Article

How Transformational Leadership Affects the Off-work Recovery of Daily Personal Energy Resources via Work Engagement: Resource and Demand-based Pathways

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Abstract

This study focuses on the transformational leadership-work engagement relationship by investigating resource and demand pathways for daily off-work recovery and employee wellbeing (EWB). While previous research highlighted how transformational leadership energizes employees to engage at work, energy is a finite resource requiring daily restoration for EWB. Yet, how the leader's energizing effect relates to daily employees' recovery remains unknown. Following job demands-resource-recovery theory, we test two pathways that relate the transformational leadership-work engagement relationship to daily employee recovery: (a) Resource-based via resource-building, (b) demand-based via increased demands. Utilizing a 10-day, two daily measurement ($N = 88$) study, multilevel path analyses revealed: transformational leadership predicted via work engagement ($b = .17$, $p < .05$) role clarity ($b = .56$, $p < .01$), then positive ($b = .39$, $p < .01$), and negative work-nonwork spillover ($b = −.38$, $p < .01$). Positive work-nonwork spillover predicted recovery positively ($b = .25$, $p < .01$), negative work-nonwork spillover negatively ($b = −.40$, $p < .01$). Recovery predicted EWB for positive ($b = .38$, $p < .01$) and for negative ($b = −.43$, $p < .01$) affect. Work engagement predicted workload ($b = .35$, $p < .01$), further negative ($b = .33$, $p < .01$) and positive work-nonwork spillover ($b = −.16$, $p < .01$), hampering EWB. As one pathway effect might cancel the other, the main effect of transformational leadership on EWB was not significant in the integrative model ($p > .05$). Results highlight dark and bright sides of the transformational leadership-work engagement relationship regarding daily recovery.

Keywords: daily diary; job demands-resources-recovery; leadership; recovery; spillover

A workday can be both energizing and depleting (Parker et al., 2021). How employees invest their personal energy resources at work (state work engagement) and restore them at the end of the workday (daily off-job recovery) is central to sustaining employee wellbeing (EWB) (Meijman & Mulder, 1998; Quinn et al., 2012). We hereby understand EWB as the way people experience feeling good and/or experience fulfillment and purpose during their workday on a day-to-day basis (Sonnentag, 2015). Sustaining EWB is an essential topic today for individuals, organizations, and societies alike (Diener et al., 2020; Madrid et al., 2014; United Nations, 2015).

Previous research has shown that leadership is an impactful social influence at work (Antonakis & Day, 2017; Schippers & Hogenes, 2011; Yukl, 2013). As such, leadership can either energize or de-energize people to engage in work-related tasks (Bakker & De Vries, 2021; Schippers & Hogenes, 2011), and is therefore thought to either bolster or hamper EWB. Correspondingly, one of the best

researched leadership-employee related relationships is arguably the positive one between transformational leadership and work engagement (Decuypere & Schaufeli, 2020; 2021). More specifically, a substantial body of cross-sectional research has shown that employees who work for transformational leaders feel more energized and engaged (Arnold, 2017), and that this positive energy shapes the perception of resources to cope with their work tasks (Bakker et al., 2023). This research body suggests that transformational leadership bolsters work engagement, often understood as a facet of EWB (Decuypere & Schaufeli, 2020).

However, research also suggests that it is this energizing effect of transformational leader behaviors that relate to the overconsumption of personal energy resources via impaired off-job recovery processes (Baethge et al., 2021; Stein et al., 2021; Syrek & Antoni, 2014). Specifically, leaders' high performance expectations (Syrek & Antoni, 2014), implicit extra role efforts (Stein et al., 2021), and inspirational elements that invoke self-sacrificing behaviors in employees (Nielsen & Daniels, 2016) have been suggested to relate to prolonged physical activation (Baethge et al., 2021) and prolonged mental representation of stressful work experiences (Syrek & Antoni, 2014) which would constitute negative work-nonwork spillover processes and hamper EWB over time. This challenges existing assumptions regarding favorable EWB effects of transformational leadership (e.g., Arnold, 2017; Nielsen & Taris, 2019;

Teetzen et al., 2022). If supported, these potential "dark sides" of transformational leadership would imply the need to recalibrate behaviors that relate to daily personal energy resource investment at work so that daily negative effects for work-nonwork processes can be avoided. This would also have implications for transformational leadership training so that it does in fact have positive outcomes for EWB, which until now receives only limited support (Nielsen & Taris, 2019).

Yet, how this energizing effect relates to the subsequent off-job recovery, on a day-to-day basis, remains a black box. In fact, research on the relationship between leadership and employee recovery is scarce (Chan et al., 2022; Kelemen et al., 2020; Sonnentag et al., 2022). Moreover, necessary within-person studies are widely lacking, although studying the effect of stable leadership perceptions on transient states such as daily work engagement, daily perception of job characteristics, daily work-nonwork spillover processes and daily recovery warrants such a methodology (Ohly et al., 2010; Sonnentag et al., 2022). In fact, the predominance of cross-sectional research is concerning, because in general, the most common occupational health theories (e.g., Bakker et al., 2023; Hobfoll et al., 2018) imply a shorter dynamic temporal lens and within-person effects (Cham et al., 2021; Kelemen et al., 2020; Sonnentag et al., 2022), which calls for diary studies when studying leadership-EWB relationships (Czakert & Berger, 2023). The main goal of this study was thus to extend previous research by integrating an energy-enriching (resource-based) and an energy-depleting (demand-based) pathway to highlight a potential double-edged sword effect of the transformational leadership-work engagement relationship on off-work recovery in a daily diary study design. We build our hypotheses development on the job demands-resource-recovery (JD-R-R) theoretical model (Bennett et al., 2018; Kinnunen et al., 2011), which states that EWB is a function of the interplay of demands, resources, spillover, and recovery processes. Regarding the energy-enriching pathway, we assume that transformational leaders influence employees' state work engagement, a personal high-arousal affective energy resource, which relates to increased daily role clarity – a contextual resource – and thereby facilitates daily positive work-nonwork spillover and off-work recovery processes (Fredrickson, 2001; Nielsen et al., 2008; Xanthopoulou et al., 2007, 2009). In contrast, regarding the energy-depleting pathway, we assume that transformational leaders' energizing effect could also potentially overtax their followers' energy system (i.e., increase daily state work engagement that relates to increased daily workload), thereby increase negative work-nonwork spillover and reduce positive work-nonwork spillover, and ultimately detrimentally impact daily off-work recovery processes (Chawla et al., 2020; Hobfoll et al., 2018; Ilies et al., 2007; Quinn et al., 2012; Rodell & Judge, 2009; Story & Repetti, 2006; ten Brummelhuis & Bakker, 2012; Zohar et al., 2003). In total, the energy-enriching resource-based pathway would bolster EWB, whereas the energy-depleting demand-based pathway would hamper EWB the next day.

In doing so, this study makes five main contributions. Firstly, we add to the few daily diary research that focuses on leadership, work-nonwork spillover and off-work recovery (Bennett et al., 2018) to provide a more nuanced understanding of the transformational leadership-EWB relationship. In general, leadership research has been insufficiently integrated into work-nonwork research in general (Sonnentag et al., 2022) and specifically into recovery research (Chan et al., 2022).

Secondly, we extend the JD-R-R model by addressing leadership as a factor that influences state work engagement (Breevaart & Bakker, 2018; Tims et al., 2011) and thereby the perception of job demands and resources (Bakker et al., 2023). By that means, we add to the limited research that investigates work engagement as a predictor rather than outcome of job characteristics (Lesener et al., 2019). This is important because it helps to understand better the causal direction and the dynamic nature of the relationships between these variables, which have been mostly studied in the opposite direction. In doing so, the study can provide a more comprehensive and nuanced picture of the reciprocal and dynamic processes involved in work engagement and its consequences, theorized in the demand-resource theories (Bakker & De Vries, 2021; Hobfoll et al., 2018). Investigating this relationship adds necessary partial support for the notion of gain and loss-cycles (Bakker et al., 2023). It also tests the extended leadership-job demand-resource-recovery model (Czakert & Berger, 2023), that sees leadership as a contextual macro-factor that influences more transient factors. Consequently, this study does not focus on explaining mechanisms that link transformational leadership to work engagement but complements this research by explaining what follows this already well-researched link on a day-to-day basis.

