001316447403400115>
- Kanfer, R., & Ackerman, P. L. (2004). Aging, adult development, and work motivation. *The Academy of Management Review*, 29(3), 440-458. <https://doi.org/10.2307/20159053>
- Kim, Y., Seidlitz, L., Ro, Y., Evinger, J. S., & Duberstein, P. R. (2004). Spirituality and affect: a function of changes in religious affiliation. *Personality and Individual Differences*, 37(4), 861-870. <https://doi.org/https://doi.org/10.1016/j.paid.2004.05.011>
- Kraepelin, E. (1902). *The curve of work*. Wilhelm Engelmann.
- Krause, A. J., Simon, E. B., Mander, B. A., Greer, S. M., Saletin, J. M., Goldstein-Piekarski, A. N., & Walker, M. P. (2017). The sleep-deprived human brain. *Nat Rev Neurosci*, 18(7), 404-418. <https://doi.org/10.1038/nrn.2017.55>
- Krauss, A. D., Chen, P. Y., DeArmond, S., & Moorcroft, B. (2003). Sleepiness in the workplace: Causes, consequences, and countermeasures. *International Review of Industrial and Organizational Psychology*, 18, 81-129.
- Kubo, T., Takahashi, M., Sato, T., Sasaki, T., Oka, T., & Iwasaki, K. (2011). Weekend sleep intervention for workers with habitually short sleep periods. *Scandinavian Journal of Work, Environment & Health*, 37(5), 418-426. <http://www.jstor.org/stable/23064903>
- Kuykendall, L., Lei, X., Zhu, Z., & Hu, X. (2020). Leisure choices and employee well-being: Comparing need fulfillment and well-being during TV and other leisure activities. *Appl Psychol Health Well Being*, 12(2), 532-558. <https://doi.org/10.1111/aphw.12196>

- Kwok, O.-m., West, S. G., & Green, S. B. (2007). The impact of misspecifying the within-subject covariance structure in multiwave longitudinal multilevel models: A Monte Carlo study. *Multivariate Behavioral Research*, 42(3), 557-592. <https://doi.org/10.1080/00273170701540537>
- Lange, K. L., Roderick, J. A. L., & Jeremy, M. G. T. (1989). Robust statistical modeling using the t distribution. *Journal of the American Statistical Association*, 84(408), 881-896. <https://doi.org/10.2307/2290063>
- Lawler-Row, K. A., & Elliott, J. (2009). The role of religious activity and spirituality in the health and well-being of older adults. *J Health Psychol*, 14(1), 43-52. <https://doi.org/10.1177/1359105308097944>
- LeBeau, B., Song, Y. A., & Liu, W. C. (2018). Model misspecification and assumption violations with the linear mixed model: A meta-analysis. *Sage Open*, 8(4), 2158244018820380. <https://doi.org/10.1177/2158244018820380>
- Lee, K.-H., Choo, S.-W., & Hyun, S. S. (2016). Effects of recovery experiences on hotel employees' subjective well-being. *International Journal of Hospitality Management*, 52, 1-12. <https://doi.org/https://doi.org/10.1016/j.ijhm.2015.04.002>
- Leger, D., Richard, J.-B., Collin, O., Sauvet, F., & Faraut, B. (2020). Napping and weekend catchup sleep do not fully compensate for high rates of sleep debt and short sleep at a population level (in a representative nationwide sample of 12,637 adults). *Sleep Medicine*, 74, 278-288. <https://doi.org/10.1016/j.sleep.2020.05.030>
- Leijten, F. R. M., van den Heuvel, S. G., van der Beek, A. J., Ybema, J. F., Robroek, S. J. W., & Burdorf, A. (2015). Associations of work-related factors and work engagement with mental and physical health: A 1-year follow-up study among older workers. *Journal of Occupational Rehabilitation*, 25(1), 86-95. <https://doi.org/10.1007/s10926-014-9525-6>
- Leong, R. L. F., & Chee, M. W. L. (2023). Understanding the need for sleep to improve cognition. *Annu Rev Psychol*, 74, 27-57. <https://doi.org/10.1146/annurev-psych-032620-034127>
- Little, T. D., Lindenberger, U., & Nesselroade, J. R. (1999). On selecting indicators for multivariate measurement and modeling with latent variables: When "good" indicators are bad and "bad" indicators are good. *Psychological Methods*, 4(2), 192-211. <https://doi.org/10.1037/1082-989X.4.2.192>
- Liu, H., Ji, Y., & Dust, S. B. (2021). "Fully recharged" evenings? The effect of evening cyber leisure on next-day vitality and performance through sleep quantity and quality,

- bedtime procrastination, and psychological detachment, and the moderating role of mindfulness. *J Appl Psychol*, 106(7), 990-1006. <https://doi.org/10.1037/apl0000818>
- Lo, J. C., Leong, R. L. F., Ng, A. S. C., Jamaluddin, S. A., Ong, J. L., Ghorbani, S., Lau, T., Chee, N. I. Y. N., Gooley, J. J., & Chee, M. W. L. (2020). Cognitive effects of split and continuous sleep schedules in adolescents differ according to total sleep opportunity. *Sleep*, 43(12). <https://doi.org/10.1093/sleep/zsaa129>
- Lounsbury, J. W., & Hoopes, L. L. (1986). A vacation from work: Changes in work and nonwork outcomes. *Journal of applied psychology*, 71(3), 392-401. <https://doi.org/10.1037/0021-9010.71.3.392>
- Lundberg, U., & Frankenhaeuser, M. (1999). Stress and workload of men and women in high-ranking positions. *J Occup Health Psychol*, 4(2), 142-151. <https://doi.org/10.1037//1076-8998.4.2.142>
- Luo, W., Li, H., Baek, E., Chen, S., Lam, K. H., & Semma, B. (2021). Reporting practice in multilevel modeling: A revisit after 10 years. *Review of Educational Research*, 91(3), 311-355. <https://doi.org/10.3102/0034654321991229>
- Maas, C. J. M., & Hox, J. J. (2005). Sufficient sample sizes for multilevel modeling. *Methodology: European Journal of Research Methods for the Behavioral and Social Sciences*, 1(3), 86-92. <https://doi.org/10.1027/1614-2241.1.3.86>
- Maltby, J., & Day, L. (2003). Religious orientation, religious coping and appraisals of stress: Assessing primary appraisal factors in the relationship between religiosity and psychological well-being. *Personality and Individual Differences*, 34(7), 1209-1224. [https://doi.org/10.1016/S0191-8869\(02\)00110-1](https://doi.org/10.1016/S0191-8869(02)00110-1)
- Manzer, C. W. (1927). *An experimental investigation of rest pauses*. Columbia University.
- Mavuru, L., & Ramnarain, U. (2020). Learners' socio-cultural backgrounds and science teaching and learning: a case study of township schools in South Africa. *Cultural Studies of Science Education*, 15(4), 1067-1095. <https://doi.org/10.1007/s11422-020-09974-8>
- Meijman, T. F., & Mulder, G. (1998). Psychological aspects of workload. In *Handbook of work and organizational: Work psychology, Vol. 2, 2nd ed.* (pp. 5-33). Psychology Press/Erlbaum (UK) Taylor & Francis.

- Mojza, E. J., Sonnentag, S., & Bornemann, C. (2011). Volunteer work as a valuable leisure-time activity: A day-level study on volunteer work, non-work experiences, and well-being at work. *Journal of Occupational and Organizational Psychology*, 84(1), 123-152. <https://doi.org/https://doi.org/10.1348/096317910X485737>
- Molino, M., Cortese, C. G., Bakker, A. B., & Ghislieri, C. (2015). Do recovery experiences moderate the relationship between workload and work-family conflict? *Career Development International*, 20(7), 686-702. <https://doi.org/10.1108/CDI-01-2015-0011>
- Motowildo, S. J., Borman, W. C., & Schmit, M. J. (1997). A theory of individual differences in task and contextual performance. *Human Performance*, 10(2), 71-83. https://doi.org/10.1207/s15327043hup1002_1
- Muraven, M., & Baumeister, R. F. (2000). Self-regulation and depletion of limited resources: does self-control resemble a muscle? *Psychol Bull*, 126(2), 247-259. <https://doi.org/10.1037/0033-2909.126.2.247>
- Newman, D. B., Tay, L., & Diener, E. (2014). Leisure and subjective well-being: A model of psychological mechanisms as mediating factors. *Journal of Happiness Studies: An Interdisciplinary Forum on Subjective Well-Being*, 15(3), 555-578. <https://doi.org/10.1007/s10902-013-9435-x>
- Ohly, S., Sonnentag, S., Niessen, C., & Zapf, D. (2010). Diary studies in organizational research: An introduction and some practical recommendations. *Journal of Personnel Psychology*, 9(2), 79-93. <https://doi.org/10.1027/1866-5888/a000009>
- Ouyang, K., Cheng, B. H., Lam, W., & Parker, S. K. (2019). Enjoy your evening, be proactive tomorrow: How off-job experiences shape daily proactivity. *Journal of applied psychology*, 104(8), 1003-1019. <https://doi.org/10.1037/apl0000391>
- Pallant, J. (2016). *SPSS survival manual (6th ed.)*. McGraw Hill Education.
- Peugh, J. L. (2010). A practical guide to multilevel modeling. *J Sch Psychol*, 48(1), 85-112. <https://doi.org/10.1016/j.jsp.2009.09.002>
- Pinheiro, J., & Bates, D. (2006). *Mixed-effects models in S and S-PLUS*. Springer New York.
- Pinheiro, J., Bates, D., & the R Core Team (2025). *nlme: Linear and nonlinear mixed effects models* (R package version 3).

- Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *J Appl Psychol*, *88*(5), 879-903. <https://doi.org/10.1037/0021-9010.88.5.879>
- Querstret, D., & Cropley, M. (2012). Exploring the relationship between work-related rumination, sleep quality, and work-related fatigue. *J Occup Health Psychol*, *17*(3), 341-353. <https://doi.org/10.1037/a0028552>
- Ragsdale, J. M., & Beehr, T. A. (2016). A rigorous test of a model of employees' resource recovery mechanisms during a weekend. *Journal of Organizational Behavior*, *37*(6), 911-932. <https://doi.org/10.1002/job.2086>
- Ragsdale, J. M., Beehr, T. A., Grebner, S., & Han, K. (2011). An integrated model of weekday stress and weekend recovery of students. *International Journal of Stress Management*, *18*(2), 153-180. <https://doi.org/10.1037/a0023190>
- Ragsdale, J. M., Hoover, C. S., & Wood, K. (2016). Investigating affective dispositions as moderators of relationships between weekend activities and recovery experiences. *Journal of Occupational and Organizational Psychology*, *89*(4), 734-750. <https://doi.org/10.1111/joop.12150>
- Redelinghuys, K., Rothmann, S., & Botha, E. (2019). Flourishing-at-work: The role of positive organizational practices. *Psychological Reports*, *122*(2), 609-631. <https://doi.org/10.1177/0033294118757935>
- Reis, D., Hoppe, A., & Schröder, A. (2015). Reciprocal relationships between resources, work and study engagement, and mental health: Evidence for gain cycles. *European Journal of Work and Organizational Psychology*, *24*(1), 59-75. <https://doi.org/10.1080/1359432X.2013.834891>
- Rhee, S.-Y., Shin, Y., Hur, W.-M., Lee, S.-H., & Hwang, H. (2024). Daily renewal for job performance: understanding the role of recovery, sleep, resilience, and job crafting from a self-regulatory strength perspective. *Current Psychology*, *43*(44), 34227-34241. <https://doi.org/10.1007/s12144-024-06906-5>
- Rich, B. L., LePine, J. A., & Crawford, E. R. (2010). Job engagement: Antecedents and effects on job performance. *Academy of Management Journal*, *53*(3), 617-635. <https://doi.org/10.5465/AMJ.2010.51468988>
- Roenneberg, T., Wirz-Justice, A., & Mellow, M. (2003). Life between clocks: daily temporal patterns of human chronotypes. *J Biol Rhythms*, *18*(1), 80-90. <https://doi.org/10.1177/0748730402239679>

