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Job Engagement Trajectories: Their Associations with Leader-Member Exchange and their Implications for Employees

István Tóth-Király†
Substantive-Methodological Synergy Research Laboratory, Concordia University
& Statistics Canada, Ottawa, Canada
Nicolas Gillet†
QualiPsy EE 1901, Université de Tours, Tours, France
Institut Universitaire de France (IUF)
Joseph Inhaber†
Substantive-Methodological Synergy Research Laboratory, Concordia University
Simon A. Houle
Substantive-Methodological Synergy Research Laboratory, Concordia University
Christian Vandenberghe
Management Department, HEC Montréal
Alexandre J.S. Morin
Substantive-Methodological Synergy Research Laboratory, Concordia University

† The first three authors (I.T.K, N.G, & J.I.) contributed equally to the preparation of this article, their order was determined at random: All three authors should be considered first authors.

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Corresponding author:
István Tóth-Király, Substantive-Methodological Synergy Research Laboratory
Department of Psychology, Concordia University
7141 Sherbrooke W, Montreal, QC, Canada, H3B 1R6
Email: tothkiralyistvan@gmail.com; istvan.toth-kiraly@statcan.gc.ca

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Abstract

The present study seeks to achieve a dynamic understanding of employees' job engagement trajectories, and of their time-structured associations with leader-member exchange (LMX) and outcomes related to psychological adaptation (turnover intentions, emotional exhaustion, job satisfaction, and life satisfaction). A sample of 285 employees was surveyed three times (six months apart) over a one-year period. Results revealed that employees' global job engagement followed high and stable trajectories, their specific cognitive and emotional job engagement followed slightly decreasing trajectories, and their specific physical engagement displayed non-linear trajectories characterized by an initial decrease followed by a slight increase. Specific LMX-contribution and LMX-professional respect were associated with positive fluctuations in global job engagement, whereas global LMX was associated with positive fluctuations in specific emotional engagement. Specific LMX-loyalty and LMX-affect (at Time 1 only) were associated with positive fluctuations in specific physical engagement, whereas global LMX was negatively associated with these fluctuations. Higher global job engagement and specific emotional engagement were associated with negative fluctuations in turnover intentions and emotional exhaustion, and with positive fluctuations in job satisfaction. Higher specific physical engagement was associated with negative fluctuations in job satisfaction, whereas higher specific cognitive engagement was associated with lower life satisfaction.

Keywords: Job engagement; trajectories; latent curve modeling (LCM); leader-member exchange (LMX); turnover intentions; emotional exhaustion; job satisfaction; life satisfaction.

Practitioner points

- Job engagement and LMX has a dual nature including global and specific aspects that needs to be properly disaggregated to obtain unbiased results.
- Global job engagement demonstrated high and stable trajectories, whereas specific cognitive, emotional and physical engagement showed some degree of malleability.
- The global and specific levels of LMX had differing effects on these trajectories.

Over the past decade, the topic of employee engagement has become increasingly popular among organizational researchers and practitioners (Byrne et al., 2016; Meyer & Schneider, 2021). This newfound enthusiasm can be partially attributed to the numerous claims that engaged employees are key to achieving organizational success and competitiveness (Macey et al., 2009; Rich et al., 2010). Furthermore, these claims seem substantiated by evidence of positive relations between job engagement and a variety of desirable outcomes including higher job and life satisfaction, and lower emotional exhaustion and turnover intentions (e.g., Gillet et al., 2019; Huyghebaert-Zouaghi et al., 2021). With this in mind, recent reports revealing low levels of employee engagement in the workforce are troubling (Harter, 2020; Harter et al., 2002). For instance, in 2020, only 20% of employees were actively engaged at work, resulting in costs due to a reduction in productivity corresponding to $483 to $605 billion for the U.S. economy and $8.1 trillion for the global economy (nearly 10% of the global GDP) (Gallup, 2021). These alarming statistics highlight the need to better understand the drivers of job engagement that can be controlled by organizations and managers.

Even though many studies have sought to improve our understanding of job engagement, most of these studies did not account for the multidimensional nature of job engagement. Indeed, as detailed in the subsequent sections, job engagement is often measured along three interrelated specific dimensions reflecting physical, emotional and cognitive engagement. At the same time, these three dimensions can also be perceived in a holistic manner as a representation of employees' global levels of engagement with their jobs. Unfortunately, a lack of consideration of these two (i.e., global and specific) layers could lead to imprecise measurement, biased estimates of the associations with other constructs and even inconsistent practical implications regarding these associations (Asparouhov et al., 2015; Mai et al., 2018). Thus, as a first contribution, the present research was designed to address this limitation by accounting for the multidimensional structure of job engagement.

Moreover, although job engagement is generally considered to be a dynamic construct that fluctuates over time (Sonnentag et al., 2021), only a handful of studies have adopted a methodological approach that accounts for this dynamic perspective (Hofmans et al., 2021). As a second contribution, the present study longitudinally addresses this limitation through latent curve modeling (LCM; Bollen & Curran, 2006) to achieve a better understanding of how job engagement trajectories evolve over a one-year period. To better understand the factors involved in the evolution of these trajectories, as a third contribution, we consider their time-structured associations with leader-member exchange (LMX). Indeed, social resources are theoretically seen as key determinants of well-being and functioning (Hobfoll et al., 1990) and employees' relationships with their supervisors are arguably one of the most important relationships employees develop in the workplace (Thomas et al., 2013). Finally, we also examined the implications of these trajectories for employees' psychological adaptation (i.e., turnover intentions, emotional exhaustion, job satisfaction, and life satisfaction).