Thirdly, building on affect-driven theories (Cropanzano et al., 2017) and the idea of finiteness of human energy resources (Quinn et al., 2012), we shed more light on the role of balancing personal energy resources (which we refer to as constituting the indirect link between state work engagement and subsequent off-job recovery) on a day-to-day basis.

Fourthly, we enrich the picture of transformational leadership and work engagement by the notion of potential "dark sides", emphasizing an adequate balance and boundary of energizing leader behaviors and engagement levels as well an awareness of potentially detrimental health effects.

Fifthly, by comparing both resource- as well as demands-based pathways, we contribute to the few dual-pathway research that finally aims to identify not only demands for work-nonwork processes, but also positive resource-enriching pathways.

The Central Role of Energy Resource Balancing for EWB

EWB can be understood as a multifaceted individual-level construct that can manifest in different ways, such as in emotions and affect, physical health, cognitive functioning, and social relationships (Arnold, 2017). However, according to Quinn et al. (2012), the central element of EWB is human energy. The psychological element of human energy, namely energetic activation (Quinn et al., 2012), may be measured best as emotional experiences in a two-dimensional space across the emotional affective circumplex (Crain et al., 2018; Russell, 1980), with one dimension representing the level of arousal (or activation) and the other dimension representing the valence (or positivity-negativity) of the emotion. In this sense, the psychological form of energy can be experienced through high arousal positive emotions, such as vigor, or its antithesis, emotional exhaustion (Crain et al., 2018). High arousal negative emotions, in turn, relate to negative EWB (Sonnentag et al., 2023). Positive energetic activation thus refers to people's perception that they are energized (Quinn et al., 2012). Emerging research fields and theories all emphasize the role of energy as a scarce resource central to EWB that needs to be managed in a balanced and regenerative way, allowing for replenishment and recovery (Crain et al., 2018; Hobfoll et al., 2018; Maslach & Leiter, 2016; Meijman & Mulder, 1998). From a temporal perspective, it is important to note that vacation-to-vacation recovery is not sufficient, as the effects of vacations vanish quickly (Sonnentag, 2003). Rather, daily recovery processes are crucial to maintain EWB (Demerouti et al., 2009; Sonnentag, 2003).

Despite its acknowledged importance, recent reports and research suggest that a proper balancing of personal energy is at significant risk, and that bolstering EWB and/or buffering ill-being is becoming increasingly difficult (Adecco, 2022; Gallup, 2021; Kniffin et al., 2021; Rudolph et al., 2021; Sonnentag et al., 2022). Reasons for this may be the accelerating flexibilization of work arrangements that has increased the permeability of boundaries between work and nonwork (McKinsey & Company, 2021), which makes the occurrence of spillover effects from work to nonwork and impaired recovery processes more likely (Sonnentag et al., 2022). Work-nonwork spillover effects refer to the idea that experiences at work can transmit to the nonwork domain (Geurts et al., 2005; Hanson et al., 2006). While positive work-nonwork spillover would set beneficial conditions for off-job recovery, negative work-nonwork spillover (e.g., prolonged negative load reactions) would make off-job recovery more difficult (Demerouti et al., 2013; ten Brummelhuis & Bakker, 2012). Indeed, a recent report shows that employees nowadays seem to have more trouble to recover from work (e.g., Adecco, 2022), i.e., to unwind and restore their resources after work (Sonnentag & Fritz, 2007), and a growing body of research shows that the difficulty of effectively restoring energy resources off-work largely affects EWB on a daily basis (Meijman & Mulder, 1998; Parker et al., 2021; Sonnentag et al., 2022). Recovery experiences were also considered as energy resources themselves (Halbesleben et al., 2014).

In this sense, on the one hand, personal energy as a positive affect state (feeling good and/or fulfilled) can be seen as EWB itself (Quinn et al., 2012). On the other hand, personal energy can also be referred to as a resource for EWB, as positive emotions have shown to be linked to other resources influencing EWB (Diener et al., 2020). In the present manuscript, we refer to both perspectives to show how the daily investment of personal energy resources at work (state work engagement) and the daily restoration of personal energy resources (off-job recovery) interact via different sets of job characteristics and spillover effects and ultimately affect EWB.

Transformational Leadership and its Effects on Daily EWB: The Resource-based Pathway

We argue that transformational leadership can offset dynamic upward spirals, also known as "gain cycles" in job-demands resource theory (Bakker et al., 2023), that enrich daily personal energy resources and thereby bolster EWB. Resources can be broadly defined as "anything perceived by the individual to help attain his or her goals" (Halbesleben et al., 2014, p. 1338) and may be found at contextual or personal level (ten Brummelhuis & Bakker, 2012). Building on the resource-based pathway inherent to the JD-R-R model (Kinnunen et al., 2011), we understand transformational leadership as a rather stable contextual macro-resource that mobilizes daily personal energy resources (i.e., state work engagement), which increase daily contextual resources (i.e., daily role clarity), daily positive affective spillover and daily recovery experiences, and thereby ultimately promote EWB the next day in a serial mediation path.

Transformational leadership, the most researched positive leadership style (Antonakis, 2012; Decuypere & Schaufeli, 2020), is a multifaceted construct that aims at transforming employee's mind-sets to spur work engagement and ultimately performance. Transformational leaders provide employees with idealized influence, individualized consideration, intellectual stimulation, and inspirational motivation (Bass, 1985). Previous research has shown that transformational leaders affect their employee's daily work engagement (Breevaart & Bakker, 2018; Tims et al., 2011) and positive

emotions at work (Bono et al., 2007) directly, and it was proposed that they may do so via emotional contagion, social learning and/or social exchange processes (Decuypere & Schaufeli, 2020). This suggests that transformational leaders do not need to interact directly daily with their employees to elicit their positive effects on state work engagement solely in an immediate way (daily specific leader behaviors), but that transformational leaders rather have broad positive effects that translate into state work engagement (Bono et al., 2007). Transformational leaders are therefore considered energizing, as they mobilize employee's energy resources (Cropanzano et al., 2017; Schippers & Hogenes, 2011). As a macro-resource, transformational leadership is a rather stable resource that is unlikely to fluctuate daily (Breevaart & Zacher, 2019). This does not neglect the fact that leader-employee interactions may differ from day to day (Kelemen et al., 2020), but rather that variations in the perception of transformational leadership remain relatively stable over time (Bakker & De Vries, 2021).

It has been suggested that on days employees feel more engaged with their work they use their positive momentary affective state to broaden their momentary thought-action repertoires which influences their perception of contextual resources (Fredrickson, 2001; Xanthopoulou et al., 2007). Although often considered as outcome rather than resource in itself (Kahn, 1990; Xanthopoulou et al., 2009), daily work engagement as a positive motivational-affective state (Macey & Schneider, 2008; Xanthopoulou et al., 2009) therefore represents an important personal energy resource for employees. Such personal resources predict contextual resources (Xanthopoulou et al., 2007). In fact, research has shown that this energizing effect of being engaged at work builds not only other personal resources, such as self-efficacy (Salanova et al., 2006), but also increases the perception of contextual resources, such as role clarity (Nielsen et al., 2008; Xanthopoulou et al., 2009). This is also in line with the assumption of reciprocity inherent to the job-demands resources model (Bakker & Demerouti, 2014; Bakker et al., 2023; Lesener et al., 2019), which posits that not only resources and demands affect work engagement, but also that on days workers feel engaged, they are more likely to recognize, seek, and build more easily additional resources (Bakker et al., 2023; Hobfoll et al., 2018; Xanthopoulou et al., 2009). In this vein, Venz et al. (2018) suggested trainings at individual level to increase daily role clarity.