- Ross, C. E. (1990). Religion and Psychological Distress. *Journal for the Scientific Study of Religion*, 29(2), 236-245. <https://doi.org/10.2307/1387431>
- Sanz-Vergel, A. I., Sebastián, J., Rodríguez-Muñoz, A., Garrosa, E., Moreno-Jiménez, B., & Sonnentag, S. (2010). Adaptation of the "Recovery Experience Questionnaire" in a Spanish sample. *Psicothema*, 22(4), 990-996.
- Schaufeli, W. B., & Bakker, A. B. (2004). Job demands, job resources, and their relationship with burnout and engagement: a multi-sample study. *Journal of Organizational Behavior*, 25(3), 293-315. <https://doi.org/https://doi.org/10.1002/job.248>
- Schaufeli, W. B., Salanova, M., González-Romá, V., & Bakker, A. B. (2002). The measurement of engagement and burnout: A two sample confirmatory factor analytic approach. *Journal of Happiness Studies: An Interdisciplinary Forum on Subjective Well-Being*, 3(1), 71-92. <https://doi.org/10.1023/A:1015630930326>
- Schaufeli, W. B., Shimazu, A., Hakanen, J., Salanova, M., & De Witte, H. (2019). An ultra-short measure for work engagement: The UWES-3 validation across five countries. *European Journal of Psychological Assessment*, 35(4), 577-591. <https://doi.org/10.1027/1015-5759/a000430>
- Scherbaum, C. A., & Ferrerter, J. M. (2009). Estimating statistical power and required sample sizes for organizational research using multilevel modeling. *Organizational Research Methods*, 12(2), 347-367. <https://doi.org/10.1177/1094428107308906>
- Schleupner, R., Kühnel, J., & Melchers, K. G. (2024). Investigating the nature of psychological reattachment to work in the morning: A qualitative study. *European Journal of Work and Organizational Psychology*, 33(4), 446-461. <https://doi.org/10.1080/1359432X.2024.2319908>
- Schleupner, R. M., Kühnel, J., Melchers, K. G., & Richter, S. S. (2023). Be prepared: Does psychological reattachment buffer the effect of a bad night's sleep on day-specific work engagement and proactivity? *Journal of Occupational and Organizational Psychology*, 96(2), 287-307. <https://doi.org/10.1111/joop.12424>
- Schwarzer, R., Diehl, M., & Schmitz, G. (1999). Self-regulation scale. *Journal of Personality Assessment*.
- Shimazu, A., Sonnentag, S., Kubota, K., & Kawakami, N. (2012). Validation of the Japanese version of the recovery experience questionnaire. *Journal of Occupational Health*, 54(3), 196-205. <https://doi.org/10.1539/joh.11-0220-OA>

- Sianoja, M., Kinnunen, U., de Bloom, J., Korpela, K., & Geurts, S. (2016). Recovery during lunch breaks: Testing long-term relations with energy levels at work. *Scandinavian Journal of Work and Organizational Psychology*, 1(1), 7. <https://doi.org/10.16993/sjwop.13>.
- Siegel, J. M. (2005). Clues to the functions of mammalian sleep. *Nature*, 437(7063), 1264-1271. <https://doi.org/10.1038/nature04285>
- Sluiter, J. K., Frings-Dresen, M. H. W., van der Beek, A. J., & Meijman, T. F. (2001). The relation between work-induced neuroendocrine reactivity and recovery, subjective need for recovery, and health status. *Journal of Psychosomatic Research*, 50(1), 29-37. [https://doi.org/10.1016/S0022-3999\(00\)00213-0](https://doi.org/10.1016/S0022-3999(00)00213-0)
- Smevik, H., Habli, S., Saksvik, S. B., Kliem, E., Evensmoen, H. R., Conde, V., Petroni, A., Asarnow, R. F., Dennis, E. L., Eikenes, L., Kallestad, H., Sand, T., Thompson, P. M., Saksvik-Lehouillier, I., Håberg, A. K., & Olsen, A. (2023). Poorer sleep health is associated with altered brain activation during cognitive control processing in healthy adults. *Cerebral Cortex*, 33(11), 7100-7119. <https://doi.org/10.1093/cercor/bhad024>
- Snijders, T. A., & Bosker, R. (2011). *Multilevel analysis: An introduction to basic and advanced multilevel modeling*. Sage.
- Sonnentag, S. (2001). Work, recovery activities, and individual well-being: A diary study. *Journal of Occupational Health Psychology*, 6(3), 196-210. <https://doi.org/10.1037/1076-8998.6.3.196>
- Sonnentag, S. (2003). Recovery, work engagement, and proactive behavior: a new look at the interface between nonwork and work. *J Appl Psychol*, 88(3), 518-528. <https://doi.org/10.1037/0021-9010.88.3.518>
- Sonnentag, S., Arbeus, H., Mahn, C., & Fritz, C. (2014). Exhaustion and lack of psychological detachment from work during off-job time: moderator effects of time pressure and leisure experiences. *J Occup Health Psychol*, 19(2), 206-216. <https://doi.org/10.1037/a0035760>
- Sonnentag, S., & Bayer, U. V. (2005). Switching off mentally: predictors and consequences of psychological detachment from work during off-job time. *J Occup Health Psychol*, 10(4), 393-414. <https://doi.org/10.1037/1076-8998.10.4.393>
- Sonnentag, S., Binnewies, C., & Mojza, E. J. (2008). "Did you have a nice evening?" A day-level study on recovery experiences, sleep, and affect. *J Appl Psychol*, 93(3), 674-684. <https://doi.org/10.1037/0021-9010.93.3.674>

- Sonnentag, S., Cheng, B. H., & Parker, S. L. (2022). Recovery from work: Advancing the field toward the future. *Annual Review of Organizational Psychology and Organizational Behavior*, 9, 33-60. <https://doi.org/10.1146/annurev-orgpsych-012420-091355>
- Sonnentag, S., Eck, K., Fritz, C., & Kühnel, J. (2020). Morning reattachment to work and work engagement during the day: A look at day-level mediators. *Journal of Management*, 46(8), 1408-1435. <https://doi.org/10.1177/0149206319829823>
- Sonnentag, S., & Fritz, C. (2007). The Recovery Experience Questionnaire: Development and validation of a measure for assessing recuperation and unwinding from work. *Journal of Occupational Health Psychology*, 12(3), 204-221. <https://doi.org/10.1037/1076-8998.12.3.204>
- Sonnentag, S., & Fritz, C. (2015). Recovery from job stress: The stressor-detachment model as an integrative framework. *Journal of Organizational Behavior*, 36(S1), S72-S103. <https://doi.org/https://doi.org/10.1002/job.1924>
- Sonnentag, S., & Geurts, S. A. E. (2009). Methodological issues in recovery research. In S. Sonnentag, P. L. Perrewé, & D. C. Ganster (Eds.), *Current Perspectives on Job-Stress Recovery* (Vol. 7, pp. 1-36). Emerald Group Publishing Limited. [https://doi.org/10.1108/S1479-3555\(2009\)0000007004](https://doi.org/10.1108/S1479-3555(2009)0000007004)
- Sonnentag, S., & Krueger, U. (2006). Psychological detachment from work during off-job time: The role of job stressors, job involvement, and recovery-related self-efficacy. *European Journal of Work and Organizational Psychology*, 15(2), 197-217. <https://doi.org/10.1080/13594320500513939>
- Sonnentag, S., & Kühnel, J. (2016). Coming back to work in the morning: Psychological detachment and reattachment as predictors of work engagement. *J Occup Health Psychol*, 21(4), 379-390. <https://doi.org/10.1037/ocp0000020>
- Sonnentag, S., Mojza, E. J., Demerouti, E., & Bakker, A. B. (2012). Reciprocal relations between recovery and work engagement: The moderating role of job stressors. *Journal of applied psychology*, 97(4), 842-853. <https://doi.org/10.1037/a0028292>
- Sonnentag, S., & Natter, E. (2004). Flight attendants' daily recovery from work: Is there no place like home? *International Journal of Stress Management*, 11(4), 366-391. <https://doi.org/10.1037/1072-5245.11.4.366>
- Sonnentag, S., Venz, L., & Casper, A. (2017). Advances in recovery research: What have we learned? What should be done next? *J Occup Health Psychol*, 22(3), 365-380. <https://doi.org/10.1037/ocp0000079>

- StatsSA. (2023). *Census 2022*. <https://census.statssa.gov.za/#/>
- Steed, L. B., Swider, B. W., Keem, S., & Liu, J. T. (2021). Leaving work at work: A meta-analysis on employee recovery from work. *Journal of Management*, 47(4), 867-897. <https://doi.org/10.1177/0149206319864153>
- Stone, A. A., Kennedy-Moore, E., & Neale, J. M. (1995). Association between daily coping and end-of-day mood. *Health Psychol*, 14(4), 341-349. <https://doi.org/10.1037//0278-6133.14.4.341>
- Strine, T. W., & Chapman, D. P. (2005). Associations of frequent sleep insufficiency with health-related quality of life and health behaviors. *Sleep Med*, 6(1), 23-27. <https://doi.org/10.1016/j.sleep.2004.06.003>
- Tabachnick, B., & Fidell, L. (2013). *Using multivariate statistics (6th ed.)*. Pearson.
- ten Brummelhuis, L. L., & Bakker, A. B. (2012). Staying engaged during the week: the effect of off-job activities on next day work engagement. *J Occup Health Psychol*, 17(4), 445-455. <https://doi.org/10.1037/a0029213>
- Tuisku, K., Pulkki-Råback, L., Ahola, K., Hakanen, J., & Virtanen, M. (2012). Cultural leisure activities and well-being at work: A study among health care professionals. *Journal of Applied Arts & Health*, 1, 273-287. https://doi.org/10.1386/jaah.2.3.273_1
- Tuisku, K., Virtanen, M., Bloom, J. D., & Kinnunen, U. (2016). Cultural leisure activities, recovery and work engagement among hospital employees. *Ind Health*, 54(3), 254-262. <https://doi.org/10.2486/indhealth.2015-0124>
- Twisk, J. W. R. (2006). *Applied multilevel analysis: A practical guide for medical researchers*. Cambridge University Press.
- Väänänen, A., Murray, M., Koskinen, A., Vahtera, J., Kouvonen, A., & Kivimäki, M. (2009). Engagement in cultural activities and cause-specific mortality: Prospective cohort study. *Preventive Medicine*, 49(2), 142-147. <https://doi.org/10.1016/j.ypmed.2009.06.026>
- Vallejo Seco, G., Ato García, M., Fernández García, M. P., & Livacic Rojas, P. E. (2013). Multilevel bootstrap analysis with assumptions violated. *Psicothema*, 25(4), 520-528. <https://doi.org/10.7334/psicothema2013.58>
- van Hooff, M. L., Geurts, S. A., Taris, T. W., Kompier, M. A., Dijkers, J. S., Houtman, I. L., & van den Heuvel, F. M. (2005). Disentangling the causal relationships between


- work-home interference and employee health. *Scand J Work Environ Health*, 31(1), 15-29. <https://doi.org/10.5271/sjweh.844>
- van Wijhe, C., Peeters, M., Schaufeli, W., & Ouweneel, E. (2013). Rise and shine: Recovery experiences of workaholic and nonworkaholic employees. *European Journal of Work and Organizational Psychology*, 22(4), 476-489. <https://doi.org/10.1080/1359432X.2012.663527>
- Virtanen, A., De Bloom, J., & Kinnunen, U. (2020). Relationships between recovery experiences and well-being among younger and older teachers. *Int Arch Occup Environ Health*, 93(2), 213-227. <https://doi.org/10.1007/s00420-019-01475-8>
- Völker, J., Koch, T. J. S., Wiegmann, M., & Sonnentag, S. (2024a). Mind the misalignment: The moderating role of daily social sleep lag in employees' recovery processes. *Journal of Organizational Behavior*, 45(5), 684-701. <https://doi.org/10.1002/job.2777>
- Völker, J., Wiegmann, M., Koch, T. J. S., & Sonnentag, S. (2024b). It is Monday again: Weekend sleep differentially relates to the workweek via reattachment on Monday. *Journal of Organizational Behavior*, 45(6), 800-817. <https://doi.org/10.1002/job.2788>
- Volman, F. E., Bakker, A. B., & Xanthopoulou, D. (2013). Recovery at home and performance at work: A diary study on self-family facilitation. *European Journal of Work and Organizational Psychology*, 22(2), 218-234. <https://doi.org/10.1080/1359432X.2011.648375>
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: the PANAS scales. *J Pers Soc Psychol*, 54(6), 1063-1070. <https://doi.org/10.1037//0022-3514.54.6.1063>
- Wendsche, J., & Lohmann-Haislah, A. (2017). A meta-analysis on antecedents and outcomes of detachment from work. *Frontiers in Psychology*, 7. <https://doi.org/10.3389/fpsyg.2016.02072>
- Wiegmann, M., Völker, J., & Sonnentag, S. (2023). Sleep has many faces: The interplay of sleep and work in predicting employees' energetic state over the course of the day. *J Occup Health Psychol*, 28(1), 52-63. <https://doi.org/10.1037/ocp0000345>
- Wild, C. J., Nichols, E. S., Battista, M. E., Stojanoski, B., & Owen, A. M. (2018). Dissociable effects of self-reported daily sleep duration on high-level cognitive abilities. *Sleep*, 41(12). <https://doi.org/10.1093/sleep/zsy182>

- Williams, L. J., & Anderson, S. E. (1991). Job satisfaction and organizational commitment as predictors of organizational citizenship and in-role behaviors. *Journal of Management*, *17*(3), 601-617. <https://doi.org/10.1177/014920639101700305>
- Wittmann, M., Dinich, J., Mellow, M., & Roenneberg, T. (2006). Social Jetlag: Misalignment of biological and social Time. *Chronobiology International*, *23*(1-2), 497-509. <https://doi.org/10.1080/07420520500545979>
- Zhang, R., Tomasi, D., Shokri-Kojori, E., Wiers, C. E., Wang, G. J., & Volkow, N. D. (2020). Sleep inconsistency between weekends and weekdays is associated with changes in brain function during task and rest. *Sleep*, *43*(10). <https://doi.org/10.1093/sleep/zsaa076>


Appendix A

Survey Cover Page

0% ————— 100%



UNIVERSITY OF CAPE TOWN
FACULTY OF COMMERCE
Igniting Knowledge and Opportunity



Hi!