The present study thus seeks to improve our understanding of the dynamic evolution of global and specific dimensions of job engagement, of the role of LMX as a time-structured driver of job engagement trajectories, and of the role of these trajectories for employees optimal functioning. Achieving a better understanding of the time-structured evolution of job engagement and of a theoretically relevant set of key drivers (i.e., LMX dimensions) and outcomes (i.e., job and life satisfaction, emotional exhaustion, and turnover intensions) will help enrich our understanding of job engagement. From a practical perspective, this knowledge represents an important prerequisite to the design of effective interventions seeking to nurture, support, and enhance employees' engagement at work and, in so doing, to support their optimal functioning. For example, observing that job engagement followed a stable trajectory would be consistent with developmental rigidity and would thus support the need to devise intervention strategies seeking to enhance its emergence early in employees' careers. In contrast, identifying less fixed trajectories would be consistent with a greater level of malleability and environmental reactivity which would, in turn, support the use of ongoing intervention strategies. Likewise, understanding the time-structured role of LMX for job engagement should also help maximize the success of interventions by highlighting how intervention seeking to improve the quality of the exchange relationships between leaders and followers might be structured over time in order to maximise their benefits in terms of job engagement, and the benefits of this engagement for their work functioning more generally.

A Multidimensional Perspective on Job Engagement

Kahn (1990) depicted job engagement as "the harnessing of organizational members' selves to their work roles” (p. 694). Engaged employees invest themselves physically, cognitively, and emotionally into their work roles (Kahn, 1990; Rich et al., 2010). *Physical* engagement occurs when employees invest efforts and energy into their work roles (e.g., they exert a lot of energy in their job). *Cognitive* engagement occurs when employees invest cognitive resources into their work through attentiveness and concentration, leading them to become fully absorbed by and focused on their work roles (e.g., at work, their mind is focused on their job). *Emotional* engagement occurs when employees feel a sense of enthusiasm, interest, and excitement when invested in their work roles (e.g., they are excited about their job). Although physical, cognitive, and emotional engagement are different in that they describe complementary aspects of engagement, described as the hands, head, and heart, respectively, by Ashforth and Humphrey (1995), Kahn (1992) proposed that the simultaneous maintenance of all three forms of engagement is needed for employees to be proactively and efficiently involved in their work roles, suggesting that these dimensions should be conceptualized in a holistic manner. Indeed, beyond the recognition that a complete picture of job engagement requires the consideration of these three interrelated dimensions, job engagement has always been conceptualized as a hierarchically organized multidimensional construct, where the three dimensions jointly define employees' global levels of job engagement (Rich et al., 2010). Supporting this representation, research has shown that, despite their distinctive nature, the three components are also experienced holistically (Gillet et al., 2020; Houle et al., 2022; Rich et al., 2010; for similar results relying on different operationalizations of engagement, see Gillet et al., 2018c, 2019; Tóth-Király et al., 2021). These studies further suggest that an accurate operationalization of job engagement should disaggregate employees’ global levels of job engagement (G-engagement) from the specific levels of physical (S-physical), cognitive (S-cognitive), and emotional (S-emotional) engagement left unexplained by the G-engagement factor (e.g., Gillet et al., 2018c, 2019, 2020).

From a theoretical perspective, distinguishing among global and specific facets of job engagement provides important information regarding the unique relevance of each component (i.e., physical, cognitive, and emotional) beyond what they all share with one another. For example, a study using a traditional operationalization of job engagement might report similar associations between cognitive and emotional engagement and a specific outcome variable, but a lack of association between physical engagement and the same outcome. However, knowing that the three dimensions are highly correlated, this conclusion might simply reflect the fact that the explanatory power of physical engagement fully overlaps with that of cognitive and emotional engagement, rather than a lack of a true, unique effect of physical engagement. In contrast, a study that properly disaggregates the global and specific levels of job engagement might rather indicate that the outcome variable is explained by employees’ global levels of job engagement shared across the cognitive, emotional, and physical components (thus supporting the idea that all three are important), with some additional effects associated with employees’ specific levels of emotional engagement (supporting the idea that being emotionally engaged plays an additional role beyond what it shares with the others). This interpretation is consistent with recent recommendations (Gillet et al., 2020; Houle et al., 2022; Rich et al., 2010) stressing the importance of disaggregating global (across all dimensions) and specific (unique to each dimension; reflecting imbalance in that engagement dimension relative to the global levels) levels of job engagement to achieve a clearer picture of the unique and complementary role played by each facet of this multidimensional construct. Despite the recently established superiority of this G/S operationalization of job engagement, research is still needed to examine how it evolves over time and how it relates to specific determinants and outcomes from a dynamic perspective. The present study seeks to fill that gap by relying on the G/S operationalization of job engagement.

