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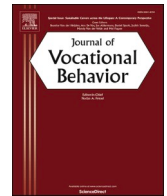
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The sum is larger than its parts: The daily interplay of leader and colleague support in facilitating employee well-being through balanced needs satisfaction and positive affect

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ABSTRACT

Previous research drawing on the Self-Determination Theory has demonstrated that the satisfaction of each basic psychological need for autonomy, competence, and relatedness exhibits unique positive effects on employee well-being independent of the satisfaction of the other needs (i.e., additive hypothesis). In comparison, more recent theorizing has suggested taking a more holistic view of needs satisfaction by proposing that the equal satisfaction of each need relative to the other needs contributes to wellbeing beyond the overall satisfaction of the three needs (i.e., balance hypothesis). The present study aims to expand our understanding of the balance hypothesis. We propose that leader and colleagues' support jointly contribute to balanced needs satisfaction, which promotes positive affect that in turn enriches home-domain wellbeing (i.e., subjective vitality). We integrate Self-Determination Theory and the Work-Home Resources model to suggest that beyond the satisfaction of each independent need, balanced needs satisfaction serves as a mechanism linking workplace support to the transfer of volatile energetic resources (positive affect) across domains. A diary study across 10 workdays with N=85 employees offers support for our research model as we find that joint leader and colleague support are indirectly related to home-domain subjective vitality via the balanced satisfaction of the basic psychological needs and positive affect. Supplementary analysis using Latent Profile Analysis (LPA) further corroborates the distinct contribution of balanced needs satisfaction to well-being. We subsequently discuss the theoretical and practical implications of our findings.

1. Introduction

Imagine a workday where an employee called Helen works autonomously from home on an individual work task. Although she experiences fairly high levels of autonomy, Helen feels moderately competent as her task does not require her full skillset. However, she feels that she lacks social connection as she has no opportunity to interact with colleagues. What would more strongly contribute to

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Helen's well-being on such a day? Working on another autonomous solitary task, switching to a task that requires her full skillset, or having a friendly interaction with one of her colleagues? This scenario illustrates how across different days employees experience varying levels of basic psychological needs satisfaction – the need for autonomy (i.e., feelings of volition and having the discretion to make autonomous decisions), –competence (i.e., feelings of mastery or efficacy), and –relatedness (i.e., feelings of connection and belonging to one's social environment). These focal needs are integral to Self Determination Theory (SDT; Ryan & Deci, 2000) – a prominent theory of human motivation, which postulates that the satisfaction of these three basic psychological needs promotes optimal functioning and well-being. The initially illustrated scenario raises an important question concerning how needs satisfaction contributes to well-being. How do qualitatively different compositions of needs satisfaction shape employee well-being?

This question reflects an emerging theoretical debate in the SDT literature about the additive and balance hypotheses (Sheldon & Niemiec, 2006; Vansteenkiste, Ryan, & Soenens, 2020). The additive hypothesis, which has been focal to a majority of studies on SDT (Vansteenkiste et al., 2020), proposes that increasing the satisfaction of any of the three needs equally contributes to Helen's well-being unless she subjectively experiences full satisfaction of that need. Given that Helen experiences fairly high autonomy need satisfaction, additional autonomy-inducing work activities, such as taking on another independent task, may enhance her well-being until her need for autonomy is fully met. Helen's well-being may also benefit from satisfying her need for competence by focusing on a task where she can use all her skills or satisfying her need for relatedness by engaging in a friendly interaction with another colleague. In contrast, the balance hypothesis (Sheldon & Niemiec, 2006) advocates a more holistic approach to basic needs satisfaction, as the satisfaction of each need is considered relative to the satisfaction of the other needs (Sheldon & Niemiec, 2006; Vansteenkiste et al., 2020). According to the balance hypothesis, Helen's well-being should benefit most from satisfying her need for relatedness through a friendly interaction with a colleague rather than satisfying her need for competence by focusing on a task that requires her full skillset or her need for autonomy by working on another independent task. This is because satisfying her need for relatedness most strongly contributes to balanced needs satisfaction that reflects an equilibrium of the satisfaction of the three needs. In comparison, the satisfaction of the need for competence or autonomy exacerbates imbalanced needs satisfaction as they create a starker difference to the unmet need for relatedness. The advocates of the balance hypothesis thus propose that the equal and proportionate satisfaction of all three needs contributes to individuals' well-being, beyond the satisfaction of each individual need (Sheldon & Niemiec, 2006; Tóth-Király, Bóthe, Orosz, & Rigó, 2020). As illustrated in our hypothetical scenario, SDT's additive and balance hypotheses provide distinct predictions regarding which need satisfaction is most beneficial for employee well-being contingent on the composition of needs satisfaction in a focal situation. However, although the balance hypothesis offers a compelling perspective on the proportionate satisfaction of needs, it also raises an important theoretical nuance. Could improving balanced needs satisfaction come at the cost of reducing an already well-satisfied need? For example, imagine a scenario where Helen's sense of autonomy is slightly reduced to match her lower levels of competence and relatedness, thereby achieving greater balance but lowering overall needs satisfaction. While this might theoretically enhance balance, it would contradict a key and well-established proposition of the additive hypothesis, which posits that each additional unit of need satisfaction independently promotes well-being (Vansteenkiste et al., 2020). Thus, rather than advocating for the reduction of well-satisfied needs, our theoretical proposition suggests that balance is best achieved by selectively enhancing the least-satisfied needs — in this case, relatedness or competence — so that employees can benefit both from the independent effects of each need (additive hypothesis) and the harmonious interplay between needs (balance hypothesis). In this way, the additive and balance hypotheses should be viewed not as competing but as complementary pathways to optimal well-being. Accordingly, the primary focus of this study is thus to advance our understanding of SDT by examining the focal work-related antecedents and consequences of balanced needs satisfaction and thereby testing the balance hypothesis against the additive hypothesis. To shed light on the work-related antecedents of balanced needs satisfaction we draw on notions that leaders and colleagues play a key role in creating need-supportive workplace environments (Deci, Olafsen, & Ryan, 2017; Jungert, Van den Broeck, Schreurs, & Osterman, 2018; Van den Broeck, Ferris, Chang, & Rosen, 2016). Thus, we examine the interplay of leaders' and colleagues' social support in determining balanced needs satisfaction. Simultaneously, our research focuses on the role of balanced needs satisfaction as a unique determinant of employee well-being beyond the additive satisfaction of each individual need.

Emerging evidence indeed suggests that general balanced needs satisfaction in one domain (i.e., general life) facilitates well-being in the same domain (Milyavskaya et al., 2009; Sheldon & Niemiec, 2006; Tóth-Király et al., 2020). However, we do not know whether the benefits of balanced needs satisfaction remain contained in a single domain or extend to other domains. Examining the cross-domain spillover of balanced needs satisfaction, which refers to the transfer of experiences from one domain of life to another (Edwards & Rothbard, 2000), is thus particularly critical because employees' work and home lives are deeply interconnected, with experiences in one domain often influencing outcomes in the other domain and shaping well-being across domains (i.e., Rivkin, Diestel, Stollberger, & Sacramento, 2023). Thus, the secondary aim of our study is to examine the spillover of balanced needs satisfaction on employee well-being across both the work- and the home domain.

To deliver on the primary and secondary objectives of our study, we integrate the SDT's balance hypothesis with the Work-Home Resources (W-HR) model (ten Brummelhuis & Bakker, 2012), which provides a complementary framework for understanding how resources generated in the work domain can spillover to the home domain. This integration positions balanced needs satisfaction as an additional mechanism linking joint workplace support from leaders and colleagues to state positive affect as an indicator of well-being in the work domain, which spills over to enhance subjective vitality – an indicator of home-domain well-being. The focus on positive affect seamlessly aligns with our theoretical integration, as positive affect serves as a bridge that connects the SDT and the W-HR model. More specifically, as positive affect reflects well-being in the work domain, it aligns well with a core proposition of SDT that needs satisfaction facilitates domain-specific well-being. Furthermore, positive affect also reflects a key concept in the W-HR model as it reflects a personal resource that facilitates cross-domain resource transfer. This theoretical integration thus justifies positioning positive affect as the link between balanced needs satisfaction in the work domain and well-being in the home domain as reflected by

subjective vitality. Our conceptual model is presented in Fig. 1.

We examine the proposed relationships in an experience sampling method (ESM) study across 10 workdays. This study design is particularly well-suited to achieving both the primary and secondary objectives of our study. Unlike cross-sectional study designs, ESM studies assess focal variables repeatedly across multiple days. Thereby our study goes beyond previous research that focused on between-person differences in balanced needs satisfaction (e.g., [Dysvik, Kuvaas, & Gagné, 2013](#); [Sheldon & Niemiec, 2006](#)) by examining the antecedents and consequences of the dynamic variability in balanced needs satisfaction across days. This is particularly important as previous research has demonstrated that the satisfaction of each basic need can considerably fluctuate across days ([Bakker & Oerlemans, 2019](#); [Gerpott, Rivkin, & Unger, 2022](#)). By assessing our focal variables at different times during the day our ESM study design is also ideal to examine the daily spillover effects of balanced needs satisfaction in the work domain to well-being in the home domain. This is because the examination of cross-domain effects inherently favors a focus on daily measurements, as spillover processes unfold over time and require fine-grained data to capture their dynamic nature ([Sonnentag & Fritz, 2015](#)). Our ESM design thus complements extant literature on domain-specific relationships between balanced needs satisfaction and well-being ([Dysvik et al., 2013](#); [Milyavskaya et al., 2009](#); [Sheldon & Niemiec, 2006](#); [Tóth-Király et al., 2020](#)) by offering a nuanced perspective on how dynamic resource processes unfold across domains.

Our research offers three contributions to the literature. First and foremost, we contribute to the SDT by examining the contributions of the balance hypothesis alongside the established additive hypothesis. We thus expand our understanding of how the balanced satisfaction of basic psychological needs contributes to employee well-being beyond the satisfaction of individual needs. By testing these two competing hypotheses, we provide empirical evidence that positions balanced needs satisfaction as a unique, complementary determinant of well-being. This contribution challenges traditional perspectives emphasizing only on the additive effects of need satisfaction and highlights the incremental importance of proportionality and harmony in satisfying psychological needs to enhance individuals' well-being ([Vansteenkiste et al., 2020](#)).