Thank you for your interest in my survey. My name is Callum Schroeder and I am completing a Master's in Organisational Psychology at the University of Cape Town. For my dissertation, I am conducting supervised research on employee wellness titled: *Recharged and Ready: A week-level study examining the relationship between weekend recovery and weekly performance.*

My research aims to contribute to understanding the effect of rest on weekends on employee performance, engagement, and well-being, over the course of three weeks. Therefore, I request your permission to complete three short questionnaires online. The current survey will only gather general information. Thereafter, you will be asked to complete a pre-weekend (on the next 3 Fridays) and a post-weekend survey (on the next 3 Mondays.)

All responses will be strictly confidential and stored on a secure server, but aggregated results can be shared with you. There is also no potential for harm to any research participants or the company.

Kindly note that this study has been granted ethical approval from the Faculty of Commerce's Ethics in Research Committee at the university.

Should you have any questions, please feel free to contact me at schcal007@myuct.ac.za or my supervisor, Professor Jeffrey Bagraim at jeffrey.bagraim@myuct.ac.za

Yours sincerely,
Callum

Appendix B

Contacts Survey

Please enter your email address.

Your email address will be used solely for the purposes of (1) linking your responses across surveys to ensure that your responses produce results that are truly reliable and meaningful, and (2) sending automated reminders for future surveys. Please note all email data will be stored on a secure server and will be deleted after data collection.

Thank you so much for completing this survey! Please feel free to leave a comment. Otherwise, enjoy the rest of your day.



Appendix C

Psychometric Analyses

Table C1

Sampling Adequacy and Factorability of the Data Obtained from Each Scale

Measure	<i>KMO</i>	Bartlett's Test of Sphericity		
		Approx. chi-square	<i>df</i>	<i>p</i>
Self-Regulation Scale	,855	305,658	45	<.001
Negative Affect Scale	,747	222,765	15	<.001
Recovery Experiences Questionnaire	,799	852,533	66	<.001
The State of Being Recovered Scale	,809	263,387	6	<.001
Psychological Reattachment Scale	,831	355,283	10	<.001
In-Role Behaviour Scale	,772	513,865	21	<.001
Ultra-Short Work Engagement Scale	,574	87,655	3	<.001

Note. *KMO* = Kaiser-Meyer-Olkin measure of sampling adequacy; *approx.* = approximate; *df* = degrees of freedom; *p* = p-value

Table C2*Factor Loadings for an Exploratory Factor Analysis of the Self-Regulation Scale*

	Factor	
	1	2
1. I can concentrate on one activity for a long time, if necessary.	.56	-.06
2. If I am distracted from an activity, I don't have any problem coming back to the topic quickly.	.71	-.17
3. If an activity arouses my feelings too much, I can calm myself down so that I can continue with the activity soon.	.62	-.29
4. If an activity requires a problem-oriented attitude, I can control my feelings.	.56	-.25
5. It is difficult for me to suppress thoughts that interfere with what I need to do. (R)	-.08	.74
6. I can control my thoughts from distracting me from the task at hand.	.53	-.14
7. When I worry about something, I cannot concentrate on an activity. (R)	-.24	.65
8. After an interruption, I don't have any problem resuming my concentrated style of working.	.53	-.25
9. I have a whole bunch of thoughts and feelings that interfere with my ability to work in a focused way. (R)	-.50	.66
10. I stay focused on my goal and don't allow anything to distract me from my plan of action.	.59	-.43
Eigenvalue	4.33	1.27
% of Variance	43.36	12.66

Note. $N = 88$. The extraction method used was principal axis factoring with an orthogonal (varimax with Kaiser Normalisation) rotation. Factor loadings are presented in boldface. Reverse-scored items are denoted with an (R).

Table C3*Factor Loadings for an Exploratory Factor Analysis of the Negative Affect Scale*

	Factor	
	1	2
1. Irritable	.20	.58
2. Upset	.14	.89
3. Distressed	.27	.71
4. Nervous	.74	.15
5. Afraid	.80	.34
6. Jittery	.75	.19
Eigenvalue	3.16	1.25
% of Variance	52.69	20.86

Note. $N = 88$. The extraction method used was principal axis factoring with an orthogonal (varimax with Kaiser Normalisation) rotation. Factor loadings are presented in boldface.

Table C4*Factor Loadings for an Exploratory Factor Analysis of the In-Role Behaviour Scale*

	Week 1 ^a		Week 2 ^b		Week 3 ^c	
	Factor		Factor		Factor	
	1	2	1	2	1	2
1. I adequately complete the duties that I am assigned to.	.73	.26	.95	.22	.97	.22
2. I fulfil the responsibilities specified in my job's description.	.85	.15	.95	-.01	.95	.20
3. I perform the tasks that are expected of me.	.92	.10	.93	-.05	.95	.27
4. I meet the formal performance requirements of the job.	.79	-.05	.88	-.04	.91	.29
5. I engage in activities that will directly affect my performance evaluation.	.31	-.22	.57	-.49	.18	.91
6. I neglect aspects of the job that I am obligated to perform. (R)	.03	.92	.00	.82	.19	.87
7. I fail to perform essential duties. (R)	.10	.51	.08	.81	-.20	-.53
Eigenvalue	3.22	1.57	3.76	1.63	4.44	1.31
% of Variance	45.94	22.44	53.76	23.26	63.47	18.69

Note. The extraction method used was principal axis factoring with an orthogonal (varimax with Kaiser Normalisation) rotation. Factor loadings are presented in boldface. Reverse-scored items are denoted with an (R).

^a *N* = 43.

^b *N* = 36.

^c *N* = 26.

Table C5

Factor Loadings for an Exploratory Factor Analysis of the In-Role Behaviour Scale (Round 2)

	Week 1 ^a		Week 2 ^b	Week 3 ^c
	Factor		Factor	Factor
	1	2	1	1
1. I adequately complete the duties that I am assigned to.	.75	.16	.83	.83
2. I fulfil the responsibilities specified in my job's description.	.87	.18	.94	.94
3. I perform the tasks that are expected of me.	.89	.26	.95	.95
4. I meet the formal performance requirements of the job.	.56	.77	.92	.92
5. I engage in activities that will directly affect my performance evaluation.	.06	.55	.48	.48
Eigenvalue	3.16	1.02	3.76	3.91
% of Variance	63.10	20.46	75.22	78.22

Note. The extraction method used was principal axis factoring with an orthogonal (varimax with Kaiser Normalisation) rotation. Factor loadings are presented in boldface.

^a $N = 43$.

^b $N = 36$.

^c $N = 26$.

Table C6

Factor Loadings for an Exploratory Factor Analysis of the Ultra-Short Work Engagement Scale

	Week 1	Week 2	Week 3
	Factor	Factor	Factor
	1	1	1
1. At my work, I feel bursting with energy.	.65	.63	.93
2. I am enthusiastic about my job.	.96	.98	.80
3. I am immersed in my work.	.68	.51	.58
Eigenvalue	2.15	1.98	1.84
% of Variance	71.52	65.84	61.17

Note. The extraction method used was principal axis factoring with an orthogonal (varimax with Kaiser Normalisation) rotation.

^a $N = 43$.

^b $N = 36$.

^c $N = 26$.

Table C7

Factor Loadings for an Exploratory Factor Analysis of the Recovery Experiences Questionnaire

	Week 1 ^a			Week 2 ^b			Week 3 ^c		
	Factor			Factor			Factor		
	1	2	3	1	2	3	1	2	3
Factor 1: Psychological Detachment									
1. I forget about work.	.79	.27	-.13	.84	.12	.07	.87	-.21	.07
2. I don't think about work at all.	.61	.23	-.06	.74	.11	.17	.88	.00	.07
3. I distance myself from my work.	.92	.11	-.05	.86	.02	.14	.90	.09	.13
4. I get a break from the demands of work.	.67	-.02	.24	.83	.10	.24	.82	.04	-.03
Factor 2: Relaxation									
5. I kick back and relax.	.10	.89	-.21	.09	.80	.33	.09	.87	.23
6. I do relaxing things.	.27	.85	.06	.36	.88	.06	.36	.68	-.07
7. I use the time to relax.	.06	.93	.06	.13	.98	.11	.13	.78	.00
8. I take time for leisure.	.23	.73	.30	.30	.77	.24	.30	.58	.15

Factor 3: Mastery

9. I learn new things.	.04	-.05	.77	.17	.14	.95	-.07	.21	.83
10. I seek out intellectual challenges.	-.12	.15	.83	.16	.08	.77	.39	-.08	.81
11. I do things that challenge me.	-.04	.02	.77	.17	-.04	.94	.11	-.20	.62
12. I do something to broaden my horizons.	.11	.02	.95	.25	.21	.83	.07	.00	.97
Eigenvalue	4.07	3.23	2.02	5.64	2.59	1.82	3.66	3.42	2.19
% of Variance	33.91	26.90	16.83	47.00	21.57	15.20	30.48	28.51	18.23

Note. The extraction method used was principal axis factoring with an orthogonal (varimax with Kaiser Normalisation) rotation. Factor loadings are in boldface.

^a $N = 43$.

^b $N = 34$.

^c $N = 25$.

Table C8*Factor Loadings for an Exploratory Factor Analysis of the State of Being Recovered Scale*

	Week 1 ^a	Week 2 ^b	Week 3 ^c
	Factor	Factor	Factor
	1	1	1
1. I feel mentally recovered.	.90	.79	.96
2. I feel physically refreshed.	.87	.82	.81
3. I feel well rested.	.69	.98	.95
4. I am now full of energy.	.65	.85	.84
Eigenvalue	2.82	3.22	3.38
% of Variance	70.46	80.39	84.41

Note. The extraction method used was principal axis factoring with an orthogonal (varimax with Kaiser Normalisation) rotation. Factor loadings are in boldface.

^a $N = 43$.

^b $N = 34$.

^c $N = 25$.

Table C9

Factor Loadings for an Exploratory Factor Analysis of the Psychological Reattachment Scale

	Week 1 ^a	Week 2 ^b	Week 3 ^c
	Factor	Factor	Factor
	1	1	1
1. Before I started my work this morning, I mentally tuned into my work.	.85	.88	.88
2. Before I started my work this morning, I prepared mentally for it.	.84	.73	.93
3. Before I started my work this morning, I reflected about/considered the upcoming workday.	.76	.91	.95
4. Before I started my work this morning, I thought about what I wanted to achieve at work today.	.74	.85	.88
5. Before I started my work this morning, I thought about what I will encounter at my work today.	.74	.78	.52
Eigenvalue	3.47	3.77	3.80
% of Variance	69.39	75.31	76.00

Note. The extraction method used was principal axis factoring with an orthogonal (varimax with Kaiser Normalisation) rotation.

^a $N = 43$.

^b $N = 34$.

^c $N = 25$.

Table C10*Results From the Reliability Analyses*

Measure	<i>n</i>	Cronbach's alpha (<i>a</i>)	Corrected item- total correlation
General Survey			
Self-Regulatory Resources	88	.82	.46 < <i>r</i> < .64
Negative Affect	88	.81	.51 < <i>r</i> < .69
Pre-Weekend Survey			
Task Performance			
Week 1	43	.79	.29 < <i>r</i> < .76
Week 2	36	.90	.47 < <i>r</i> < .87
Week 3	26	.81	-.29 < <i>r</i> < .95
Work Engagement			
Week 1	43	.79	.59 < <i>r</i> < .74
Week 2	36	.72	.44 < <i>r</i> < .70
Week 3	26	.67	.29 < <i>r</i> < .76
Post-Weekend Survey			
Recovery Experiences			
Week 1	43	.80	.29 < <i>r</i> < .69
Week 2	34	.89	.53 < <i>r</i> < .72
Week 3	25	.78	.19 < <i>r</i> < .58
The State of Being Recovered			
Week 1	43	.86	.62 < <i>r</i> < .80
Week 2	34	.92	.76 < <i>r</i> < .91
Week 3	25	.94	.79 < <i>r</i> < .92
Psychological Reattachment			
Week 1	43	.89	.69 < <i>r</i> < .79
Week 2	34	.92	.70 < <i>r</i> < .85
Week 3	25	.92	.51 < <i>r</i> < .91

Table C11*Results From the Reliability Analyses for the In-Role Behaviour Scale*

Item	Corrected item- total correlation	Cronbach's alpha (<i>a</i>) if item deleted
1. I adequately complete the duties that I am assigned to.		
Week 1	.60	.74
Week 2	.79	.87
Week 3	.85	.69
2. I fulfil the responsibilities specified in my job's description.		
Week 1	.71	.72
Week 2	.87	.86
Week 3	.95	.66
3. I perform the tasks that are expected of me.		
Week 1	.73	.72
Week 2	.89	.86
Week 3	.90	.67
4. I meet the formal performance requirements of the job.		
Week 1	.76	.68
Week 2	.84	.86
Week 3	.91	.68
5. I engage in activities that will directly affect my performance evaluation.		
Week 1	.29	.88
Week 2	.47	.95
Week 3	-.29	.98

Note. Week 1 $a = .79$; Week 2 $a = .90$; Week 3 $a = .81$.