A Longitudinal Perspective on Job Engagement

Job engagement, like many other psychological constructs (Hofmans et al., 2021; Navarro et al., 2020), has never been conceptualized as a static phenomenon, but rather as a dynamic construct which fluctuates over time and shares time-structured associations with other constructs (e.g., Byrne et al., 2016; Crawford et al., 2010; Sonnentag et al., 2021). Unfortunately, the bulk of research on job engagement has relied on cross-sectional designs, or on limited longitudinal designs (including only two measurement points; Gillet et al., 2020; Rich et al., 2010), making it impossible to capture the dynamic nature of job engagement trajectories (Fletcher et al., 2018). To inform this issue, which is a core objective of the present study, more extensive longitudinal designs (i.e., including three or more time points) are necessary (Kelloway & Francis, 2013). This study addresses this limitation using a sample of employees surveyed three times, six months apart, over a one-year period (Elliott et al., 2019). The use of six-month time intervals is consistent with time separation recommended for the study of job attitudes (e.g., Podsakoff et al., 2012).

Two complementary theoretical perspectives provide guidance regarding the expected shape of job engagement trajectories (Makikangas et al., 2016). First, a variety of models note that humans, by homeostatic principles, are driven to seek balance in their interactions with their environment (e.g., the homeostasis model: Cummins et al., 2002; the dynamic equilibrium model: Headey & Wearing, 1989; the self-equilibrium model; Morin et al., 2013, 2017). From this perspective, job engagement, like most other psychological characteristics, should display some stability reflecting an employee's "trait-like" tendencies anchored in their genetic predispositions, personality, and exposure to generally stable environmental conditions. Obviously, for most dynamic psychological constructs, positive or negative "state-like" fluctuations (i.e., deviations) can still occur around these generally stable trait-like trajectories, resulting from internal or external changes. However, homeostatic principles are expected to bring back these deviations to their original level. This stability perspective thus suggests that trait-like trajectories of job engagement should remain relatively stable over time, even though time-specific fluctuations around these trajectories remain possible for some employees. Supporting this perspective, relatively high rank-order estimates of stability were reported by Hakanen and Schaufeli (2012: M = .77 across periods of three to seven years) and Simbula et al. (2011) (M = .79 across periods ranging from one school term to one academic year) for employees' levels of engagement. Similarly, van den Heuvel et al. (2020) reported no overall change in job engagement during the first five weeks following the implementation of an organizational change, while also highlighting inter-individual differences in the shape of these trajectories.

In contrast, conservation of resources theory (Hobfoll, 1989) as well as the broaden-to-build theory (Frederickson, 1998) both emphasize the malleability of job engagement. More specifically, based on these theories, job engagement levels can increase or decrease due to the availability of various personal and environmental resources, their fluctuations, and even their accumulation. When lots of resources are available, employees might become more engaged with their jobs. Conversely, when resources become scarce, they might not be able to maintain their previous levels of engagement. Empirical studies support these propositions. For instance, in a sample of junior physicians, who have yet to achieve full integration to their occupations and workplaces, Heinrichs et al. (2020) reported lower rank-order stability coefficients, ranging from $r = .61$ over a one-year period to $r = .47$ over a ten-year period. Likewise, other studies have found job engagement to slightly increase as a function of age among mixed samples of employees (James et al., 2011; Kim & Kang, 2017), whereas Zuo et al. (2021) noted that job engagement tends to slightly decrease over time over five days among two samples of employees (entrepreneurs undergoing a professional development program and a mixed sample of employees). Despite this small decline, Zuo et al.'s results also revealed the presence of substantial inter-individual heterogeneity in the shape of job engagement trajectories. In contrast, in a one-year longitudinal study of white-collar employees, Alessandri et al. (2018) noted that job engagement increased slightly over time.

It is important to note that "trait-like" tendencies can still evolve over time (e.g., Morin et al., 2013, 2017), which may occur when the internal or external changes leading to fluctuations in job engagement are maintained long enough to override the homeostatic principles. A chronic and persistent exposure to these internal or external changes is likely to exert a stable influence on employees' job engagement which might, in turn, demonstrate a slow but steady downward, or upward, evolution over a longer period of time. Thus, while temporary, situation-specific exposure to changes might only result in short-term dynamic fluctuations in job engagement, repeated, persistent and chronic exposure to the same changes could catalyze a new normative way of functioning characterized by slowly decreasing, or increasing, job engagement levels.

To reconcile these different perspectives, de Wind et al. (2017) used growth mixture analyses to better capture inter-individual differences in job engagement trajectories. Their results revealed four profiles of older employees (55-62 years) presenting distinctive job engagement during the three-year period preceding their retirement: (a) high initial levels followed by a stable trajectory; (b) low initial levels followed by a stable trajectory; (c) high initial levels followed by a decreasing trajectory; and (d) low initial levels followed by an increasing trajectory. Interestingly, these profiles support both perspectives, providing evidence of stability and change for different types of employees.

Yet, despite the possibility to reconcile these divergent theoretical perspectives, it remains difficult to make sense of the differing results obtained from previous studies, partly because most of them have relied on specific samples of employees (i.e., white-collar employees: Alessandri et al., 2018; dentists: Hakanen & Schaufeli, 2012; junior physicians: Heinrichs et al., 2020; entrepreneurs: Zuo et al., 2021, Study 1; employees exposed to organizational changes: van den Heuvel et al., 2020; school teachers: Simbula et al., 2011; pre-retired older employees: de Wind et al., 2017) and different time points (i.e., from five days to 10 years). This calls into question the generalizability of these findings and their relevance to employees "in general" and to a more "normative" period within employees' careers. Indeed, before seeking to understand how job engagement evolves within specific samples, it is important to first document how it unfolds over time among more generic samples of employees, if only to help us better understand the role played by these specificities. The present study addresses this issue by relying on a generic sample of employees from a variety of occupations. Previous studies (e.g., de Wind et al., 2017; Zuo et al., 2021) highlighted differences in how employees' job engagement might change over time: some employees might experience positive trajectories (high or increasing), while others might experience moderate (average) or problematic (decreasing) trajectories. As a result, we expected job engagement trajectories to be characterized by substantial inter-individual variability due to their experiences not being completely the same. At the same time, the divergent nature of previous conclusions, coupled with the fact that no previous study relied on a proper disaggregation of G/S job engagement components, make it hard to formulate specific hypotheses regarding the expected shape of the job engagement trajectories that will be observed for each G/S component of engagement in the present study. Still, given our focus on a generic sample of employees in their normative periods, we propose the following predictions:

Hypothesis 1. Both global and specific levels of job engagement will demonstrate significant inter-individual variability over a one-year period.

Hypothesis 2. On average, global and specific levels of job engagement will not change substantially (i.e., display more stability than change over time).

LMX as a Dynamic Determinant of Job Engagement Trajectories

Job engagement is conceptualized as an indicator of positive psychological functioning at work emerging from the experience of a congruence between employees' own goals and values and those of their work environment (Kahn, 1990; Rich et al., 2010). As a result, job engagement trajectories should demonstrate reactivity to fluctuations in employees' work context (Gillet et al., 2015; Sonnentag, 2017). To accurately grasp the dynamic nature of the time-structured associations between work characteristics and job engagement trajectories to guide the development of dynamic interventions, longitudinal methods are required. Unfortunately, with few exceptions (Heinrichs et al., 2020; James et al., 2011), previous studies seeking to improve our understanding of job engagement dynamics did not examine work characteristics as time-structured predictors of job engagement.

The present study seeks to add to our understanding of the time-structured contextual predictors of job engagement trajectories by considering the role played by LMX, a construct reflecting the quality of the bidirectional social exchange relationship between employees and supervisors (Dienesch & Liden, 1986; Liden & Maslyn, 1998) which has also been found to be dynamic (Ellis et al., 2019; Kangas, 2013). LMX is known to be influenced by how supervisors initiate the exchange process with employees (Liden & Maslyn, 1998). By virtue of their position, supervisors' relationship with their employees may influence their functioning, attitudes and behaviors at work (Kelloway & Barling, 2010; Wang et al., 2022). In high-quality exchange relationships, employees are likely to reap the benefits of these relationships (e.g., mentoring, more time and direction, access to additional resources), making their perceptions of these exchanges particularly important targets of research. This approach is also in line with other areas of research (e.g., Clarkson et al., 2010) arguing that subjective perceptions matter more with respect to one's functioning than the actual reality.

LMX is typically viewed as a dynamic multidimensional construct encompassing different components (i.e., loyalty, affect, contribution, and professional respect; Liden & Maslyn, 1998) expected to play distinct, yet complementary roles (Olsson et al., 2012). Following Liden and Maslyn's (1998) conceptualization of LMX, loyalty reflects the public demonstration of supervisor's support for the actions and character of an employee; affect refers to the mutual affection held by employees and supervisors; contribution entails the investment of employees' work-oriented efforts toward supporting the mutual goals of the employee-supervisor dyad; and professional respect is defined as employees' perceptions of the supervisor's reputation as a productive and efficient worker. Despite this multidimensional view, most researchers have examined LMX as an overarching and global construct (e.g., Rockstuhl et al., 2012). Although Liden and Maslyn (1998) argued for the multidimensional operationalization of LMX, they also found support for a unique contribution of each LMX component to the global LMX construct. To reconcile these two perspectives, recent research has demonstrated that LMX, just like job engagement, better matched a G/S operationalization (Gillet et al., 2022), where the joint effects of global LMX perceptions and unique effects associated with each LMX component are considered.

LMX positively associates with trust, autonomy, positive self-perceptions, and positive social interactions at work (Carnevale et al., 2017; Montano et al., 2017). From this perspective, LMX may foster the satisfaction of the psychological needs for autonomy, competence, and relatedness (Graves & Luciano, 2013; Kuvaas & Buch, 2020), which are critical drivers of intrinsic motivation, well-being, and performance according to self-determination theory (Deci et al., 2017; Ryan & Deci, 2017). By supporting these needs, LMX should encourage employees to invest more energy into their work (e.g., Graves & Luciano, 2013; Gillet et al., 2018b), leading to higher levels of job engagement (e.g., Sandrin et al., 2022). Although this assertion has been empirically supported (Agarwal et al., 2012; Tanskanen et al., 2019), the time-structured effect of LMX on employees' job engagement trajectories is not well-understood. While research has traditionally treated LMX as a stable phenomenon with little environmental reactivity, evidence also suggests that employees' perceptions of their leaders (Breevaart et al., 2012) and coworkers (Simon et al., 2010) change over time, suggesting that LMX may be similarly dynamic and reflect the evolving nature of employee-supervisor exchange relationships (Ellis et al., 2019; Kangas, 2013). In line with this view, Ellis et al. (2019) positioned LMX as a job resource which fluctuates over time due to change in employees' and leaders' expectations, work conditions, and needs. As a result, it is difficult for both parties to continuously maintain the same level of social exchange and reciprocity over time. Therefore, LMX perceptions are likely to vary over time. Empirically, while some studies have reported high stability among LMX perceptions (e.g., Robert & Vandenberghe, 2021), other studies have reported daily variability (Ellis et al., 2019) and moderate rank-order correlations (e.g., Gregersen et al., 2016; Nahrgang et al., 2009; Wang et al., 2022) for LMX. Still other studies have reported change in LMX over 12 months (Chen et al., 2021) and that dynamic relationships between LMX and antecedent and outcome variables extend over periods as long as 7 years (Park et al., 2015). Our approach is consistent with a long-term change perspective on LMX.