Second, our study sheds light on leaders' and colleagues' support as two focal antecedents of balanced needs satisfaction, which offers important insights into what constitutes a need-supportive environment for employees. We do this by examining the complementary interactive effects of leaders' and colleagues' support on employees' balanced needs satisfaction. This is an important contribution to SDT as it singles out the important role of leaders and colleagues in catering to an employee's different needs and thereby facilitating experiences of balanced need satisfaction. Thereby, our research can also offer practical recommendations on how these two important sources of workplace support can jointly facilitate balanced needs satisfaction and associated employee well-being.

Third, the simultaneous focus of our study on both within- and cross-domain well-being complements the single-domain focus of the balanced needs satisfaction literature (e.g., [Dysvik et al., 2013](#); [Sheldon & Niemiec, 2006](#); [Milyavskaya et al., 2009](#)). Our theoretical integration of SDT and the W-HR model thus extends the applicability of SDT to cross-domain relationships by unveiling how balanced needs satisfaction facilitates the transfer of personal resources (i.e., positive affect) to promote well-being in the home domain. At the same time, our integration enriches the W-HR model by introducing balanced needs satisfaction as a psychological mechanism transforming contextual resources into personal resources ([ten Brummelhuis & Bakker, 2012](#)). This synthesis not only extends our theoretical understanding of the W-HR model but also offers actionable insights for fostering employee well-being holistically, considering the interconnected nature of work and home lives.

1.1. Self-Determination Theory: the role of additive and balanced needs satisfaction

Self Determination Theory ([Ryan & Deci, 2000](#)) considered as one of the focal theories of human motivation helps understand how supportive workplace environments facilitate employee well-being ([Deci et al., 2017](#)). According to SDT, experiencing the satisfaction of each of the basic psychological needs facilitates self-determination, which encompasses feelings of control and ownership of one's actions, and is associated with enhanced feelings of aliveness, and enthusiasm ([Martela, DeHaan, & Ryan, 2016](#); [Ryan & Frederick, 1997](#)). As such, experiencing needs satisfaction promotes subjective vitality which is a focal indicator of well-being within the framework of SDT as it reflects an organismic state characterized by experiences of aliveness, vigor, and energy ([Martela et al., 2016](#); [Ryan & Frederick, 1997](#)).

At the core of SDT lies the additive hypothesis, which proposes that the satisfaction of each basic psychological need is uniquely and equally important for individuals' well-being ([Ryan & Deci, 2000](#)). For instance, on a day when an employee experiences medium levels of autonomy and competence needs satisfaction but low levels of relatedness satisfaction, enhancing the satisfaction of the need for autonomy — while the other two needs remain unchanged — should lead to improvements in their well-being. However, what is the implication for well-being considering the other needs are not equally satisfied, and particularly the need for relatedness is not satisfied at all? Would the employee experience similar increases in well-being if their satisfaction of the need for relatedness was improved instead of their autonomy need satisfaction? According to the additive hypothesis, as long as the satisfaction of any need increases, this increase equally contributes to well-being independent of the satisfaction of the other two needs. It is precisely this assumption that has prompted scholars to examine the possibility of a more holistic view of the satisfaction of each need relative to the satisfaction of the other needs ([Sheldon & Niemiec, 2006](#); [Vansteenkiste et al., 2020](#)).

[Sheldon and Niemiec \(2006\)](#) introduced the balance hypothesis — a theoretical extension of SDT — proposing that it is not only the satisfaction of each distinct need that is beneficial for individuals but also the harmonious and balanced satisfaction of all three needs. Their seminal study, conducted with university students, provided initial empirical evidence showing that balanced needs satisfaction predicts well-being above and beyond the satisfaction of their individual needs. [Milyavskaya et al. \(2009\)](#) replicated these findings in a sample of adolescents, reaffirming that balanced needs satisfaction explains incremental variance in well-being, measured as positive

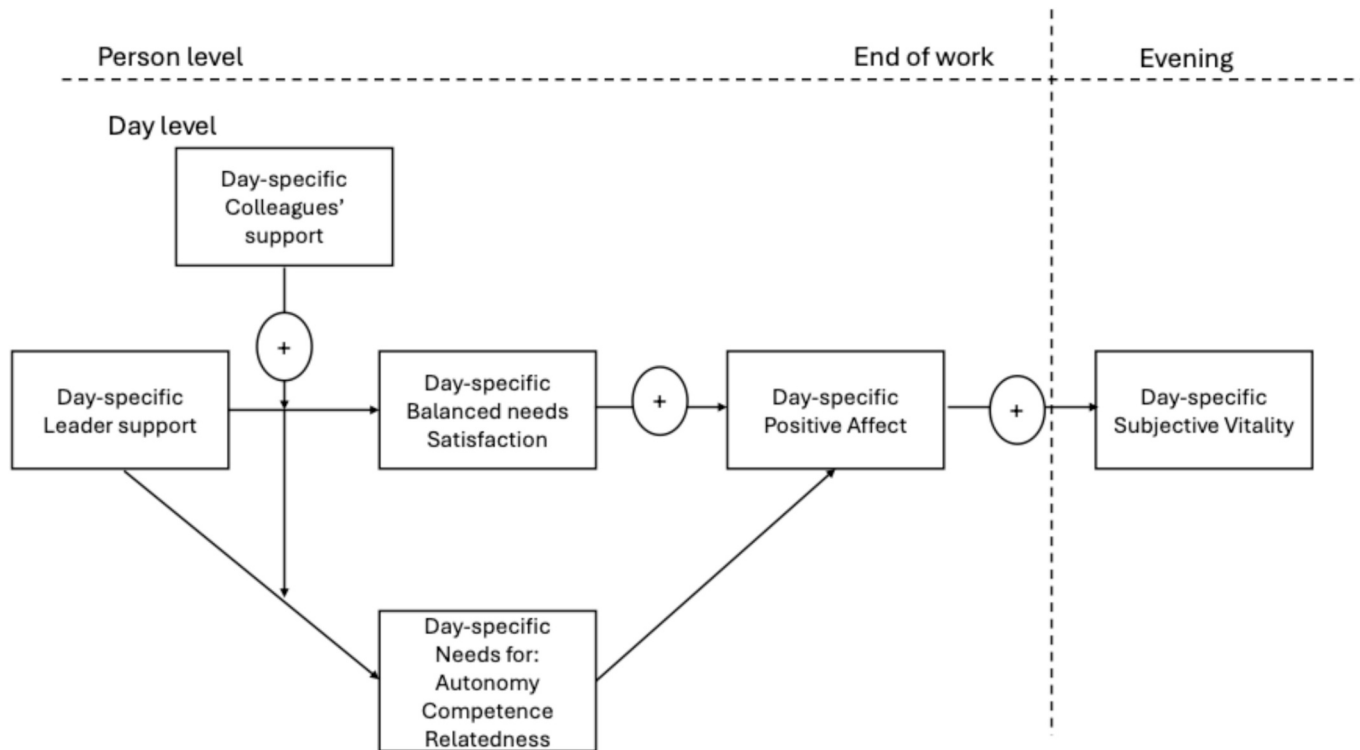


Fig. 1. Conceptual model.

affect and life satisfaction while accounting for the satisfaction of each individual need. Expanding on these findings, Tóth-Király et al. (2020) conducted Latent Profile Analysis (LPA) and demonstrated that balanced needs satisfaction is positively related to positive affective states. While initial empirical research supports the balance hypothesis outside of the work domain, it offers no support for the benefits of work-related balanced needs satisfaction. Specifically, Dysvik et al. (2013) found no support for the benefits of balanced needs satisfaction after controlling for total needs satisfaction when examining the relationship between work-related balanced needs satisfaction and intrinsic motivation.

Accordingly, there are several ways to expand on this important emerging research stream. First, contemplating the lack of evidence for the benefits of work-related balanced needs satisfaction, one reason may be that previous research relied on static, cross-sectional designs that capture global levels of needs satisfaction. Such study designs neglect the dynamic, day-to-day fluctuations in needs satisfaction (Bakker & Oerlemans, 2019; Gerpott et al., 2022; Ryan, Bernstein, & Brown, 2010) that likely influence the experience of balanced needs satisfaction. Second, considering the theoretical propositions (Sheldon & Niemiec, 2006) and initial empirical evidence (Milyavskaya et al., 2009; Tóth-Király et al., 2020) for the benefits of balanced needs satisfaction, there has been little research on the antecedents of such beneficial experiences of balanced need satisfaction. One notable exception is the study by Tóth-Király et al. (2020), who explored generic need-supportive experiences rather than workplace-specific factors. Accordingly, our study aims to extend previous research by examining balanced needs satisfaction as a dynamic, day-to-day phenomenon, and shedding light on its antecedents and implications for well-being within the work domain and its spillover to home-domain well-being. By focusing on positive affect as an indicator of well-being in the work domain and subjective vitality as a reflection of well-being in the home domain our study complements previous research that focuses exclusively on domain-specific rather than cross-domain implications of balanced needs satisfaction (Dysvik et al., 2013; Milyavskaya et al., 2009; Sheldon & Niemiec, 2006; Tóth-Király et al., 2020).

In the following, we first expand on how leaders' and colleagues' supportive behaviors jointly facilitate balanced needs satisfaction. Next, we focus on the cross-domain enrichment process and explain how balanced needs satisfaction promotes work-domain positive affect and home-domain Subjective Vitality.

