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Different Levels, Same Relations? A Meta-Analysis on the Homology of the Nomological Network of (Daily) Work Engagement

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ABSTRACT

Work engagement has garnered significant attention from researchers and practitioners in recent decades, and several meta-analyses have examined its stable, between-person correlates. However, work engagement also has a dynamic component, meaning that it varies daily, across situations, and within individuals. Despite growing interest, the strength and direction of many associations within the nomological network of *daily* work engagement, as well as their consistency with the relations observed for stable manifestations of work engagement, remain unclear. In the present study, we meta-analyze within-person correlations of work engagement from daily diary studies ($k = 230$) and compare them to (a) meta-analytic between-person correlations based on aggregated daily scores and (b) true between-person correlations from earlier meta-analyses. Our findings reveal important similarities and differences in the nomological networks of daily and stable work engagement but generally demonstrate that predictions derived from major theories are invariant across levels of analyses. Yet, differences exist in the strength of relations, which could not be attributed to differences in reliabilities across levels or to aggregation bias, suggesting that theories should be refined to account for level-specific differences. We conclude by providing specific recommendations for the development and refinement of multilevel theories explaining work engagement.

1 | Introduction

Work engagement, which is commonly defined as an affective, motivational state consisting of vigor, dedication, and absorption (Schaufeli and Bakker 2023), is a desirable condition for employees and organizations (da Rodrigues Costa and Correia Loureiro 2019). Several meta-analyses have examined antecedents, correlates, and outcomes of work engagement (e.g., Mazzetti et al. 2019; Neuber et al. 2022; Pletzer, Breevaart, and Bakker 2024; Young et al. 2018). In all previous meta-analyses, work engagement was conceptualized as a stable, between-person tendency that captures the extent to which employees differ from one another in their overall level of work engagement and that is responsible for between-person relations with other variables. However, this approach neglects the dynamic nature of work engagement. In fact, it is widely accepted that work engagement has both a stable, between-person component and a dynamic component that may vary substantially within employees over short periods of time (Xanthopoulou and Bakker 2021).

Although it is desirable that employees maintain generally high levels of engagement, they can be more engaged (than their average) on certain days to ensure focus, precision, and effective

decision-making. For example, surgeons and academics are likely more engaged in their work than they usually are on days on which they are performing a challenging operation or delivering an interesting lecture, and less engaged on other days when less challenging and interesting tasks have to be completed. These examples highlight the relevance of momentary or daily engagement because it may have profound consequences for both individual outcomes and broader organizational success (Bakker 2014).

To capture such dynamic realities, daily diary studies are crucial because days and daily events shape individual experiences at work, fluctuations within employees are conceptually different from stable differences between employees, and results from between-person studies do not always replicate to within-person studies (for a review, see Sonnentag et al. 2025). Diary studies examining within-person variations in work engagement have examined state antecedents, correlates, and consequences to create a finer-grained understanding of daily work engagement. After decades of research, it is now time to conduct a meta-analytic test of those studies with the aim of understanding if the nomological network of state work engagement converges or diverges with that of general work engagement. To achieve this aim, we will report meta-analytic within-person correlations and will compare them with between-person correlations based on aggregated daily scores, as well as true between-person correlations based on one-off scores from earlier meta-analyses.

By doing so, we contribute to the literature in the following ways. First, we deepen our theoretical understanding of the nomological network of daily work engagement by quantifying its estimated true score correlations with potential antecedents, correlates, and consequences. Second, the comparison of dynamic and stable perspectives in work engagement enables us to uncover patterns, triggers, and targeted interventions that help employees stay engaged across a variety of contexts. Third, and most importantly, given that meta-analyses provide an excellent opportunity to test and extend theories (Pletzer, Joseph, et al. 2024), we are able to test predictions from several prominent psychological theories, including job demands-resources (JD-R) theory (Bakker et al. 2023), conservation of resources (COR) theory (Hobfoll 1989), and self-determination theory (Ryan and Deci 2000), on a daily level. Although these theories have been extensively tested and supported at the between-person level, this does not automatically mean that they generalize to the daily, within-person level (cf. ecological fallacy; Kozlowski and Klein 2000).[1] By analyzing the convergence or divergence of within- and between-person correlations, we contribute to the understanding of homology in organizational behavior research (Kozlowski and Klein 2000), providing insights as to whether theoretical predictions about the nomological network of work engagement hold consistently across different levels of analysis. Support for homology (i.e., structural similarity) would indicate that theories invariantly explain relations of both daily and general work engagement. If homology is (partially) rejected, theories should be revised to account for and explain differences across levels. Accordingly, our findings will either validate theoretical assumptions or underscore the need to revise and refine existing theories.

1.1 | Work Engagement Theories in a Multilevel Context

The work engagement literature draws on multiple theoretical perspectives, yet they share the core assumption that work engagement is an outcome of resource-based motivational processes and that human functioning reflects a dynamic balance between processes of resource depletion and resource accumulation that jointly shape engagement and well-being. That is, employees are engaged when they possess sufficient and relevant psychological, cognitive, and energetic resources to deal with their job demands. Most prominently, JD-R theory (Bakker et al. 2023; Demerouti et al. 2001) proposes that job and personal resources promote work engagement, whereas job demands deplete energy and impair well-being. More recent versions of JD-R theory (Bakker 2015; Bakker and de Vries 2021) have incorporated related literatures on emotional labor, recovery, and proactive behavior because these describe mechanisms through which resources are either drained or replenished. Complementing this view, COR theory (Hobfoll 1989) highlights the importance of gain and loss cycles, whereby the accumulation of resources in "resource caravans" can sustain high levels of engagement, whereas resource loss cycles may undermine them over time. Self-determination theory (Ryan and Deci 2000) adds that engagement is fueled through the satisfaction of basic psychological needs, whereas the work–home resources model (ten Brummelhuis and Bakker 2012) extends this resource-based logic to the interplay between the work and non-work/home domain. Finally, broaden-and-build theory (Fredrickson 2001) holds that positive affective experiences build personal resources, thereby fostering engagement. Together, these theoretical perspectives conceptualize work engagement as a primarily resource-driven phenomenon and are commonly used in daily diary studies (Sonnentag et al. 2025).

Although work engagement is now understood as a phenomenon that encompasses both stable tendencies and meaningful daily fluctuations, this was not always the case. Early research predominantly treated work engagement as a trait-like, enduring motivational variable, and many of the foundational theories mentioned above were originally formulated to explain relatively stable differences as opposed to daily fluctuations in work engagement. Over the past two decades, however, technological and methodological advancements have enabled an increase in diary and experience-sampling studies (Ohly et al. 2010), which require participants to complete the same questionnaire repeatedly over short periods of time (e.g., each day over a work week). Participants report their level of engagement at specific moments of their workday or on particular days (e.g., at the end of each workday during a given week), rather than providing a general assessment of their engagement (which is commonly assessed in between-person designs, such as cross-sectional or longitudinal studies; Ohly et al. 2010). In this way, diary studies allow researchers to capture intra-individual variability in employees' work engagement "as it happens," as opposed to inquiring about their overall experiences and behaviors (Sonnentag 2015).

Within- and between-person correlations therefore reflect fundamentally different things: Within-person correlations reflect day-level correlations with other variables assessed daily (i.e., momentary associations), whereas between-person

correlations reflect how employees generally vary from one another in work engagement and how these general tendencies relate to other variables. For example, although job resources are typically positively related to work engagement on both levels, the theoretical meaning of this relation differs fundamentally across levels. At the between-person level, job resources reflect stable features of an individual's work environment that are present irrespectively of whether the employee needs them. A between-person positive correlation between resources and work engagement therefore captures a structural mechanism: Employees who generally have more autonomy, support, or feedback tend to be more engaged because these enduring resources shape long-term motivational functioning. In contrast, positive within-person correlations derived from daily diary studies reflect daily fluctuations in resource experiences. Here, the same employee is more engaged on days when they experience, for example, more decision latitude about the content and timing of their work, than usual. This represents a short-term, regulatory mechanism driven by momentary appraisals, affective shifts, and daily resource activation within the same individual, not by stable job design, individual differences, or other enduring conditions. Thus, even when the direction of relations is similar across levels, the underlying processes and time scales differ: Between-person relations reflect chronic resource availability, whereas within-person relations reflect episodic resource increases.

Despite this empirical shift towards diary studies, theoretical frameworks have often not been explicitly adapted to the within-person level and new multilevel theories have rarely been developed to account for these short-term dynamics. As a result, there remains a conceptual gap between trait-oriented work engagement theories and the increasingly state-focused empirical literature. Although some theoretical refinements have been made to incorporate multilevel processes (e.g., the multilevel version of JD-R theory; Bakker 2015), theories do not commonly specify whether and how the direction and/or strength of relations differs across analytical levels. This can lead to a mismatch between theory and method, suggesting that researchers should not automatically assume that theories developed to explain between-person phenomena apply to daily processes because underlying mechanisms may function differently, or with varying strength, across levels of analysis. In addition, diary studies typically just focus on the within-person level, rarely testing the homology of different theoretical predictions.

2 | Homology of Work Engagement Relations Across Levels

This evolution of the work engagement literature highlights the need to test if theoretical predictions developed at the between-person level also describe daily fluctuations at the within-person level. As such, the main aim of this study is to meta-analyze all available within-person correlations of daily work engagement with other daily variables to determine the direction and magnitude of relations in the nomological network of daily work engagement and to test whether theoretical predictions from major engagement-related theories are homologous (or not) across levels of analysis.

Homology refers to the structural similarity in form or function of constructs or relations across levels of analysis (Kozlowski and Klein 2000). The importance of examining homology of theoretical predictions across levels can be best explained with the analogy of the invention of the microscope in biology. The ability to study organisms at the cellular level did not merely confirm organism-level theories but revealed qualitatively different processes that required theoretical refinement. Similarly, diary and experience-sampling studies allow researchers to examine psychological processes at much finer temporal resolution. This shift in resolution creates the opportunity that relations observed between individuals may not map directly on to processes unfolding within individuals across days and therefore allows researchers to refine and extend theoretical predictions to account for relations at both levels.[2]

In the current context, homology is supported if theoretically rooted relations of daily work engagement with other variables converge across the between- and within-person level. We therefore explore meta-analytically if the same theoretical predictions can be used to explain differences between individuals as well as differences within individuals across days, ultimately indicating if theory refinement is needed to accurately describe and predict processes at both levels of analysis. Systematically comparing within- and between-person relations will help us to identify the boundary conditions under which resource-based engagement theories operate similarly versus differently across levels of analyses, rather than merely documenting differences in the strength and direction of effect sizes. Convergence of within- and between-person correlations would support the homology of the respective theories, implying that they explain the relations of interest irrespective of the level of analysis. Divergence of within- and between-person correlations (either in direction or strength) could imply that distinct processes operate at different levels of analysis (Chen et al. 2005; Kozlowski and Klein 2000), and that the respective theories need to be revised or refined to explain processes at the within- and between-person level—or that new multi-level theories need to be developed.[3]

Prior empirical work has rarely tested the homology of theoretical predictions about work engagement, and the evidence is mixed. Huhtala et al. (2015) showed that ethical culture was positively related to work engagement at both the work-unit level (i.e., shared perceptions predicting shared engagement) and the individual level (i.e., individual perceptions predicting individual engagement), indicating convergent relations across levels. Watanabe and Yamauchi (2018) found that involuntary overtime due to workload was negatively related to work engagement at both the ward and individual levels, whereas involuntary overtime due to conformity pressure related negatively to engagement only at the individual level, suggesting partial non-homology across levels.[4] However, both studies focused on homology across the individual and higher levels of analysis (e.g., teams, organizations), leaving it unresolved whether theoretical mechanisms that characterize stable between-person differences in work engagement also operate at the within-person level to explain day-to-day fluctuations over time.

Beyond improving theoretical clarity, testing the invariance of theoretical predictions across levels has important implications for both researchers and practitioners. Having

information about effect sizes across levels enables researchers to better understand whether the correlates of work engagement differ or converge across analytical levels, ultimately improving construct clarity, the alignment between theoretical claims and measurement, and efficiency when conducting studies. Practitioners receive more precise guidance on how to effectively promote either state or trait work engagement. If homology is supported, interventions at both levels may share similar content, though their execution should reflect differences between stable traits and transient states. If it is not, strategies should be tailored to the distinct drivers of state and trait work engagement. As such, we pose the following general research question on which we further elaborate specifically for each variable category below.