We focus on role clarity –employees' clear understanding of responsibilities and expectations (Kauppila, 2014)– because it is of particular importance for employees in the modern working world characterized by rather high levels of autonomy but that often lack a clear sense of tasks and performance expectations (Venz et al., 2018). Moreover, organizational health experts suggest that especially in contemporary uncertain times and virtual work settings, promoting role clarity is of paramount importance to sustain EWB (Kniffin et al., 2021). We assume that daily role clarity is not only provided by the organization or by the supervisor, but rather perceived bottom-up by the engaged individual employee (Kauppila, 2014). We further assume that daily role clarity relates to daily positive affective spillover processes (Romeo et al., 2014), because on days when tasks and expectations are clear, employees accomplish task goals better and make their work more enjoyable, which raises their affective mood that might spill over to the nonwork domain (Rodríguez-Muñoz et al., 2014). While a meta-analysis showed that contextual resources generally improve recovery processes (Bennett et al., 2018), we argue that it is this effect of daily role clarity on positive affective spillover (being in a positive mood at the end of the workday) as a personal energy resource that

facilitates daily recovery processes (Gallegos et al., 2021; Sonnentag & Binnewies, 2013). Similarly, we hypothesize that daily role clarity reduces the negative spillover effect of lack of energy or negative emotions (Romeo et al., 2014) which would impair daily recovery processes (Gallegos et al., 2021; Geurts et al., 2005). In other words, the contextual resource of daily role clarity enhances personal resources that are functional in the nonwork domain (Kempen et al., 2019; ten Brummelhuis & Bakker, 2012). Daily recovery processes, in turn, are enabled through experiences of mastery, control, psychological detachment, and/or relaxation. These processes are fundamental to restore daily personal energy resource losses (Bakker et al., 2015; Meijman & Mulder, 1998). Previous research has shown that positive affective spillover is positively linked to all of these recovery experiences (e.g., Bennett et al., 2018; Fredrickson & Levenson, 1998; Kempen et al., 2019). For instance, on days employees experience more positive affective spillover, they may perceive to have more personal resources available for learning (mastery) and decision making (control) during nonwork time. Moreover, regarding the reduction of daily negative work-nonwork spillover, employees would ruminate less about stressful work events and would therefore more easily psychologically detach and relax (Kinnunen et al., 2011).

We therefore propose that transformational leadership enriches daily personal energy resources and thereby bolsters EWB.

Hypothesis 1a: Transformational leadership predicts daily positive EWB via daily work engagement, daily role clarity, increased daily positive work-nonwork spillover, and daily recovery processes.

Hypothesis 1b: Transformational leadership predicts daily positive EWB via daily work engagement, daily role clarity, decreased daily negative work-nonwork spillover, and daily recovery processes.

Transformational Leadership and its Effects on Daily EWB: The Demands-based Pathway
Moving away from the resource-based pathway and focusing on the hypothesized demands-based pathway, we also argue that the transformational leadership-work engagement relationship as a demand can offset demand-based downward spirals (Bakker et al., 2023) that deplete personal energy resources and thus affect daily off-job recovery and EWB adversely, and that these effects can coexist. Demands can broadly be defined as physical, emotional, social, or organizational aspects of the social context that require sustained psychophysiological effort (Demerouti et al., 2001). They can be categorized into challenging demands and hindrance demands (Podsakoff et al., 2023). Typical challenging demands are workload and time pressure, whereas hindrance demands may be role conflict (Bennett et al., 2018), job insecurity, constraints, and interpersonal conflicts (Tadić et al., 2015). The distinction seems relevant because challenge demands are, unlike hindrance demands, not solely perceived as stressful, personal resource-depleting, and impairing goal attainment, but also have positive effects on goal attainment and thus may boost personal resources, such as increased levels of energy, self-efficacy, and learning (Tadić et al., 2015). Following this, a meta-analysis (Crawford et al., 2010) showed that challenge demands are positively associated with work engagement. From a daily perspective, it therefore seems plausible to assume that employees might choose to work on the most challenging tasks when they feel particularly energetic, i.e., work engaged (Sonnentag, 2015). Indeed, this motivational element of challenging demands was also associated with higher positive affect (Tadić Vujčić et al., 2017).

However, the same meta-analysis found that both challenging and hindering demands are positively associated with burnout (Crawford et al., 2010), suggesting that all kinds of demands deplete personal energy resources. Moreover, recent research emerged that opened discussions around potential "dark sides" of transformational leadership and work engagement (Baethge et al., 2021; Bennett et al., 2018; Schaufeli et al., 2009; Rantanen et al., 2013; Syrek & Antoni, 2014), which are strongly related to over-engagement and increased tackling of challenging demands. Related to this, a meta-analysis showed that work engagement shares considerable overlap with some workaholism dimensions that are working excessively and working compulsorily (Di Stefano & Gaudino, 2019). In sum, transformational leaders' energizing effect could potentially overtax their followers' energy system, i.e., increase over-engagement, increase daily challenging demands, and thereby detrimentally impact recovery processes (Quinn et al., 2012). From a dynamic recovery perspective, these relationships between transformational leadership, work engagement, and challenging demands are particularly concerning, as meta-analytical evidence shows that challenging demands impair recovery processes even more than hindrance demands (Bennett et al., 2018). This would also question the favorable connotation of challenge demands as "positive events/conditions" (Podsakoff et al., 2023, p. 170).

We argue that high workload and related overload is of particular importance for negative spillover effects and impaired recovery processes (Geurts et al., 2005; Nixon et al., 2011; Steed et al., 2021). Workload can be defined as the intensity or the extent of work assigned to an employee in a specific time frame (Inegbedion et al., 2020). We focus on this demand because nowadays, overload is "widespread and chronic" (Kelly & Moen, 2020a, p. 48, particularly in emerging remote work settings characterized by higher work intensification, working at high speed to meet tight deadlines, and overwork (Kelly & Moen, 2020b; Zappalà et al., 2022). The recent research landscape shows inconsistent patterns of findings for daily within-individual variations of workload and relations to daily recovery experiences (Sonnentag et al., 2022). Whereas some studies found that on days with high workload individuals experienced less recovery (Chawla et al., 2020; Germeys & De Gieter, 2017; Sonnentag & Fritz, 2007), others did not find such a relationship (Lanaj et al., 2021; Smit, 2016). We argue that although high workload might be accompanied by high energetic activation in the short term, negative spillover processes might be the linking pin between daily workload and daily recovery (ten Brummelhuis & Bakker, 2012): On days when facing high workload, increased negative spillover processes, and decreased positive spillover respectively, impair recovery processes and decrease EWB. This is supported by previous research that links workload to negative work-nonwork spillover (Bowling et al., 2015), and research that has shown that on days when tackling challenge stressors, employees typically experience a higher level of activated negative affect during work (Ilies et al., 2007; Rodell & Judge, 2009), at the end of the workday (Story & Repetti, 2006; Zohar et al., 2003), and after work (Ilies et al., 2007). Regarding recovery experiences, Chawla et al. (2020) found that challenging demands perceived as sources of strain limit their beneficial outcomes to the work domain and impair off-job recovery. Negative spillover in form of ruminating about work-related tasks (Syrek & Antoni, 2014), boundaryless working hours (Vieten et al., 2022) and depleted personal energy resources in general (Meijman & Mulder, 1998) impair off-job recovery processes. More specifically, Bennett et al. (2018) could show that negative spillover resulting from job demands impairs

psychological detachment, relaxation, and control, but not significantly mastery.

We therefore propose that transformational leadership depletes personal energy resources and thereby impairs EWB.