1.2. Facilitating balanced needs satisfaction – a joint effort of supportive leaders and colleagues

Leaders and colleagues are two proximal sources of social support (i.e., the provision of emotional, instrumental, and informational support; Ferguson, Carlson, Zivnuska, & Whitten, 2012; ten Brummelhuis & Bakker, 2012) that can satisfy employees' basic psychological needs (Deci et al., 2017; Jungert et al., 2018; Van den Broeck et al., 2016). This is supported by previous research showing that various leadership styles characterized by high levels of social support—such as servant leadership (Chiniara & Bentein, 2016), empowering leadership (Kim & Beehr, 2020), and authentic leadership (Leroy, Anseel, Gardner, & Sels, 2015)—enhance employees' basic need satisfaction (Deci et al., 2017; Van den Broeck et al., 2016). Similarly, support from colleagues has been found to facilitate basic need satisfaction (Jungert et al., 2018; Moreau & Mageau, 2012; Pedersen, Halvari, & Olafsen, 2019).

However, the daily effects of leader and colleagues' support on balanced needs satisfaction are not yet well understood as the majority of past research has independently examined the role of leaders and colleagues, thus failing to account for the full support system available to employees. The importance of concurrently examining the effects of both sources of support is further underlined by the very essence of the balance hypothesis, which focuses on the holistic and proportionate satisfaction of basic psychological needs. Considering that previous research on leaders' and colleagues' support has emphasized the unique respective importance of each source of support, we propose that the concurrent examination of the joint support provided by leaders and colleagues may expand our understanding of how the full workplace social support system shapes balanced needs satisfaction. Unlike the additive hypothesis, the balance hypothesis emphasizes the equilibrium among the satisfaction of all three needs rather than focusing on individual needs (Sheldon & Niemiec, 2006). Consequently, it may be premature to assume that the same factors influencing the satisfaction of individual needs would similarly determine balanced need satisfaction. Moreover, empirical studies on the role of leaders' and colleagues' support for needs satisfaction have predominantly adopted between-person designs focusing on more general long-term support. However, both leaders' and colleagues' support represent volatile contextual resources that vary daily (Ilies et al., 2007; ten Brummelhuis & Bakker, 2012). Hence, we cannot assume that the relationships between different sources of support and needs satisfaction are homologous across levels of analysis, that is similar at the between- and within-person level (Chen, Bliese, & Mathieu, 2005). This is because studies using between-person designs compare individuals across longer time frames (i.e., months and years), which allows more time for the respective relationships to emerge. In comparison, within-person studies focus on more volatile factors (i.e., across days), which may unveil differences in focal relationships (McCormick, Reeves, Downes, Li, & Ilies, 2020). To illustrate, whereas leader support may be sufficient to satisfy all three basic needs during longer timeframes (i.e., months and years), as the leader can provide support to satisfy different needs during that time, this may not be the case at a daily level as due to the limited number of interactions a leader may not comprehensively satisfy all three basic needs. Accordingly, we argue that concurrently examining daily variations in both sources of support allows for a more in-depth consideration of how their interplay affects balanced needs satisfaction.

Leaders are in a position of authority and have the capacity to set goals, provide guidance, and shape workplace practices, demands, and day-to-day experiences (Fischer, Dietz, & Antonakis, 2017; Goh, Ilies, & Wilson, 2015). We propose that due to the hierarchical leader-employee relationship (Basford & Offermann, 2012), leaders are better positioned to satisfy the need for autonomy and competence, for two reasons. First, a leader's key responsibility is to supervise the work of their employees and ensure that tasks are completed effectively and efficiently. For example, a leader can support their employee by asking about any difficulties related to an allocated task and providing support accordingly. Second, because leaders distribute work and set deadlines, employees will likely

contact their leader when they want to work on another task or extend a deadline. Because employees interact with their leaders predominantly about work-related tasks, leaders are in a good position to assess employees' levels of autonomy and competence needs satisfaction, which they can enhance through their support. A recent meta-analysis (Slemp et al., 2024) offers strong support for our arguments showing substantial relationships between leader support and autonomy as well as competence satisfaction.

In comparison, we argue that colleagues are in a better position to facilitate relatedness needs satisfaction. Colleagues have typically more egalitarian relationships due to being at a similar level in the organizational hierarchy (Basford & Offermann, 2012), which makes it easier to develop workplace friendships (Mao, 2006). We propose that the nature of relationships among colleagues and because they often share the same physical workspace (Chiaburu & Harrison, 2008; McMullan, Lapierre, & Li, 2018) makes colleagues' support qualitatively different from leaders' support. For example, on a daily basis, one is more likely to approach a colleague to discuss a personal problem, share positive experiences, or have a casual informal social interaction. There are also practical reasons why colleagues are more likely to engage in social rather than task-related interactions with each other. Whereas a leader usually has several team members (Jungert et al., 2018; Liao, Lee, Johnson, & Lin, 2021) colleagues reflect multiple and often readily available proximal sources of support as a team member has usually several colleagues (Basford & Offermann, 2012; Chiaburu & Harrison, 2008). Hence, for practical reasons, it may be easier to engage in social interactions with different colleagues as compared to one's leader who may have less availability. This proposition aligns with findings that lateral sources of support, such as colleagues, are especially effective in satisfying the need for relatedness (Slemp et al., 2024), as they constitute the focal relational element of the workplace (Chiaburu & Harrison, 2008).

Drawing on our propositions that on a daily basis, colleagues' support primarily caters predominantly to the social and interpersonal aspects, whereas leader support primarily contributes to shaping the task-related aspects (Slemp et al., 2024), we argue that jointly leaders' and colleagues' support facilitate balanced needs satisfaction. Undoubtedly, over time, employees who receive leader support would develop feelings of connectedness with their leaders and belongingness with the organization, thus having their need for relatedness satisfied (Van den Broeck et al., 2016). However, on a daily basis, topical feelings of connectedness and belongingness that encompass the satisfaction of the need for relatedness can be sustained and reinforced through direct interactions with colleagues (Reis, Sheldon, Gable, Roscoe, & Ryan, 2000). Thus, we propose that the pervasive influence of colleague support can make the difference between experiencing higher as compared to lower levels of balanced needs satisfaction. If colleagues' support is low, it would not be sustainable for leaders to identify on a daily basis the status of the satisfaction of all three needs for all their employees and accordingly engage in supportive behaviors that facilitate balanced needs satisfaction, which also encompasses sustaining informal social interactions.

Hypothesis 1. Day-specific colleagues' support moderates the relationship between day-specific supportive leadership behaviors and the day-specific balanced satisfaction of the basic psychological needs in the work domain, such that balanced needs satisfaction is highest on days when employees experience higher levels of leader- and colleagues' support.

1.3. How balanced needs satisfaction facilitates well-being across domains? A theoretical integration of SDT and the W-HR model

Moving from the antecedents to the consequences of balanced needs satisfaction, we integrate SDT with the W-HR model (ten Brummelhuis & Bakker, 2012) to substantiate our propositions for balanced needs satisfaction as the lynchpin that links experiences in the work domain to employee well-being in the home domain. The W-HR model explains how resources in one domain (i.e., work) spill over and enrich well-being in another domain (i.e., home). This model highlights the central role of contextual (e.g., workplace support) and personal (e.g., positive affect) resources in promoting cross-domain enrichment, which can be defined as a positive spillover of resources between domains (i.e., from the work- to the home domain). In the W-HR model, contextual and personal resources are conceptualized as two types of resources that can either be stable or volatile. Contextual resources are part of one's external environment, whereas personal resources are situated within the individual. For example, the social support received on a given day and the positive affective state an employee experiences after successfully completing a work task reflect examples of a volatile contextual and a personal resource as they can vary across situations.

The integration of SDT and the W-HR model provides a unique and complementary perspective for understanding the cross-domain dynamics of needs satisfaction and well-being. While SDT offers a nuanced explanation of the psychological mechanisms through which need satisfaction enhances well-being, it remains domain-centric and does not address resource spillover processes across domains. Conversely, the W-HR model emphasizes the spillover of resources across domains but lacks a detailed account of the underlying psychological processes. By incorporating the W-HR model, which provides a structured approach to understanding resource spillover between the work- and home domain, we address the aforementioned limitations of each theory. We argue for balanced needs satisfaction as a psychological mechanism that explains how work-domain contextual resources (e.g., leader and colleagues' support) are transformed into work-domain personal resources (e.g., positive affect), enabling the subsequent cross-domain enrichment processes to facilitate subjective vitality in the home domain.

1.4. The role of positive affect in the work-home enrichment process linking balanced needs satisfaction in the work domain to well-being in the home domain

Integrating SDT's theoretical argument that balanced needs satisfaction represents a unique antecedent of well-being (Sheldon & Niemiec, 2006; Tóth-Király et al., 2020) and the W-HR model, we propose that balanced needs satisfaction represents a distinct psychological mechanism that incrementally facilitates the generation of volatile personal resources over the total satisfaction of the

basic psychological needs. Although it is novel within the SDT literature, the concept of balance is not unique to SDT as it has been incorporated in other psychological theories, which highlights its ubiquitous relevance and thus makes its addition to SDT particularly relevant. For example, the eudaimonic well-being literature postulates that experiencing harmony across different domains of life is associated with eudaimonia (Ryan & Deci, 2008). According to this literature, which is strongly embedded within SDT, feelings of completeness and fulfillment emanate from experiencing harmonious satisfaction in every aspect of life (Ryan & Deci, 2008). Another term that refers to balance is equilibrium. According to the personal-relational equilibrium model (Kumashiro, Rusbult, & Finkel, 2008), individuals are motivated to reach a state of equilibrium with respect to their needs rather than maximize the satisfaction of one need at the expense of others, as a state of equilibrium contributes to well-being. Nevertheless, despite the existence of several studies that support the idea that the more broadly approached concept of balance is important and beneficial across various aspects of human life (Fave, Brdar, Freire, Vella-Brodrick, & Wissing, 2011; Greenhaus, Collins, & Shaw, 2003; Kelliher, Richardson, & Boiarintseva, 2019; Kumashiro et al., 2008; Sirgy & Wu, 2009) the SDT literature has not yet integrated these ideas to explain spillover mechanisms of landed needs satisfaction across domains. Drawing on our theoretical integration of the SDT and the W-HR model, we propose a work-home enrichment process where balanced needs satisfaction is positively related to home-domain subjective vitality because experiencing balanced needs satisfaction generates positive affective states as a personal resource which in turn spills over to the home-domain. We focus on positive affect as a volatile personal resource because positive emotions emerge as a proximal aftermath to pleasant and fulfilling experiences (Weiss & Cropanzano, 1996), such as balanced needs satisfaction. Our proposition that balanced needs satisfaction positively influences home-domain well-being via positive affective states is based on theoretical and empirical work suggesting that balance is a desired state that induces positive feelings. Specifically, we argue that humans value balanced and harmonious needs satisfaction, instead of maximizing the satisfaction of a specific need at the expense of balance, because when balance is accomplished, positive feelings arise (Kumashiro et al., 2008; Ryan & Deci, 2008; Sheldon & Gunz, 2009). Thus, individuals perceive balance to be an end in itself as they associate it with feelings of pleasure, happiness, and satisfaction (Kumashiro et al., 2008).