Research Question 1. To what extent do within-person correlations of work engagement with variables in its nomological network converge or diverge with respective between-person correlations?

3 | Comparing Types of Between-Person Correlations

Finally, two types of between-person correlations can be distinguished: Those based on aggregated daily scores and those based on one-time measurements. Aggregated scores reflect average levels across days, whereas one-off measures at the between-person level capture overall tendencies. To date, it remains unclear if the two types of between-person correlations converge conceptually, and previous within-person meta-analyses have not yet compared them systematically (e.g., Aitken et al. 2025; Pindek et al. 2019). They should converge if there is low within-person variability in daily measures and the assessed constructs are relatively stable, and if the aggregated scores capture the average level of the constructs over time (e.g., if data was not collected in an atypical week). If the opposite holds true (i.e., high within-person variability of state-like variables), they should not converge. Comparing these two types of between-person correlations is important because it informs us whether aggregation bias (James 1982) can explain differences in within- and between-person correlations. Aggregation bias might inflate between-person correlations based on aggregated daily scores, but does not affect the strength of true between-person correlations. If the two types of between-person correlations converge, this suggests that aggregation did not introduce systematic bias and that effect size differences on the within- and between person level likely indicate true differences across levels. If between-person correlations based on aggregated daily scores are stronger than those from traditional between-person studies, aggregation bias might have been at play and could also explain potential differences across the within- and between-person level. This results in the following research question:

Research Question 2. To what extent do between-person correlations based on aggregated daily scores of work engagement with variables in its nomological network converge or diverge with between-person correlations based on one-off scores?

4 | The Nomological Network of (Daily) Work Engagement

In the following sections, we review theoretical arguments and empirical evidence for categories of daily variables that have been studied in relation to daily work engagement and briefly summarize (potential) theoretical and empirical evidence for differences in within- and between-person correlations.

4.1 | Job and Personal Resources

JD–R theory (Bakker et al. 2023; Demerouti et al. 2001) holds that all job characteristics can be classified as either job demands or job resources. Job resources (e.g., autonomy, feedback, skill variety) are aspects of the job that help employees achieve goals, overcome demands, and foster personal growth. JD-R theory also highlights the importance of personal resources (e.g., self-efficacy, optimism), which describe employees' perceptions about their ability to control their environment successfully. The motivational pathway of JD-R theory suggests that job and personal resources are the main antecedents of work engagement because they equip employees with the necessary vital "tools," such as more support than usual or a better sense of control over the environment, that can foster vigor, dedication, and absorption (Bakker et al. 2023). The multilevel extension of JD-R theory suggests that these relations also apply at the daily level (Bakker 2015). Consistent with this perspective, daily within-person studies indicate that employees are more engaged on days on which they have more job and personal resources than their average levels (Downes et al. 2021; Kühnel et al. 2012; Xanthopoulou et al. 2009). We therefore hypothesize the following:

Hypothesis 1. *Daily job resources relate positively to daily work engagement.*

Hypothesis 2. *Daily personal resources relate positively to daily work engagement.*

Yet, whether daily fluctuations in resources exhibit the same relations with daily work engagement as the continuous presence of resources has not been systematically investigated. Although a multilevel version of JD-R theory exists that distinguishes between daily and stable relations (Bakker 2015), it does not specify if relations are expected to differ at the within- and between-person level. Empirical findings are also mixed, with some studies finding similar relations across levels of analysis (e.g., Xanthopoulou et al. 2008), whereas others reporting stronger between-person relations (e.g., Jennings et al. 2023). However, these cross-level differences have not been compared statistically. We therefore examine this exploratorily.

4.2 | Job Demands

In JD-R theory, job demands (e.g., role conflict, emotional demands) are aspects of the job that require effort and cost energy (Bakker et al. 2023; Demerouti et al. 2001). The challenge-hindrance stressor framework (Crawford et al. 2010; Pindek

et al. 2024) further distinguishes between challenge and hindrance demands. Challenge demands cost energy but also result in increased engagement and help employees grow, if overcome. Hindrance demands just cost energy and hinder goal progress and development. In line with the challenge-hindrance framework, diary studies indicate that demands commonly appraised as challenges at the day-level (e.g., workload, time pressure) are positively, whereas demands commonly appraised as hindrances (e.g., role ambiguity, destructive leadership) are negatively related to daily work engagement (Breevaart and Bakker 2018; Downes et al. 2021; Tadić et al. 2015). Hence, we hypothesize the following:

Hypothesis 3. *Daily challenge demands relate positively to daily work engagement.*

Hypothesis 4. *Daily hindrance demands relate negatively to daily work engagement.*

Yet, the motivational effects of demands may depend on their temporal pattern. Although challenge demands can be motivational in the short term, sustained exposure may exceed employees' ability to deal with them and lead to resource depletion and reduced engagement. For instance, momentary increases in workload may foster engagement by creating a sense of urgency and accomplishment, but chronic overload may result in weaker relations on the between-person level. Accordingly, meta-analytic evidence suggests that general challenge demands are positively, but weakly associated with work engagement (Crawford et al. 2010). At the between-person level, exposure to hindrance demands has been consistently negatively related to work engagement (Crawford et al. 2010). Thus, in this meta-analysis we systematically test whether these differences hold across levels or not.

4.3 | Home Resources and Demands

Parallel to the work domain, the home domain also contains resources and demands that can influence employees' work-related functioning. The work–home resources model (ten Brummelhuis and Bakker 2012) posits that home resources (e.g., family support) and demands (e.g., household chores, caregiving responsibilities) can spill over into the work domain via volatile personal resources (e.g., energy, resilience), affecting outcomes like work engagement. Specifically, home resources promote energy which translates into increased work engagement, whereas home demands deplete energy which results in lower work engagement. Although the relation of home demands and resources with work engagement is supposed to be mediated by personal resources, empirical evidence supports direct relations (Lapierre et al. 2018), also at the day-level (Diestel et al. 2015; Haar et al. 2018). We, therefore, hypothesize:

Hypothesis 5. *Daily home resources relate positively to daily work engagement.*

Hypothesis 6. *Daily home demands relate negatively to daily work engagement.*

Although the work–home resources model distinguishes within- and between-person work–home processes (ten Brummelhuis and Bakker 2012), the processes only differ regarding the mediators that explain the spillover (i.e., energies for short-term, more stable resources for long-term processes). But the theory does not offer specific predictions about differing strengths of relations at the within- versus between-person level. Therefore, we examine this exploratorily.

4.4 | Cognitive–Affective States

Employees experience a variety of thoughts and emotions during work and at home, and diary studies on work engagement have extensively explored its relations with momentary positive and negative cognitions and emotions. According to broaden-and-build theory (Fredrickson 2001), positive emotions (e.g., happiness or satisfaction with work) broaden employees' thought-action repertoire, making them more capable to address work goals and feel engaged. Negative cognitive and affective experiences, such as anger, exhaustion, or stress, immediately deplete employees' energetic and cognitive resources (cf. COR theory; Hobfoll 1989), thus, reducing available resources to invest at work to feel vigorous, dedicated, and absorbed. Diary studies (Reis et al. 2016; Sawhney and Michel 2022) consistently demonstrate that daily resource-replenishing cognitive–affective states are positively and daily resource-depleting cognitive–affective states are negatively related to daily work engagement, providing empirical support at the daily level for the theoretical arguments outlined above. This leads to the following hypotheses:

Hypothesis 7. *Daily negative cognitive–affective states relate negatively to daily work engagement.*

Hypothesis 8. *Daily positive cognitive–affective states relate positively to daily work engagement.*

Although not originally formulated as multilevel theories, broaden-and-build theory and COR theory are compatible with multilevel perspectives. Broaden-and-build theory (Fredrickson 2001) suggests that positive affect at the day-level broadens cognition and behavior (within-person), which over time build enduring resources (between-person). COR theory (Hobfoll 1989) has been applied in within-person studies to explain how daily cognitive and affective states deplete or preserve energetic and psychological resources, thereby influencing work engagement. Although both theories provide clear mechanisms linking cognition and affect to work engagement, they do not specify whether the strength of these associations should differ across levels of analysis. Empirical findings also offer mixed results: Studies have found weaker (e.g., Uy et al. 2017), similar (e.g., Rivkin et al. 2023), but also stronger relations on the within- than on the between-person level (e.g., Kronenwett and Rigotti 2022). Yet, no study has statistically compared these effect size differences across levels, leaving the question unresolved. We examine this exploratorily.

4.5 | Motivational States

In the context of motivation, self-determination theory (Ryan and Deci 2000) suggests that when the basic psychological

needs of autonomy (i.e., deciding when, how, and where to work), competence (i.e., being able to use one's abilities), and relatedness (i.e., being part of a group) are satisfied, employees can be their authentic selves and be enthusiastically engaged in their work (Van den Broeck et al. 2016). On days when employees have more control over their tasks and decisions, they feel more empowered and motivated; on days they apply their skills and overcome challenges in a more successful manner than they usually do, they gain confidence and a sense of accomplishment; on days when employees feel more connected to colleagues and more valued by their team—through collaboration or recognition—they experience a positive emotional state; all of these experiences enhance the likelihood that employees will be more engaged in their work on those days. Daily diary studies support these theoretical arguments (Gerpott et al. 2022; Scharp et al. 2022), but the reported positive relations vary in magnitude, illustrating the necessity to meta-analyze these relations. In addition to need satisfaction, other positive motivational experiences—such as experiencing purpose or flow—may also contribute to daily work engagement, but it remains unclear how often these motivational states are studied. We hypothesize:

Hypothesis 9. *Motivational states relate positively to daily work engagement.*

While theorizing on how basic need satisfaction benefits well-being holds on both the between- and within-person level of analysis (Ryan and Deci 2017), the theory does not make predictions about effect size differences across levels. Within-person associations could be stronger because motivational experiences fluctuate substantially across days (Hewitt et al. 2025), fueling daily work engagement. However, individuals with chronically higher motivation may possess stronger self-regulatory skills and may accumulate more opportunities for engagement over time (e.g., by selecting into engaging jobs), driving strong relations on the between-person level (Van den Broeck et al. 2016). Given these competing considerations, we examine this exploratorily.

4.6 | Emotional Labor

Emotional labor refers to the regulation of emotions to meet organizational display rules (Grandey and Gabriel 2015). The most common emotional labor strategies are deep acting (i.e., changing inner feelings) and surface acting (i.e., only changing outer emotional displays to produce the desired emotional response). According to COR theory (Hobfoll 1989), emotional labor impairs employee well-being because it depletes cognitive and emotional resources. This holds especially for surface acting. Deep acting requires energy but also fosters a sense of authenticity in employees (Hülsheger and Schewe 2011). Daily surface acting consistently related negatively to daily work engagement (Schreurs et al. 2014; Uy et al. 2017), but findings for daily deep acting vary. Some studies find a positive association with daily work engagement (Schreurs et al. 2014), whereas others find a non-significant relation (Uy et al. 2017), highlighting the necessity to examine this relation meta-analytically. Therefore, we formulated a hypothesis for surface acting but a research question for deep acting:

Hypothesis 10. *Daily surface acting relates negatively to daily work engagement.*

Research Question 3. To what extent is daily deep acting related to daily work engagement?

As explained, COR theory (Hobfoll 1989) makes no predictions about the strength of between- and within-person processes. At the within-person level, daily fluctuations in emotional labor can have direct consequences for daily work engagement because emotional labor depletes resources, which holds particularly for surface acting. At the between-person level, emotional labor strategies reflect trait-like coping styles or role expectations that determine work engagement. Engaging in surface acting systematically drains resources, whereas the effects of deep acting are less clear. Available evidence also does not clearly indicate whether within- or between-person correlations are stronger (Saleem et al. 2022; Uy et al. 2017), and these cross-level differences have not yet been formally compared. We therefore examine this exploratorily.