Hypothesis 2a: Transformational leadership predicts daily negative EWB via increased state work engagement, increased daily workload, increased daily negative work-nonwork spillover, and decreased off-work recovery processes.

Hypothesis 2b: Transformational leadership predicts daily negative EWB via increased state work engagement, increased daily workload, decreased positive work-nonwork spillover, and decreased off-work recovery processes.

Finally, we assume that, due to the coexistence of both pathways, the main effect between transformational leadership and EWB is not significant. This is also in line with the notion that for many leadership-EWB interventions, nonsignificant results appeared (Nielsen & Taris, 2019). Moreover, it complements previous research that highlighted differential effects of transformational leadership on EWB and argued that effects related to overload and energy resource depletion explain the low coefficients found in previous research (Franke & Felfe, 2011). Building on this, we suggest that the indirect energy-resource depleting pathway cancels potential positive effects of transformational leadership on EWB.

Hypothesis 3: The main effect between transformational leadership and EWB is not significant.

Figure 1 illustrates the hypothesized model.

Method

Sample

This study was approved by the Institutional Review Board (IRB00003099). A quantitative interval-contingent daily diary study design (Ohly & Gochmann, 2017) was used to capture within-person effects over time, which is suitable to assess leadership-follower outcome mechanisms (Kelemen et al., 2020). An initial sample of 108 full-time employees in Spain was recruited via informal and professional networks of master students at the

University of Barcelona in April 2021. Additionally, participants were recruited via advertising the study on LinkedIn, using the snowball sampling method (Biernacki & Waldorf, 1981). All questionnaires were implemented in and distributed through Qualtrics.

The announcement of the study including detailed information on study objective, data collection procedures, ethics, and data protection issues, along with an e-mail assuring confidentiality and voluntary participation, was sent to all partners. No incentives were offered to participants to reduce potential rise of arbitrary response options that would affect data quality (Gabriel et al., 2019).

Data collection was administered in multiple phases. The invitation included an informed consent button that led participants to an initial baseline survey, which included sociodemographic variables as well as the measurement for transformational leadership. This baseline survey was filled in the week prior to day-level data collection. Informed consent was obtained from all individual participants included in the study.

Common diary study-related risks such as respondent fatigue, over disclosure and raised awareness of negative aspects (Bartlett & Milligan, 2015) were kept in mind when designing informed consent and the study methodology. For example, online survey completion of the daily measures took about five minutes not to compromise response rates and data quality and to mitigate the risk of respondent fatigue (Ohly & Gochmann, 2017). The individual survey links were sent twice daily, in the morning at 9 am and at 7 pm from Monday to Friday over two consecutive workweeks. We chose a two-week period, which is consistent with Wheeler and Reis's (1991) suggestion and recent recommendations (Gabriel et al., 2019) that two weeks represent a generalizable sample of individuals' lives. The links were configured with an appropriate expiration date to ensure that only data entries at the same day are possible.

To ensure proximity to the individual's actual experience, work-related experiences were asked in the evening survey after work, and non-work-related aspects were asked the following morning. By combining retrospective reconstructing methods (Kahneman et al., 2004) with state investigations in the morning survey, we not only reduced participants burden to answer on another timepoint (e.g., before going to bed), but we also assured that the entire potential recovery experience timeframe can be evaluated by the individual. Previous diary studies asked about recovery processes at time points
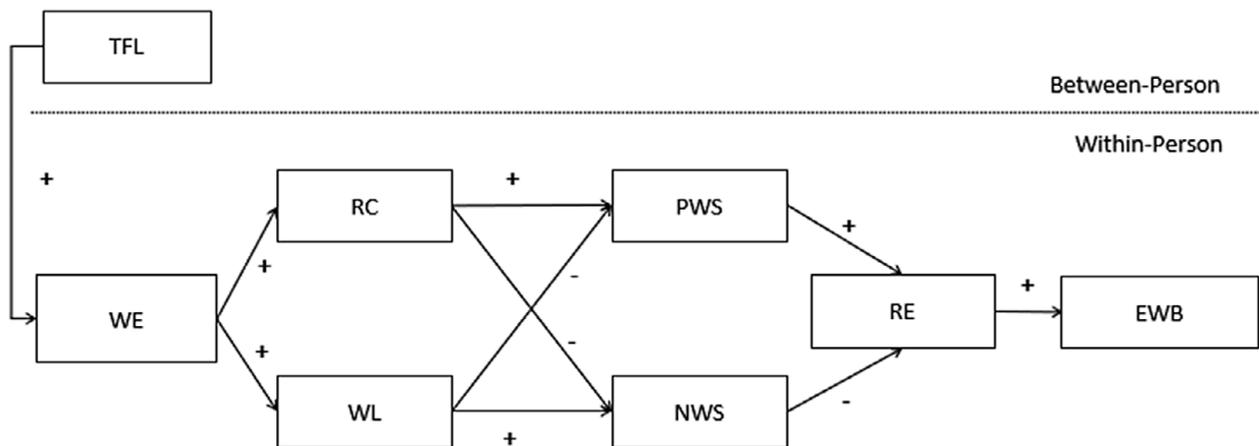
Figure 1. Hypothesized Model.
Note. TFL = Transformational leadership; WE = Daily work engagement; RC = daily role clarity; WL = daily workload; PWS = daily positive work-nonwork spillover; NWS = daily negative work-nonwork spillover; RE = daily recovery; EWB = Daily employee wellbeing.

where these processes were supposed to be experienced (Blanco-Donoso et al., 2017), which not only does not capture the entire potential recovery timeframe but also risks impairing actual recovery experiences (Bolger & Laurenceau, 2013).

Before analyzing the data, we excluded data from participants who completed less than 30%, i.e., three or less daily workday questionnaires (see Barnes et al., 2015, for a similar procedure). Our final sample consisted of $N = 844$ observations (Level 1) of $N = 88$ Spanish employees (Level 2) from a wide variety of occupations in the service sector, including, for instance, the IT sector, health sector, public administration, architecture, sales, and human resources. On average, these participants filled out $M = 17.06$ ($Mdn = 18$) of the 20 daily questionnaires, with a minimum of seven filled out daily questionnaires. This sample size is similar to that of conventional diary studies published in top-tier journals (Gabriel et al., 2019). Most of the sample was female (75%), one person self-labelled as "other". Average age was $M = 31.7$ years ($SD = 8.9$ years) and ranged between 21 and 61 years. 92% of the participants worked from home for at least some time, while the remaining 8% worked from the employer's premises. As for parental and caring responsibilities, 13.6% had one dependent co-living child, 3.4% two dependent co-living children, and 5.7% self-defined as informal caregivers (i.e., people providing care at least on a weekly basis for older family members or people in their social network). 20.5% of the participants occupied managerial positions.

Measures

For most of the scales in use, validated versions in Spanish language already existed. To assess daily positive spillover and daily role clarity, we translated existing scales into Spanish following the guidelines of the International Test Commission (2017) for translating and adapting tests, including forward and backward translation procedures in duplicate. All scales of the daily measures were adapted to the temporal diary design of the study (e.g., "Today, …").

General Questionnaire

Stable measures related to transformational leadership were introduced by the following statement, "Please indicate to what extent the following statements apply to your direct supervisor (the person to whom you report directly and who supervises your work on a regular basis)."

We measured transformational leadership, based on the full range leadership model (Bass, 1985), using the Spanish version of the Human System Audit Short-Scale of transformational leadership which has shown to be unidimensional (Berger et al., 2011), since it is shorter than the Multifactor Leadership Questionnaire MLQ–5X–Short (Avolio & Bass, 2004) and an easy to apply instrument (Berger et al., 2011). The scale consists of eight items (e.g., "My leader promotes the use of intelligence as a means of overcoming obstacles") that measure transformational leadership using a five-point Likert scale ranging from *strongly agree* (1) to *strongly disagree* (5). Previous research has provided empirical evidence for the construct validity of this measure (Berger et al., 2011, 2012) in diverse languages. Cronbach's alpha was. 88.