If LMX does indeed fluctuate over time, then a proper understanding of its association with job engagement requires considering the time-structured dynamic nature of the constructs. Arguing that the LMX-job engagement association is time-structured does not mean that the strength of the association will change over time, but simply that it would not be sufficient to assess how one construct measured at a single point in time may relate to the other one at the same, or another, point in time. It requires examining the association across all time points to understand how time-specific fluctuations in one construct can lead to time-specific fluctuations in the other. Thus, although previous research has generally ignored this dynamic nature, the bulk of current evidence allows us to expect positive associations between LMX at any given time point and time-specific increases (relative to one's job engagement trajectory) in job engagement levels. In the current study, we relied on six-month time intervals between waves to allow employees' job engagement trajectories to display some trait-like evolution between simple state-like fluctuations (i.e., allowing time for the changing trajectories to reach a new homeostasis), while also allowing for LMX to change over that same period. This assertion is consistent with previous longitudinal research on job engagement and LMX as it goes beyond the observation of daily fluctuations likely to return to their initial levels (e.g., Bakker, 2014) and makes it possible to capture evolution over a period long enough to allow for change to occur while remaining short enough to capture changes that may be missed over longer periods (e.g., Hakanen & Schaufeli, 2012).

Due to the lack of prior theoretical development and studies specifically addressing how the association between LMX and job engagement should differ across their subdimensions, particularly from a G/S disaggregation perspective, it is hard to draw hypotheses for the specific associations between and G- and S-factors. However, as theory and empirical evidence suggest that the LMX-job engagement relation may be dynamic and as each subdimension of these constructs is unique, it is worth investigating their dynamic association from a subdimension perspective. This endeavor would help fill an important gap in our knowledge which, once resolved, is likely to contribute to generate future theoretical developments (e.g., Antonakis, 2017).

Prior research using a comprehensive operationalisation of job engagement (Gillet et al., 2020; Houle et al., 2022) or LMX (Gillet et al., 2022) allows us to formulate some predictions. First, these studies have generally demonstrated that the global (G) component of both constructs typically presents the strongest and most widespread associations with a variety of predictors or outcomes. Second, these studies have also demonstrated that at least a subset of specific (S) dimensions of both constructs also demonstrate unique and well-differentiated associations with a subset of predictors and outcomes. Although it would be tempting to posit that global levels of LMX should influence all facets of job engagement beyond their likely effect on employees' global levels of job engagement, this assertion would not be consistent with the theoretical underpinnings of Kahn's (1990) conceptualization of job engagement. On the one hand, cognitive engagement refers to employees' ability to invest cognitive resources into their work, such as staying concentrated and absorbed (Houle et al., 2022), and is thus likely to be more strongly associated with characteristics of the work itself rather than on social aspects of the work environment such as LMX. Similarly, physical engagement, defined as an investment of energy into one's work, is also somewhat devoid of a true social underpinning, hence should depend on other situational characteristics influencing how much energy one is able to devote to working. Moreover, a strong LMX may also lead an employee to develop a sense of relational security with the supervisor such that they no longer feel the urge to invest more energy than needed. Thus, based on the relational nature of LMX, we expect the largest associations to occur between global levels of LMX and employees' emotional engagement. Thus, employees who report a strong combination of affect, loyalty, contribution, and professional respect should experience higher levels of emotional engagement.

As global engagement stems from the variance shared between emotional, cognitive, and physical engagement, it is unclear how much of an impact LMX will have on employees' global levels of job engagement. In fact, for the reasons discussed above, global levels of LMX may not predict global levels of engagement as strongly as they should predict specific levels of emotional engagement. Turning our attention to the four LMX dimensions, we posit that the facet most likely to influence global (and possibly physical) levels of job engagement should be LMX-contribution, because it fosters the exchange relationship by focusing on achieving mutual goals (Dienesch & Liden, 1986; Liden & Maslyn, 1998; Robert & Vandenberghe, 2020). In contrast, the remaining facets of LMX (i.e., affect, professional respect, and loyalty) should primarily influence employees' specific levels of emotional engagement (just as global levels of LMX) and global levels of job engagement. Contrary to LMX-contribution, these LMX dimensions have an attitudinal and emotional background. LMX-affect represents mutual affection, LMX-loyalty refers to public support and faithfulness, while LMX-professional respect reflects admiration for the dyad partner's reputation (Liden & Maslyn, 1998), all of them being indications of engaging leadership (Rahmadani et al., 2019). These dimensions not only have an emotional connotation, but are also relatively broad in scope, thereby fostering global levels of job engagement. Thus, the following hypothesis is proposed:

> ***Hypothesis 3***. Employees' time-specific perceptions of the G- and some (but not all) S-components of LMX will be associated with matched increases in their levels of job engagement, with the largest effects unfolding between global LMX and the emotional engagement S-factor, as well as between the LMX-contribution S-factor and global levels of job engagement.