Experiencing positive affect at work, in turn, contributes to home-domain subjective vitality by carrying over affective resources from the work- to the home-domain (Edwards & Rothbard, 2000; Ilies et al., 2007; ten Brummelhuis & Bakker, 2012). The availability of affective resources makes it more likely that employees engage in interesting and invigorating activities and interactions at home (Edwards & Rothbard, 2000; Fredrickson, 2001), and also are accompanied by states of mind during which employees recognize the positive sides even when engaging in negative or effortful experiences (Schweitzer et al., 2022), which in turn contribute to their overall psychological and physical well-being (Dockray & Steptoe, 2010) as reflected by high levels of subjective vitality in the home-domain.

Hypothesis 2. Positive affect in the work domain mediates the day-specific relationship between balanced needs satisfaction in the work domain to subjective vitality in the home domain.

Finally, integrating our previous hypotheses we propose **Hypothesis 3**:

Hypothesis 3. Day-specific colleagues' support moderates the indirect relationship of day-specific leader support in the work domain on day-specific subjective vitality in the home domain via day-specific balanced needs satisfaction and positive affect in the work domain, such that the indirect relationship between leader support and day-specific subjective vitality is strongest on days when colleagues' support is high as compared to low.

When testing all hypotheses we control for the individual levels of each independent need as they represent the additive hypothesis. Controlling for each need allows us to explore the unique effects of balanced needs satisfaction and thus, the balance hypothesis.

2. Method

2.1. Participants

The research protocol was developed according to the APA's Ethical Principles as the organizational policies at the authors' institutions at the time of data collection did not require ethical approval for noninvasive, survey-based research. The data collection was implemented in the UK, via Prolific Academic, an online service that provides access to participants and ensures high-quality data (Palan & Schitter, 2018; Peer, Brandimarte, Samat, & Acquisti, 2017). Walter, Seibert, Goering, and O'Boyle (2019) have shown that data obtained via online providers possess similar psychometric properties and produce criterion validity that generally falls within the credibility intervals of existing meta-analytic results from conventionally sourced data. Past research has shown that compared to participants recruited via other platforms (e.g., Mechanical Turk, Crowd Flower), participants recruited via Prolific Academic are more diverse and produce higher-quality data (Palan & Schitter, 2018; Peer et al., 2017). It should be noted that data were collected during the pandemic and people worked in hybrid work arrangements remotely and in the office.

First, we selected participants by conducting an eligibility check. Eligible participants had to be at least 18 years old, work full-time in the UK, and have not taken any days off work during the time of the data collection. We screened $N = 445$ participants, of whom $N = 107$ participants were eligible. These 107 employees received a pre-survey with an informed consent form. This pre-survey was completed by $N = 102$ participants. In this pre-survey, we asked participants to estimate the times at which they started and finished work, and when they go to bed on a regular workday. Depending on the indicated times, each participant received three surveys a day. The midday survey was sent out four hours after the start of work, the end-of-work survey after they finished work, and the evening survey one hour before going to bed. For each survey participants received a reminder if they did not complete a survey within an hour after receipt. After receiving each survey, participants were given two hours to respond; thereafter, the specific survey was

automatically deactivated. The present study was part of a larger research project and participants received compensation of £0.50 for each completed survey. In line with [Gabriel et al.'s \(2019\)](#) recommendations to increase the response rate, we offered a conditional monetary incentive of £5 if participants completed all surveys on seven out of ten days. The maximum amount a participant could have earned is £20.50.

We excluded 17 participants (from the initial $N = 102$ responses) who did not complete any daily surveys. In total, $N = 85$ employees (83.3 % response rate on the person level) completed surveys in a period of 10 days, resulting in 572 day-level data points (6.73 days per employee, 67.29 % response rate on the day level). Participants (56 % female) were between 20 and 63 years old years ($M = 36.11$; $SD = 12.09$). They worked in various sectors (24 % health, 11 % IT & communication, 8 % production & industry, 8 % teaching & education, 7 % retail, 6 % public administration, 6 % science, 5 % finance & insurance, 25 % in other sectors). Participants' everyday dominant work activities involve interactions with others (58.6 %), computer work (19.2 %), and manual labor (18.2 %). Participants could select multiple activities.

2.2. Measures

All reported scales were adapted to daily measurement and were assessed on 5-point Likert scales.

2.2.1. Day-specific leader's support (end of work)

We assess leader support with five items adapted from the social support scale of the National Institute for Occupational Safety and Health Generic Job Stress Questionnaire ([Hurrell Jr. & McLaney, 1988](#)). The scale assesses a leader's enacted daily supportive behaviors concerning work tasks, the daily accessibility of the leader to the employees, and the leader's willingness to provide non-work-related social support. An example item is "Today, how much did you rely on your leader when things got difficult at work?" (α -range across days = 0.88–0.94; 1: Not at all – 5: A great deal).

2.2.2. Colleagues' support (end of work)

We assess colleagues' support with the same items and response format as leader support but refer to colleagues as opposed to one's leader (α -range across days = 0.82–0.94).

2.2.3. Day-specific basic needs satisfaction (end of work)

We measure work-related autonomy, competence, and relatedness needs satisfaction with the 12-item scale developed by [Chiniara and Bentein \(2016\)](#), who developed a shortened version of the original basic needs satisfaction scale introduced by [Van den Broeck, Vansteenkiste, De Witte, Soenens, and Lens \(2010\)](#). Each need comprises four items (e.g., autonomy: "Today, how satisfied are you with the opportunities to take personal initiatives in your work?", α -range across days = 0.83–0.93; competence: "Today, how satisfied are you with the feeling of being competent at doing your job?", α -range across days = 0.88–0.94, relatedness: "Today, how satisfied are you with the positive social interactions you have at work with other people?", α -range across days = 0.88–0.96; 1: Very dissatisfied – 5: Very satisfied).

2.2.4. Balanced needs satisfaction

We calculate an index of balanced needs satisfaction by applying a method widely used in studies that focus on balanced needs satisfaction ([Dysvik et al., 2013](#); [Sheldon & Niemiec, 2006](#); [Tóth-Király et al., 2020](#)). Specifically, we computed the difference between each pair of needs and then added the absolute values of these three scores. To create a variable where higher values, indicate more balance, the resulting difference scores were subtracted from the highest observed score of the sum of the absolute difference scores, which in this sample was 7.5.

2.2.5. Positive affect (end of work)

We assess day-specific positive affect with 6 items from the positive affect dimension of [Watson, Clark, and Tellegen's \(1988\)](#) PANAS scale. An example item is "Right now I feel enthusiastic" (α -range across days = 0.88–0.94; 1: Not at all – 5: Extremely).

2.2.6. Subjective vitality (evening)

We assess day-specific subjective vitality with [Ryan and Frederick's \(1997\)](#) 7-item scale. An example item is "Right now I feel alive and vital" (α -range across days = 0.87–0.931: Strongly Disagree – 5: Strongly Agree).

2.2.7. Control variables

Because the data collection was conducted during the pandemic, we controlled for participants' working mode. We measured at the midday survey whether employees were working in their office or their home with one item rated using a binary no-yes format (i.e., Today, I work from home). Further, we control for subjective vitality at midday using the same scale we use for the end-of-workday assessment of subjective vitality. We did so because by controlling for T1 subjective vitality our results reflect change in subjective vitality throughout the day ([Ohly, Sonnentag, Niessen, & Zapf, 2010](#)). Additionally, because we use positive affect as a mediating variable, we also control for negative affect to rule out alternative affective mediating mechanisms. We measure negative affect using 6 items from [Watson et al.'s \(1988\)](#) PANAS scale.

2.3. Construct validity

We conduct MCFAs to assess the psychometrical distinctiveness of our variables. Following Dyer, Hanges, and Hall's (2005) recommendations, we specify the day-level variables in our model at the within-person level. To assess our models' goodness of fit, we apply cut-off values as recommended by Hu and Bentler (1999; root mean square error of approximation [RMSEA] = .06; comparative fit index [CFI] = .95; standardized root mean square residual [SRMR] = .08). However, because these cut-off points were calculated using simulated data that does not account for nested data structures, a deviation from these cut-off values should not unequivocally suggest the dismissing the proposed theoretical model (Williams, O'Boyle, & Yu, 2020). The results of MCFAs examining different models are presented in Table 1. In line with our research model, we specify an MCFA model where all variables used are modeled as correlated single factors. To demonstrate that our variables are psychometrically distinctive, we specify alternative nested models (see Table 1) where theoretically related variables are merged to form a single variable, while the other factors remain modeled as single factors. For example, in model 2 we specify all the basic psychological needs in a single factor and all the other factors are modeled as in model 1. For model 5 we specify all measures to form a single factor. Each model is compared against the baseline model 1 by inspecting the fit statistics and conducting the S-B corrected Chi-square test that accounts for nested data (Satorra & Bentler, 2010). The measurement model that specifies 8 factors yields an acceptable fit: $\chi^2(751) = 1601.575$, $p < .01$, RMSEA = 0.048, CFI = 0.925, SRMR = 0.056) and outperforms any other model in which we combined different variables into a single factor.