4.7 | Recovery Experiences

Employees engage in various leisure activities and recovery experiences to replenish mental and physical resources used during work (Sonnentag and Fritz 2007). Four key recovery experiences are distinguished: Mastery experiences (i.e., seeking challenges unrelated to work that promote growth and development), psychological detachment (i.e., mentally disconnecting from work), relaxation (i.e., engaging in calm and relaxing activities), and control (i.e., having autonomy about how to spend one's leisure time). Sleep quantity and quality are also important recovery experiences. Less frequently studied aspects of the recovery process concern work-related thinking during leisure time, such as affective rumination, problem-solving pondering, and (positive or negative) work reflection (Fritz et al. 2011), and may also relate to work engagement. Engaging in effective recovery experiences reduces stress and replenishes energetic resources, enabling employees to approach work with renewed focus and motivation, which enhances next-day work engagement (cf. COR theory and effort-recovery model; Meijman and Mulder 1998). In fact, meta-analytic within-person correlations (Headrick et al. 2023) show that daily psychological detachment ($r = 0.15$) and daily relaxation ($r = 0.15$) relate positively to daily work engagement, but these correlations are based on a small number of effect sizes ($k = 7$ and 4, respectively). Meta-analytic within-person correlations for other recovery experiences, such as mastery and control as well as sleep quality and quantity, are not available, indicating that strength and consistency remain unclear. Given the role of recovery experiences in replenishing resources and their proven link with daily work engagement, we hypothesize:

Hypothesis 11. *Daily experiences that facilitate recovery relate positively to daily work engagement.*

The effort-recovery model (Meijman and Mulder 1998) was originally framed at the episodic level, focusing on short-term fluctuations in effort and recovery. Accordingly, engaging in recovery after work may increase next-day work engagement due to immediate unwinding. This short-term perspective suggests that recovery experiences might be particularly beneficial in the short-term. Supporting this notion, meta-analytic findings indicate that psychological detachment correlates positively with work engagement at the within-person ($r = 0.15$) but not at the between-person level ($r = -0.01$; Headrick et al. 2023). Yet, meta-analytic correlations for relaxation do not meaningfully differ across levels (within $r = 0.15$, between $r = 0.20$). Mastery and control were positively related to work engagement at the between-person level, but within-person correlations were not reported. For other recovery experiences, such sleep or affective rumination, it remains unclear whether the strength of within- and between-person correlations differs across levels of analyses. We therefore examine this exploratorily.

4.8 | Proactive Behavior

JD-R theory (Bakker et al. 2023) suggests that engaged employees behave proactively to create and build additional resources. On a daily level, engaged employees are driven by their positive emotional state and intrinsic motivation to sustain their engagement. As a result, they proactively seek new challenges and resources by, for example, asking for feedback from supervisors, taking on a challenging task, or setting themselves time-based goals for task completion and then rewarding themselves (cf. job crafting and playful work design). Such proactive behavior helps them stay engaged. Research shows that employees exhibit higher proactivity on days when they experience greater engagement (Bakker and Oerlemans 2019; Petrou et al. 2012), but the effectiveness of different proactive behaviors (e.g., job crafting, playful work design, general proactive behavior) has not yet been compared on a daily level.[5] Hence, we hypothesize:

Hypothesis 12. *Daily work engagement relates positively to daily proactive behaviors.*

According to JD-R theory (Bakker et al. 2023) and its multilevel extension (Bakker 2015), positive relations between proactive behavior and work engagement can exist both at the between- and within-person level, but it is not clear if they differ in strength. Although empirical evidence hints at stronger between- than within-person relations (e.g., Vakola et al. 2021), this impression is based on a selective review of the literature and not on formal statistical comparisons, which is why we examine this exploratorily.

4.9 | Job Performance

The motivational pathway of JD-R theory (Bakker et al. 2023) posits that work engagement enhances both task and contextual performance and reduces counterproductive work behaviors (CWBs) because engaged employees (a) possess the energy that is required to pursue their goals, (b) are willing to invest this energy to achieve their goals, and (c) tend to reciprocate to the organization by adopting extra-role behaviors and avoiding CWBs. Daily within-person studies generally support these theoretical arguments, but some find very strong (Christian et al. 2015; Delanoeije and Verbruggen 2020), whereas others find relatively weak (or sometimes even non-significant) correlations (Guarana et al. 2021; Petrou et al. 2020). These inconsistencies highlight the need to better understand the strength of these relations, but we hypothesize the following:

Hypothesis 13. *Daily work engagement relates (a) positively to daily task and contextual performance, and (b) negatively to daily CWB.*

The multilevel extension of JD-R theory (Bakker 2015) does not make specific predictions about the strength of the relation between daily work engagement and daily job performance. Available studies are also inconclusive, finding stronger between-person correlations (e.g., McClean et al. 2021), stronger within-person correlations (e.g., Xanthopoulou et al. 2008), or no substantial differences (e.g., Guarana et al. 2021), and these relations were not formally compared. We therefore examine this exploratorily.

5 | Open Science Statement

The current meta-analysis was not pre-registered. All codings and analytic scripts can be found on the OSF page for this manuscript.

6 | Method

6.1 | Literature Review

To find suitable studies, we conducted a systematic literature review on Web of Science on March 29, 2023, using the following search terms:

TS = (("work engagement" OR "job engagement" OR "employee engagement" OR vigor OR vigour OR dedication OR absorption) AND ("within-person" OR "within-subject" OR "diary stud*" OR "daily report" OR "daily diary" OR "experience sampling" OR "event sampling")).

After excluding one duplicate, this search resulted in 530 individual hits, for which the first author examined all titles, abstracts, and keywords to assess if the article reported results of a daily diary study about employees' work engagement. A total of 215 documents met these initial criteria and were therefore examined in full by the first author.

To be included in the current meta-analysis, studies had to meet the following criteria. First, studies had to assess daily work engagement (or one of its sub-components) in a work context. We excluded studies assessing academic/student engagement or team engagement because these variables measure fundamentally different phenomena. In line with previous reviews and meta-analyses of diary studies (Kelemen et al. 2020; Pindek et al. 2019, 2024), we focused on daily studies and not on weekly studies. This also guarantees the comparability of included effect sizes because temporal aspects are

held constant across all included studies. Second, studies had to relate daily work engagement (or one of its sub-dimensions) to at least one other variable measured daily.[6] We coded correlations for all available variables measured daily, but we did not code correlations with trait-like variables assessed one time (e.g., at baseline). Third, studies had to report within-person or between-person correlations based on aggregated daily scores. When either within- or between-person correlations were not reported, we requested them from the authors. We requested correlations from 82 independent studies and received information for 26 studies.

In total, 172 documents from the literature search met the inclusion criteria and were coded. We also conducted a systematic literature search on ProQuest Dissertations & Theses on April 5, 2023, using the same search terms and following the same procedure as outlined above. This search resulted in 40 results, of which 13 documents were included. The first author also manually screened the first 10–25 pages of different search term combinations on Google Scholar (depending on the relevance of the search results), which resulted in 24 additional documents that were coded. In addition, we posted a call for unpublished data on X and on the websites of various professional associations (i.e., EAWOP, SIOP, AoM). This way, we received six additional documents that were coded. In total, we included data from 215 documents including 230 individual studies. Figure S1 provides a flowchart outlining the literature search process.

6.2 | Coding

A coding protocol was developed to increase consistency in codings. Following this protocol, the first author and either the second author or a trained student assistant independently coded all included studies. Agreement was 94.6% for all coded correlations and sample sizes (93.8% for all study codings). All inconsistencies were resolved by revisiting the respective document and by discussing the coding in question.

For each study, we coded the within-person correlation (r_w) and the associated within-person sample size reflecting the number of daily observations (N_w), and the between-person correlation (r_b) and the associated between-person sample size (N_b). Whenever a range for the sample sizes was reported, we conservatively coded the smallest sample size. Whenever studies measured a variable more than once daily (e.g., morning and afternoon engagement), we calculated an aggregate correlation accounting for the inter-correlation between the aggregated variables. We also coded the number of days on which data was collected, the number of daily measurement points, and the intra-class correlations (ICCs) for all included variables. The ICCs provide an estimate of the amount of variance that is due to differences between individuals, whereas 1-ICC indicates the amount of variance that is due to within-person fluctuations.

We initially coded the original variable names as reported in the included studies. Given that conceptually identical variables can be named differently (e.g., autonomy and job control), the first and second author independently adapted these variable names to create a consistent set of variable names. When in doubt, we consulted the definitions and item content from the primary studies. The first and second author also independently categorized variables into broader categories (e.g., autonomy and feedback under job resources) based on the different theoretical frameworks used in this meta-analysis. Inconsistencies were resolved by discussion. All other authors subsequently provided feedback on the variable labelling and categorization until agreement was reached.

6.3 | Data Analyses

We relied on Hunter and Schmidt's (1990) meta-analytic approach in a random-effects model. We report meta-analytic results for all relations with at least $k \geq 3$ included studies, and conducted all analyses using the *metafor* package in R (Viechtbauer 2010). For all within- and between-person level relations, we report the number of included studies (k), the number of included participants (N_b), the number of included daily observations (N_w), the sample size-weighted meta-analytic within-person (r_w) and between-person correlation (r_b), the standard error for the respective correlation (SEr), the 95% confidence interval (CI) (95% CI), and the 80% prediction interval (PI) (80% PI). The 95% CI provides a range of possible values that has a 95% chance of including the true population effect size: If the 95% CI excludes zero, the meta-analytic effect size is statistically significant. The 80% PI indicates the presence of moderators: If the 80% PI excludes zero, the effect size distribution is likely not moderated by other variables and validity generalization exists (Tett et al. 2017). For within-person correlations, we use the number of daily observations N_w as the sample size, whereas we use the number of participants N_b as the sample size for between-person correlations. In line with other meta-analyses of daily diary studies (Downes et al. 2021; Pindek et al. 2024), we did not correct correlations for unreliability because the included studies differed substantially in how they calculated and reported within-person reliabilities, often disregarding the multi-level nature of the data.

Statistically significant studies are more likely to be published than studies with non-significant results (Borenstein et al. 2009), resulting in publication bias. Such publication bias can inflate meta-analytic effect size estimates. We test for publication bias using Begg and Mazumdar's (1994) rank correlation test and Egger et al.'s (1997) regression intercept. Statistically significant results indicate that publication bias is present, with significance on both tests suggesting a stronger likelihood of publication bias than significance on just one.