Table C12*Results From the Reliability Analyses for the Ultra-Short Work Engagement Scale*

Item	Corrected item- total correlation	Cronbach's alpha (<i>a</i>) if item deleted
1. At my work, I feel bursting with energy.		
Week 1	.59	.78
Week 2	.55	.67
Week 3	.47	.61
2. I am enthusiastic about my job.		
Week 1	.74	.59
Week 2	.70	.46
Week 3	.76	.15
3. I am immersed in my work.		
Week 1	.60	.76
Week 2	.44	.75
Week 3	.29	.80

Note. Week 1 $a = .79$; Week 2 $a = .72$; Week 3 $a = .63$.

Table C13

Results From the Reliability Analyses for the Mastery Experiences Scale (Derived from the Recovery Experiences Questionnaire)

Item	Corrected item- total correlation	Cronbach's alpha (<i>a</i>) if item deleted
1. I learn new things.		
Week 1	.30	.80
Week 2	.63	.88
Week 3	.46	.76
2. I seek out intellectual challenges.		
Week 1	.32	.80
Week 2	.51	.89
Week 3	.49	.75
3. I do things that challenge me.		
Week 1	.29	.80
Week 2	.51	.89
Week 3	.19	.79
4. I do something to broaden my horizons.		
Week 1	.45	.79
Week 2	.67	.88
Week 3	.43	.76

Note. Week 1 $a = .80$; Week 2 $a = .89$; Week 3 $a = .78$.

Appendix D*Descriptive Statistics***Table D1***Descriptive Statistics of the Overall Data*

	M	SD	Min	Max	Skewness	Kurtosis
General Survey						
Self-Regulation	3.00	.56	1.71	4.00	-.07	-.54
Negative Affect	2.07	.86	1.00	4.60	1.13	.74
Pre-Weekend Survey						
Task Performance	4.35	1.03	1.00	5.00	-2.19	4.27
Work Engagement	4.24	.91	2.00	6.00	.04	-.35
Sleep Duration	6.58	1.04	4.00	8.00	-.65	.09
Post-Weekend Survey						
High-Duty Activities						
Work-Related	1.79	1.83	.00	6.00	.90	-.17
Household	4.30	1.48	.00	6.00	-.62	.08
Childcare	2.19	2.17	.00	6.00	.54	-1.12
Low-Duty Activities						
Low-Effort	3.39	1.66	1.00	6.00	.33	-1.01
Social	2.82	1.77	.00	6.00	.26	-.74
Physical	1.91	1.67	.00	6.00	.58	-.57
Cultural	2.08	1.54	.00	6.00	.83	.17
Religious and Spiritual	1.63	1.62	.00	6.00	.97	.48
Sleep Quality	2.81	.70	1.00	4.00	-.61	.73
Sleep Duration	6.74	1.05	4.00	9.00	-.33	-.08
Weekend Catch-Up Sleep	.17	1.30	-2.00	4.00	.87	.50
Recovery Experiences						
Psychological Detachment	2.80	1.14	1.00	5.00	.45	-.92
Relaxation	3.56	1.01	1.00	5.00	-.64	.05
Mastery	3.52	1.01	1.00	5.00	-.22	-.71

	M	SD	Min	Max	Skewness	Kurtosis
The State of Being Recovered	3.05	1.05	1.00	5.00	-.44	-.89
Psychological Reattachment	4.03	.97	1.00	5.00	-1.59	2.57

Note. $N = 102$. M = mean; SD = standard deviation; Min = minimum; Max = maximum.

Table D2*Descriptive Statistics of the Person-Level Data*

	M	SD	Min	Max	Skewness	Kurtosis
General Survey						
Self-Regulation	3.00	.57	1.71	4.00	-.07	-.50
Negative Affect	2.07	.86	1.00	4.60	1.15	.86
Pre-Weekend Survey						
Task Performance	4.34	.89	1.00	5.00	-2.16	5.40
Work Engagement	4.22	.78	2.50	6.00	-.06	-.24
Sleep Duration	6.52	.98	4.00	8.00	-.43	.08
Post-Weekend Survey						
High-Duty Activities						
Work-Related	1.68	1.59	.00	6.00	1.13	.79
Household	4.23	1.26	.00	6.00	-.70	1.27
Childcare	2.25	2.06	.00	6.00	.41	-1.29
Low-Duty Activities						
Low-Effort	3.16	1.54	1.00	6.00	.53	-.67
Social	2.76	1.64	.00	6.00	.29	-.65
Physical	1.91	1.55	.00	5.00	.26	-1.29
Cultural	2.08	1.43	.00	6.00	.66	.38
Religious and Spiritual	1.79	1.51	.00	6.00	.79	.32
Sleep Quality	2.79	.69	1.00	4.00	-1.09	1.53
Sleep Duration	6.68	.92	4.50	8.33	-.46	-.32
Weekend Catch-Up Sleep	.15	1.16	-2.00	3.50	.90	.73
Recovery Experiences						
Psychological Detachment	2.79	1.09	1.00	5.00	.40	-.75
Relaxation	3.45	.99	1.00	5.00	-.59	.18
Mastery	3.56	1.04	1.00	5.00	-.32	-.65
The State of Being Recovered	3.03	1.00	1.00	5.00	-.41	-.83
Psychological Reattachment	4.04	1.00	1.00	5.00	-1.74	3.03

Note. $N = 57$. M = mean; SD = standard deviation; Min = minimum; Max = maximum.

Table D3*Descriptive Statistics of the Week-Level Data*

	M	SD	Min	Max	Skewness	Kurtosis
Pre-Weekend Survey ^a						
Task Performance						
Week 1	4.60	.69	1.00	5.00	-3.70	17.57
Week 2	4.18	1.15	1.00	5.00	-1.84	2.78
Week 3	4.17	1.27	1.00	5.00	-1.60	1.46
Work Engagement						
Week 1	4.41	.91	3.00	6.00	.28	-.84
Week 2	4.06	.86	2.33	6.00	-.01	-.08
Week 3	4.22	.95	2.00	6.00	-.36	-.04
Sleep Duration						
Week 1	6.38	1.19	4.00	8.00	-.46	-.47
Week 2	6.67	.80	5.00	8.00	-.73	.29
Week 3	6.77	1.03	4.00	8.00	-.68	.53
Post-Weekend Survey ^b						
High-Duty Activities						
Week 1	8.14	3.45	1.00	18.00	.80	1.07
Week 2	8.29	3.52	2.00	15.00	.11	-.85
Week 3	8.52	4.20	.00	18.00	.40	.87
Work-Related						
Week 1	1.63	1.56	.00	6.00	1.06	1.00
Week 2	1.88	2.03	.00	6.00	.75	-.68
Week 3	1.96	2.01	.00	6.00	.86	-.58
Household						
Week 1	4.28	1.37	1.00	6.00	-.30	-.54
Week 2	4.29	1.53	.00	6.00	-.64	.25
Week 3	4.36	1.66	.00	6.00	-.99	.81

	M	SD	Min	Max	Skewness	Kurtosis
Childcare						
Week 1	2.23	2.13	.00	6.00	.54	-1.10
Week 2	2.12	2.37	.00	6.00	.65	-1.19
Week 3	2.20	2.02	.00	6.00	.40	-1.09
Low-Duty Activities						
Week 1	12.60	3.87	3.00	22.00	.02	1.09
Week 2	10.91	4.52	3.00	26.00	.86	2.57
Week 3	11.76	4.71	3.00	24.00	.54	.50
Low-Effort						
Week 1	3.37	1.71	1.00	6.00	.29	-1.00
Week 2	3.68	1.63	1.00	6.00	.16	-1.04
Week 3	3.04	1.62	1.00	6.00	.76	-.50
Social						
Week 1	3.12	1.79	.00	6.00	-.05	-.72
Week 2	2.44	1.69	.00	6.00	.73	-.09
Week 3	2.84	1.82	.00	6.00	.26	-.63
Physical						
Week 1	2.12	1.76	.00	6.00	.45	-.79
Week 2	1.62	1.60	.00	5.00	.72	-.34
Week 3	1.96	1.62	.00	6.00	.71	-.05
Cultural						
Week 1	2.23	1.48	.00	6.00	.74	.16
Week 2	1.74	1.46	.00	6.00	1.54	2.79
Week 3	2.28	1.72	.00	6.00	.38	-.83
Religious and Spiritual						
Week 1	1.77	1.66	.00	6.00	.72	-.23
Week 2	1.44	1.48	.00	6.00	1.19	1.76
Week 3	1.64	1.75	.00	6.00	1.21	1.13

	M	SD	Min	Max	Skewness	Kurtosis
Sleep Quality						
Week 1	2.91	.68	1.00	4.00	-.82	1.69
Week 2	2.76	.78	1.00	4.00	-.77	.67
Week 3	2.72	.61	2.00	4.00	.22	-.45
Sleep Duration						
Week 1	6.84	.98	4.00	9.00	-.29	1.16
Week 2	6.76	1.13	5.00	9.00	-.18	-.92
Week 3	6.52	1.08	4.00	8.00	-.59	-.25
Weekend Catch-Up Sleep						
Week 1	.45	1.44	-2.00	4.00	.71	-.08
Week 2	.10	1.11	-2.00	3.00	.87	1.41
Week 3	-.24	1.20	-2.00	3.00	1.13	1.37
Recovery Experiences						
Week 1	3.32	.66	1.33	4.67	-.52	1.21
Week 2	3.25	.86	1.00	5.00	-.23	.27
Week 3	3.24	.67	1.92	5.00	.57	.94
Psychological Detachment						
Week 1	2.84	1.06	1.00	5.00	.44	-.72
Week 2	2.85	1.19	1.00	5.00	.47	-.91
Week 3	2.67	1.26	1.00	5.00	.55	-1.09
Relaxation						
Week 1	3.64	.99	1.00	5.00	-.95	.73
Week 2	3.53	1.15	1.00	5.00	-.67	-.20
Week 3	3.48	.85	2.00	5.00	.25	-.64
Mastery						
Week 1	3.49	.97	1.50	5.00	-.04	-.82
Week 2	3.49	1.05	1.00	5.00	-.48	-.36
Week 3	3.64	1.06	1.50	5.00	-.16	-.99

	M	SD	Min	Max	Skewness	Kurtosis
The State of Being Recovered						
Week 1	3.16	.88	1.00	4.75	-.85	.10
Week 2	2.97	1.15	1.00	5.00	-.25	-1.29
Week 3	2.99	1.19	1.00	5.00	-.22	-1.22
Psychological Reattachment						
Week 1	4.19	.82	1.00	5.00	-1.81	4.42
Week 2	3.83	1.08	1.00	5.00	-1.47	2.05
Week 3	4.01	1.02	1.00	5.00	-1.48	1.99

Note. *M* = mean; *SD* = standard deviation; *Min* = minimum; *Max* = maximum.

^a Week 1 *N* = 43; Week 2 *N* = 36; Week 3 *N* = 26.

^b Week 1 *N* = 43; Week 2 *N* = 34; Week 3 *N* = 25.

Table D4

Descriptive Statistics for Cultural and Religious/Spiritual Activity of the Sample

Activity	Cultural		Religious and Spiritual	
	<i>N</i>	%	<i>N</i>	%
Active ^a	50	87,7%	50	87,7%
Inactive ^b	7	12,3%	7	12,3%

Note. *N* = 57.

^a Individuals who reportedly engaged in an average of one hour or more of cultural and religious/spiritual activities over the three-week duration were considered ‘active’.

^b Individuals who reportedly engaged in less than one hour of cultural and religious/spiritual activities were considered ‘inactive’.

Table D5*Bivariate Correlations for the Recovery Experiences Scores Across Three Weeks*

	Week 1	Week 2	Week 3
Week 1^a			
<i>r</i>	1	.81***	.63**
<i>p</i>		<.001	<.01
Week 2^b			
<i>r</i>	.81***	1	.85***
<i>p</i>	<.001		<.001
Week 3^c			
<i>r</i>	.63**	.85***	1
<i>p</i>	<.01	<.01	

Note. *r* = Pearson product-moment correlation coefficient; *p* = p-value. **p* < .05; ***p* < .01;

****p* < .001.

^a *N* = 43.

^b *N* = 34.

^c *N* = 25.