2.4. Data analysis strategy

Due to the nested structure of our data, we used multilevel modeling to examine our hypotheses. All models were specified with the software Mplus 8.2 (Muthén & Muthén, 1998) using Maximum Likelihood estimation with robust standard errors and Monte Carlo integration. A moderated-mediation 1–1–1 model was specified to test the proposed hypotheses (Preacher, Rucker, & Hayes, 2007). After conducting a test for random slopes, it was determined that the variance was not significant. The significance values of the tested random slopes ranged from $p = .256$ to $p = .992$. Accordingly, we proceeded to specify all relationships as fixed slopes. First leader and colleagues' support were specified to predict each individual basic psychological need, which represents the additive hypothesis. Moreover, the aforementioned predictors were linked to balanced needs satisfaction, which reflects the balance hypothesis. Further, we specified the interaction term of leader and colleagues' support predicting each individual basic psychological need and balanced needs satisfaction. Subsequently, each basic psychological need and balanced needs satisfaction were specified to predict positive affect, which was in turn specified to predict subjective vitality. Additionally, we specified each basic psychological need and balanced needs satisfaction to directly predict subjective vitality. Following recommendations by Hofmann, Griffin, and Gavin (2000), we group-mean centered our exogenous day-level variables.

Considering that the conventional bootstrapping method of re-sampling cannot be applied to multilevel models (Preacher & Selig, 2012; Van der Leeden, Meijer, & Busing, 2008), to estimate the confidence intervals for the indirect effects for the proposed mediation hypotheses, we applied a Monte Carlo approach of re-sampling (Preacher & Selig, 2012). For testing the moderated mediation effects, we extended the above procedure to test conditional indirect effects where the magnitude of the first-stage coefficient was calculated at lower (-1 SD) and higher ($+1$ SD) levels of colleagues' support (Gerpott et al., 2022). The presence of an indirect effect is rejected if a corresponding confidence interval includes zero (Preacher et al., 2007).

3. Results

In Table 2 we report the means, standard deviations, correlations, and α reliability ranges of all study variables. Table 3 shows the results of our multilevel structural equation model and the corresponding indirect effects.

Hypothesis 1 predicts an interaction effect of leader and colleagues' support on balanced needs satisfaction in the work domain. First, our results indicate that colleagues' support predicts balanced needs satisfaction ($\gamma = 0.276$, $p = .001$), whereas the direct relationship between leader support and balanced needs satisfaction is not significant ($\gamma = 0.115$, $p = .062$). Furthermore, our results

Table 1
MCFA results.

	χ^2	df	RMSEA	CFI	SRMR	S-B scaled $\chi^2 \Delta$ to Model 1	Δ df	p
Model 1 (8 factors: Leader support colleague support, Needs for autonomy, competence, relatedness, Positive, Negative Affect, Subjective Vitality)	1601.575	751	0.048	0.925	0.056			
Model 2 (Basic needs satisfaction as a single factor)	2892.273	764	0.076	0.813	0.090	3128.837	13	0.000
Model 3 (Leader support and Colleague support as a single factor)	2629.820	758	0.071	0.836	0.069	520.121	7	0.000
Model 4 (Positive and Negative affect a single factor)	2299.813	758	0.065	0.865	0.084	368.453	7	0.000
Model 5 (Single factor)	8.773.489	779	0.145	0.298	0.151	7295.813	28	0.000

Note. df = Degrees of freedom; RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; SRMR = Standardized Root Mean Square Residual; S-B = Sattora-Bentler.

support the hypothesized interaction as the product term of leaders' and colleagues' support was significantly related to balanced needs satisfaction ($\gamma = 0.256, p = .013$). We plotted this interaction and conducted simple slope test (Liu, West, Levy, & Aiken, 2017). Fig. 2 reveals that the relationship between leader support and balanced needs satisfaction is positive and significant on days with higher levels of colleagues' support, but not significant on days with lower levels of colleague support.

Hypothesis 2 predicts that work-domain balanced needs satisfaction is indirectly related to home-domain subjective vitality via positive affect. Examining the corresponding direct effects our results indicate that work-domain balanced needs satisfaction is positively related to work-domain positive affect ($\gamma = 0.085, p = .04$). However, it is not related to home-domain subjective vitality ($\gamma = 0.046, p = .115$) after controlling for work-domain positive affect. Moreover, work-domain positive affect predicts home-domain subjective vitality ($\gamma = 0.313, p = .001$). Our results also support the proposed indirect relationship as after controlling for each individual basic psychological we find that the 95 % CI of the corresponding indirect effect linking balanced needs satisfaction in the work domain to subjective vitality in the home-domain via positive affect in the work-domain does not include zero (95 % CI [0.01, 0.05]). Finally, we did not observe a significant direct relationship between balanced needs satisfaction and our control variable negative affect in the work domain ($\gamma = -0.037, p = .076$) suggesting that balanced needs satisfaction is more strongly related to positive as compared to negative affective states.

Hypothesis 3 proposes a moderated mediation model where work-domain colleagues' support moderates the indirect relationship between leader support in the work domain and subjective vitality in the home domain via balanced satisfaction of the basic psychological needs and positive affect in the work domain. We argue that the day-specific indirect relationship between leader support and subjective vitality becomes stronger on those days when colleague support is higher as compared to those days when it is lower. Our results indicate that on days when colleagues' support is higher, there is a significant indirect relationship between daily leader support in the work domain and subjective vitality in the home domain via balanced needs satisfaction and positive affect in the work domain (95 % CI [0.001, 0.020]). In comparison, the indirect effects on days where employees receive medium and low levels of colleagues' support were non-significant as the corresponding 95 % CIs did include zero (cf., Table 3).

To evaluate the relative contributions of the additive- and balance hypotheses in predicting our mediator — positive affect and outcome — subjective vitality, we compared the total variance of a model, which represents the additive hypothesis where we specify individual needs as predictors of each dependent variable and another model corresponding to the balance hypothesis where we add balanced needs satisfaction in addition to the individual needs. For positive affect, our analyses representing the additive hypothesis explained 25.2 % of the total variance. A model representing the balance hypothesis explained 25.5 % of the total variance, indicating an incremental increase of 0.3 %. Similarly, for subjective vitality a model representing the additive hypothesis explained 31.9 % of the total variance, whereas adding balanced needs satisfaction explained 33.4 % of the total variance, representing an incremental increase of 1.5 %. These results highlight the unique contributions of the balance hypothesis beyond the additive hypothesis, particularly for subjective vitality, while also demonstrating its modest but complementary role in explaining positive affect. While the amounts of incremental variance explained by the addition of balanced need satisfaction appear small these explained variances align with effect sizes reported in applied psychology research (Bosco, Aguinis, Singh, Field, & Pierce, 2015). Furthermore, considering that we focus on the role of daily balanced needs satisfaction for practical purposes these small amounts of explained variance may translate into considerably larger practical implications considering the scaling effects across individuals and across time.

3.1. Supplementary analyses

Considering that the use of difference scores has been criticized in the empirical literature (for a comprehensive review see Edwards, 1994), to substantiate the robustness of our findings and the fundamental premise of the balance hypothesis, we conducted a latent profile analysis (LPA). LPA is a latent variable modeling approach that explores the presence of latent subpopulations within a population based on a certain set of variables (Spurk, Hirschi, Wang, Valero, & Kauffeld, 2020). We utilized LPA to examine the relationship between different daily profiles of needs satisfaction and positive affect as well as subjective vitality.

As a first step, we identified how many different profiles exist in our dataset. To identify the optimal profile solution, we considered both the theoretical and the statistical adequacy of the solutions (Spurk et al., 2020). For statistical adequacy, we examined the Akaike Information Criterion (AIC), the Bayesian Information Criterion (BIC), the Sample-Size-Adjusted BIC (SSABIC), entropy, and the adjusted Lo-Mendell-Rubin (LMR) likelihood ratio test. Lower values on AIC, BIC, and SSABIC indicate an overall better profile solution. Entropy indicates the precision of the classification with values ranging from 0 (lower accuracy) to 1 (higher accuracy). Finally, the LMR test compares the estimated model (e.g., six classes) with a model having one less class (e.g., five classes) and a non-significant p -value indicates that the model with one less class should be accepted (Lo, Mendell, & Rubin, 2001). For a more comprehensive description of the LPA approach please see Spurk et al. (2020).

Following the inspection of the theoretical and statistical adequacy of different LPA solutions (see Table 4) we opted for the solution which distinguishes five Profiles, encompassing four balanced profiles with varying levels of total needs satisfaction, and one imbalanced profile. Table 5 presents the focal profiles and their designated labels based on the means of the satisfaction of each basic psychological need associated with each profile. The first four profiles represent balanced needs satisfaction whereby in each profile the means reflecting the satisfaction for each need are similar. The first four profiles differ in terms of the level of satisfaction of each need and, accordingly, the total level of needs satisfaction. For example, profile P1 reflects balance but overall low levels of needs satisfaction, whereas profile P4 reflects balance at high levels of overall needs satisfaction. Profile P5 represents imbalance at overall moderate to high levels of needs satisfaction, as the needs for autonomy and competence are highly satisfied, whereas the satisfaction of the need for relatedness is lower. Hence, the proportionality of the satisfaction of each need represents the balance hypothesis and the total level of needs satisfaction the additive hypothesis.

Table 2Means, standard deviations, intercorrelations, and α reliabilities.