To answer our research question about differences between within- and between-person correlations, we also tried to locate meta-analytic true between-person correlations based on one-off scores (r_{tb}; hereafter only called "true between-person correlations") from earlier meta-analyses for the relations of work engagement with all variables meta-analyzed in the current study (see Figure 1 and Table S4). Whenever multiple meta-analyses were available, we chose the one that included data from the largest number of studies and participants. To test whether the three types of meta-analytic correlations differed

	r_w	r_b	r_{tb}	Diff r_w - r_b	Diff r_w - r_{tb}	Diff r_b - r_{tb}
Job Resources						
Autonomy	0.22	0.32	0.33	**	**	ns
Constructive leadership	0.23	0.42	0.42	**	**	ns
Coworker support	0.30	0.42	0.27	**	*	**
Composite job resources	0.45	0.48	0.37	ns	**	*
Meaningful work	0.42	0.76	0.74	**	**	ns
Skill variety	0.45	0.48	0.44	ns	ns	ns
Personal Resources						
Mindfulness	0.33	0.34		ns		
Composite personal resources		0.40	0.48	ns	ns	ns
Optimism		0.54	0.55	ns	ns	ns
Psychological availability	0.31	0.55		**		
Self-esteem/efficacy	0.40	0.56	0.47	**	**	*
Sense of power	0.03					
Challenge Demands						
Composite challenge demands	0.16	0.19	0.14	ns	ns	*
Time/work pressure	0.09	0.11	0.18	ns	**	*
Workload	0.05	0.04	0.11	ns	**	*
Hindrance Demands						
Destructive leadership	-0.20		-0.20		ns	
Emotional demands	-0.04	0.02		ns		
Composite hindrance demands	-0.04	-0.15	-0.16	**	**	ns
Interruptions	0.09	-0.02		*		
Role ambiguity/conflict	-0.15	-0.25	-0.20	*	*	ns
Self-control demands	-0.14	-0.16		ns		
Work-Home Interface Variables						
Work-family enrichment	0.20	0.31	0.51	*	**	**
Working from home	0.11	-0.03		*		
Family-work conflict	-0.12	-0.16		ns		
Work-family conflict	-0.10	-0.05	-0.18	ns	**	*
Morning routine disruption	-0.04	-0.06		ns		
Cognitive-Affective States						
Ego depletion	-0.23	-0.39		**		
Emotional exhaustion	-0.33	-0.36	-0.39	*	**	*
Family satisfaction	0.06	0.36		**		
Job satisfaction	0.50	0.65	0.60	**	**	*
Need for recovery	-0.40	-0.40		ns		
Negative affect	-0.15	-0.22	-0.22	**	**	ns
Positive affect	0.35	0.61	0.52	**	ns	**
Stress	-0.10	-0.22		**		
Motivational States						
Autonomy need satisfaction	0.37	0.51	0.54	**	**	ns
Competence need satisfaction	0.39	0.59	0.33	**	**	**
Relatedness need satisfaction	0.29	0.44	0.40	**	**	ns
Flow	0.63	0.80		**		
Emotion Regulation						
Deep acting	0.15	0.17		ns		
Surface acting	-0.23	-0.26		ns		
Recovery Experiences						
Mastery experiences	0.19	0.32	0.30	*	**	ns
Psychological detachment	0.11	0.13	-0.01	ns	**	**
Relaxation	0.11	0.20	0.20	*	**	ns
Control	0.12	0.22	0.19	*	*	ns
Affective rumination	-0.29					
Positive work reflection	0.14	0.75		**		
Microbreaks	0.10	0.12		ns		
Sleep duration	0.09	0.12	0.03	ns	ns	ns
Sleep quality	0.14	0.22	0.19	**	*	ns
Smartphone use after work	-0.04					
Feeling recovered	0.39	0.50		**		
Proactive Behavior						
Job crafting - Reducing demands	-0.01	-0.09	-0.07	ns	*	ns
Job crafting - Seeking challenges	0.22	0.37	0.38	**	**	ns
Job crafting - Seeking resources	0.17	0.24	0.39	ns	**	**
Proactive behavior	0.51	0.62	0.55	**	ns	*
PWD - Designing competition	0.43	0.44		ns		
PWD - Designing fun	0.44	0.47		ns		
Self-leadership	0.25	0.32	0.37	ns	**	ns
Job Performance						
Creativity	0.40	0.39	0.29	ns	**	*
CWB	-0.24	-0.20		ns		
OCB	0.30	0.40	0.40	**	**	ns
Task performance	0.39	0.52	0.40	**	ns	**
Events						
Day of the week	-0.01	0.00		ns		
Study day	-0.01	0.07		ns		
Hours worked	0.03	-0.01		ns		

FIGURE 1 | Legend on next page.

FIGURE 1 | Comparison of meta-analytic within-, between-, and true between-person correlations. *Note:* Color gradients represent the direction and magnitude of correlations (blue = negative, red = positive). Diff = statistical significance of the difference tests of two correlations; r_w = within-person correlation, r_b = between-person correlation based on aggregated daily scores, r_{tb} = true between-person correlation from earlier meta-analyses. $^{**}p < 0.001$, $^{*}p < 0.05$, ns = not significant. Please consult Table S4 for details about *k*, *N*, and the source of the meta-analytic true between-person correlations. [Colour figure can be viewed at wileyonlinelibrary.com]

significantly, we compared Fisher *z*-transformed correlations with standard errors calculated based on the sample sizes for each correlation type (r_w, r_b, and r_{tb}, respectively). The Fisher *z*-transformation stabilizes the variance of the correlations, ensuring that the standard errors are comparable across different correlations. Differences between correlations were assessed using *z*-tests, with the test statistic calculated as the difference between two Fisher *z*-transformed correlations divided by the pooled standard error.

7 | Results

7.1 | Descriptives

On average, the included daily diary studies collected data on 8.73 days (SD = 4.61, median = 10, range = 3–34) and used 2.06 daily ratings (SD = 0.87, median = 2, range = 1–5). Data was collected in 26 countries, with most studies being conducted in the United States of America ($k = 42$), Germany ($k = 36$), China ($k = 30$), and the Netherlands ($k = 29$). The average ICC for work engagement was 0.53, indicating that 53% of the variance in work engagement existed between individuals, whereas 47% was within individuals. The average ICCs for all included correlates of work engagement ranged from 0.35 (composite job resources) to 0.71 (meaningful work), with an average of 0.51 (see Table S1). On average, within-person correlations were weaker ($r_{w\_mean} = 0.13$, $n = 63$) than between-person correlations based on aggregated daily scores ($r_{b\_mean} = 0.22$, $n = 61$) and true-between correlations ($r_{tb\_mean} = 0.24$, $n = 39$). The three types of correlations correlated very strongly with one another ($r_{Within\text{-}Between}(59) = 0.93$; $r_{Within\text{-}TrueBetween}(37) = 0.92$; $r_{Between\text{-}TrueBetween}(37) = 0.94$), indicating that, overall, relations of daily work engagement exhibit the same pattern as those of stable manifestations of work engagement. Moreover, the close correspondence between correlations based on aggregated daily scores and true between-person correlations suggests that aggregation bias, if present, is likely to be limited. The correlation between meta-analytic within-person correlations and ICCs was $r(60) = -0.09$, suggesting that within-person correlations are slightly stronger if there is more variability on the within-person level.

Table 1 includes the meta-analytic results for within-person correlations and Table 2 for between-person correlations based on aggregated daily scores. Figure 1 and Table S4 include an overview and a statistical comparison of all within- and between-person correlations from the current meta-analysis, as well as true between-person correlations from earlier meta-analyses. Below, we describe the results of the publication bias and moderator analyses, followed by descriptions of findings per variable category.

7.2 | Publication Bias Analyses

Among the 63 meta-analytic within-person correlations, Egger's regression intercept test was significant 15 times, whereas the rank correlation test was significant twice. Just two meta-analytic correlations had significant results for both tests: daily work engagement with feeling recovered and CWB. Visual inspection of the funnel plots for these relations suggests that less precise but large effect sizes were missing to make the funnel plot symmetric, indicating that these meta-analytic within-person correlations seem to be under- rather than over-estimated. Among the 61 meta-analytic between-person correlations, Egger's regression intercept test was significant 24 times and the rank correlation test was significant six times. Six meta-analytic correlations had significant values on both publication bias tests (i.e., composite challenge demands, self-esteem/efficacy, positive affect, ego depletion, feeling recovered, and task performance). For all these relations, visual inspection of the funnel plots again indicated that the meta-analytic between-person correlations are more likely to be under- than over-estimated. Our findings should be interpreted with this in mind.

7.3 | Moderator Analyses

We examined whether within-person correlations varied depending on whether work engagement and its correlates were measured simultaneously or with a time lag, and depending on the measure of work engagement (Utrecht Work Engagement Scale versus all other measures) (see Tables S2 and S3 for detailed results). Overall, there was weak evidence for the idea that effect sizes are weaker when the measurement of work engagement and its correlate were separated in time, except for affectively charged variables (i.e., positive and negative affect as well as need satisfaction). This suggests that effect sizes may be inflated by content overlap when variables are measured simultaneously or by transient affective states when both variables are affective in nature, but less so when work engagement is correlated with behavioral or cognitive constructs. Within-person correlations were largely invariant across work engagement measures (with a few exceptions but no consistent pattern of findings).

7.4 | The Nomological Network of Work Engagement

7.4.1 | Job Resources

All daily job resources were positively related to daily work engagement ($0.22 < r_w < 0.45$), confirming Hypothesis 1. Both types of between-person correlations were also significant and

TABLE 1 | Meta-analytic within-person correlations.

	k	N_b	N_w	r_w	SEr	95% CI	80% PI	Rank$_p$	Egger$_p$
Job resources									
Autonomy	17	1812	11 658	0.22	0.04	0.15, 0.30	0.02, 0.42	0.440	0.306
Constructive leadership	17	2142	15 139	0.23	0.03	0.17, 0.29	0.08, 0.39	0.151	0.825
Coworker support	12	1294	10 166	0.30	0.04	0.21, 0.39	0.10, 0.50	0.381	0.372
Composite job resources	4	395	3311	0.45	0.03	0.39, 0.51	0.37, 0.53	0.750	0.171
Meaningful work	7	835	5860	0.42	0.07	0.29, 0.55	0.19, 0.66	0.381	< 0.001
Skill variety	3	232	1267	0.45	0.08	0.29, 0.61	0.25, 0.66	0.333	< 0.001
Personal resources									
Mindfulness	5	931	5895	0.33	0.04	0.26, 0.40	0.23, 0.44	0.083	< 0.001
Psychological availability	5	575	3862	0.31	0.07	0.18, 0.44	0.11, 0.51	0.233	< 0.001
Self-esteem/efficacy	9	1318	7186	0.40	0.03	0.34, 0.46	0.30, 0.50	0.919	0.906
Sense of power	3	301	2084	0.03	0.02	−0.02, 0.07	−0.00, 0.05	0.999	0.626
Challenge demands									
Composite challenge demands	17	2082	10 317	0.16	0.05	0.07, 0.26	−0.09, 0.42	0.109	0.034
Time/work pressure	19	2412	13 851	0.09	0.05	−0.01, 0.19	−0.20, 0.37	0.999	0.162
Workload	13	1586	8253	0.05	0.04	−0.02, 0.13	−0.13, 0.23	0.435	0.393
Hindrance demands									
Destructive leadership	7	665	3664	−0.20	0.08	−0.36, −0.05	−0.48, 0.07	0.562	0.406
Emotional demands	7	741	4125	−0.04	0.02	−0.09, 0.00	−0.10, 0.02	0.999	0.207
Composite hindrance demands	13	1709	8441	−0.04	0.03	−0.10, 0.01	−0.16, 0.07	0.765	0.626
Interruptions	6	783	5861	0.09	0.15	−0.21, 0.39	−0.42, 0.60	0.719	0.031
Role ambiguity/conflict	6	884	4115	−0.15	0.06	−0.26, −0.04	−0.33, 0.04	0.999	0.739
Self-control demands	5	379	2711	−0.14	0.04	−0.23, −0.06	−0.27, −0.02	0.817	0.838
Work–home interface variables									
Work–family enrichment	6	579	4484	0.20	0.05	0.10, 0.30	0.03, 0.36	0.272	0.146
Working from home	3	253	2455	0.11	0.05	0.02, 0.20	0.01, 0.22	0.999	0.467
Family–work conflict	3	358	2252	−0.12	0.07	−0.26, 0.03	−0.30, 0.07	0.999	0.557
Work–family conflict	5	447	3924	−0.10	0.05	−0.20, −0.00	−0.24, 0.04	0.483	0.057
Morning routine disruption	3	382	4724	−0.04	0.01	−0.07, −0.01	−0.06, −0.02	0.999	0.494
Cognitive–affective states									
Ego depletion	20	2223	19 038	−0.23	0.04	−0.31, −0.16	−0.46, −0.01	0.501	0.670
Emotional exhaustion	30	3952	24 406	−0.33	0.03	−0.38, −0.28	−0.51, −0.15	0.116	0.130
Family satisfaction	3	363	3328	0.06	0.02	0.03, 0.10	0.04, 0.08	0.333	0.503
Job satisfaction	8	772	5637	0.50	0.06	0.38, 0.63	0.27, 0.74	0.548	0.288

(Continues)