As conceptualized before, the reason to operationalize transformational leadership as a stable trait-like measure is threefold: (a) The construct is originally conceptualized as a leadership style or profile variable that is stable within employees and therefore does not warrant a repeated measurement approach (Avolio & Bass,

2004), (b) existing literature posited leadership as a rather stable upper-level macro-variable that influences more volatile resources and demands (Bakker & De Vries, 2021; ten Brummelhuis & Bakker, 2012), (c) we assume this perception will not change over the course of two workweeks since most employees do not interact with their supervisor on a daily basis (Breevaart & Zacher, 2019; Dolce et al., 2020; Kacmar et al., 2003; Lundqvist et al., 2022; Wang et al., 2021).

Daily Questionnaires

Participants could respond on a five-point Likert scale ranging from *strongly agree* (1) to *strongly disagree* (5). In the evening, daily workload was assessed by measuring three items for daily quantitative workload, based on the Spanish validated Psychosocial Factors Questionnaire 75 (PSF–75; Madrid et al., 2020). An example item for workload is "Today, I had to do a lot of things at work".

Daily role clarity was assessed with three items from Edwards et al. (2008) translated into Spanish. An example item is "Today, I knew how to go about getting my job done".

Daily work engagement was measured using three items from the Spanish Version of the Utrecht Work Engagement Scale (UWES) by Schaufeli and Bakker (2003) to measure vigor, dedication, and absorption (Breevaart et al., 2012; Schaufeli & Bakker, 2010; Sonnentag, 2003; Xanthopoulou et al., 2009). An example item for vigor is "Today, I felt full of energy at my work".

In the morning survey, participants were first asked to reflect on potential spillover processes and recovery process from the previous day. We used four items (one for each of the four recovery dimensions "psychological detachment", "relaxation", "mastery", "control") from the Spanish version of the state recovery scale (Bakker et al., 2015; Sanz-Vergel et al., 2010). One example item is "Yesterday, after my workday, I completely forgot about work." (Psychological detachment).

We assessed positive affect spillover from work to nonwork by using and translating three items from the Multidimensional Scale of Perceived Work-Family Positive Spillover developed by Hanson et al. (2006). One example item is "Yesterday being happy at work improved my mood at home".

We assessed negative spillover from work to nonwork by using three items from the Spanish validated version of the Survey Work/home Interaction Nijmegen (SWING; Geurts et al., 2005; Romeo et al., 2014). One example item is "Yesterday, my work obligations made it difficult for me to feel relaxed at home".

To assess momentary EWB ("Please indicate the option that best reflects how you feel now:"), we used three items for high-arousal positive affect (motivated, firm, enthusiastic) and three items for high-arousal negative affect (irritable, aggressive, nervous) from the Spanish validated version of PANAS by López-Gómez et al. (2015).

It is rational to adopt a dynamic daily perspective when researching the present processes of interest for two main reasons. Firstly, all daily variables are thought to fluctuate on a day-to-day basis. Affective concepts such as state work engagement, daily spillover and daily EWB, as well as daily recovery are highly dynamic concepts at the within-person level (Sonnentag et al., 2022). Although the dynamic of role clarity has not been researched yet, extant diary studies have shown that not only personal, but also contextual demands such as role conflict and workload fluctuate considerably within individuals on a daily basis (Bakker & Xanthopoulou, 2009; Breevaart & Bakker, 2018; Ouweneel et al., 2012; Sonnentag, 2003).

Data Analysis

As described in the sample description subsection, and common for daily diary studies (Gabriel et al., 2019), missingness (both monotonic and intermittent) is an issue in the current study. For that reason, using an imputation procedure for keeping the maximum information might be of practical utility. Amongst the different options to impute longitudinally, the so-called *copy mean* procedure was carried out given its proved efficiency over other alternatives (Genolini et al., 2013). To illustrate this imputation routine, let's suppose two individuals with missing observations in a three-wave design, Individual 1 missed to answer in Moment 2, whereas Individual 2 only answered at Occasions 1 and 2. The first case is an example of intermittent missing data, and the second example illustrates monotonic missing data type. Copy mean procedure carries out two types of data imputation techniques depending on the missingness kind (see Genolini et al., 2015, for further details). Specifically, when having intermittent missing data this procedure adds a variation in linear interpolated data ensuring thus that the average shape is kept in the imputed individual trajectory. Similarly, in the case of monotonic missing data, last occurrence carried forward procedure is slightly modified to keep average pattern in the individual trajectory.

Given the multilevel, nested structure of the data, we employed multilevel path analysis to test our hypotheses with the open-source packages lavaan in R (Rosseel, 2012). Leadership was included as upper-level predictor at between-person level, daily variables and processes at within-person level. We applied a two-level random effects analysis with maximum likelihood estimator for estimating the different effects of the path model.

Results

Descriptives and Reliability

The descriptive statistics including minimum, maximum, global mean scores and standard deviations are shown in Table 1. As can be seen, on average, the sample showed relatively high average levels of personal energy and contextual resources, with TFL ($M = 2.09$); daily work engagement (WE), $M = 2.32$; daily role clarity (RC), $M = 1.89$; daily positive work-nonwork spillover (PWS), $M = 2.48$; daily

Table 1. Descriptive Statistics of Study Variables (N = 844 Observations at Level 1; N = 88 Persons at Level 2)

Variable	Min.	Max.	M	SD
TFL	1.00	4.25	2.09	0.69
WE	1.00	5.00	2.32	0.71
RC	1.00	4.00	1.89	0.62
WL	1.00	5.00	2.85	0.96
PWS	1.00	5.00	2.48	0.83
NWS	1.00	5.00	3.69	0.91
RE	1.00	5.00	2.26	0.75
PA	1.00	5.00	2.39	0.78
NA	1.33	5.00	4.11	0.77

Note. TFL = Transformational leadership; WE = Daily work engagement; RC = Daily role clarity; WL = Daily workload; PWS = Daily positive work-nonwork spillover; NWS = Daily negative work-nonwork spillover; RE = Daily recovery; PA = Daily positive affect; NA = Daily negative affect.

recovery (RE), $M = 2.26$; and daily positive affect (PA), $M = 2.39$; compared to demands.

Table 2 and 3 show the correlations between study variables at between-person and within-person level respectively. Gender and age showed no significant correlations with any of the study variables. Accordingly, and not to over-complexify the model, we chose to not enter gender nor age as variables in our models.

We conducted a series of multilevel confirmatory factor analyses with the lavaan package in R (Rosseel, 2012) to discriminate the within-person variables to be included in the study (e.g., daily work engagement, daily role clarity, daily workload, daily positive work-nonwork spillover, daily negative work-nonwork spillover, daily recovery, daily employee wellbeing). Before testing the hypotheses, we examined the partitioning of variance in individual outcomes across levels. Moreover, we followed Bolger and Laurenceau (2013) and tested reliability by calculating the reliability measure R_C and longitudinal intra-class coefficients (ICC) of the daily measures. R_C assesses whether there are reliable within-person differences in change over time. For calculating the longitudinal ICC, the individual is the cluster in which multiple observations are grouped. It indicates the proportion of the total variance in the observed measures that is accounted for by the clustering. Based on these results, we can conclude that it is possible to reliably distinguish people in terms of their patterns of change over time (Bolger & Laurenceau, 2013). As shown in Table 4, R_C ranged between. 58–.86, and longitudinal ICC ranged between. 62–.84. These results indicate that there were significant between- and within-person effects for each of the dependent variables, rendering it appropriate to employ multilevel modeling (Bolger & Laurenceau, 2013).

Hypotheses Testing

Table 5 shows the results of the multilevel path modeling analyses including unstandardized coefficient estimates (b) with standard errors (SE), standardized coefficient estimates (β) and beta 95% confidence intervals for 10,000 bootstrap samples. Figure 2 illustrates the empirical multilevel path model.