Table D6*Bivariate Correlations for the State of Being Recovered Scores Across Three Weeks*

	Week 1	Week 2	Week 3
Week 1^a			
<i>r</i>	1	.50**	.50**
<i>p</i>		<.01	<.01
Week 2^b			
<i>r</i>	.50**	1	.85***
<i>p</i>	<.01		<.001
Week 3^c			
<i>r</i>	.50**	.85***	1
<i>p</i>	<.01	<.001	

Note. *r* = Pearson product-moment correlation coefficient; *p* = p-value. **p* < .05; ***p* < .01;

****p* < .001.

^a *N* = 43.

^b *N* = 34.

^c *N* = 25.

Table D7*Bivariate Correlations for the Psychological Reattachment Scores Across Three Weeks*

	Week 1	Week 2	Week 3
Week 1^a			
<i>r</i>	1	.59**	.53**
<i>p</i>		<.01	<.01
Week 2^b			
<i>r</i>	.59**	1	.62**
<i>p</i>	<.01		<.01
Week 3^c			
<i>r</i>	.53**	.62**	1
<i>p</i>	.03	<.01	

Note. *r* = Pearson product-moment correlation coefficient; *p* = p-value. **p* < .05; ***p* < .01;

****p* < .001.

^a *N* = 43.

^b *N* = 34.

^c *N* = 25.

Table D8*Bivariate Correlations for the Task Performance Scores Across Three Weeks*

	Week 1	Week 2	Week 3
Week 1^a			
<i>r</i>	1	-.20	.30
<i>p</i>		.34	.23
Week 2^b			
<i>r</i>	-.20	1	.37
<i>p</i>	.34		.12
Week 3^c			
<i>r</i>	.30	.37	1
<i>p</i>	.23	.12	

Note. *r* = Pearson product-moment correlation coefficient; *p* = p-value. **p* < .05; ***p* < .01;

****p* < .001.

^a *N* = 43.

^b *N* = 36.

^c *N* = 26.

Table D9*Bivariate Correlations for the Work Engagement Scores Across Three Weeks*

	Week 1	Week 2	Week 3
Week 1^a			
<i>r</i>	1	.41**	.25
<i>p</i>		<.01	.33
Week 2^b			
<i>r</i>	.41**	1	.63**
<i>p</i>	<.01		<.01
Week 3^c			
<i>r</i>	.25	.63**	1
<i>p</i>	.33	<.01	

Note. *r* = Pearson product-moment correlation coefficient; *p* = p-value. **p* < .05; ***p* < .01;

****p* < .001.

^a *N* = 43.

^b *N* = 36.

^c *N* = 26.

Appendix E

Syntaxes

Figure E1

R Script for Multilevel Model Fit: Hypothesis 1

```
uv_rec<- lme(RecoveryExperiences ~ Gender + Age + Children + Employment +  
  Education + SelfRegulation_cen + NegativeAffect_cen +  
  LowDuty_cen + HighDuty_cen + SleepQualityPost_cen +  
  CatchUpSleep_cen,  
  random = list(ID = ~ 1),  
  correlation = corAR1(form = ~ Week | ID),  
  method = "REML",  
  control = lmeControl(opt = "optim", maxIter = 1000,  
    msMaxIter = 1000),  
  na.action = na.exclude,  
  data = Long_Overall_R)
```

Note. All functions were performed in RStudio, version 2024.09.1. *uv* = univariate; *cen* = centred; *corAR1* = first-order autoregressive covariance structure; *REML* = restricted-maximum likelihood; *opt* = optimisation; *maxIter* = maximum iterations; *na* = missing values; *data* = dataset.

Figure E2*R Script for Multilevel Model Fit: Hypothesis 2a*

```
uv_sbr <- lme(StateOfBeingRecovered ~ Gender + Age + Children +
  Employment + Education + SelfRegulation_cen +
  NegativeAffect_cen + RecoveryExperiences_cen,
  random = list(ID = ~ 1),
  correlation = corAR1(form = ~ Week | ID),
  method = "REML",
  control = lmeControl(opt = "optim", maxIter = 1000,
    msMaxIter = 1000),
  na.action = na.exclude,
  data = Long_Overall_R)
```

Note. All functions were performed in RStudio, version 2024.09.1. *uv* = univariate; *cen* = centred; *corAR1* = first-order autoregressive covariance structure; *REML* = restricted-maximum likelihood; *opt* = optimisation; *maxIter* = maximum iterations; *na* = missing values; *data* = dataset.

Figure E3*R Script for Multilevel Model Fit: Hypothesis 2b*

```
uv_pr <- lme(PsychologicalReattachment ~ Gender + Age + Children +
  Employment + Education + SelfRegulation_cen +
  NegativeAffect_cen + RecoveryExperiences_cen,
  random = list(ID = ~ 1),
  correlation = corAR1(form = ~ Week | ID),
  method = "REML",
  control = lmeControl(opt = "optim", maxIter = 1000,
    msMaxIter = 1000),
  na.action = na.exclude,
  data = Long_Overall_R)
```

Note. All functions were performed in RStudio, version 2024.09.1. *uv* = univariate; *cen* = centred; *corAR1* = first-order autoregressive covariance structure; *REML* = restricted-maximum likelihood; *opt* = optimisation; *maxIter* = maximum iterations; *na* = missing values; *data* = dataset.

Figure E4*R Script for Multilevel Model Fit: Hypothesis 3a*

```
uv_tp <- lme(TaskPerformance ~ Gender + Age + Children + Employment +
  Education + SelfRegulation_cen + NegativeAffect_cen +
  StateOfBeingRecovered_cen + PsychologicalReattachment_cen,
  random = list(ID = ~ 1),
  method = "REML",
  control = lmeControl(opt = "optim", maxIter = 1000,
    msMaxIter = 1000),
  na.action = na.exclude,
  data = Long_Overall_R)
```

Note. All functions were performed in RStudio, version 2024.09.1. *uv* = univariate; *cen* = centred; *REML* = restricted-maximum likelihood; *opt* = optimisation; *maxIter* = maximum iterations; *na* = missing values; *data* = dataset.

Figure E5*R Script for Multilevel Model Fit: Hypothesis 3b*

```
uv_we <- lme(WorkEngagement ~ Gender + Age + Children + Employment +
  Education + SelfRegulation_cen + NegativeAffect_cen +
  StateOfBeingRecovered_cen + PsychologicalReattachment_cen,
  random = list(ID = ~ 1),
  correlation = corAR1(form = ~ Week | ID),
  method = "REML",
  control = lmeControl(opt = "optim", maxIter = 1000,
    msMaxIter = 1000),
  na.action = na.exclude,
  data = Long_Overall_R)
```

Note. All functions were performed in RStudio, version 2024.09.1. *uv* = univariate; *cen* = centred; *corAR1* = first-order autoregressive covariance structure; *REML* = restricted-maximum likelihood; *opt* = optimisation; *maxIter* = maximum iterations; *na* = missing values; *data* = dataset.

Figure E6*R Script for the Model Fit Procedure to Test the Hypotheses*

```

null_model_reca <- lme(RecoveryExperiences ~ 1,
  random = ~ 1 | ID,
  correlation = corAR1(form = ~ Week | ID),
  data = Long_Overall_R,
  method = "REML",
  na.action = na.exclude)

m1_recb <- lme(RecoveryExperiences ~ Gender + Age + Children + Employment +
  Education + SelfRegulation_cen + NegativeAffect_cen,
  random = ~ 1 | ID,
  correlation = corAR1(form = ~ Week | ID),
  method = "REML",
  control = lmeControl(opt = "optim", maxIter = 1000,
    msMaxIter = 1000),
  na.action = na.exclude,
  data = Long_Overall_R)

m2_recc <- lme(RecoveryExperiences ~ Gender + Age + Children + Employment +
  Education + SelfRegulation_cen + NegativeAffect_cen +
  LowDuty_cen + HighDuty_cen + SleepQualityPost_cen +
  CatchUpSleep_cen,
  random = list(ID = ~ 1),
  correlation = corAR1(form = ~ Week | ID),
  method = "REML",
  control = lmeControl(opt = "optim", maxIter = 1000,
    msMaxIter = 1000),
  na.action = na.exclude,
  data = Long_Overall_R)

```

Note. All functions were performed in RStudio, version 2024.09.1. *cen* = centred; *corAR1* = first-order autoregressive covariance structure; *REML* = restricted-maximum likelihood; *opt* = optimisation; *maxIter* = maximum iterations; *na* = missing values; *data* = dataset.

^a Null model

^b Model 1

^c Model 2

Appendix F

Assumptions of Multilevel Model Analysis

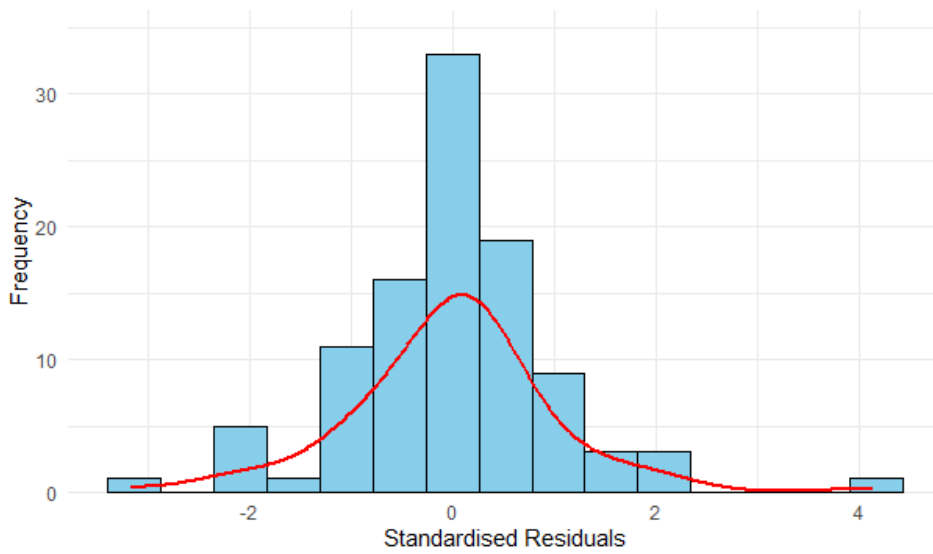
Given the linear framework of the model, multilevel models are tested in accordance with the assumptions similar to those of general linear models. These assumptions include normality, linearity, and homoscedasticity of variances (Field, 2017). However, unlike standard linear models, multilevel models model dependence directly and partition variance due to the hierarchical data structure (Field, 2017). Therefore, the distributional trends of the random effects were also assessed, instead of the assumptions of independence of observations and multicollinearity. Unless stated otherwise, all plots presented below were generated using the *ggplot2* package in RStudio, version 2024.09.1.

Normally Distributed Standardised Residuals

Multilevel models assume that the standardised residuals for each level are normally distributed (Heck et al., 2014). As a result, the model is able to produce relatively more accurate parameter estimates (Field, 2017; Heck et al., 2014). To test this assumption, the standardised residual values of each dependent variable were extracted and plotted on a histogram. The assumption of normality was valid if a bell-shaped curve was evident in the distribution (Field, 2017). While Figures F1, F2, and F5 illustrate that normality was present in most distributions, the distributions including psychological reattachment (Figure F3) and task performance as the outcome variable (Figure F4) were negatively skewed ($< -.50$); therefore, the assumption of normality was violated for these models (Field, 2017).