TABLE 1 | (Continued)

	k	N_b	N_w	r_w	SEr	95% CI	80% PI	Rank$_p$	Egger$_p$
Need for recovery	5	360	3064	−0.40	0.04	−0.47, −0.33	−0.50, −0.30	0.999	0.847
Negative affect	51	7220	57 257	−0.15	0.02	−0.18, −0.12	−0.28, −0.02	0.465	0.762
Positive affect	57	7377	58 335	0.35	0.03	0.30, 0.40	0.10, 0.59	0.369	0.021
Stress	16	1840	15 834	−0.10	0.05	−0.20, 0.00	−0.36, 0.17	0.626	0.469
Motivational states									
Autonomy need satisfaction	8	912	5359	0.37	0.08	0.21, 0.53	0.06, 0.67	0.399	0.700
Competence need satisfaction	9	1287	8900	0.39	0.07	0.25, 0.53	0.11, 0.68	0.477	0.533
Relatedness need satisfaction	10	1150	6365	0.29	0.05	0.20, 0.39	0.10, 0.49	0.484	0.658
Flow	5	526	3893	0.63	0.05	0.53, 0.73	0.47, 0.78	0.233	< 0.001
Emotional labor									
Deep acting	5	564	3701	0.15	0.02	0.11, 0.18	0.11, 0.18	0.483	0.159
Surface acting	5	564	3701	−0.23	0.04	−0.31, −0.15	−0.35, −0.12	0.817	0.427
Recovery experiences									
Mastery experiences	4	484	2000	0.19	0.04	0.11, 0.26	0.09, 0.28	0.750	0.634
Psychological detachment	14	1597	9957	0.11	0.03	0.05, 0.17	−0.03, 0.25	0.233	0.048
Relaxation	8	834	6213	0.11	0.03	0.04, 0.18	−0.02, 0.23	0.275	0.199
Control	4	522	2200	0.12	0.03	0.05, 0.18	0.04, 0.20	0.750	0.005
Affective rumination	3	184	778	−0.29	0.04	−0.36, −0.21	−0.36, −0.22	0.999	0.043
Positive work reflection	3	339	1481	0.14	0.07	−0.00, 0.28	−0.03, 0.31	0.999	0.872
Microbreaks	4	530	3179	0.10	0.06	−0.01, 0.21	−0.06, 0.26	0.999	0.729
Sleep duration	14	1426	9214	0.09	0.02	0.04, 0.13	−0.02, 0.19	0.157	0.456
Sleep quality	25	2786	17 442	0.14	0.03	0.09, 0.20	−0.02, 0.31	0.872	0.908
Smartphone use after work	3	318	1753	−0.04	0.02	−0.09, 0.00	−0.07, −0.01	0.999	0.250
Feeling recovered	15	1587	7891	0.39	0.03	0.34, 0.45	0.26, 0.53	0.027	0.002
Proactive behavior									
Job crafting—reducing demands	8	719	2969	−0.01	0.07	−0.15, 0.12	−0.27, 0.25	0.905	0.605
Job crafting—seeking challenges	6	547	2435	0.22	0.07	0.08, 0.36	−0.02, 0.46	0.272	0.301
Job crafting—seeking resources	6	547	2435	0.17	0.07	0.03, 0.31	−0.07, 0.41	0.719	0.266
Proactive behavior	5	700	3359	0.51	0.04	0.44, 0.58	0.41, 0.61	0.083	0.004
PWD—designing competition	3	452	2127	0.43	0.05	0.34, 0.52	0.32, 0.54	0.999	0.685
PWD—designing fun	3	452	2127	0.44	0.04	0.36, 0.53	0.35, 0.54	0.999	0.436
Self-leadership	4	458	4881	0.25	0.05	0.15, 0.34	0.11, 0.38	0.333	0.148

(Continues)

TABLE 1 | (Continued)

	k	N_b	N_w	r_w	SEr	95% CI	80% PI	Rank$_p$	Egger$_p$
Job performance									
Creativity	7	954	5917	0.40	0.09	0.21, 0.58	0.06, 0.73	0.999	0.480
CWB	11	1779	15 225	−0.24	0.05	−0.33, −0.15	−0.43, −0.04	0.041	< 0.001
OCB	25	3283	23 274	0.30	0.04	0.22, 0.38	0.04, 0.56	0.660	0.150
Task performance	33	4034	27 907	0.39	0.03	0.33, 0.45	0.17, 0.62	0.097	0.037
Events									
Day of the week	7	1105	7022	−0.01	0.02	−0.06, 0.04	−0.09, 0.07	0.562	0.583
Study day	5	646	5234	−0.01	0.02	−0.04, 0.03	−0.05, 0.04	0.817	0.187
Hours worked	6	864	4276	0.03	0.04	−0.05, 0.10	−0.09, 0.14	0.272	0.735

Abbreviations: 80% PI = 80% prediction interval for r; 95% CI = 95% confidence interval for r; CWB = counterproductive work behavior; Egger$_p$ = p-value for the regression test of funnel plot asymmetry; k = number of included studies; N_b = cumulative sample size; N_w = cumulative number of included daily observations; OCB = organizational citizenship behavior; PWD = playful work design; Rank$_p$ = p-value for the rank correlation test of funnel plot asymmetry; r_w = sample size-weighted meta-analytic within-person correlation; SEr = standard error of r.

positive for almost all examined job resources ($0.32 < r_b < 0.45$; $0.27 < r_{tb} < 0.74$). The two types of between-person correlations only differed for coworker support ($r_b = 0.42$, $r_{tb} = 0.27$) and composite job resources[7] ($r_b = 0.48$, $r_{tb} = 0.37$), indicating that aggregation bias might have inflated between-person correlations based on aggregated daily scores. Yet, most within-person correlations were significantly weaker than both types of between-person correlations (see Figure 1). Most notably, meaningful work exhibited much stronger between-person correlations ($r_b = 0.76$; $r_{tb} = 0.74$) than the already strong within-person correlation ($r_w = 0.42$), but constructive leadership ($r_w = 0.23$; $r_b = 0.42$; $r_{tb} = 0.42$) and autonomy ($r_w = 0.22$; $r_b = 0.32$; $r_{tb} = 0.33$) also correlated more strongly with work engagement on the between- than on the within-person level.

7.4.2 | Personal Resources

Mindfulness ($r_w = 0.33$), psychological availability ($r_w = 0.31$), and self-esteem/efficacy ($r_w = 0.40$) exhibited positive within-person correlations with daily work engagement; sense of power ($r_w = 0.03$) did not. This largely confirms Hypothesis 2. The between-person correlations based on aggregated daily scores ($0.34 < r_b < 0.56$) and the true between-person correlations ($0.26 < r_{tb} < 0.55$) were all positive and did not differ significantly from one another (except for self-esteem/efficacy), but were, on average, slightly stronger than the within-person correlations.

7.4.3 | Challenge Demands

Among the within-person correlations, composite challenge demands correlated positively ($r_w = 0.16$), whereas time/work pressure ($r_w = 0.09$) and workload ($r_w = 0.05$) did not significantly correlate with daily work engagement. Overall, this provides mixed support for Hypothesis 3. These within-person correlations converged with between-person correlations based on aggregated daily scores (composite challenge demands: $r_b = 0.19$; time/work pressure: $r_b = 0.11$; workload: $r_b = 0.04$). No consistent differences emerged between within- and true between-person correlations (composite challenge demands: $r_{tb} = 0.14$; time/work pressure: $r_{tb} = 0.18$; workload: $r_{tb} = 0.11$) nor between the two types of between-person correlations (see Figure 1).

7.4.4 | Hindrance Demands

Emotional demands ($r_w = -0.04$), composite hindrance demands ($r_w = -0.04$), and interruptions ($r_w = 0.09$) did not exhibit significant within-person correlations with daily work engagement, but destructive leadership ($r_w = -0.20$), role ambiguity/conflict ($r_w = -0.15$), and self-control demands ($r_w = -0.14$) did. Between-person correlations converged with the within-person correlations for emotional demands ($r_b = 0.02$), destructive leadership ($r_{tb} = -0.20$), and self-control demands ($r_b = -0.16$), but they were significantly weaker for interruptions ($r_b = -0.02$) and significantly stronger for role ambiguity/conflict ($r_b = -0.25$, $r_{tb} = -0.20$) and composite hindrance demands ($r_b = -0.15$, $r_{tb} = -0.16$). There were no significant differences in the two types of between-person correlations. These findings provide mixed support for Hypothesis 4 and suggest that some differences in strength exist at within- and between-person correlations.

7.4.5 | Work–Home Interface Variables

We were not able to locate enough studies to meta-analytically test Hypotheses 5 and 6 about relations of home resources and demands with daily work engagement, but we did locate several variables at the work–home interface. Work–family enrichment ($r_w = 0.20$) and working from home ($r_w = 0.11$) correlated positively with daily work engagement. Both between-person correlations for work–family enrichment were stronger ($r_b = 0.31$, $r_{tb} = 0.51$; note the difference between the two), but the between-person correlation based on aggregated daily scores was weaker and non-significant for working from home ($r_b = -0.03$).

TABLE 2 | Meta-analytic between-person correlations based on aggregated daily scores.

	k	N_b	N_w	r_b	SEr	95% CI	80% PI	Rank$_p$	Egger$_p$
Job resources									
Autonomy	17	1793	11 691	0.32	0.03	0.26, 0.39	0.19, 0.46	0.052	0.026
Constructive leadership	15	1946	14 131	0.42	0.04	0.34, 0.50	0.24, 0.59	0.328	0.409
Coworker support	14	1490	11 106	0.42	0.05	0.32, 0.52	0.20, 0.64	0.079	0.019
Composite job resources	5	412	2760	0.48	0.06	0.36, 0.60	0.34, 0.62	0.233	0.004
Meaningful work	5	584	4322	0.76	0.04	0.69, 0.83	0.66, 0.86	0.083	< 0.001
Skill variety	4	296	1471	0.48	0.05	0.37, 0.58	0.37, 0.58	0.750	0.044
Personal resources									
Mindfulness	5	931	5895	0.34	0.03	0.29, 0.40	0.31, 0.38	0.483	0.192
Composite personal resources	3	313	2202	0.40	0.12	0.16, 0.64	0.11, 0.70	0.999	< 0.001
Optimism	3	163	1065	0.54	0.06	0.43, 0.65	0.46, 0.61	0.333	0.333
Psychological availability	6	635	4462	0.55	0.06	0.43, 0.67	0.36, 0.74	0.272	0.002
Self-esteem/efficacy	9	985	3855	0.56	0.04	0.48, 0.63	0.45, 0.67	0.025	< 0.001
Challenge demands									
Composite challenge demands	17	2032	9801	0.19	0.05	0.09, 0.28	−0.05, 0.42	0.017	0.001
Time/work pressure	20	2479	14 153	0.11	0.05	0.01, 0.21	−0.16, 0.38	0.999	0.621
Workload	14	1593	—	0.04	0.05	−0.06, 0.14	−0.17, 0.25	0.388	0.139
Hindrance demands									
Emotional demands	7	741	4125	0.02	0.06	−0.09, 0.14	−0.15, 0.19	0.381	0.116
Composite hindrance demands	12	1588	7450	−0.15	0.04	−0.24, −0.06	−0.32, 0.02	0.459	0.689
Interruptions	5	684	4834	−0.02	0.09	−0.20, 0.16	−0.28, 0.24	0.483	0.342
Role ambiguity/conflict	6	884	4115	−0.25	0.05	−0.35, −0.15	−0.39, −0.11	0.272	0.002
Self-control demands	5	379	2711	−0.16	0.07	−0.30, −0.02	−0.33, 0.01	0.817	0.654
Work–home interface variables									
Work–family enrichment	9	819	5755	0.31	0.04	0.24, 0.39	0.23, 0.40	0.761	0.303
Working from home	3	253	2455	−0.03	0.06	−0.15, 0.09	−0.11, 0.05	0.999	0.979
Work–family conflict	4	512	—	−0.16	0.08	−0.31, −0.00	−0.35, 0.03	0.333	0.001
Family–work conflict	8	714	5639	−0.05	0.05	−0.15, 0.06	−0.19, 0.10	0.999	0.710
Morning routine disruption	3	382	4724	−0.06	0.06	−0.18, 0.05	−0.16, 0.04	0.999	0.262
Cognitive–affective states									
Ego depletion	17	1631	14 808	−0.39	0.04	−0.47, −0.30	−0.59, −0.18	0.022	< 0.001
Emotional exhaustion	31	4153	25 252	−0.36	0.04	−0.43, −0.29	−0.59, −0.13	0.083	0.094
Family satisfaction	4	423	—	0.36	0.04	0.27, 0.44	0.30, 0.41	0.750	0.409
Job satisfaction	7	615	3604	0.65	0.05	0.54, 0.76	0.47, 0.83	0.999	0.087