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Subjective vitality 1- Midday	<i>0.90–0.93</i>	0.01	0.08	0.15	0.27	0.29	0.19	0.10	0.41	−0.24	0.34
2. Office-home working- Midday	−0.12	–	−0.05	−0.24	0.00	−0.04	−0.28	−0.14	0.04	−0.02	0.12
3. Leader support - End of work	0.38	−0.14	<i>0.88–0.94</i>	0.36	0.20	0.23	0.22	0.14	0.20	−0.05	0.07
4. Colleagues' support -End of work	0.41	−0.25	0.56	<i>0.82–0.94</i>	0.20	0.23	0.44	0.19	0.20	−0.04	0.05
5. Need for autonomy – End of work	0.34	−0.08	0.21	0.32	<i>0.83–0.93</i>	0.66	0.37	0.03	0.33	−0.22	0.28
6. Need for competence – End of work	0.41	−0.10	0.11	0.25	0.75	<i>0.88–0.94</i>	0.52	−0.01	0.35	−0.23	0.24
7. Need for relatedness – End of work	0.37	−0.33	0.49	0.69	0.40	0.45	<i>0.88–0.96</i>	0.37	0.23	−0.16	0.15
8. Balanced needs satisfaction	0.28	−0.08	0.49	0.45	−0.12	−0.12	0.55	–	0.18	−0.11	0.15
9. Positive affect – End of work	0.81	−0.05	0.31	0.29	0.35	0.35	0.22	0.16	<i>0.88–0.94</i>	−0.31	0.49
10. Negative affect – End of work	−0.34	0.18	−0.15	−0.29	−0.43	−0.53	−0.32	0.08	−0.20	<i>0.80–0.92</i>	−0.32
11. Subjective vitality 3- Evening	0.85	0.06	0.35	0.29	0.37	0.39	0.26	0.16	0.87	−0.27	<i>0.87–0.93</i>
Mean	3.05	1.68	2.88	3.35	3.76	3.92	3.49	5.38	2.74	1.71	2.45
SD	1.07	0.48	1.15	1.05	0.85	0.77	0.98	1.47	0.98	0.70	0.84

Note. Correlations below the diagonal represent person-level correlations ($N = 85$). Correlations above the diagonal are day- level correlations ($N = 572$). Numbers in **bold** $p < .05$. Along the diagonal, in italics, the α reliabilities range across the 10 days of the study are presented.

Table 3
Multilevel structural equation modeling results.

Within-person direct effects	Need for autonomy - end of work			Need for competence - end of work			Need for relatedness- end of work			Balanced needs satisfaction- end of work		
	Estimate	(SE)	p	Estimate	(SE)	p	Estimate	(SE)	p	Estimate	(SE)	p
Leader support- end of work	0.097	(0.039)	0.013	0.112	(0.038)	0.003	0.056	(0.037)	0.127	0.115	(0.062)	0.062
Colleague support- end of work	0.097	(0.055)	0.081	0.088	(0.057)	0.122	0.334	(0.057)	0.001	0.276	(0.086)	0.001
Need for autonomy- end of work												
Need for competence - end of work												
Need for relatedness- end of work												
Balanced needs satisfaction												
Positive affect- End of work												
Leader support x Colleagues' support										0.256	(0.103)	0.013
T1 Subjective vitality - Midday	0.240	(0.048)	0.001	0.263	(0.051)	0.001	0.181	(0.053)	0.001	0.200	(0.087)	0.021
Office-home working – Midday	0.007	(0.070)	0.920	0.006	(0.249)	0.981	0.016	(0.200)	0.936	–0.220	(0.117)	0.060
Negative affect – End of work												
Residual variance	0.314	(0.032)	0.001	0.305	(0.036)	0.001	0.350	(0.054)	0.001	1.205	(0.149)	0.001
Between-level												
Intercept	3.909	(0.070)	0.001	3.923	(0.065)	0.001	3.512	(0.089)	0.001	5.524	(0.122)	0.001
Residual variance												

Within-person direct effects	Positive affect- end of work			Negative affect-end of work			Subjective vitality - evening		
	Estimate	(SE)	p	Estimate	(SE)	p	Estimate	(SE)	p
Leader support- end of work	0.069	(0.030)	0.020	0.006 (0.026)	0.813		–0.017	(0.033)	0.617
Colleague support- end of work	0.073	(0.042)	0.083	0.031 (0.032)	0.337		–0.031	(0.050)	0.540
Need for autonomy- end of work	0.114	(0.064)	0.076	–0.069 (0.043)	0.110		0.090	(0.069)	0.189
Need for competence - end of work	0.210	(0.071)	0.003	–0.108 (0.072)	0.132		–0.004	(0.069)	0.494
Need for relatedness- end of work	–0.073	(0.060)	0.083	–0.007 (0.054)	0.903		0.007	(0.056)	0.897
Balanced needs satisfaction	0.085	(0.030)	0.004	–0.037 (0.021)	0.076		0.046	(0.029)	0.115
Positive affect- End of work							0.313	(0.039)	0.001
Leader support x Colleagues' support									
T1 Subjective vitality - Midday	0.373	(0.062)	0.001	–0.110 (0.045)	0.014		0.184	(0.051)	0.001
Office-home working – Midday	0.084	(0.066)	0.206	–0.010 (0.061)	0.865		0.181	(0.059)	0.001
Negative affect – End of work							–0.180	(0.062)	0.004
Residual variance	0.307	(0.026)	0.001	0.183 (0.026)	0.001		0.267	(0.028)	0.001
Between-level									
Intercept	2.782	(0.080)	0.001	1.488 (0.080)	0.001		–0.227	(0.772)	0.753
Residual variance							0.118	(0.029)	0.001

Indirect effects				
Outcome	Mediators	Moderator:	95 % CI indirect effect:	
			LL 95% CI	UL 95% CI
(H3)Subjective vitality	Balanced needs satisfaction – Positive affect	High colleague support	0.001	0.0200
		Low colleague support	–0.007	.0030
		Medium colleague support	–0.001	.001
(H1)Subjective Vitality	Positive affect		0.010	0.050

Next, following [Asparouhov and Muthén's \(2014\)](#) procedure for including auxiliary variables in mixture modeling, we tested for profile-specific intercepts of work-domain positive affect and home-domain subjective vitality while controlling for employees' work mode. This analysis allows identifying how latent profiles are associated with distal outcomes of interest. [Table 6](#) presents the results. In line with our theoretical propositions, our results indicate that when the balance of needs satisfaction is held constant, higher total levels of needs satisfaction are associated with higher experiences of positive affect and subjective vitality. This is shown by comparing the displayed intercepts for positive affect and subjective vitality across the four balanced profiles. Accordingly, these results support

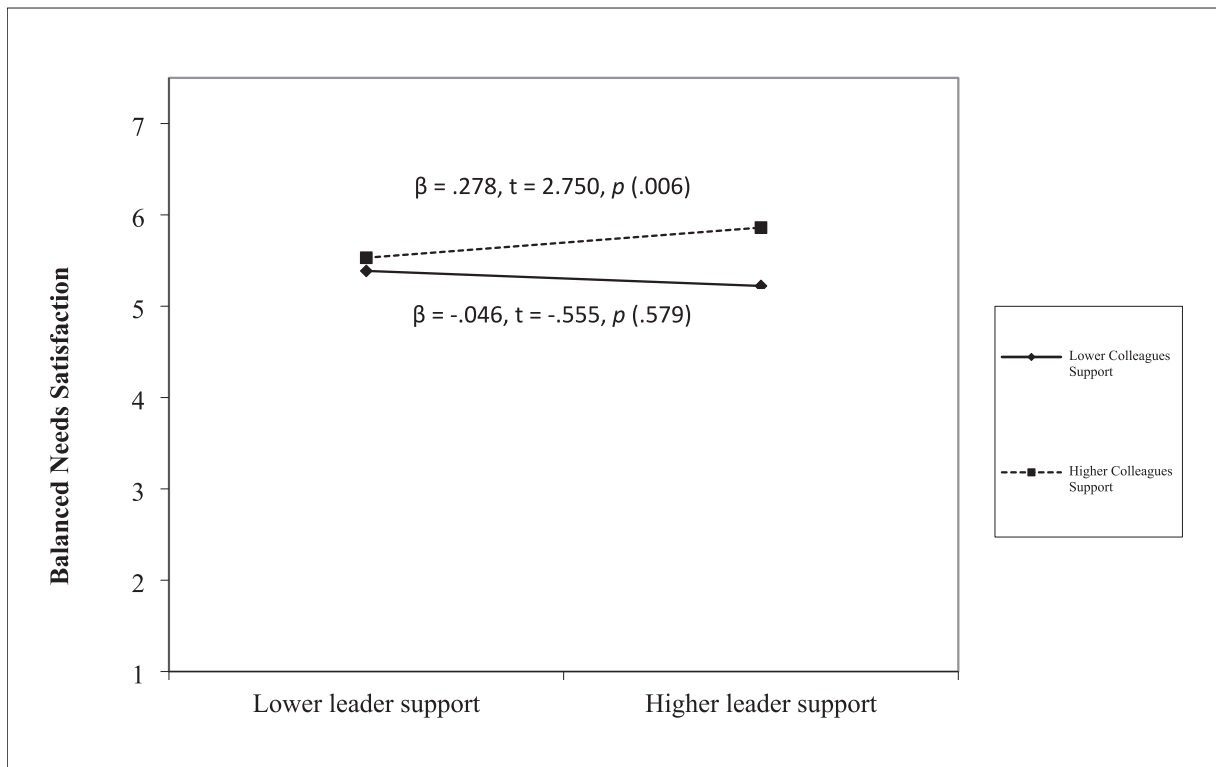


Fig. 2. Interaction effect of colleagues' support on the relationship between leader support and the balanced satisfaction of the basic psychological needs.

Table 4

Fit statistics for the latent profiles and class enumeration.

Model	LL	# of fp	Scaling	AIC	BIC	SSABIC	Entropy	LMR
1 Profile	−2245.973	6	1.078	4503.946	4530.040	4510.993	–	–
2 Profiles	−2039.346	10	1.295	4098.692	4142.183	4110.437	0.837	< 0.001
3 Profiles	−1957.037	14	1.623	3942.075	4002.963	3958.519	0.803	0.152
4 Profiles	−1871.021	18	1.149	3778.043	3856.327	3799.185	0.892	< 0.001
5 Profiles	−1846.629	22	1.150	3737.259	3832.940	3763.100	0.875	< 0.001
6 Profiles	−1826.730	26	1.521	3705.461	3818.538	3736.000	0.883	0.645

Note. LL: loglikelihood; # of fp: number of free parameters; AIC: Akaike Information Criterion; BIC: Bayesian Information Criterion; SSABIC: Sample-Size Adjusted BIC; LMR: p-value associated with the adjusted Lo-Mendell-Rubin likelihood ratio test. **Bold** values indicate that the four-profile solution was selected as the final model.