Figure F1

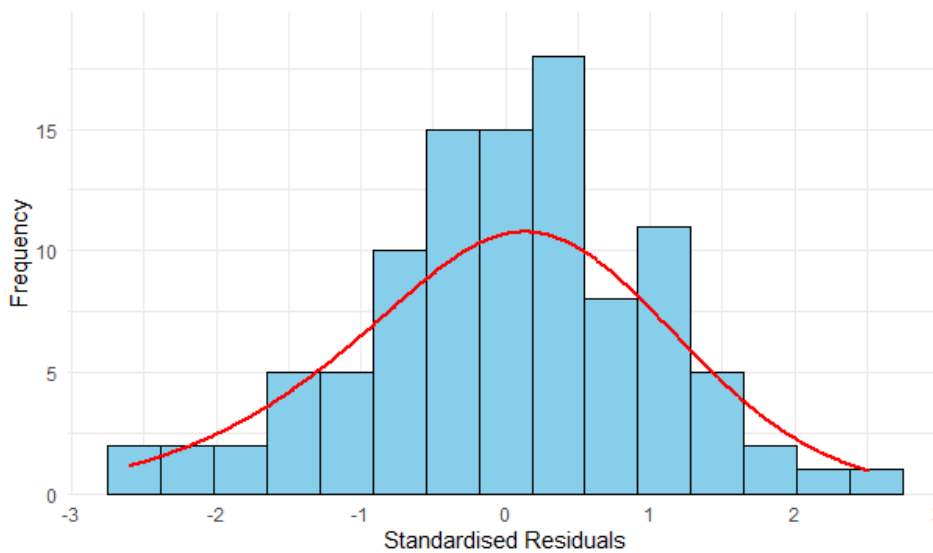
Distribution of the Standardised Residuals for the Recovery Experiences Model



Note. Skewness = .29

Figure F2

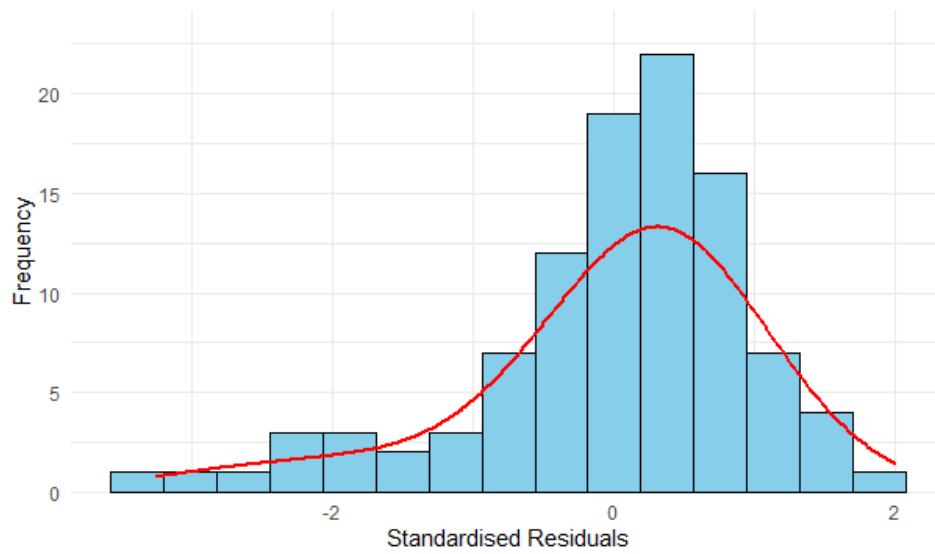
Distribution of the Standardised Residuals for the State of Being Recovered Model



Note. Skewness = -.26

Figure F3

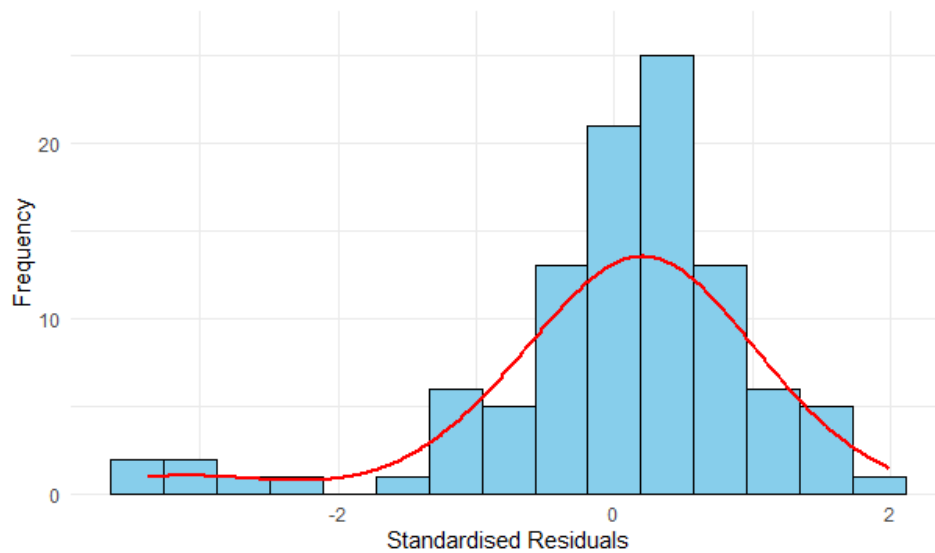
Distribution of the Standardised Residuals for the Psychological Reattachment Model



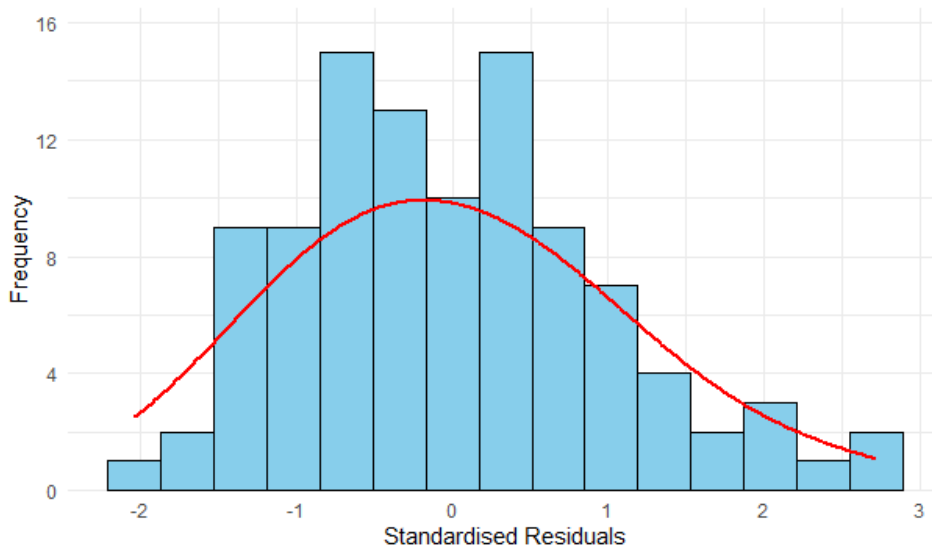
Note. Skewness = -1.16

Figure F4

Distribution of the Standardised Residuals for the Task Performance Model



Note. Skewness = -1.42

Figure F5*Distribution of the Standardised Residuals for the Work Engagement Model*

Note. Skewness = .47

Linearity of Standardised Residuals

The outcome variable should be linearly related to the predictor variables (Field, 2017). To test this assumption, the standardised residuals of each predictor variable were plotted against those of the outcome variables. For this assumption to be met, the model distribution lines should not be curved. As seen in Figures F6 - F10, all plots illustrated a straight line, which was indicative of linearly related standardised residuals. Therefore, the assumption of linearity was met (Field, 2017). However, the plot with task performance as the dependent variable notably yielded a distribution line on the zero x -axis. Despite the straight line, this trend may have been suggestive of non-linearity, nonetheless. While this may have been due to a lack of variability explained by the predictor variables, the possibility that this trend was a result of a negatively skewed distribution of the standardised residuals was not ruled out (Field, 2017).

Figure F6

Linearity of the Recovery Experiences Model

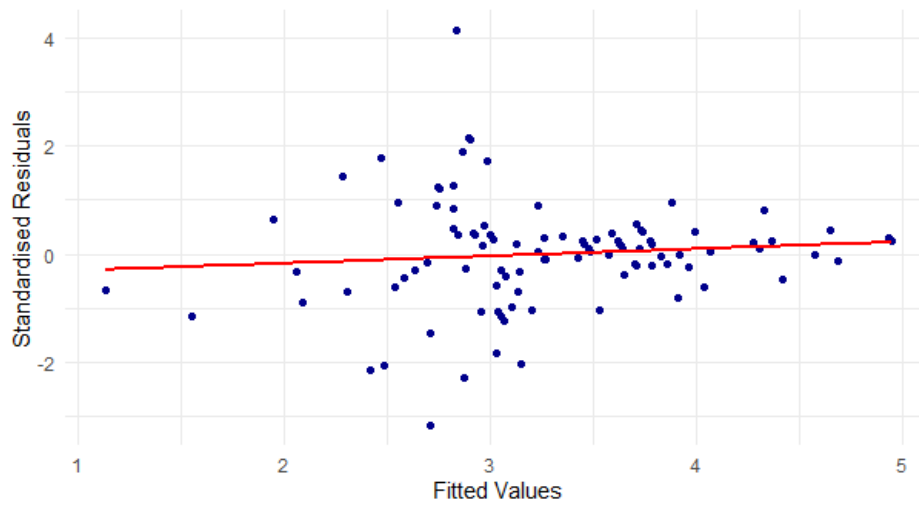


Figure F7

Linearity of the State of Being Recovered Model

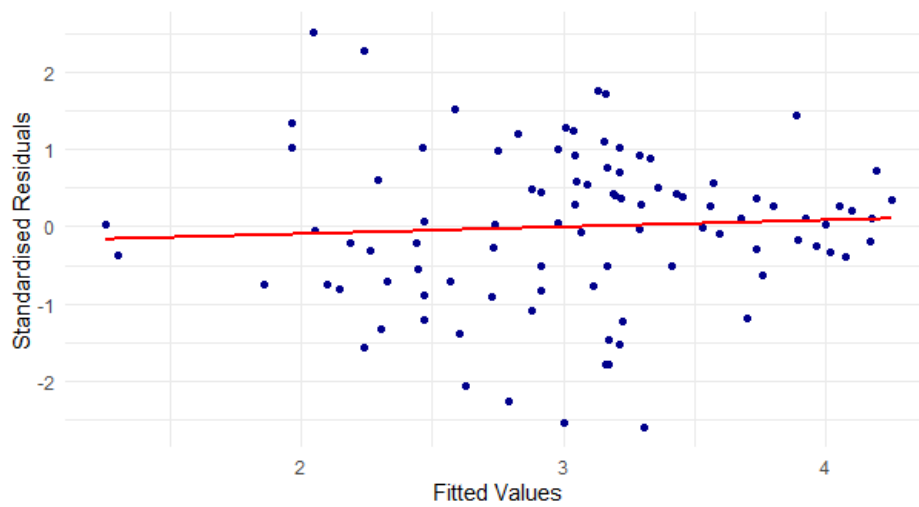


Figure F8

Linearity of the Psychological Reattachment Model

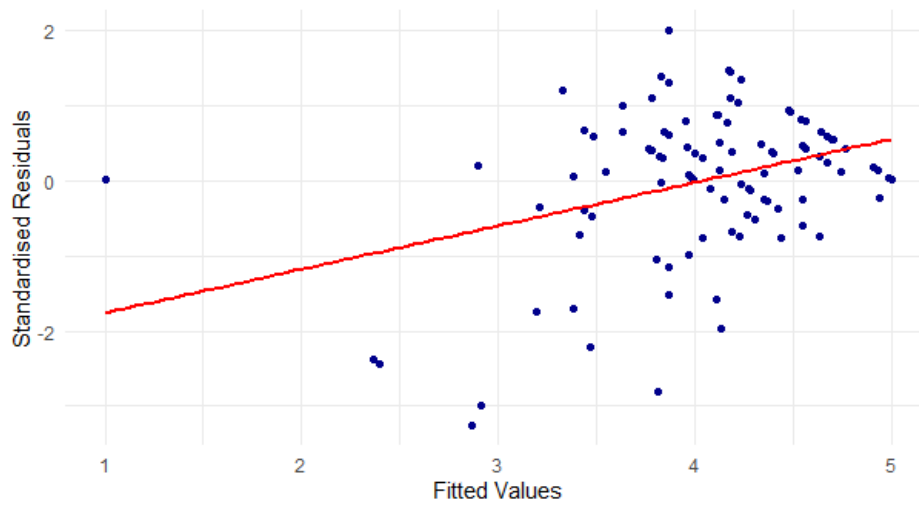


Figure F9

Linearity of the Task Performance Model

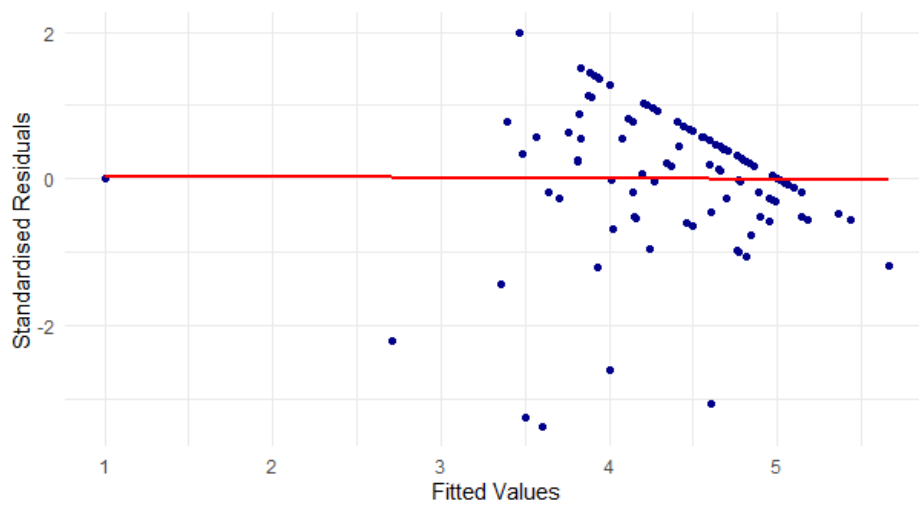
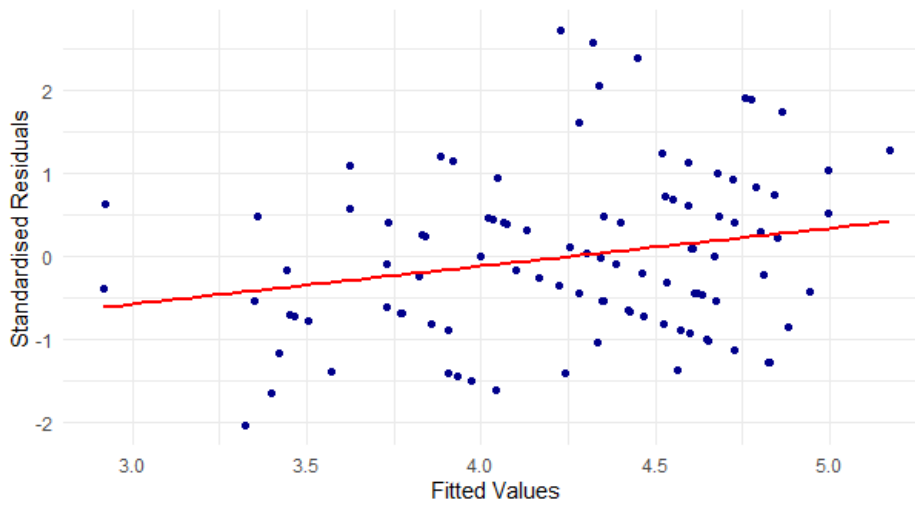