(Continues)

TABLE 2 | (Continued)

	k	N_b	N_w	r_b	SEr	95% CI	80% PI	Rank$_p$	Egger$_p$
Need for recovery	5	360	3064	−0.40	0.05	−0.48, −0.31	−0.46, −0.33	0.817	0.490
Negative affect	48	5867	—	−0.22	0.02	−0.26, −0.18	−0.38, −0.06	0.077	0.015
Positive affect	54	5925	—	0.61	0.02	0.57, 0.64	0.44, 0.77	<0.001	<0.001
Stress	16	1840	15834	−0.22	0.08	−0.37, −0.07	−0.61, 0.17	0.506	0.289
Motivational states									
Autonomy need satisfaction	8	1010	5652	0.51	0.05	0.41, 0.60	0.35, 0.67	0.548	0.005
Competence need satisfaction	8	1010	5652	0.59	0.05	0.50, 0.68	0.43, 0.75	0.109	<0.001
Relatedness need satisfaction	10	1248	6658	0.44	0.05	0.34, 0.55	0.24, 0.65	0.108	<0.001
Flow	5	526	3893	0.80	0.03	0.74, 0.86	0.72, 0.88	0.233	<0.001
Emotional labor									
Deep acting	5	564	3701	0.17	0.04	0.09, 0.25	0.12, 0.22	0.817	0.631
Surface acting	5	564	3701	−0.26	0.04	−0.34, −0.19	−0.31, −0.21	0.817	0.513
Recovery experiences									
Mastery experiences	4	484	2000	0.32	0.05	0.23, 0.41	0.24, 0.40	0.999	0.048
Psychological detachment	17	1845	—	0.13	0.04	0.05, 0.22	−0.07, 0.33	0.393	0.495
Relaxation	8	834	6213	0.20	0.03	0.13, 0.26	0.15, 0.24	0.548	0.548
Control	4	522	2200	0.22	0.04	0.14, 0.30	0.17, 0.28	0.333	0.631
Positive work reflection	3	339	1481	0.75	0.03	0.68, 0.81	0.68, 0.81	0.333	0.031
Microbreaks	4	530	3179	0.12	0.12	−0.11, 0.35	−0.20, 0.44	0.750	0.064
Sleep duration	12	1208	7828	0.12	0.03	0.07, 0.18	0.09, 0.16	0.947	0.669
Sleep quality	23	2497	16074	0.22	0.04	0.14, 0.31	−0.02, 0.47	0.172	0.258
Feeling recovered	15	1499	7301	0.50	0.03	0.43, 0.57	0.36, 0.64	0.027	0.001
Proactive behavior									
Job crafting—reducing demands	6	532	2296	−0.09	0.07	−0.23, 0.06	−0.30, 0.12	0.469	0.101
Job crafting—seeking challenges	7	603	2599	0.37	0.06	0.26, 0.49	0.20, 0.55	0.381	0.888
Job crafting—seeking resources	7	603	2599	0.24	0.08	0.09, 0.39	−0.01, 0.49	0.069	<0.001
Proactive behavior	5	700	3359	0.62	0.05	0.53, 0.71	0.49, 0.74	0.083	<0.001
PWD—designing competition	3	452	2127	0.44	0.07	0.30, 0.58	0.28, 0.60	0.999	0.640
PWD—designing fun	3	452	2127	0.47	0.05	0.37, 0.57	0.36, 0.57	0.999	0.709
Self-leadership	4	458	4881	0.32	0.09	0.14, 0.50	0.09, 0.56	0.333	0.028
Job performance									
Creativity	8	984	6102	0.39	0.10	0.19, 0.59	0.02, 0.77	0.905	0.074

(Continues)

TABLE 2 | (Continued)

	k	N_b	N_w	r_b	SEr	95% CI	80% PI	Rank$_p$	Egger$_p$
CWB	9	991	6971	−0.20	0.05	−0.31, −0.10	−0.39, −0.02	0.260	0.058
OCB	19	2294	12 587	0.40	0.03	0.35, 0.45	0.30, 0.50	0.332	0.305
Task performance	33	3895	—	0.52	0.03	0.46, 0.59	0.29, 0.75	< 0.001	< 0.001
Events									
Day of the week	4	749	5313	0.00	0.04	−0.07, 0.07	−0.04, 0.05	0.750	0.183
Study day	5	646	5234	0.07	0.07	−0.05, 0.20	−0.10, 0.25	0.999	0.808
Hours worked	8	1073	5970	−0.01	0.05	−0.10, 0.09	−0.16, 0.14	0.109	0.173

Note: Some N_w values are missing (i.e., "—") because not all included studies reported the exact number of daily observations.
Abbreviations: 80% PI = 80% prediction interval for r; 95% CI = 95% confidence interval for r; CWB = counterproductive work behavior; Egger$_p$ = p-value for the regression test of funnel plot asymmetry; k = number of included studies; N_b = cumulative sample size; N_w = cumulative number of included daily observations; OCB = organizational citizenship behavior; PWD = playful work design; Rank$_p$ = p-value for the rank correlation test of funnel plot asymmetry; r_b = sample size weighted meta-analytic between-person correlation; SEr = standard error of r.

Daily work–family conflict ($r_w = -0.10$) and morning routine disruption ($r_w = -0.04$) related negatively with daily work engagement, whereas family–work conflict ($r_w = -0.12$) was not significantly related to daily work engagement. Between-person correlations based on aggregated daily scores did not significantly differ from the respective within-person correlations: Family–work conflict related negatively to work engagement ($r_b = -0.16$), work–family conflict ($r_b = -0.05$), and morning routine disruption ($r_b = -0.06$) did not. However, work–family conflict exhibited a negative true between-person correlation with work engagement ($r_{tb} = -0.18$), and this correlation was significantly stronger than the two other types of correlations.

7.4.6 | Cognitive–Affective States

Daily negative affect ($r_w = -0.15$), ego depletion ($r_w = -0.23$), emotional exhaustion ($r_w = -0.33$), and need for recovery ($r_w = -0.40$) all correlated negatively with daily work engagement, whereas daily positive affect ($r_w = 0.35$) and job satisfaction ($r_w = 0.50$) correlated positively with daily work engagement (daily family satisfaction did not, $r_w = 0.06$). These findings largely confirm Hypotheses 7 and 8. Between-person correlations exhibited a similar pattern but were stronger than the within-person correlations (except for need for recovery); the two types of between-person correlations did not consistently differ from one another.

7.4.7 | Motivational States

Employees whose daily needs for autonomy ($r_w = 0.37$), competence ($r_w = 0.39$), and relatedness ($r_w = 0.29$) were satisfied were more engaged on the same day. Although these within-person correlations were already relatively strong, the respective between-person correlations ($0.44 < r_b < 0.59$; $0.33 < r_{tb} < 0.54$) were significantly stronger (the two types of between-person correlations only differed significantly from one another for competence). Flow correlated very strongly with daily work engagement on the within- ($r_w = 0.63$) and even more strongly on between-person level ($r_b = 0.80$). These findings support Hypothesis 9.

7.4.8 | Emotional Labor

Surface acting exhibited a negative within-person correlation with daily work engagement ($r_w = -0.23$), providing support for Hypothesis 10. Deep acting correlated positively with daily work engagement ($r_w = 0.15$), answering Research Question 3. The between-person correlations based on aggregated daily scores for surface acting ($r_b = -0.26$) and deep acting ($r_b = 0.17$) were of similar magnitude. We did not locate meta-analytic true between-person correlations for any of the emotional labor variables.

7.4.9 | Recovery Experiences

Mastery ($r_w = 0.19$), psychological detachment ($r_w = 0.11$), relaxation ($r_w = 0.11$), and control ($r_w = 0.12$) were associated with being more engaged on the same day. Daily sleep duration ($r_w = 0.09$) and quality ($r_w = 0.14$) also correlated positively with daily work engagement, but positive work reflection ($r_w = 0.14$) and microbreaks ($r_w = 0.10$) did not. Among ineffective forms of recovery, affective rumination ($r_w = -0.29$) was, but smartphone use after work ($r_w = -0.04$) was not negatively correlated with daily work engagement. Employees were more engaged on days on which they felt recovered ($r_w = 0.39$). These findings, with exceptions for positive work reflection, microbreaks, and smartphone use after work, provide support for Hypothesis 11, but most within-person correlations were weak. Most of the two types of between-person correlations exhibited the same pattern of results and did not differ significantly from one another, but were significantly stronger ($0.12 < r_b < 0.75$; $-0.01 < r_{tb} < 0.30$) than the respective within-person correlations.

7.4.10 | Proactive Behavior

We were able to meta-analyze quite a few different conceptualizations of proactive behavior (i.e., different dimensions of job crafting and playful work design, general proactive behavior, self-leadership), and almost all exhibited positive within-person correlations with daily work

engagement ($0.17 < r_w < 0.51$), in support of Hypothesis 12. The one exception was the non-significant correlation of the job crafting sub-dimension reducing demands ($r_w = -0.01$), but this is in line with non-significant between-person correlations ($r_b = -0.09$, $r_{tb} = -0.07$), and with evidence indicating that this sub-dimension does not load well onto an overarching job crafting factor (Rudolph et al. 2017). The available between-person correlations for the other indicators of proactive behavior were, on average, slightly larger than the respective within-person correlations ($0.24 < r_b < 0.62$; $0.37 < r_{tb} < 0.55$), except for the within- and between-person correlations of playful work design that were of similar magnitude ($0.43 < r_w < 0.44$; $0.44 < r_b < 0.47$). The two types of between-person correlations converged for most proactive behavior indicators, and the two significant differences that we did observe were in opposite directions.

7.4.11 | Job Performance

Daily work engagement was positively related to daily task performance ($r_w = 0.39$) and daily OCB ($r_w = 0.30$), and negatively related to daily CWB ($r_w = -0.24$), supporting Hypotheses 13a and b). We also found a positive within-person correlation of daily work engagement with daily creativity ($r_w = 0.40$). Both between-person correlations were stronger for OCB ($r_b = 0.40$, $r_{tb} = 0.40$), but only the between-person correlations based on aggregated daily scores were significantly stronger for task performance ($r_b = 0.52$); true between-person correlations were not ($r_{tb} = 0.40$). Within- and between-person correlations based on aggregated daily scores for creativity ($r_w = 0.40$; $r_b = 0.39$) and CWB ($r_w = -0.24$; $r_b = -0.20$) did not differ significantly, but the true between-person correlation for creativity was significantly weaker ($r_{tb} = 0.29$) than the respective within-person correlation. Most of the true between-person correlations were also weaker than the between-person correlations based on aggregated daily scores (except for OCB).

7.4.12 | Events

The day of the week ($r_w = -0.01$, $r_b = 0.00$), study day ($r_w = -0.01$, $r_b = 0.07$), and the number of hours worked on a given day ($r_w = 0.03$, $r_b = -0.01$) did not correlate significantly with work engagement. No differences in within- and between-person correlations existed.

8 | Discussion

Although Young et al. (2018) demonstrated that work engagement has a substantial trait-like component, our meta-analytic findings indicate that work engagement also exhibits considerable daily fluctuations and correlates with theoretically relevant variables at the within-person level. Based on our meta-analysis of the nomological network of daily work engagement, we found support for most theoretically derived hypotheses. We further compared within- and between-person correlations (based on both aggregated daily scores and on–off assessments) to test the invariance of theoretical predictions across levels of analysis. These results demonstrate that the nomological network of work engagement largely transcends daily and stable levels of analyses. These findings provide evidence for the homology of most theoretical predictions involving work engagement, but also indicate that some theoretical predictions should be refined to accurately explain why the strength of work engagement's relations with other variables differs at the within- and between-person levels of analysis.