Table 5

Latent profiles means, variance, and total levels of needs satisfaction.^a

Model	Profile 1	Profile 2	Profile 3	Profile 4	Profile 5	Variance
	Mean	Mean	Mean	Mean	Mean	
1. A-S	1.612	3.050	3.891	4.758	4.349	0.267
2. C-S	1.562	2.891	3.919	4.862	4.304	0.099
3. R-S	1.801	2.711	3.712	4.360	2.065	0.559
T-S	4.975	8.652	11.532	13.98	10.718	–
Profile membership %	2.78 %	18.94 %	49.43 %	21.90 %	6.97 %	

Note: A-S: autonomy satisfaction; C-S: competence satisfaction; R-S: relatedness satisfaction; T-S: Total level of needs satisfaction.

^a Profile means represent the average level of satisfaction for each individual need within a given profile; variance values reflect the within-profile variances for each indicator; total levels represent the accumulated overall needs satisfaction by aggregating each need, in line with the additive hypothesis.

the basic premise of the additive hypothesis.

To draw conclusions for the balance hypothesis we inspected the differences between the first four balance profiles and Profile 5 which represents an imbalanced profile with a moderately high total level of needs satisfaction. Of particular interest is the pairwise comparison between Profiles 2 (Balanced needs satisfaction at medium overall levels) and 5 (Imbalanced needs satisfaction at moderately-high overall satisfaction levels). Our results suggest that there is no significant difference between Profiles 2 and 5 in both positive affect (P2 intercept: 2.473; P5 intercept 2.409) and subjective vitality (P2 intercept: 2.266; P5 intercept: 2.231), although the total level of needs satisfaction for Profile 5 ($\Sigma = 10.718$) is higher than the total level of needs satisfaction for Profile 2 ($\Sigma = 8.652$). Further, support for the balance hypothesis is provided by the pairwise comparison between Profiles 3 (Balanced needs satisfaction at moderately high overall levels) and 5 (Imbalanced needs satisfaction at high overall levels). Results indicate that although the two profiles are close in terms of levels of total needs satisfaction (P3 $\Sigma = 11.532$; P5 $\Sigma = 10.718$), there is a significant difference between Profiles 3 and 5 in both positive affect (P3 intercept: 2.825; P5 intercept 2.409) and subjective vitality (P3 intercept: 2.690; P5 intercept: 2.231). Hence, this supplementary analysis substantiates the robustness of our findings when examined across methodologies and thus supports our core theoretical proposition that balanced needs satisfaction constitutes an additional SDT mechanism complementing the additive hypothesis. It should be noted that although only 6.97 % of the profiles are imbalanced (see Table 5), indicating that a state of imbalanced needs satisfaction is not the most prevalent experience of needs satisfaction, it still affects a notable percentage of employees across days. This highlights the importance of considering the implications of imbalanced needs satisfaction in workplace contexts, as even a relatively small proportion of employees experiencing this state could have meaningful consequences for overall organizational well-being and productivity.

4. Discussion

Reflecting a focal part of SDT, the satisfaction of the three basic psychological needs is considered a crucial determinant of employees' well-being among other aspects of work-related functioning (Ryan & Deci, 2000; Van Den Broeck et al., 2016). Our study primarily aimed at expanding our understanding of how needs satisfaction contributes to employee well-being by examining the balance hypothesis – a theoretical extension of SDT – that complements the additive hypothesis, which has been predominantly focused on by studies on SDT (Sheldon & Niemiec, 2006). To do so we integrated SDT and the WH-R model to develop and test a conceptual model that examines (a) leader and colleagues' support as two key antecedents of needs satisfaction to understand how the interplay of these proximal sources of support contributes to daily balanced needs satisfaction, (b) work-domain positive affect as a key affective mechanism that explains why balanced needs satisfaction has a positive impact on home-domain well-being, and c) home-domain well-being as reflected by subjective vitality to understand how work-domain experiences of balanced needs satisfaction spill-over and affect well-being as an important outcome in the home domain.

Overall, our data support the hypothesized relationships as our results indicate that the interplay of leader and colleagues' support predicts balanced needs satisfaction whereby we find that employees experience the highest levels of balanced needs satisfaction on days when they receive both higher leader and colleague support. Furthermore, our results strongly suggest that at the within-person level, balanced need satisfaction represents an additional complementary mechanism that facilitates employees' well-being over and above the additive satisfaction of each individual basic psychological need. More specifically, our results indicate that balanced needs satisfaction is not only an additional determinant of work-domain well-being but also contributes to the facilitation of a work-home enrichment process as it indirectly predicts home-domain subjective vitality through positive affect as a personal resource. Integrating our hypotheses our results suggest that on days with higher as compared to lower leader and colleagues' support employees are more likely to experience a work-home enrichment process that culminates in enhanced subjective vitality in the home domain. This is because the joint support facilitates balanced needs satisfaction, which puts in motion the generation of positive affect as a personal

Table 6
Intercept and pairwise comparisons for positive affect and subjective vitality between the five profiles.

	Positive affect	Subjective vitality	Profile 1	Profile 2	Profile 3	Profile 4	Profile 5
	Intercept (<i>Residual variance</i>)	Intercept (<i>Residual variance</i>)	Wald test sig	Wald test sig	Wald test sig	Wald test sig	Wald test sig
Profile 1 (Balanced-low total satisfaction)	1.166(0.018)	1.630 (0.042)	–	< 0.001	< 0.001	< 0.001	< 0.001
Profile 2 (Balanced-medium total satisfaction)	2.473(0.608)	2.266 (0.459)	< 0.001	–	0.001	< 0.001	0.804
Profile 3 (Balanced-moderately high total satisfaction)	2.825(0.772)	2.690 (0.638)	< 0.001	0.004	–	0.001	0.001
Profile 4 (Balanced-high total satisfaction)	3.263(0.942)	3.093 (0.818)	< 0.001	< 0.001	0.001	–	< 0.001
Profile 5 (Imbalance- moderately high total satisfaction)	2.409(0.367)	2.231 (0.119)	< 0.001	0.738	0.029	< 0.001	–

Note: Below the diagonal, we present the Wald test's significance for the model including Positive Affect. Above the diagonal, we present the Wald test's significance for the model including Subjective Vitality.

resource that spills over to the home domain and promotes subjective vitality (ten Brummelhuis & Bakker, 2012).

Another interesting finding of our study is that there was no significant relationship between balanced needs satisfaction and negative affect. This suggests that while balanced needs satisfaction may play a positive role in enhancing positive affect and promoting well-being, it may not directly mitigate negative affective states. This outcome aligns with theoretical distinctions within Self-Determination Theory (SDT), which emphasizes that needs satisfaction and needs frustration are conceptually distinct constructs (Vansteenkiste & Ryan, 2013). Specifically, balanced needs satisfaction may primarily foster positive emotional states and optimal functioning, while negative affect may arise more directly from active need frustration rather than from imbalanced needs satisfaction.

4.1. Theoretical contributions

The present study contributes to the literature in three ways. First, it shows that the balance hypothesis provides new insights into how basic psychological needs contribute to employee well-being beyond the additive hypothesis. Our results support theoretical propositions and initial empirical findings that balanced needs satisfaction incrementally predicts well-being over and above the additive satisfaction of each individual need (Milyavskaya et al., 2009; Sheldon & Niemiec, 2006; Tóth-Király et al., 2020; Vansteenkiste et al., 2020). In particular, against the backdrop that research on work-related findings has provided no evidence regarding the benefits of balanced need satisfaction (Dysvik et al., 2013) our study highlights the importance of studying within-person as compared to between-person effects of balanced needs satisfaction due to the more dynamic nature of experiencing balanced needs satisfaction. Accordingly, at the within-person level, our study supports theoretical propositions suggesting that harmonious and balanced experiences of work-related needs satisfaction are positive determinants of well-being in the home and work domain because such experiences are associated with positive emotions (Kumashiro et al., 2008; Ryan & Deci, 2008). By demonstrating that balanced needs satisfaction generates positive daily affective states, we offer empirical support for this theoretical argument and suggest that the unique element of balanced needs satisfaction is that it reflects pleasant harmonious experiences (Sheldon & Niemiec, 2006). Accordingly, our findings allude to the existence of an appraisal process through which individuals evaluate the degree of needs satisfaction. Specifically, our results suggest that individuals might not compartmentalize the perceived satisfaction of their basic psychological needs but rather have a more holistic perception of the degree to which their needs are satisfied. Hence, overall comparative assessments of needs satisfaction experiences are likely to be a valid representation of how individuals construct personalized assessments of the degree of perceived needs satisfaction. That said, our work does not propose that the balance hypothesis should substitute the additive hypothesis, but rather that it complements it. Indeed, drawing on the results of our tested theoretical model and the supplementary latent profile analysis, we demonstrate that both balanced and total levels of needs satisfaction have a role in promoting positive affective and well-being experiences. Hence, our study advances SDT by demonstrating a supplementary pathway through which need supportive environments in the work domain contribute to employee well-being in the home domain.