Figure F10*Linearity of the Work Engagement Model***Homoscedasticity of Variances**

In models with nested data structures, the standardised residuals should be stable at all levels of the model (Field, 2017). Accordingly, this would suggest that each group was sampled from a population of similar variance. As with the assessment of the assumption of linearity, this assumption was tested by plotting the standardised residuals for the predictor variables against the standardised predicted values (Field, 2017). For this assumption to be met, there should be no underlying relationship between the model's standardised residuals and standardised predicted values. Essentially, this may have manifested in the plots via a cone-shaped distribution (Field, 2017). While most plots did not show this distribution, the plots with psychological reattachment (Figure F3) and task performance as the respective outcome variables (Figure F4) illustrated a distribution where plots became less spread out across the graph. Given that this trend was analogous to heterogeneity, the assumption of homoscedasticity of variances for these models was violated.

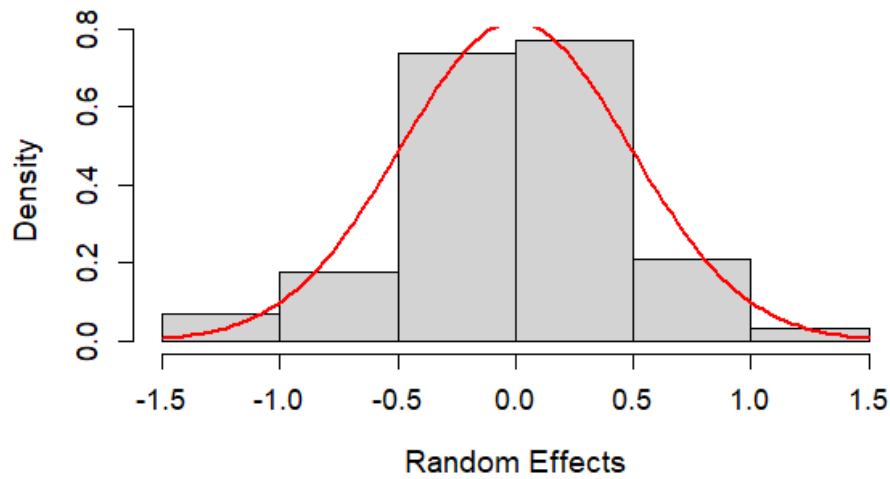
Normality of Random Effects

Multilevel models assume that the random intercepts at each level of the data hierarchy must approximate a normal distribution (Field, 2017). To test this assumption, the random intercept values were extracted and plotted on a histogram. Essentially, normality was assumed if a bell-shaped curve emerged in the distribution (Field, 2017). While the plots illustrated in Figures F11, F12, and F15 were normally distributed, a negatively skewed distribution was observed in the plot with psychological reattachment (Figure F13) and task

performance (Figure F14) as the outcome variables. Therefore, the assumption of normality of random effects was violated for these models.

Figure F11

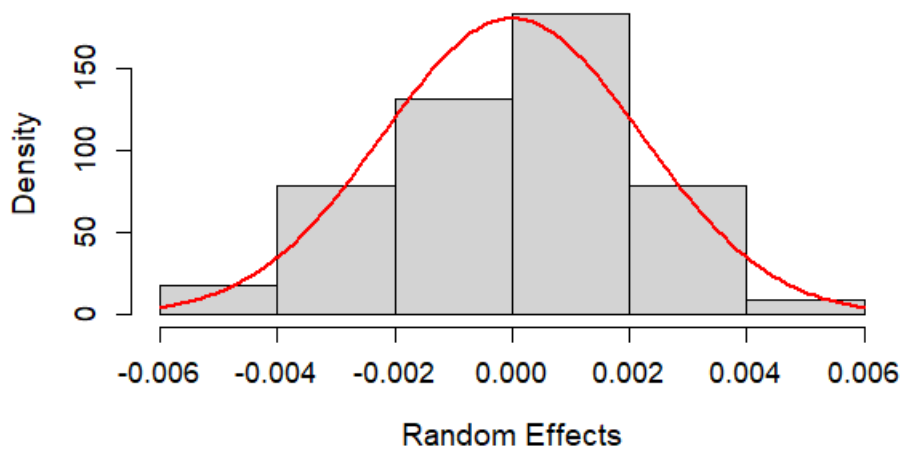
Distribution of the Random Effects of the Recovery Experiences Model



Note. Skewness = -.18

Figure F12

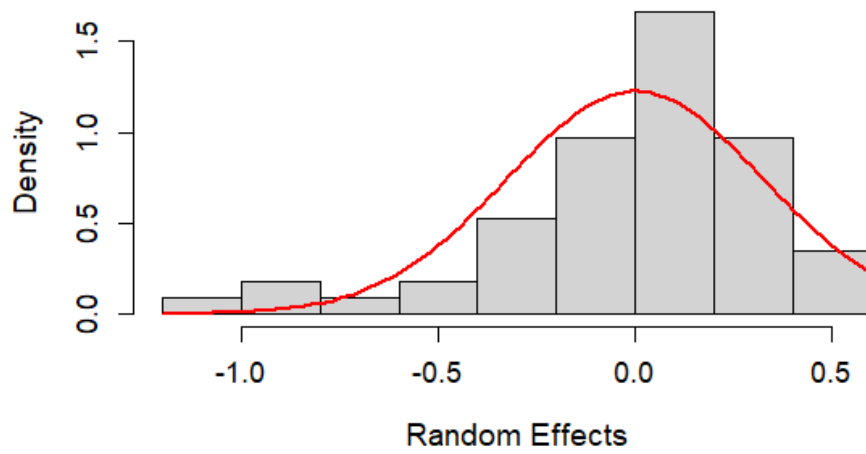
Distribution of the Random Effects of the State of Being Recovered Model



Note. Skewness = -.16

Figure F13

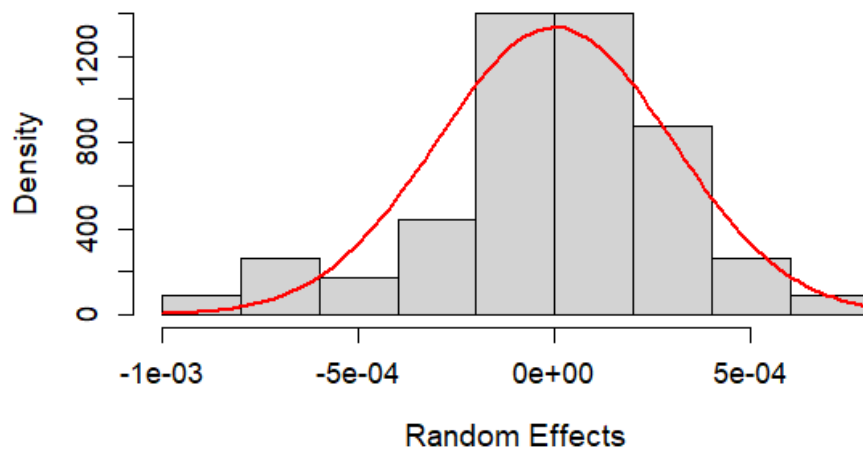
Distribution of the Random Effects of the Psychological Reattachment Model



Note. Skewness = -1.11

Figure F14

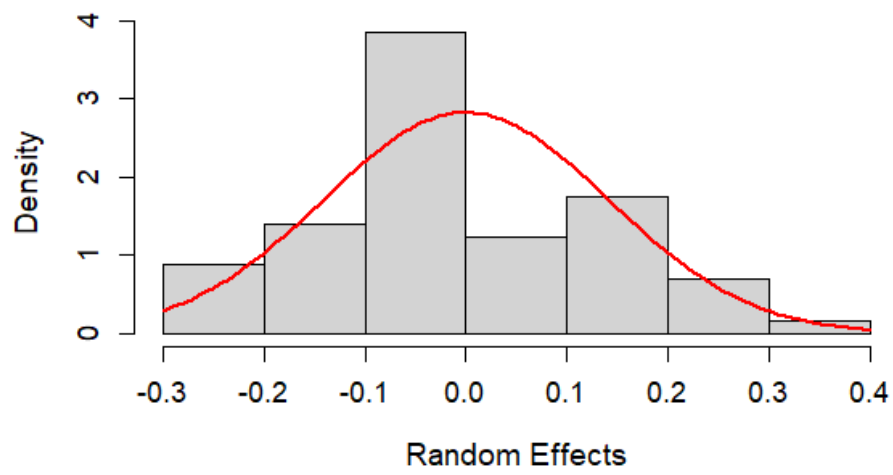
Distribution of the Random Effects of the Task Performance Model



Note. Skewness = -.66

Figure F15

Distribution of the Random Effects of the Work Engagement Model



Note. Skewness = .11

Appendix G

Assumption Violations

Unless stated otherwise, all plots included in this appendix was generated using SPSS, version 29.

Outliers

Several studies have underscored the implications that outliers may have in the presence of multilevel models (Luo et al., 2021; Maas & Hox, 2005; Vallejo Seco et al., 2013). Fundamentally, outliers may introduce biased parameter estimates and standard errors to the model, resulting in findings that may not accurately capture the characteristics of the dataset (Luo et al., 2021). For the current study, outliers were identified using the casewise diagnostics generated from SPSS. Field (2017) suggested that cases with standardised residual values greater than 3 may be outliers. Notably, the diagnostics revealed that cases 15, 23, and 138 may be cause for concern and, thus, could be removed. However, to avoid unnecessary data loss, as well as compromising the model fit and statistical power (Finch, 2017; Heck et al., 2014), the decision of whether or not these cases were to be removed was made on their degree of influence over the respective models. Accordingly, the influence statistics of the case encompassing these models were investigated in SPSS and assessed via the Cook's distance, centred leverage, and Mahalanobis distance values (Field, 2017).

Table G1

Casewise Diagnostics

	Std. Residual	Predicted Value	Residual
Psychological Reattachment			
Case No. 23	-3.20	3.98	-2.98
Task Performance			
Case No. 15	-3.46	3.98	-2.98
Case No. 138	-3.33	3.86	-2.86

Note. *Std. Residual* = standardised residual; *Case No.* = case number.

Field (2017) suggested that in order for cases to exert a considerable amount of influence on their respective models, the case should have a corresponding Cook's distance value greater than 1, a centred leverage value two or three times greater than the mean centred leverage value, or a Mahalanobis distance greater than 15. Nevertheless, inspection of the case summary tables, as illustrated in Table G2, indicated that neither of the outliers identified above were substantially influential in their models; therefore, these outliers were not removed from the dataset.

Table G2*Influential Statistics of the Outliers*

	Mahalanobis Distance	Cook's Distance	Centred Leverage Value
Psychological Reattachment			
Case No. 23	6.76	.10	.07
<i>M</i>	7.92	.01	.78
Task Performance			
Case No. 15	8.63	.14	.09
Case No. 138	10.28	.16	.10
<i>M</i>	8.91	.01	.09

Note. Case No. = case number; *M* = mean.

Notwithstanding, while the decision to retain outliers, particularly in multilevel models, goes against recommendation, it is also important to consider the nature of the distribution from which these outliers emerged. Crucially, it should be noted that among heavy-tailed distributions (i.e., kurtosis value greater than zero), a relatively greater number of extreme observations are naturally produced (Lange et al., 1989). Consequently, the removal of these observations may result in biased estimates, as subsequent extreme values may be misidentified as outliers (Finch, 2017; Lange et al., 1989). In the present study, this tendency was particularly pronounced in models with outliers that exhibited heavy-tailed distributions (see Appendix D). To illustrate, as seen in Table G3, upon the removal of the outliers from the model with task performance as the outcome variable (namely, cases 15 and

138), regression analyses produced another casewise diagnosis highlighting three additional outliers (viz., cases 16, 21, and 128). While this was not the case for the psychological reattachment model, as casewise diagnostics were not returned for the model excluding the outlier (viz., case 23), these findings, in conjunction with the lack of influence of the identified outliers, provided valuable support for the decision to retain them.