8.1 | Insights About the Homology of Theoretical Predictions

Most efforts to test the homology of organizational theories have focused on establishing homology across individual, team, and organizational levels (Chen et al. 2005), whereas relatively little (meta-analytic) attention has been paid to homology of within- and between-person processes. Meta-analytically supporting the homology of most theoretical predictions (e.g., JD-R theory, COR theory, self-determination theory) across the within- and between-person levels enhances the parsimony and comprehensiveness of these theories. Specifically, the exceptionally strong correlations between within- and both types of between-person effect sizes demonstrated that the direction and relative strength of relations in the nomological network of work engagement are generally consistent across levels of analyses. Stated differently, variables that correlate relatively strongly with work engagement at the between-person level (e.g., job resources) tend to also correlate relatively strongly at the within-person level, whereas relatively weaker between-person correlations (e.g., job demands and work engagement) are also relatively weaker at the within-person level. This supports the *structural* homology of the examined theoretical predictions, meaning that predictions developed at one level are broadly applicable at the other level.

However, theories should not just predict the direction of the relations between variables, but also include predictions about the strength of relations as well as possible thresholds or turning points (Edwards and Christian 2014). This increases chances of falsification and improves the practical usefulness of theories. The fact that within-person correlations were, on average, weaker than the two types of between-person correlations indicates that the magnitude of the theoretically derived predictions varies at the two levels of analyses. In other words, we found evidence for the scalar similarity of most relations, meaning that the strength of relations differs proportionally and the pattern of relations is consistent across levels, but not for configural similarity (i.e., the pattern of statistical significance is similar across levels) or metric similarity (i.e., the strength of relations is identical across levels; Chen et al. 2005). This could indicate that the theoretical mechanisms underlying between-person relations might differ from those of within-person relations, and that theories should be refined to incorporate level-specific mechanisms that account for the observed variation in the strength of relations across levels. The lack of strong differences across levels could also reflect a limitation of existing theories which were largely developed to explain between-person processes and do not explicitly theorize about within-person processes, ultimately failing to accurately describe within-person processes

TABLE 3 | Suggestions for the development and refinement of multilevel theories.

Suggestion	Description	Example questions
1. Validate construct definition across levels	Ensure that constructs have equivalent meaning across levels and that they capture the same underlying phenomenon	Is daily work engagement psychologically equivalent to general work engagement? Does it reflect the same motivational process or a distinct temporal state?
2. Distinguish level-specific assumptions and predictions	Theorize whether the antecedents and consequences of the constructs are the same or different across levels	Are the same or different variables predictive of daily and general work engagement? Which variables predict (momentary or long-term) changes in work engagement? Do job resources need to be consistently present, or can single-day resources promote engagement?
3. Differentiate mechanisms across levels	Identify whether the same or different mechanisms explain relations across levels	Do the same mechanisms (e.g., sequence of mediators) explain why some individuals are generally engaged and why others feel more engaged on a given day? Does daily recovery benefit next-day engagement through resource replenishment, while general recovery and engagement reflect trait-like regulatory skills?
4. Articulate the time scale of hypothesized processes and model temporal dynamics	Specify how quickly effects unfold, how long they endure, and when accumulation or turning points occur	Does recovery affect next-day engagement or is engagement only promoted when recovery occurs systematically over longer periods? How long do the effects of a stressful day persist? Is there a point when additional recovery no longer helps?
5. Specify effect strength and boundary conditions	Predict not just the direction, but also the magnitude and variability of effects across levels, contexts, individuals, or times	What is the strength of the effect of job resources on work engagement across levels of analysis? When is this effect stronger, weaker, or possibly not present at all?
6. Incorporate within- and cross-level interactions	Theorize how daily and stable characteristics shape within-person, between-person, and cross-level processes.	Can personality traits buffer the negative effect of daily hindrance demands on daily work engagement? Are daily job resources particularly useful for daily work engagement among individuals working in demanding jobs? Are daily resources particularly favorable for daily work engagement on days when they are needed the most (e.g., when employees had not recovered adequately the previous evening)? Does the same/different hold at the between-person level?

that differ conceptually from between-person processes. Homology may not have emerged if daily work engagement was tested in the context of theories developed specifically to explain within-person processes, such as the restricted employee sustainability theory (Barnes et al. 2023), as these theories are designed to explain dynamic, day-to-day fluctuations rather than between-person differences. These ideas underscore the need for more specific multilevel theories that

describe and differentiate between dynamics operating between and within individuals.

In Table 3, we present specific recommendations for the development and refinement of truly multilevel theories (on work engagement). We propose that such theories should (1) validate construct definitions across levels, (2) distinguish level-specific assumptions and predictions, (3) differentiate mechanisms across levels, (4) articulate the time scale of hypothesized processes and model temporal dynamics (cf. Roe 2008), (5) specify expected effect strengths and boundary conditions (Lakens et al. 2018), and (6) incorporate within- and cross-level interactions. Some recent theoretical advances already address aspects of these principles. For example, the multilevel version of JD-R theory (Bakker 2015; Bakker et al. 2023) explicitly distinguishes within- and between-person effects. It posits that general levels of job demands and resources moderate the strength of day-level relations with daily well-being and employee behaviors, and that daily work engagement can accumulate over time to shape more stable, between-person engagement levels. Another example is the restricted employee sustainability theory (Barnes et al. 2023; Sonnentag et al. 2025) which makes specific predictions about synergies and dynamic balances between maintenance, growth, and generativity factors that need to be protected against entropic forces to ensure (long-term) employee functioning.

That said, within-person correlations could also be weaker than between-person correlations because of methodological rather than substantive reasons. At the between-person level, aggregated data reduces the influence of noise and emphasizes stable patterns, inflating effect sizes. Common method variance, which inflates effect sizes, is more problematic in between- than in within-person studies because within-person studies typically control for all between-person differences, including response tendencies and socially desirable responding, by person-mean centering (yet, person-mean centering does not diminish the influence of transient affective or mood states; Gabriel et al. 2019). Recall bias might further inflate between-person correlations, whereas within-person measurements contain relatively higher levels of error variance, attenuating within-person correlations. Although within-person measures are often less reliable than their between-person counterparts, plausible reliability differences across levels in our study are far too small to account for the observed effect size differences (on average). In the subset of studies included in our meta-analysis that reported both within- and between-person reliabilities ($k = 23$), within-person reliabilities were, on average, only 0.09 lower than between-person reliabilities, whereas reliability differences of more than 0.40 would have been necessary for measurement error to fully account for the observed effect size differences (Spearman 1904). As such, reliability differences can only explain a fraction of the observed effect size differences. This conclusion is further supported by meta-analytic evidence showing that correcting within-person correlations for unreliability leads to only negligible increases in effect sizes (e.g., differences of ≤ 0.02; Pindek et al. 2019).

Related, aggregation bias (James 1982) may occur when correlations derived from aggregated within-person data do not accurately reflect the underlying between-person relations, leading to systematic discrepancies between the two levels of analysis (James 1982). However, the two types of between-person correlations correlated very strongly and did, in most instances, not differ significantly from one another. If aggregation bias would have inflated between-person correlations based on aggregated daily scores, we would have expected those correlations to be stronger than true between-person correlations. Yet, the close convergence of these two types of between-person correlations suggests that aggregation bias was unlikely to have played a substantial role. Rather, on average, aggregated data from within-person studies appear well-suited to inform us about stable processes that characterize employees' work engagement, but researchers should carefully consider relation-specific differences in these two types of between-person correlations.[8] In addition, while correcting for unreliability is generally preferred, our ability to do so was constrained by insufficient reporting in primary studies. As such, we urge researchers conducting daily diary studies to calculate and report within-person reliabilities (Nezlek 2017).

Together, these points suggest that methodological artifacts might explain parts of but certainly not the entirety of the differences that we observed in within- and between-person correlations. Instead, the observed effect size differences likely reflect substantive differences in the strength of relations across levels of analyses. However, this discrepancy could also suggest that additional processes or contextual moderators (e.g., daily stressors, coping strategies) might operate at the within-person level, which are less relevant or averaged out at the between-person level. As such, more nuanced, theory-specific studies that integrate within-person data from daily diary designs with stable between-person data from cross-sectional or longitudinal approaches (i.e., truly multi-level studies) are essential to determine which theories demonstrate homology across within- and between-person levels (see also Dormann and Griffin 2015).

8.2 | Implications for the Nomological Network of Work Engagement

8.2.1 | Job and Personal Resources

Overall, our findings showed that job and personal resources are effective in promoting daily work engagement, but most between-person correlations were stronger. This suggests that resources not only exert an immediate motivational effect, as predicted by the multilevel version of JD-R theory (Bakker 2015), but also that the chronic exposure to resources makes employees more engaged. Individuals with consistent access to resources build and reinforce them through positive feedback loops (cf. resource caravans from COR theory; Hobfoll 2011), which might explain the strong between-person relations with work engagement. For example, employees who consistently receive coworker support may develop trust and psychological safety, which, in turn, fosters additional resources (e.g., feedback) through which employees can more fully engage in their work. Thus, although the similar pattern of within- and between-person correlations supports the homology assumption implicit in JD-R theory, the consistently stronger between-person correlations indicate that the multilevel version of JD-R theory could be refined to specify when and why the magnitude of resource-engagement relations should differ across levels. To provide more nuance

and potentially explain differences across levels, the theory could differentiate between short-term resource fluctuations that elicit immediate motivational responses and consistent resource availability that fosters long-term engagement through resource-building processes. This will reduce the risk of overlooking potential thresholds or tipping points at which resources shift from being momentary motivators to stable facilitators of engagement.

8.2.2 | Job Demands

Overall, there was mixed evidence, both from within- and between-person correlations, for propositions based on the challenge-hindrance stressor framework that daily challenge demands benefit daily work engagement, whereas daily hindrance demands harm daily work engagement. Composite challenge demands were positively associated with daily work engagement, whereas some specific types were not (e.g., time/work pressure, workload). Similarly, some hindrance demands were negatively associated with daily work engagement (e.g., destructive leadership, role ambiguity/conflict), others were not (e.g., emotional demands, interruptions). Although many correlations differed significantly in magnitude across levels, the general pattern was relatively consistent, demonstrating scalar similarity and supporting the structural homology of the respective relations.

The mixed findings for challenge and hindrance demands are in line with JD-R theory (Bakker et al. 2023), which does not propose a link between job demands and work engagement, and with recent approaches to the challenge-hindrance stressor framework arguing that not all job demands can be defined a priori as either challenges or hindrances. Rather, the appraisal of such demands may also matter (Mazzola and Disselhorst 2019). The fact that such appraisals are inherently subjective can explain the mixed findings in our meta-analysis. In addition, some hindrance demands (i.e., destructive leadership, role ambiguity/conflict) show consistent negative relations across levels, indicating that their detrimental effects on work engagement are immediate *and* stable. By contrast, other hindrance demands are more demotivating only at the between-person level of analysis (e.g., composite hindrance demands), implying that the construct meaning or underlying processes may differ across levels. Practically, this means that organizations need to avoid even one-time occurrences of destructive leadership and role ambiguity. Theoretically, this means that theories could be refined to specify construct meanings and the conditions (e.g., appraisal processes, resource thresholds) under which demands have divergent short- and long-term effects on engagement.

8.2.3 | Work–Home Interface Variables

Because we were not able to locate enough studies, we could not test predictions derived from the work–home resources model (ten Brummelhuis and Bakker 2012) on the within- and between-person level. However, we were able to locate several variables concerning the work–home interface, resulting in some interesting findings. For example, work–family enrichment was more beneficial for (daily) work engagement than work–family conflict was detrimental for it. Also, employees were more engaged on days they worked from home. However, a higher percentage of working from home was not associated with work engagement. Yet, most within- and between-person correlations were, on average, weak and often non-significant. This could be explained by the principle of correspondence (Fishbein and Ajzen 1977), which holds that relations are stronger when correlated constructs correspond in target, action, context, and time. The domain-mismatch between work engagement and work–home interface variables therefore attenuates correlations at both levels. Another explanation could be that other same- or cross-level factors, such as daily commuting time or boundary management preferences, affect the strength of the spillover between the home and work domain.