According to Hypotheses 1a and 1b, transformational leadership predicts a positive personal energy path via daily work engagement, which predicts daily role clarity, daily positive spillover, daily recovery, and ultimately daily EWB. As expected, transformational leadership increased daily work engagement, $b = .17$, $p < .05$, beta 95% CI [0.11., 0.20]. Daily work engagement predicted daily role clarity, $b = .56$, $p < .01$, beta 95% CI [0.27, 0.60]); daily role clarity predicted positive work-nonwork spillover, $b = .39$, $p < .01$, beta 95% CI [0.20, 0.61]; and daily negative work-nonwork spillover, $b = -.38$, $p < .01$, beta 95% CI [−0.43, −0.28]; daily positive work-nonwork spillover predicted daily recovery, $b = .25$, $p < .01$, beta 95% CI [0.19, 0.30]; daily negative work-nonwork spillover predicted daily recovery, $b = -.40$, $p < .01$, beta 95% CI [−0.41, −0.29]; and daily recovery predicted EWB, $b = .38$, $p < .01$, beta 95% CI [0.34, 0.44] for positive affect; $b = -.43$, $p < .01$, beta 95% CI [−0.47, −0.36] for negative affect. This suggests that transformational leaders increase the work engagement of their employees and that these, on a day-to-day basis, shape the perceptions of daily role clarity, which leads to positive affect spillover and increases daily recovery. These processes lead to increased positive affect and decreased negative affect the next morning (i.e., EWB). Thus, Hypotheses 1a and 1b were supported.

According to Hypotheses 2a and 2b, transformational leadership predicts a negative personal energy path via increased daily work engagement, increased daily workload, increased daily

Table 2. Correlations at the Between-person Level of Study Variables (N = 844 Observations at Level 1; N = 88 Persons at Level 2)

Variable	Gender	Age	TFL	WE	WL	RC	PWS	NWS	RE	PA	NA
Gender	–										
Age	−.04[a]	–									
TFL	−.02[a]	.15	–								
WE	−.02[a]	−.02	.28**	–							
WL	−.06[a]	−.04	.09	.06	–						
RC	−.18[a]	.14	.22*	.39**	−.05	–					
PWS	−.19[a]	.05	.38**	.63**	−.22*	.49**	–				
NWS	.03[a]	−.09	−.15	−.30**	.62**	−.35**	−.55**	–			
RE	−.12[a]	.10	.01	.31**	−.39**	.32**	.56**	−.69**	–		
PA	−.08[a]	−.08	.25*	.77**	−.19	.50**	.71**	−.45**	.41**	–	
NA	−.01[a]	−.02	.11	−.28**	.43**	−.23*	−.41**	.59**	−.54**	−.46**	–

Note. TFL = Transformational leadership; WE = Daily work engagement; RC = Daily role clarity; WL = Daily workload; PWS = Daily positive work-nonwork spillover; NWS = Daily negative work-nonwork spillover; RE = Daily recovery; PA = Daily positive affect; NA = Daily negative affect.
[a]= Point-biserial correlation.
** = Correlation is significant at the .01 level (2-tailed). * = Correlation is significant at the .05 level (2-tailed).

Table 3. Correlations at the Within-person Level of Study Variables (N = 844 Observations at Level 1; N = 88 Persons at Level 2)

Variable	WE	WL	RC	PWS	NWS	RE	PA	NA
WE	–							
WL	.23**	–						
RC	.27**	.14**	–					
PWS	.05	−.12**	.05	–				
NWS	−.01	.05	−.04	−.37**	–			
RE	.08**	−.01	.03	.39**	−.46**	–		
PA	.15**	.01	.02	.30**	−.20**	.29**	–	
NA	−.09**	.00	−.04	−.28**	.23**	−.25**	−.41**	–

Note. TFL = Transformational leadership; WE = Daily work engagement; RC = Daily role clarity; WL = Daily workload; PWS = Daily positive work-nonwork spillover; NWS = Daily negative work-nonwork spillover; RE = Daily recovery; PA = Daily positive affect; NA = Daily negative affect.
** = Correlation is significant at the .01 level (2-tailed). * = Correlation is significant at the .05 level (2-tailed).

Table 4. Reliability Indicators for Daily Variables (N = 844 Observations at Level 1; N = 88 Persons at Level 2)

Daily variable	R_C	Longitudinal *ICC*
WE	.69	.78
WL	.83	.84
RC	.62	.75
RE	.58	.62
PWS	.86	.83
NWS	.77	.71
PA	.72	.77
NA	.67	.77

TFL = Transformational leadership; WE = Daily work engagement; RC = Daily role clarity; WL = Daily workload; PWS = Daily positive work-nonwork spillover; NWS = Daily negative work-nonwork spillover; RE = Daily recovery; PA = Daily positive affect; NA = Daily negative affect.

negative work-nonwork spillover, decreased daily recovery, and ultimately decreased EWB. Daily work engagement predicted daily workload, $b = .35$, $p < .01$, beta 95% CI [0.20, 0.61]; daily workload predicted negative work-nonwork spillover, $b = .33$, $p < .01$, beta 95% CI [0.30, 0.41]; and daily positive work-nonwork spillover, $b = −.16$, $p < .01$, beta 95% CI [−0.21, −0.11]. Thus, Hypotheses 2a and 2b were also supported.

The main effect between transformational leadership and EWB was not significant ($p > .05$), thus hypothesis H_3 was supported. When splitting the model according to the two pathways into two separate models, we could detect both a significant main effect between transformational leadership and positive EWB (i.e., $b = .004$, $p < .05$, for positive affect), as well as between transformational leadership and negative EWB (i.e., $b = −.002$, $p < .05$).

Discussion

The main goal of the study was to show how the energizing effect of transformational leadership influences daily processes of balancing personal energy (state work engagement and subsequent off-job recovery), in both positive and negative ways. We hypothesized that transformational leadership mobilizes daily personal energy resource investments at work (i.e., state work engagement), which

offset positive resource gain processes through self-initiated changes at work. These processes may result in clear and pleasurable work experiences on a day-to-day basis, which spill over to the nonwork domain and facilitate necessary recovery experiences. This pathway facilitates a balancing of personal energy resources and thus bolsters EWB. We also hypothesized that the energizing effect of transformational leadership (i.e., the transformational leadership-work engagement relationship) might offset negative resource loss processes through workload: Tackling higher daily workload might result in energy depletion and detrimentally influence the daily off-work recovery processes. This pathway might

impede the necessary balancing of personal energy resources and thereby hamper EWB.

We tested these conjectures by using a two-week diary study with employees, so we could assess daily variations of EWB, personal and contextual resources at work, as well as spillover and recovery experiences. For both pathways, we found support in our analyses. Our results highlight substantial within-person variations of our variables (ICCs ranged between. 62 and. 84.), which could potentially be explained by the transformational leadership-work engagement relationship. Focusing on daily role clarity as a contextual resource that is highly relevant for current work contexts, it is worthy to highlight that, to our best knowledge, daily variations of role clarity have not been investigated yet, although our results show that these are substantial (ICC =. 75). This is in line with extant diary studies which have shown that not only personal, but also contextual resources such as role conflict fluctuate considerably within individuals daily (Bakker & Xanthopoulou, 2009; Breevaart & Bakker, 2018; Ouweneel et al., 2012; Sonnentag, 2003). In line with Sonnentag's study (2003), off-work recovery processes on the previous day influence daily EWB the next day.