Table G3

Casewise Diagnostics After the Removal of Outliers

	Std. Residual	Predicted Value	Residual
Task Performance			
Case No. 16	-3.78	3.68	-2.68
Case No. 21	-3.57	4.54	-2.54
Case No. 128	-3.15	4.49	-2.24

Note. Case No. = case number; *M* = mean.

Transformations

The assumptions underlying the distribution of the plots were frequently violated. Notably, the plot distributions under investigation (namely, the respective models including psychological reattachment and task performance as outcome variables) were found to be highly positively skewed (> -1). Therefore, to address the distributional issues and the consequent assumption violations, data transformations were performed on these variables. First, the data was reflected by adding a numerical value of one to the maximum possible value of the respective scales. Second, given the highly skewed distributions, the data was transformed via a natural log transformation and a square root transformation to determine which transformation better suited the data. Finally, the data was reflected back to its original range by finding the maximum value of the transformed variables, adding one, and subtracting the transformed variable scores. Essentially, this approach prevented the transformation from reversing the distribution to a negatively skewed distribution. Table G4 presents the descriptive statistics of the transformed variables in comparison to the untransformed variables. As the natural log-transformed variables yielded more normally distributed scores, this version was selected over the square root-transformed variables.

Table G4*Descriptive Statistics of the Transformed Variables*

	<i>M</i>	<i>SD</i>	Min	Max	Skewness	Kurtosis
Psychological Reattachment						
<i>Ln</i>	2.03	.43	1.00	2.61	-.51 ^a	-.17
<i>Sqrt</i>	1.87	.31	1.00	2.24	-1.04	.92
Task Performance						
<i>Ln</i>	2.24	.47	1.00	2.61	-1.31 ^b	.93
<i>Sqrt</i>	2.00	.34	1.00	2.24	-1.74	2.47

Note. *M* = mean; *SD* = standard deviation; *Min* = minimum; *Max* = maximum; *Ln* = natural logarithm; *Sqrt* = square-root.

^a Skewness of standardised residuals = -.44.

^b Skewness of standardised residuals = -.74.

Appendix H

Statistical Power Analyses

In the context of multilevel models, statistical power can refer to the ability of the test to detect an effect between the variables of interest at different levels of the model. To evaluate the achieved power at Levels 1 and 2, a post-hoc power analysis was conducted using G*Power, version 3.1, for each dependent variable. While power analysis is often conducted after the statistical analyses, a pre-test power analysis was considered appropriate to identify possible limitations associated with the complexity of multilevel designs.

Field (2017) suggested that the power of a statistical test largely depends on three key aspects, namely the effect size, Type I error, and the sample size. Initially, the pre-analysis effect sizes were calculated using the *MuMIn* package in RStudio by extracting the R^2 , marginal R^2 , and conditional R^2 values for each model. Thereafter, the estimated effect sizes were exported to G*Power, where the power analysis was conducted. Notably, given the inclusion of demographic (categorical) variable data in the models, each level of the categorical variables was specified as a unique predictor in the power analysis.

In accordance with Cohen (1988), a minimum statistical power value of .80 was considered an ideal estimation of power. As presented in Table H1, the achieved statistical power for each model was estimated between .98 and .99 at the person level, suggesting that there was at least a 98% chance that a genuine effect was to be observed in each model.

Table H1*Results From Post-Hoc Power Analyses*

<i>DV</i>	f^2	<i>N</i>	Tested Predictors	Total Predictors	$1 - \beta$ <i>err</i> <i>prob</i>
Recovery Experiences	.45	57	4	24	.98
The State of Being Recovered	.35	57	1	21	.99
Psychological Reattachment	.29	57	1	21	.98
Task Performance	.51	57	2	22	.99
Work Engagement	.27	57	2	22	.99

Note. *DV* = dependent variable; f^2 = effect size; *N* = sample size; $1 - \beta$ *err prob* = Power.

Appendix I

Supplementary Analyses

Table I1

Multilevel Estimates for Models Predicting Psychological Detachment, Relaxation, and Mastery

	Psychological Detachment					Relaxation					Mastery				
	Estimate	SE	95% CI		t	Estimate	SE	95% CI		t	Estimate	SE	95% CI		t
			LL	UL				LL	UL				LL	UL	
Fixed Effects															
(Intercept)	2.57	.49	2.65	3.93	5.20***	3.11	.40	2.30	3.93	7.73***	3.83	.41	2.99	4.67	9.23***
Gender	-.20	.47	-.42	.78	-.42	.59	.39	-.20	1.38	1.52	.34	.40	-.47	1.15	.84
Age	.26	1.20	-1.74	1.26	.21	-.39	1.01	-2.45	1.66	-.39	-.90	1.05	-3.03	1.22	-.86
Number of Children	.04	.60	-.72	.80	.06	-.21	.49	-1.20	.77	-.44	.18	.50	-.83	1.20	.37
Status of Employment	.16	.42	-.55	.52	.38	.22	.33	-.46	.89	.64	-.46	.34	-1.16	.23	-1.35
Level of Education	.53	.48	-.33	.89	1.10	.17	.39	-.61	.96	.44	-.12	.40	-.93	.68	-.31
Self-Regulation	.14	.36	-.37	.57	.39	.22	.30	-.38	.82	.74	.11	.30	-.51	.73	.37
Negative Affect	.25	.23	-.30	.29	1.08	-.14	.19	-.52	.24	-.76	-.10	.19	-.49	.28	-.54
Work-Related	-.10	.04	-.13	-.01	-2.59**	-.04	.04	-.13	.05	-.89	-.05	.05	-.14	.05	-1.04
Household	.03	.04	-.07	.06	.73	.02	.05	-.08	.12	.42	.03	.05	-.08	.13	.50
Childcare	-.04	.05	-.06	.10	-.66	-.07	.06	-.19	.04	-1.26	.07	.06	-.05	.20	1.17
Low-Effort	-.04	.05	-.03	.12	-.78	.20	.06	.09	.32	3.65***	-.10	.06	-.22	.02	-1.66
Social	.03	.03	-.03	.09	.94	.07	.04	-.02	.16	1.61	.00	.05	-.10	.10	.01

	Psychological Detachment					Relaxation					Mastery				
	Estimate	SE	95% CI		t	Estimate	SE	95% CI		t	Estimate	SE	95% CI		t
			LL	UL				LL	UL				LL	UL	
Physical	.08	.03	.01	.15	-33	.12	.05	.01	.22	2.31*	.12	.05	.01	.23	2.19
Cultural	.09	.04	.01	.16	-.04	.05	.06	-.06	.17	.96	.22	.06	.09	.34	3.61***
Religious and Spiritual	.08	.05	-.03	.18	2.72**	.05	.08	-.11	.21	.61	-.05	.08	-.21	.12	-.57
Random Effects															
σ^2			.12					.20					.24		
τ_{00}			1.03					.58					.60		
ICC			.90					.74					.72		
Model Fit															
-2LL			235.21					240.60					248.70		
AIC			295.21					300.60					308.70		
BIC			364.34					369.72					377.83		
R ²			.31					.38					.33		
f ²			.44					.61					.49		
df			37					37					37		

Note. SE = standard error; CI = confidence interval; LL = lower level; UL = upper level; t = t-statistic; σ^2 = Level 1 variance; τ_{00} = Level 2 variance; ICC = interclass correlation; -2LL = model deviance; AIC = Akaike’s Information Criterion; BIC = Bayesian Information Criterion; R² = coefficient of determination; f² = effect size; df = degrees of freedom.

Person-level N = 57; week-level N = 102.

^a 0 = female; 1 = male.

^b 0 = full-time; 1 = part-time; 3 = contract.

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

Table I2

Multilevel Estimates for Models Predicting Psychological Detachment, Relaxation, and Mastery

	Psychological Detachment					Relaxation					Mastery				
	Estimate	SE	95% CI		t	Estimate	SE	95% CI		t	Estimate	SE	95% CI		t
			LL	UL				LL	UL				LL	UL	
Fixed Effects															
(Intercept)	2.85	.50	1.84	3.86	5.70***	3.02	.44	2.14	3.90	6.93***	3.80	.52	2.75	4.85	7.28***
Gender	-.35	.46	-1.29	.59	-.76	1.00	.40	.19	1.81	2.50*	.42	.48	-.55	1.40	.88
Age	-.44	1.16	-2.79	1.92	-.38	-.34	1.03	-2.42	1.74	-.33	.15	1.22	-2.32	2.62	.12
Number of Children	.19	.60	-1.03	1.41	.32	-.35	.51	-1.39	.69	-.68	.43	.62	-.83	1.69	.69
Status of Employment	.12	.42	-.74	.97	.28	-.03	.36	-.75	.70	-.07	-.52	.44	-1.40	.37	-1.19
Level of Education	.72	.48	-.25	1.69	1.51	.07	.41	-.76	.90	.16	-.14	.50	-1.14	.87	-.27
Self-Regulation	.02	.36	-.71	.75	.06	.05	.31	-.58	.68	.16	.11	.37	-.64	.87	.31
Negative Affect	.24	.23	-.22	.71	1.07	-.19	.20	-.59	.21	-.96	.02	.24	-.46	.50	.07
Sleep Quality	.37	.11	.15	.59	3.36***	.22	.15	-.07	.51	1.51	.22	.15	-.09	.52	1.45
Catch-Up Sleep	.04	.05	-.05	.13	.82	.11	.07	-.02	.24	1.66	-.05	.06	-.18	.08	-.71

	Psychological Detachment	Relaxation	Mastery
	Estimate	Estimate	Estimate
Random Effects			
σ^2	.11	.29	.25
τ_{00}	1.06	.64	1.05
<i>ICC</i>	.91	.69	.81
Model Fit			
<i>-2LL</i>	210.45	239.74	247.28
<i>AIC</i>	258.45	287.74	295.28
<i>BIC</i>	315.62	344.91	352.45
R^2	.26	.29	.15
f^2	.35	.42	.18
<i>df</i>	37	37	37

Note. *SE* = standard error; *CI* = confidence interval; *LL* = lower level; *UL* = upper level; *t* = t-statistic; σ^2 = Level 1 variance; τ_{00} = Level 2 variance; *ICC* = interclass correlation; *-2LL* = model deviance; *AIC* = Akaike's Information Criterion; *BIC* = Bayesian Information Criterion; R^2 = coefficient of determination; f^2 = effect size; *df* = degrees of freedom.

Person-level $N = 57$; week-level $N = 102$.

^a 0 = female; 1 = male.

^b 0 = full-time; 1 = part-time; 3 = contract.

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

Table I3*Multilevel Estimates for Models Predicting the State of Being Recovered and Psychological Reattachment*

	The State of Being Recovered					Psychological Reattachment				
	Estimate	SE	95% CI		t	Estimate	SE	95% CI		t
			LL	UL				LL	UL	
Fixed Effects										
(Intercept)	2.72	.40	1.90	3.53	6.73***	2.08	.18	1.71	2.45	11.39***
Gender	-.31	.40	-1.11	.50	-.77	-.10	.18	-.46	.26	-.57
Age	-.90	.94	-2.81	1.02	-.95	.95	.42	.09	1.81	2.24*
Number of Children	.33	.47	-.63	1.29	.70	.28	.22	-.16	.72	1.30
Status of Employment	.16	.33	-.50	.83	.50	-.05	.15	-.36	.25	-.36
Level of Education	.31	.38	-.47	1.08	.80	-.18	.17	-.53	.18	-1.01
Self-Regulation	.25	.28	-.31	.82	.91	.09	.13	-.16	.35	.73
Negative Affect	-.06	.19	-.43	.32	-.30	.11	.08	-.06	.28	1.31
Psychological Detachment	.38	.12	.15	.62	3.31***	.01	.05	-.10	.11	.10
Relaxation	.09	.12	-.15	.32	.76	-.07	.05	-.17	.03	1.35
Mastery	.32	.11	.11	.54	3.01***	.18	.05	.09	.27	3.87***

	The State of Being Recovered	Psychological Reattachment
	Estimate	Estimate
Random Effects		
σ^2	.40	.07
τ_{00}	.41	.10
<i>ICC</i>	.52	.61
Model Fit		
<i>-2LL</i>	249.38	114.47
<i>AIC</i>	299.38	164.47
<i>BIC</i>	358.62	223.71
R^2	.38	.32
f^2	.60	.47
<i>df</i>	37	37

Note. *SE* = standard error; *CI* = confidence interval; *LL* = lower level; *UL* = upper level; *t* = t-statistic; σ^2 = Level 1 variance; τ_{00} = Level 2 variance; *ICC* = interclass correlation; *-2LL* = model deviance; *AIC* = Akaike's Information Criterion; *BIC* = Bayesian Information Criterion; R^2 = coefficient of determination; f^2 = effect size; *df* = degrees of freedom.

Person-level $N = 57$; week-level $N = 102$.

^a 0 = female; 1 = male.

^b 0 = full-time; 1 = part-time; 3 = contract.

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