Outcomes of the Job Engagement Trajectories

Although job engagement has been conceived as a core driver of positive functioning at work (Byrne et al., 2016; Kahn, 1990; Rich et al., 2010), the present study expands on prior longitudinal research by considering a broader range of outcomes pertaining to individuals' functioning inside and outside their work settings (Bowling et al., 2015; Erdogan et al., 2012). First, turnover intentions have long been recognized as a direct, and critically important, precursor of a wide variety of undesirable work outcomes (e.g., actual turnover: Cohen et al., 2016; reduced performance: Jiang et al., 2019). Second, we relied on one of burnout's key components, emotional exhaustion which has been identified as a negative indicator of workplace wellbeing (Bakker & Oerlemans, 2011) and has often been related to reduced levels of work performance and organizational citizenship behaviors, due in part to its negative impact on employees' behavioral, motivational, physical, and/or cognitive functioning (Bowling et al., 2015; Taris, 2006). In contrast, as positive indicators of employees' psychological well-being (Monnot & Beehr, 2022), job satisfaction and life satisfaction are typically considered as positive drivers of career satisfaction, job performance, and organizational commitment (Bowling et al., 2015; Erdogan et al., 2012). More specifically, job satisfaction is a positive component of employees' psychological well-being at work (Bakker & Oerlemans, 2011; Ryan & Deci, 2001) and has often been considered as a key source of information about employees' work functioning (e.g., Faragher et al., 2005). Finally, given that work is one of the most important life domains, it is reasonable to assume that employees' work experiences could spill over onto their personal life and the two domains could either be in conflict or enrich one another (Huyghebaert-Zouaghi et al., 2022). This proposition also matches the spillover effect (Hakanen & Schaufeli, 2012) which itself is rooted in conservation of resources theory (Hobfoll et al., 2018). Importantly, all these outcomes were selected due to their known dynamic nature (Dunford et al., 2012; Hale et al., 2016; Reh et al., 2021; Willroth et al., 2021), making them naturally suited to the investigation of time-structured associations with job engagement trajectories.

Many theoretical arguments have been offered to account for the desirable consequences of job engagement. For instance, highly engaged workers have been proposed to be more physically active, cognitively vigilant, and emotionally connected to the pursuit of their work objectives (e.g., Ashforth & Humphrey, 1995). As a result, job engagement should facilitate the demonstration of organizationally valued behaviors, in addition to helping employees to cope with the emotional demands of their work (Kahn, 1990). Likewise, highly engaged employees are typically described as experiencing more positive perceptions of their work role, as viewing their job as more agreeable and stimulating, and has deriving more pleasure from the accomplishment of their tasks, which should lead to more adaptive outcomes (Gillet et al., 2020). In contrast, employees characterized by lower levels of job engagement are generally expected to withhold their physical, cognitive, and emotional energies, leading them to adopt a detached and passive approach to their work (Kahn, 1990). In addition, their lack of interest and volition in relation to work also leads them to limit their interactions with supervisors and colleagues, to miss some workdays, and to refrain from engaging in several tasks (Sandrin et al., 2022), thereby limiting their satisfaction and increasing their turnover intentions. Although research has seldom investigated these specific variables as dynamic outcomes of job engagement trajectories while also accounting for the G/S nature of these trajectories, the bulk of research on job engagement has reported positive associations between job engagement and employees' levels of job and life satisfaction, and negative associations between job engagement and employees' levels of emotional exhaustion and turnover intentions (e.g., Gillet et al., 2019; Huyghebaert et al., 2018b; Huyghebaert-Zouaghi et al., 2021). Thus, we propose that:

Hypothesis 4. Across dimensions, employees' time-specific levels of job engagement will be associated with matched increases in their levels of job and life satisfaction, and with matched decreases in their levels of emotional exhaustion and turnover intentions.

Method

Procedure and Participants

Online questionnaires were sent to a pool of prospective participants affiliated with companies located in the Canadian province of Quebec. Participants were also recruited through the network of the research team (e.g., LinkedIn, personal contacts). Respondents did not receive any rewards or incentives for participation and the maximum survey completion time was around 15-20 minutes. At Time 1, prospective participants were contacted via an email describing the goals of the study, ensuring that responses would be confidential, and providing a link to the questionnaire. Time 1 respondents were then contacted again six (Time 2) and twelve (Time 3) months after Time 1 to complete the same questionnaires (having the possibility to withdraw from the study at any time). Participants occupied a range of occupations (e.g., managers, salespersons) and were employed in a variety of public and private organizations from diverse industries (e.g., manufacturing, finance).

A total of 285 respondents (63.9% female), aged between 21 and 66 (M = 38.88, SD = 10.30) participated at Time 1. Among them, 92.7% had a full-time job, while 7.3% had a part-time job. Close to one-third (36.8%) of the respondents reported occupying a managerial position. More than half (55.8%) of the participants worked in the private sector. Respondents worked in manufacturing (11.7%), commerce and transportation (5.5%), finance, insurance, real-estate and public administration (14.5%), professional services (23.7%), education (13.1%), health and social services (16.4%), and other services (15%). Of those 285 initial participants, 154 also completed the Time 2 questionnaire, and 118 completed the Time 3 questionnaire. More precisely, out of the 285 participants considered in this study, 128 participated in a single measurement occasion (Time 1), 43 participated in two measurement occasions (Time 1, and either Time 2 or Time 3), and 114 participated in all three measurement occasions[1].