Our results mostly align with previous research works. In line with established transformational leadership theory (Bass, 1985), previous reviews (Decuypere & Schaufeli, 2021), and empirical findings (Breevaart & Bakker, 2018), transformational leadership as a contextual macro-resource predicted daily work engagement as a personal energy resource. This location of leadership at macro-level suggests that it might indeed be useful to consider leadership as a stand-alone factor in the JD-R-R model (Kinnunen et al., 2011), which shapes not only contextual but also personal resources and demands (Berger et al., 2019; Schaufeli, 2015). Thus, our results add to the existing assumptio7n that transformational leaders may be called "energizers" (Schippers & Hogenes, 2011, p. 194) and affect work engagement, when seen as a volatile personal energy resource, directly.

Extending this, in line with the assumption of dynamic relations between work engagement and job resources, and challenging job demands respectively (Bakker et al., 2023; Lesener et al., 2019; Xanthopoulou et al., 2009), our results show that daily work engagement affects both daily resources and daily challenging demands. Thus, partially supporting the idea of resource gain cycles

Table 5. Results of the Multilevel Path Modeling Analyses Including Unstandardized Coefficient Estimates (b) With Standard Errors (b_SE), Standardized Coefficient Estimates (beta) and beta 95% Confidence Intervals

Regression paths	b	b_SE	beta	beta 95% CI [LL, UL]
TFL → WE	.17*	.08	.276	[.11., .20]
WE → RC	.56**	.05	.468	[.27, .60]
WE → WL	.35**	.08	.206	[.20, .61]
RC → PWS	.39**	.04	.294	[.37, .51]
WL → PWS	−.19**	.03	−.207	[−.21, −.11]
RC → NWS	−.38**	.04	−.276	[−.43, −.28]
WL → NWS	.33**	.03	.340	[.30, .41]
PWS → RE	.25**	.03	.285	[.19, .30]
NWS → RE	−.40**	.03	−.468	[−.41, −.29]
RE → PA	.38**	.03	.368	[.34, .44]
RE → NA	−.43**	.03	−.455	[−.47, −.36]
indPA	.004	.002	.004	[.00, .01]
indNA	−.002	.001	−.003	[.00, .00]

Note. N = 844 daily observations nested within 88 persons; WE = Daily work engagement; RC = Daily role clarity; WL = Daily workload; PWS = Daily positive work-nonwork spillover; NWS = Daily negative work-nonwork spillover; RE = Daily recovery; PA = Daily positive affect; NA = Daily negative affect; indPA = Main effect of TFL on daily positive affect; indNA = Main effect of TFL on daily negative NA.
* p < .05. ** p < .01.
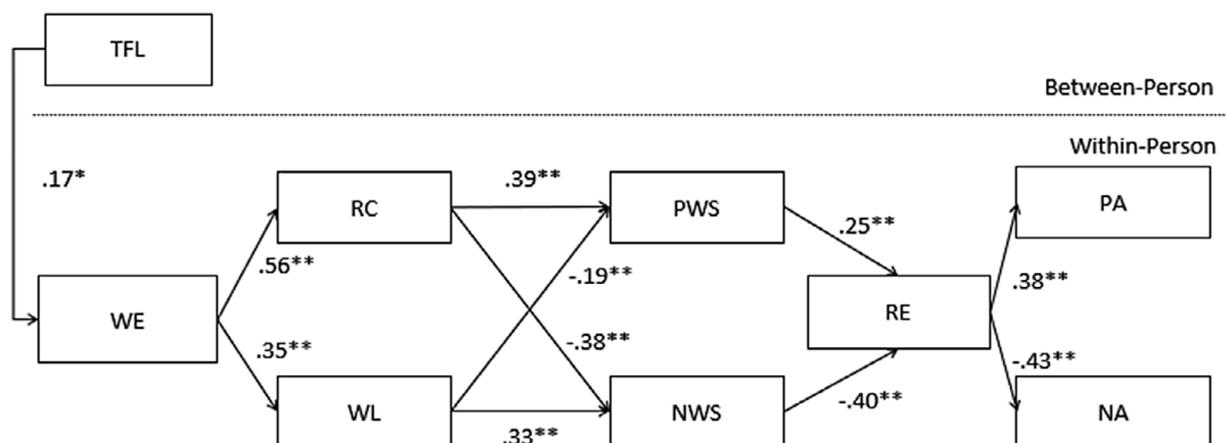
Figure 2. Results of Multilevel Path Modeling Analyses Predicting Employee well-being.
Note. N = 844 daily observations nested within 88 persons; WE = Daily work engagement; RC = Daily role clarity; WL = Daily workload; PWS = Daily positive work-nonwork spillover; NWS = Daily negative work-nonwork spillover; RE = Daily recovery; PA = Daily positive affect; NA = Daily negative affect.
* p < .05. ** p < .01.

(Bakker et al., 2023; Fredrickson, 2001) daily work engagement predicted daily role clarity. Regarding Hypotheses 1a and 1b, the findings regarding the daily role clarity-positive spillover-daily recovery relationship indicate that employees use their energy resources to engage in clarification measures of their role to make the workday more pleasurable. The pleasurable experience at work transmits to the nonwork domain and facilitates recovery processes after the workday, which affects EWB the next morning.

Yet, regarding Hypotheses 2a and 2b, and adding to the detrimental effects of challenging demands on recovery discussed in previous research (Bennett et al., 2018; Kelly & Moen, 2020a), we also show that the transformational leadership-daily work engagement relationship predicts high levels of daily workload, which result in increased negative work-nonwork spillover and decreased positive work-nonwork spillover, impaired daily recovery processes and thus impede a necessary balancing of personal energy resources. We therefore demonstrate that tackling high levels of daily workload, as opposed to moderate levels, rather represent hindrance instead of challenging demands (Podsakoff et al., 2023). This is in line with previous research that noted potential dark sides of the transformational leadership-work engagement relationship (e.g., Baethge et al., 2021; Di Stefano & Gaudino, 2019). The results indicate that work engagement might indeed be related to working excessively (although not specifically measured with our measurement instruments) and thus, on a day-to-day basis, may be confounded with negative exploitative work-related behaviors related to workaholism (Di Stefano & Gaudino, 2019). Noteworthy, the regression coefficient 95% CIs of the daily work engagement-daily workload relationship and the one between daily work engagement and daily role clarity are similar.

Like previous research (Moen et al., 2016; Munir et al., 2012), and regarding Hypothesis 3, we were unable to detect a main effect between transformational leadership and daily EWB when considering the two investigated pathways. The fact that splitting the integrative model into two separate models according to the hypothesized positive and negative pathways generated significant results for the relationship between transformational leadership and EWB indicates that the effect of one of the two pathways cannibalizes the effect of the other.

Here, extending the JD-R-R model, we positioned positive leadership as a potential contextual macro resource, but also demand, that affects volatile resources and demands and thereby employees' daily recovery and EWB. Our findings regarding the role of spillover effects are in line with the propositions of ten Brummelhuis and Bakker (2012), which posit that it is the personal energy resource, or lack thereof, that determines how work experiences affect recovery off-work. Our findings related to the work engagement-role clarity and work engagement-workload relationships are also partially consistent with the assumptions of reciprocity inherent to the job demands-resource model (Bakker et al., 2023; Lesener et al., 2019). Reciprocity means here that not only resources and demands predict work engagement, but also that work engagement predicts resources and demands vice versa. Notably, the present study only tested the latter set of relationships, and not bidirectional processes that may unfold over time. Moreover, our study adds insight to the link between state work engagement and challenging demands, as we show that this linkage might indeed overtax the personal energy system of the employees (Quinn et al., 2012). Also, by showing how volatile personal resources are linked to volatile contextual resources and demands, we complement research that linked stable personal resources to resources and demands (Xanthopoulou et al., 2007).