Second, our study sheds light on important workplace antecedents of the balance hypothesis. To the best of our knowledge, our study is the first to provide an account of how leaders and colleagues, two important contextual sources of support, jointly contribute to balanced needs satisfaction. Given the relative novelty of the balance hypothesis, past research has predominantly focused on the exploration of the uniqueness of the balance hypothesis and the investigation of its contributions to well-being (e.g., Milyavskaya et al., 2009; Sheldon & Niemiec, 2006). Our work provides a novel and more comprehensive assessment of how colleagues' support complements leader support in jointly facilitating balanced needs satisfaction. Upon the examination of the direct effects of leader and colleagues' support on each individual need, our results concur with our theoretical proposition and meta-analytic findings (Slomp et al., 2024) that organizational hierarchies render leader and colleagues' support more likely to differentially contribute to the satisfaction of different needs and associated balanced needs satisfaction. Our results on the direct effects of leader and colleagues' support on each individual need imply that, on a daily basis, leaders might be better positioned to identify and subsequently address impediments in the satisfaction of their employees' needs for autonomy and competence, whereas colleagues might be better positioned to identify and subsequently address impediments in the satisfaction of the focal employees' need for relatedness. Accordingly, our findings suggest that balanced needs satisfaction is most likely to be experienced when employees can draw on the full social support system of their workplace. Thus, our study supports theoretical and empirical considerations suggesting colleagues to be of paramount importance as agents of well-functioning workplaces that often define the relational element of the workplace (Basford & Offermann, 2012; Chiaburu & Harrison, 2008). Additionally, our study's results suggest that leader support is not a panacea and that despite leaders' beneficial impact on followers, they cannot fully substitute the importance of supportive colleagues on a daily basis. Hence, our work suggests that both sources of support play a unique differential role and complement each other in jointly facilitating employees' daily balanced needs satisfaction.

The third contribution of our study lies in the integration of SDT and the W-HR model (ten Brummelhuis & Bakker, 2012), which adds important nuances to both theories. Specifically, by emphasizing the cross-domain effects of balanced needs satisfaction (i.e., from the work- to the home domain), our study extends SDT's applicability to different domains, which opens up potential new research avenues. For example, based on this integration future studies can explore how balanced needs satisfaction facilitates the generation and transfer of personal resources, such as positive affect or energy, across life domains, promoting well-being in interconnected contexts. Our study also extends the W-HR model by introducing balanced needs satisfaction as an additional psychological mechanism that explains, over and above total needs satisfaction, how contextual resources (i.e., leader and colleagues' support) are transformed into personal resources, driving enrichment across domains. While the additive hypothesis explained more variance in well-being indicators, our findings show that balanced needs satisfaction offers a complementary perspective that enriches our understanding of how well-being arises from the configuration — not just the level — of need satisfaction. This is an important theoretical

extension as although the W-HR model identifies contextual resources as initiators of resource accumulation, it does not address the psychological mechanisms underlying this transformation. Balanced needs satisfaction provides a nuanced understanding of why certain contextual resources are particularly effective by demonstrating that albeit the total level of needs satisfaction is the primary driver of work-home enrichment processes, balanced needs satisfaction is an additional and incremental contributor because it reflects pleasant harmonious experiences (Sheldon & Niemiec, 2006), that have a unique incremental effect on well-being. This interpretation is further supported by our LPA results, which showed that profiles with similar total levels of needs satisfaction, but differing levels of balance, were associated with different levels of well-being outcomes. By enabling the transformation of contextual resources into personal resources, this enriched framework bridges theoretical gaps in the W-HR model and offers a comprehensive understanding of the mechanisms underlying work-home enrichment.

4.2. Limitations and suggestions for future research

Despite some relevant contributions, the present study has also some limitations that can inform future research. First, the possibility of common method variance (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003) is raised due to two methodological choices. First, although our measurement of leader and colleagues' support and needs satisfaction explicitly referred to experiences reflecting the whole day, whereas our measurement of positive affect explicitly referred to a momentary assessment, measuring key to our model work domain variables at one-time point (i.e., end of work) raises the possibility of common methods bias (Ohly et al., 2010; Podsakoff et al., 2003). However, given that we find an interaction effect between leader and colleagues' support on balanced needs satisfaction as well as differential effects of balanced needs satisfaction on positive and negative affect as well as by controlling for subjective vitality at noon, our results are unlikely to be a reflection of common method variance but rather reflect the actual relationships between the focal constructs. Obtaining such results patterns is unlikely under the assumption of high common methods variance, because it inflates correlations between variables (Podsakoff et al., 2003) and because it reduces the likelihood of identifying interaction effects (Siemens, Roth, & Oliveira, 2010). The second potential source of common methods bias is the reliance on self-reports for all the variables assessed in the present study (Podsakoff et al., 2003). Future studies should obtain ratings from multiple sources to counter this possibility. For example, leaders and colleagues could rate their respective provision of support or home-domain well-being could be assessed by an employee's partner. Nevertheless, it should be noted that for variables reflecting personal subjective experiences, such as needs satisfaction, positive affect or well-being, other-ratings might not be able to reliably assess these variables (Gabriel et al., 2019).

The second limitation of our study is that due to its correlational design, our study cannot establish causality among the examined relationships. However, it should be noted that we have controlled for levels of subjective vitality at midday, therefore, to an extent, we have controlled for the possibility that the level of perceived subjective vitality at the time of survey completion might influence the retrospective assessment of the other focal variables (Wickham & Knee, 2013). Nevertheless, future research could benefit from examining how the relationship between need-supportive workplace environments and the satisfaction of basic psychological needs evolves over the workday by adopting experimental designs and specifying narrower temporal intervals.

Third, our study did not explicitly consider different forms of leader and colleagues' support (i.e., task-related support, instrumental support, relational support). However, empirical assessments of general support have demonstrated that general support is positively associated with the satisfaction of all needs, as support can be offered across various aspects of an employee's workday (Van Den Broeck et al., 2016). Nevertheless, future research would benefit from incorporating different types of support, such as task-related support, knowledge-sharing support, emotional support, and support for personal growth and development, by providing a more nuanced assessment of the reasons why leaders and colleagues differentially contribute to balanced needs satisfaction.

Beyond future research directions emanating from the outlined limitations, several research avenues can further advance our understanding of balanced needs satisfaction and its role in the work-home enrichment process. Future research could explore whether the existence of upper limits or thresholds for each independent need influence how balanced needs satisfaction is best achieved. For example, if one's need for autonomy is already highly satisfied, additional need-supportive activities targeting that need may not yield further benefits for well-being. Instead, redirecting resources and interventions toward under-fulfilled needs could be more effective in fostering balanced needs satisfaction and associated benefits. This approach would deepen our understanding of the mechanisms through which balanced needs satisfaction can be promoted and its unique contribution to cross-domain resource enrichment processes. Additionally, longitudinal designs could explore the long-term implications of balanced needs satisfaction, shedding light on its role in shaping well-being trajectories and resilience over extended periods. Moreover, sector-specific studies could further explore how organizational contexts and job demands influence the ability to foster balanced needs satisfaction. For instance, highly demanding contexts such as healthcare or emergency services may pose unique challenges to achieving balanced needs satisfaction due to the nature of the work and the often-limited opportunities to satisfy autonomy or competence needs. Conversely, less demanding work environments and flexible work arrangements, such as remote knowledge work, might provide greater opportunities for balanced needs satisfaction, particularly through enhanced autonomy. Investigating these contextual differences could help identify tailored interventions that optimize balanced needs satisfaction and resource enrichment processes across diverse workplace settings. These directions would deepen our understanding of the dynamic, cross-domain processes of resource enrichment and extend the applicability of both SDT and the W-HR model.

4.3. Practical implications

Our research offers practical implications that might be helpful for organizations and leaders alike to foster a need supportive work

environment that promotes employee well-being. As our study indicates that balanced needs satisfaction is an additional determinant of well-being as it induces positive affective states, leaders should not choose to satisfy any random need. Leaders should rather focus on the need least satisfied to promote balanced needs satisfaction and at the same time contribute to increased total levels of needs satisfaction. This could be accomplished either by themselves or by creating the conditions whereby employees could draw support from their colleagues. For example, if leaders identify that the need for autonomy is not proportionately satisfied they could encourage employees to take ownership of their work and make decisions on their own. Importantly, while interventions should aim to improve balance, they should not do so by reducing the satisfaction of already well-fulfilled needs, as this would risk undermining the independent benefits associated with total need satisfaction. Instead, balance should be enhanced through targeted support of under-satisfied needs, allowing organizations to simultaneously leverage both the additive and balance perspectives to optimize employee well-being. Further, because colleague support is an important determinant of relatedness needs satisfaction, if leaders identify impediments in the satisfaction of the employees' need for relatedness, they could encourage collaboration and teamwork and provide opportunities for employees to socialize and build relationships. Moreover, at the organizational level organizations should prioritize introducing initiatives that would increase the availability of support so that employees can draw on these initiatives and achieve balance. For example, the HRM literature offers several policies and initiatives, such as career development, training, direct employee participation, developmental appraisal, and mentoring that can create fertile ground for the satisfaction of each need (Marescaux, De Winne, & Sels, 2013) and accordingly balanced needs satisfaction. Finally, given the importance of colleagues' support, leaders could promote inter-colleagues support by being role models. Drawing on servant leadership theory we know that leading by example can show employees that their leader is willing to support and help others (Liden, Wayne, Liao, & Meuser, 2014). This can encourage employees to do the same with their colleagues (Liden et al., 2014), and accordingly, colleagues' supportive behaviors could jointly with leaders' efforts contribute to the balanced satisfaction of basic psychological needs.

5. Conclusion

This study advances our understanding of the balance hypothesis within the framework of Self-Determination Theory (SDT) by exploring its predictors and implications for cross-domain well-being. By integrating SDT with the Work-Home Resources (W-HR) model, we demonstrate how balanced needs satisfaction serves as a psychological mechanism that facilitates the transformation of workplace support into personal resources, driving enrichment across life domains. Our findings highlight the complementary roles of leader and colleague support in promoting balanced needs satisfaction, positive affect, and ultimately, home-domain well-being. The use of an experience sampling methodology allowed us to capture the dynamic and cross-domain nature of these processes, providing nuanced insights into daily resource interactions. These contributions not only expand the applicability of SDT to cross-domain contexts but also address theoretical gaps in the W-HR model, paving the way for future research to further examine the temporal, contextual, and sector-specific factors influencing balanced needs satisfaction and its broader implications.

CRedit authorship contribution statement

Ioannis Kratsiotis: Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization, Writing – review & editing, Writing – original draft. **Wladislaw Rivkin:** Supervision, Methodology, Formal analysis, Data curation, Conceptualization, Writing – review & editing. **Nicholas Theodorakopoulos:** Resources. **Charlotte Hohnemann:** Data curation.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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