Measures

Job Engagement. Job engagement was assessed using the French version (Gillet et al., 2020) of the Job Engagement Scale (JES; Rich et al., 2010). The JES captures the three dimensions of job engagement described in Kahn's (1990) theoretical model: (a) *physical engagement* (6 items; e.g., "I try my hardest to perform well on my job"; α_{t1} = .903; α_{t2} = .923; α_{t3} = .918); (b) *cognitive engagement* (6 items, e.g., "At work, I focus a great deal of attention on my job"; α_{t1} = .899; α_{t2} = .923; α_{t3} = .904); and (c) *emotional engagement* (6 items, e.g., "I feel positive about my job"; α_{t1} = .890; α_{t2} = .922; α_{t3} = .899). Scale score reliability estimates for participants' global levels of job engagement across all three dimensions were also satisfactory (α_{t1} = .950; α_{t2} = .956; α_{t3} = .952). All items were rated on a 1 (*strongly disagree*) to 5 (*strongly agree*) response scale.

LMX (Predictor). Participants rated their exchange relationship with the supervisor using the French version (El Akremi et al., 2010; Gillet et al., 2022) of Liden and Maslyn's (1998) LMX instrument. This measure covers four subscales related to: (a) *loyalty* (3 items; e.g., "My supervisor defends my work actions to a superior, even without complete knowledge of the issue in question"; α_{t1} = .900; α_{t2} = .943; α_{t3} = .940); (b) *affect* (3 items; e.g., "I like my supervisor very much as a person"; α_{t1} = .926; α_{t2} = .941; α_{t3} = .931); (c) *professional respect* (3 items; e.g., "I respect my supervisor's knowledge of and competence on the job"; α_{t1} = .933; α_{t2} = .937; α_{t3} = .940); and (d) *contribution* (two items; e.g., I do work for my supervisor that goes beyond what is specified in my job description; α_{t1} = .734; α_{t2} = .737; α_{t3} = .599). Scale score reliability estimates for participants' global LMX levels across all four dimensions were also satisfactory (α_{t1} = .924; α_{t2} = .940; α_{t3} = .929). All items were rated on a 1 (*strongly disagree*) to 5 (*strongly agree*) response scale.

Job Satisfaction (Outcome). Job satisfaction was assessed using the French version (Gillet et al., 2017) of the Job Satisfaction subscale from the Michigan Organizational Assessment Questionnaire (Cammann et al., 1983). Participants were asked to rate the three items forming this subscale (e.g., "All in all I am satisfied with my job"; α_{t1} = .874; α_{t2} = .851; α_{t3} = .791) on a 1 (*strongly disagree*) to 5 (*strongly agree*) response scale.

Emotional Exhaustion (Outcome). Emotional exhaustion was assessed using the French adaptation (Lapointe et al., 2013) of the relevant dimension from the short form (Riley et al., 2018) of the Maslach Burnout Inventory (Schaufeli et al., 1996). Participants were asked to respond to this three-item questionnaire (e.g., "I feel emotionally drained from my work"; α_{t1} = .866; α_{t2} = .864; α_{t3} = .892) using a 1 (*strongly disagree*) to 5 (*strongly agree*) response scale.

Life Satisfaction (Outcome). Life satisfaction was assessed using the French version (Blais et al., 1989) of the Life Satisfaction Scale (Diener et al., 1985). Participants rated the five items from this measure (e.g., "In most ways my life is close to my ideal"; α_{t1} = .839; α_{t2} = .872; α_{t3} = .846) using a 1 (*strongly disagree*) to 5 (*strongly agree*) response scale.

Turnover Intentions (Outcome). Turnover intentions were assessed using two items (i.e., "I often think about quitting this organization" and "I intend to search for a position with another employer within the next year"; α_{t1} = .837; α_{t2} = .864; α_{t3} = .825) adapted to French by Stinglhamber et al. (2002) from items initially proposed by Jaros (1997). Participants rated these items using a 1 (*strongly disagree*) to 5 (*strongly agree*) response scale.

Analyses

Preliminary Measurement Models

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[1] Participants who completed one, two or three time points did not differ from one another in relation to sex (*p* = .361), job type (*p* = .242), part-time/full-time status (*p* = .643), company size (*p* = .147), and sector (*p* = .529). However, older participants tended to complete slightly more time points than younger ones (*r* = .152; *p* = .012). To also test whether any of the main variables included in this study were related to attrition, we regressed the Time 1 scores (obtained from 100% of the participants) on these variables on the number of time points completed by each participant. Apart from one very weak association related to the S-contribution factor (p = .026), no other significant association was detected (all other *p*s > .065). Moreover, attrition is less concerning under missing at random assumptions, which are robust to participant attrition on all key variables included in the model, allowing the probability of missingness to be conditioned on all observed and latent variables included in the model (Enders, 2010).

Preliminary analyses were conducted to verify the psychometric adequacy of our measures and their longitudinal invariance. These analyses were conducted in Mplus 8.6 (Muthén & Muthén, 2021), using the robust weighted least squares estimator with mean and variance adjusted statistics (WLSMV). This decision is based on research results demonstrating the superiority of this estimator over maximum likelihood-based estimators with ordinal rating scales including five or less response categories following asymmetric thresholds (Finney & DiStefano, 2013). The limited number of missing responses within each time point were handled using the algorithms implemented in Mplus for WLSMV estimation (Asparohov & Muthén, 2010). Given that these algorithms are slightly less effective than Full Information Maximum Likelihood (FIML; Enders, 2010) to handle attrition, missing time points were rather handled as part of our main analyses. Among participants who completed each time point, missing responses were very low (Time 1: 0% to 3.20%, M = 2.32%; Time 2: 0% to 3.90%, M = 2.84%; Time 3: 0% to 2.54%, M = 1.25%).