We also bridge the gap between stress-related (i.e., demand-based) work nonwork and recovery research on the one hand and motivational-related (i.e., resource-based) transformational leadership research on the other hand. Notably, transformational leadership has been almost unanimously theorized as being beneficial for EWB, based on an overwhelming predominance of cross-sectional research (Arnold, 2017), or on evidence related to emotions expressed at work (Bono et al., 2007). Even more, despite scarce empirical evidence, it was argued that leaders that provide necessary resources would facilitate employees' recovery (Chan et al., 2022). However, transformational leadership focuses in essence on leadership effectiveness (Inceoglu et al., 2018), and therefore rather on optimizing performance and psychological wellbeing indicators that are closely related to performance, such as work engagement. Yet, our findings suggest that transformational leaders might also induce excessive work-behaviors related to over-engagement and workaholism, which impair important daily recovery processes and thus hamper EWB over time. We therefore hope to spark a theoretical debate about the trade-offs of energizing leadership behaviors regarding employee's recovery and EWB over time. Although we agree that work engagement is per definition not workaholism (Bakker et al., 2008), our energy-depleting pathway results indicate that the widely assessed work engagement scale (UWES) might indeed also measure elements of over-engagement related to workaholism, as it related to daily workload that negatively related to favorable spillover processes and undermined daily off-job recovery. Additionally, reflecting on our findings, we echo the recent theorizing that work engagement might not be the antithesis of burnout (Maslach & Leiter, 2016), but propose that high levels of work engagement and related high-performance work behaviors may eventually turn into burnout through the overconsumption of personal energy (Bakker & De Vries, 2021; Leon et al., 2015). One explanatory factor of this shift might be the failed balancing and restoration of personal energy resources through recovery (Bennett et al., 2018; Sonnentag et al., 2022).

Practically, our findings suggest that transformational leaders should be aware that a sole motivational focus on energizing individuals at work may impair EWB over time. Adequate energizing leader behaviors/communications that do not lead to over-engagement is key. While moderate workload may be considered a positive stressor that may lead to accomplishment and personal development, excessive workload is not (Podsakoff et al., 2023). Therefore, managing adequate workload and bearing in mind individual recovery processes, both during and off-work, on a day-to-day-basis is essential. The transformational leadership element of individual consideration should address individual needs of personal energy restoration. Providing daily role clarity through work (re-)design measures, complementary to the here investigated bottom-up approach of daily role clarity, may present a powerful resource to facilitate recovery processes. One final practical implication of this research could be human resource training and development interventions at both leader and employee level on how to balance personal energy resources and how to reduce negative spillover effects from work to nonwork. For example, leaders might learn about employee profiles that might be particularly prone to excessive work behaviors (Kossek et al., 2012; Parker et al., 2021) and how to engage in adequate energy-related role-modeling and communications, whereas employees may learn new ways to create transition rituals and to separate work and nonwork domains.

One key limitation of the present research is the sole reliance on self-reported data, which raises the risk of common method bias.

However, our use of a quantitative daily diary design over the course of two subsequent working weeks does mitigate this issue (Beal, 2015). Moreover, the person-centric approach and investigation of personal psychological energy constructs might justify the use of self-reports as the best possible data source (Bolger & Laurenceau, 2013). In any case, future research might include data from leader-follower dyads and/or more objective data of workload, such as electronic automated data of working hours. Also, objective data of physical arousal measured by a heart rate monitor on a fit-bit or similar wearables might provide further insight into how personal energy spills over from work to the nonwork domain in form of prolonged activation (Baethge et al., 2021).

Another limitation might be our restricted sample. Nonetheless, our sample size at the between-person level is with $N = 88$ higher than expert recommendations on multilevel analyses and indicates robust data quality (Gabriel et al., 2019). However, as the sample size was too small, we were unable to study potential differences between occupational sectors. Additionally, the sample was unbalanced with 75% of the participants being female, as opposed to 47.1% of women in the Spanish labor force (The World Bank, 2023). Future research should therefore replicate the findings with a more diverse sample size to ensure generalizability of the findings.

Another limitation concerns the large proportion of participants that worked in remote or hybrid work settings, which may affect their perception of transformational leadership. Even though almost all of the participants worked at least sometimes remotely from home ($n = 92\%$), the sample size did not allow us to compare effects for different subsamples, or to narrow our research focus down to employees working from home exclusively. However, we assume that the perception of transformational leadership, and especially the studied relationships, are unlikely to change significantly regarding work localities. Indeed, recent research suggests that the role of leadership for EWB is not diminished by physical distance through remote work settings (Dolce et al., 2020; Lundqvist et al., 2022). Even more so, the result of a recent cross-sectional study suggests that the absence of leadership might be particularly harmful in remote work conditions (e.g., Wang et al., 2021). This indicates that the role of leadership for EWB is unlikely to diminish in the future working world, characterized by more flexible work arrangements (Sonnentag et al., 2022). Despite this, our conceptualization of leadership as a rather stable contextual macro-factor did not take into account the potential variations of leadership behaviors over time, so that daily changes or inconsistencies of such behaviors were not considered in the present study. Yet, as discussed further above, research found that daily interactions with direct supervisors are rare across a variety of occupations (Breevaart & Zacher, 2019). Moreover, a bigger sample size would have enabled more complex analyses, including potential moderating functions between work stress and recovery processes, which we were unable to conduct with the present data. For example, existing human resource practices or key personal resources such as emotional intelligence might moderate the relationship between high workload and negative spillover (Bakker & De Vries, 2021; Bakker et al., 2023). Additionally, employee characteristics such as, e.g., high promotion focus, high intrinsic motivation, and high need for leadership, as well as organizational context such as high uncertainty might accentuate the transformational leadership-state work engagement relationship (Decuypere & Schaufeli, 2021).

Regarding the relationship between state work engagement and daily role clarity, we may have inferred proactive measures undertaken by the employees to justify this process (Sonnentag, 2003). However, our operationalization measures did not explicitly take this into account. Future research should therefore measure such job crafting techniques for daily role clarity explicitly.

Regarding the relationship between work-nonwork spillover and recovery, also reverse or moderating processes may be possible that we did not test. Specifically, recovery can also be seen as antecedent to work-life conflict or enrichment when the latter are seen as outcomes rather than daily spillover processes (Demerouti et al., 2009). For instance, people that lack off-job recovery experiences over time may likely face difficulties in managing work and nonwork roles (Demerouti et al., 2009). Moreover, Moreno-Jiménez et al. (2009) showed how recovery moderates the effect of work-nonwork conflict on EWB. Consequently, it can be assumed that the relationship between work-nonwork spillover and recovery is more complex than modeled in the present study (Demerouti et al., 2013). Nonetheless, we argue that the idea of daily positive and negative work-nonwork spillover temporally preceding recovery experiences is in line with previous research and fits the here adopted short-term perspective (Demerouti et al., 2009; Geurts et al., 2005; ten Brummelhuis & Bakker, 2012).

Ultimately, our measure of EWB only included high arousal positive and negative well-being items. Although we argue that these items refer to high positive and high negative energetic activation and therefore describe EWB facets highly relevant for occupational behavior (Sonnentag et al., 2023; Warr, 1990), we acknowledge that for a more comprehensive picture of EWB, future research should also include low arousal positive and negative items to investigate potential differential effects of recovery on EWB (Bennett et al., 2018; Sonnentag, 2003). For example, the most immediate links from recovery to EWB might address vigor-related well-being items and its opposite, i.e., exhaustion-related well-being items (Bennett et al., 2018). Yet, regarding the latter, we linked recovery to anxiety-related well-being items to show that recovery not only predicts vigor or exhaustion, but also high arousal negative EWB.

This study showed that the energizing effect of transformational leadership leads to both favorable and unfavorable pathways for off-work recovery processes on a day-to-day basis. Favorably, employees might mobilize their personal energy resources to increase role clarity, which leads to pleasant workday experiences that facilitate positive spillover and off-work recovery processes. Unfavorably, employees might tackle higher workloads on days they feel energized, leading to negative spillover and impaired off-work recovery processes. Off-work recovery processes on the previous day influence daily EWB the next day. In summary, these dark sides of the energizing transformational leadership influence require leader behaviors that focus on the adequate balancing of daily personal energy resource investment at work.

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