8.2.4 | Cognitive–Affective States

Daily experiences of positive and negative cognitive–affective states relate relatively strongly to daily variations in work engagement, demonstrating that theoretical predictions based on COR theory (Hobfoll 1989) and Broaden-and-Build theory (Fredrickson 2001) also explain these processes on a within-person, daily level. For example, ego depletion, emotional exhaustion, and need for recovery exhibit strong negative within-person relations with work engagement, underscoring the critical role of resource preservation and recovery in maintaining engagement. Yet, between-person correlations were generally stronger than within-person ones, which could indicate that the respective theories may require refinement to more explicitly address temporal dynamics, and specifically the stronger chronic patterns. One explanation might be that the underlying mechanisms are more complex (e.g., include more sequential mediators; Xanthopoulou et al. 2018) on the within-person level. Another explanation could be that trait-like variables, such as Extraversion or Neuroticism, overlap strongly with positive and negative affect and therefore cause stronger between-person correlations. Theoretically, this shows that integrating personality and resource-accumulation perspectives into the respective theories could be valuable to better distinguish short-term from stable affective influences on engagement.

8.2.5 | Motivational States

The satisfaction of all three basic psychological needs related positively to work engagement, consistent with self-determination theory (Ryan and Deci 2000). Comparisons of within- and between-person correlations demonstrated that momentary need satisfaction is important, but that sustained satisfaction of these needs is even more beneficial. In addition, whereas meta-analytic between-person evidence demonstrated that autonomy need satisfaction is most crucial for work engagement (Van den Broeck et al. 2016), our findings at the daily level indicated that autonomy and competence need satisfaction are slightly more important for daily work engagement than relatedness need satisfaction. This might occur because autonomy and competence are more sensitive to daily fluctuations or to the influence of situational characteristics, such as the assigned tasks, whereas feelings of relatedness might be rather stable across time (which is in line with the

slightly higher ICC for relatedness satisfaction). Theoretically, these findings support the structural homology of the self-determination theory but also highlight possibilities for refinement by emphasizing that the relative salience of different needs varies depending on the intended timescale.

8.2.6 | Emotional Labor

Our findings show that surface acting is detrimental, whereas deep acting is slightly beneficial for work engagement. The moderate negative correlations for surface acting were consistent at both the within- and between-person level, suggesting that the energy-draining and dissonance-inducing effects of surface acting on engagement are both immediate and stable. This is in line with theorizing on emotional labor (Grandey and Melloy 2017) and COR theory (Hobfoll 1989). The positive correlation for deep acting suggests that when employees can align their true feelings with organizational expectations, the experienced authenticity in emotional expression enhances work engagement because employees feel they are managing their emotions genuinely. Notably, this variable category is one of the few in which within- and between-person correlations did not differ substantially from one another, suggesting that the dynamics of emotional labor unfold similarly daily and in general. This stability could be explicitly acknowledged in the respective theories.

8.2.7 | Recovery Experiences

COR theory (Hobfoll 1989) and the effort-recovery model (Meijman and Mulder 1998) argue that effort expended at work depletes resources, which can be replenished by engaging in recovery experiences after work, restoring energy for the next day's tasks. Yet, our findings challenge this temporal mechanism: Within-person correlations of recovery experiences with daily work engagement were generally weak and sometimes non-significant, whereas between-person correlations were generally stronger. This suggests that it is regular recovery that counts, consistent with the idea that long-term self-care gives employees more energy to invest in their work tasks.

One notable exception was the relation between psychological detachment and work engagement, which was positive on the daily level but non-significant in general. This suggests that the mechanisms linking detachment and engagement might differ across levels: within individuals, temporally detaching from work can replenish energetic resources and foster work engagement, whereas between individuals, stable differences in how much employees care about their work or how much they value their recovery time may explain the non-significant relation between detachment and engagement. Theoretical accounts should be adapted to include the possibility of such differing mechanisms across levels. Two other findings are noteworthy. First, sleep quality was found to matter slightly more for (daily) work engagement than sleep quantity, mirroring earlier between-person meta-analytic findings (Litwiller et al. 2017). Second, positive work reflection showed a particularly strong between-person correlation, suggesting that employees who regularly reflect positively on their work are more engaged. Together, these findings suggest that theoretical predictions about recovery experiences may need to be adapted to more accurately account for temporal factors and need to carefully account for the type of recovery experience.

8.2.8 | Proactive Behavior

Job crafting is more beneficial for work engagement at the between-person level, which aligns with recent conceptualizations of job crafting as a bottom-up, employee-driven initiative to make structural changes to their work environment (Tims et al. 2012). Such changes typically take time (e.g., across multiple days or weeks), suggesting that employees might not be as successful in crafting resources and challenges on a given day (or that this does not immediately and strongly affect how engaged they are). Yet, job crafting, and other forms of proactive behavior, are still positively associated with daily work engagement. Notably, playful work design (Scharp et al. 2022) is as beneficial for being engaged in one's tasks on a given day as in general, demonstrating that this is an effective short-term solution to help employees stay engaged. Overall, these findings align well with conceptualizations of proactive behavior in general, and job crafting and playful work design in particular, and provide evidence for the structural homology of the gain cycle in JD-R theory (Bakker et al. 2023), but also suggest that different forms of proactive behavior vary in their short- and long-term effectiveness. This could be incorporated into the multilevel JD-R theory.

8.2.9 | Job Performance

The pattern of results across within- and between-person correlations for different job performance indicators converged well. Engaged employees have more energy and the desire to invest this energy to achieve their goals, which is associated with increased performance, both in general and on specific days. These associations are also explained by higher intrinsic motivation and the fulfillment of basic psychological needs. Mechanisms underlying these relations derived from JD-R (Bakker et al. 2023) and self-determination theory (Ryan and Deci 2000) accurately describe both daily and stable dynamics of how work engagement predicts performance at work, but the fact that some of the within-person correlations were weaker than their between-person counterparts suggests that being consistently engaged is more important for performance than daily engagement. This points to the possibility for refining JD-R and self-determination theory to more accurately distinguish between immediate motivational benefits of daily engagement and the cumulative benefits for performance of being consistently engaged.

One additional notable finding is that correlations with CWB were somewhat weaker than those with other performance indicators—both on the within- and between-person level. This could occur because CWB is a low base rate phenomenon that is more strongly predicted by stable individual differences than other performance indicators (Pletzer et al. 2019, 2021), and by the fact that CWBs are often driven by employees'

desire to retaliate rather than the absence of engagement (Zhang et al. 2019).

8.3 | Practical Implications

The present findings demonstrate that work engagement is inherently multilevel, emerging both as a relatively stable individual orientation and as a dynamic, day-to-day state shaped by proximal experiences. This distinction carries important implications for intervention design. At the between-person level, engagement is fostered when employees have sustained access to structural job resources, such as autonomy, skill variety, constructive feedback, developmental opportunities, and supportive leadership (Bakker et al. 2023; Lesener et al. 2019; Pletzer, Breevaart, and Bakker 2024). Interventions aimed at job redesign, leadership development, and opportunity-enhancing human resource practices therefore provide the enduring resource infrastructure necessary to elevate employees' general level of engagement over time. However, a structurally enriched job does not eliminate the substantial within-person variability in engagement that employees experience across workdays. Because daily engagement is sensitive to short-term fluctuations in resources, affective experiences, proactive behaviors, and goal progress, organizations should also implement interventions that operate at the day or episodic level. Daily access to job resources and micro-interventions, such as daily job crafting exercises, proactive vitality management, playful work design, and brief recovery episodes (Bakker and Junker 2025; Oprea et al. 2019; Sonnentag et al. 2022), enable employees to regulate their engagement in real time. These interventions are effective precisely because they target the situational antecedents that give rise to daily fluctuations in vigor, dedication, and absorption.

Together, these insights suggest that improving work engagement requires a dual-level intervention logic. Structural interventions create a resource-rich context that elevates employees' overall engagement potential, whereas daily micro-interventions help employees capitalize on this potential during the unfolding flow of work. Organizations that recognize and act upon this multilevel nature of engagement are better positioned to cultivate a workforce capable of sustaining high-quality engagement and adaptive functioning across both stable and dynamic work conditions.

8.4 | Limitations and Ideas for Future Research

Several limitations and ideas for future research deserve to be mentioned. First, research on several variables relevant in the context of daily work engagement was not prevalent enough to be meta-analyzed (e.g., emotional dissonance, feedback, task complexity, etc.). Some of these would be particularly helpful (e.g., challenge and hindrance *appraisals*) to refine theories, and future studies are necessary to examine how daily fluctuations in these variables relate to daily fluctuations in work engagement. Second, although our meta-analyses was rooted in well-establish organizational theories, correlations cannot be used to establish causality. Particularly at the within-person level, reciprocal relations are plausible (and also often theorized). In addition, our meta-analysis was focused on linear relations, although curvilinear relations between some variables have been established. For example, Rudolph et al. (2025) recently found consistent non-linear relations of autonomy and workload with job crafting at the within-person level, and similar relations might exist with work engagement. As such, future studies should employ designs that allow for stronger causal inference and a more explicit examination of temporal dynamics, including lagged and non-linear within-person relations.

Two additional ideas for future research are worth mentioning. First, although our findings provide some indications, they cannot readily inform us about the processes through which daily work engagement (intra-individual variability) develops over time (intra-individual change) into stable work engagement. In other words, it is possible that within-person processes develop over time to explain between-person differences in work engagement, but studies with baseline and follow-up measures of trait work engagement with regular assessments of daily work engagement in between are necessary to examine if and to what extent intra-individual variability can drive intra-individual change. Second, future research should examine cross-level interactions in which between-person constructs, such as general levels of work engagement or personality traits, shape the patterns observed in within-person relations, or vice versa. For example, research has shown that microbreaks, which were not a significant predictor of daily work engagement in our meta-analysis, only predict job performance for employees who were generally less engaged at work (Kim et al. 2018), or that job demands are particularly (de-)motivating when there is a lot of variability in them (Downes et al. 2021). We hope that our theoretical analysis and meta-analytic findings will inspire future research to integrate within- and between-person assessments of work engagement, enabling a more comprehensive understanding of the complex relations within the daily and stable nomological networks of work engagement.

9 | Conclusion

Overall, our meta-analysis suggests that theoretical models explaining work engagement are largely invariant across levels of analysis and, when relations vary across levels, these differences mainly concern their strength and not their direction. These findings are important for theory development but also for practice because they highlight that interventions aimed at improving work engagement may rely on dominant theories but should also account for both between- and within-person effects.

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Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are openly available in OSF at https://osf.io/q3y75/.

Endnotes

[1] It is also unclear if findings on the within-person level generalize to the between-person level (cf. atomistic fallacy).

[2] We thank an anonymous reviewer for suggesting this analogy.

[3] Chen et al. (2005) further distinguish between configural similarity (i.e., the pattern of statistical significance is similar across levels of analysis), scalar similarity (i.e., the magnitude of correlations is proportional across levels of analysis), and metric similarity (i.e., the magnitude of correlations is identical across levels of analysis). When statistically comparing the magnitude of correlations, we test for metric similarity.

[4] In addition, Van Veldhoven et al. (2025) examined homology across the individual and team level for occupational well-being, which was operationalized as task satisfaction, need for recovery, and anxiety. They showed that the relations of job demands and participation in decision-making with occupational well-being are homologous, whereas those for skill variety and autonomy are not.

[5] Note that not all proactive behaviors are effective. For example, the reducing hindering demands dimension of job crafting (Tims et al. 2012) relates negatively, but very weakly to work engagement (Rudolph et al. 2017).

[6] Most studies measured overall work engagement, but some measured only the sub-dimension absorption ($k = 2$), dedication ($k = 2$), or vigor ($k = 20$).

[7] We use the term "composite job resources" (and also "composite personal resources," "composite challenge demands," and "composite hindrance demands" further below) to describe variables that combine the measurement of several specific job resources (e.g., autonomy, feedback, and support).

[8] Specifically, a few exceptions to this general pattern emerged, suggesting that aggregation bias may have inflated between-person correlations based on aggregated daily scores for variables such as for coworker support, positive affect, competence need satisfaction, or creativity.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section. **Data S1:** Supporting information. **Table S1:** Average ICCs for all included variables. **Table S2:** Within-person correlations moderated by the measurement timing of the correlate relative to the measurement of work engagement (same vs. different). **Table S3:** Within-person correlations moderated by the measurement of work engagement (Utrecht Work Engagement vs. all other scales). **Table S4:** Comparisons of different meta-analytic correlations. **Figure S1:** Flowchart of the literature search process.