Due to the complexity of longitudinal measurement models underpinning all constructs, three distinct sets of longitudinal models were estimated focusing on: (1) job engagement; (2) LMX (predictor); and (3) the outcomes (job satisfaction, emotional exhaustion, life satisfaction, and turnover intentions). For job engagement, a bifactor confirmatory factor analysis (CFA) model was estimated including a G-engagement factor reflecting participants' global levels of job engagement across all dimensions, and three orthogonal S-factors, representing their levels of S-physical, S-cognitive, and S-emotional engagement left unexplained by the G-factor. This representation follows from recent evidence supporting the superiority of a bifactor representation for measures of engagement (Gillet et al., 2018c, 2019; 2020; Tóth-Király et al., 2021). A similar approach was followed for LMX (one LMX G-factor and four orthogonal S-factors, namely contribution, loyalty, affect, and professional respect). This approach is aligned with Liden and Maslyn's (1998) higher-order results and with recent evidence supporting a bifactor representation of LMX (Gillet et al., 2022). Finally, outcomes were represented in a CFA including four correlated factors (job satisfaction, turnover intentions, emotional exhaustion, and life satisfaction).

In these three longitudinal models, all factors were freely allowed to correlate across time points, and a priori correlated uniquenesses were included between the matching indicators utilized at different time points to avoid inflated stability estimates (Marsh, 2007). These models were used to assess the measurement invariance of the constructs across time points in the following sequence (Millsap, 2011): (1) configural invariance (i.e., same factor structure); (2) weak invariance (i.e., invariance of factor loadings); (3) strong invariance (i.e., invariance of factor loadings and thresholds); (4) strict invariance (i.e., invariance of factor loadings, thresholds, and uniquenesses); (5) latent variance-covariance invariance; and (6) latent means invariance. Factor scores saved from the most invariant measurement models were used as inputs for the subsequent analyses. More precisely, factor scores from the most invariant model up to strict invariance were retained for the job engagement components (to allow for the free estimation of the means and variance of participants' growth trajectories over time). These job engagement factor scores were estimated using the referent indicator approach to allow the trajectories to be estimated in meaningful measurement units. For the predictors and outcomes, factor scores were saved in standardized units (M = 0 and SD = 1) from the most invariant model (up to latent means invariance). Relative to more typical scale scores (formed by averaging the items forming a scale), factor scores are able to partially control for unreliability (Skrondal & Laake, 2001) and more accurately preserve the structure of the measurement models (i.e., invariance and bifactor) (Morin et al., 2020).

Latent Curve Models

Our main analyses were conducted in Mplus 8.6 (Muthén & Muthén, 2021), using the Maximum Likelihood robust (MLR) estimator, which is robust to non-normality, and FIML (Enders, 2010) procedures to handle missing time points, allowing us to retain all available participants. This procedure has been shown to be robust under a "missing at random" assumption, thus allowing missingness to be conditioned on all latent and observed variables included in the model, which comprises the constructs at the preceding time point (Enders, 2010).

Latent curve models (LCM; Bollen & Curran, 2006) were used to represent participants' growth trajectories of job engagement. Two growth factors were estimated for each of the four job engagement factors (the G-engagement factor, and the three S-factors), consistent with a linear LCM parameterization: (a) an intercept factor, reflecting the average initial level of job engagement across all participants, and inter-individual variations around this average level; (b) a slope factor, reflecting the average amount of change per unit of time across all participants, and inter-individual variations around this average level of change. In accordance with linear LCM parameterizations (Bollen & Curran, 2006), the factor loadings of the repeated measures on the intercept factor were all set to be 1, whereas their factor loadings on the slope factors was set to be 0-1-2 to reflect the passage of time as a function of the equivalent six-month intervals between time points. For each job engagement component, we contrasted an intercept-only model (i.e., reflecting stable trajectories) with a linear model (reflecting linear change over time), both with time-specific residuals allowed to vary over time (heteroscedasticity). The retained solution was then contrasted with a more parsimonious solution in which the time-specific residuals were specified to be equal over time (homoscedasticity; e.g., Diallo & Morin, 2015; Fan & Fan, 2005). LCMs and all subsequent analyses were estimated separately for each job engagement factor. Indeed, attempts to integrate all four components (global, physical, emotional, and cognitive) of job engagement into a single model systematically failed to converge on proper solutions, suggesting overparameterization. However, due to the orthogonal nature of the bifactor measurement models from which the job engagement factor scores were taken, each of these components is truly independent from the others (i.e., uncorrelated), meaning that conclusions would be unlikely to change by the simultaneous consideration of all components in a single model.

The factor scores representing the time-varying predictors were incorporated into the LCMs and allowed to influence the time-specific levels of job engagement. A total of four alternative predictor models were contrasted for each component of job engagement. In a first model, the effects of the LMX G-factor on the engagement factor were freely estimated across time points but the effects of the LMX S-factors were constrained to be zero. In a second model, the effects of the LMX G-factor on the engagement factor were constrained to be equal over time. In a third model, the effects of the LMX G-factor were kept equal over time, and the effects of the LMX S-factors were freely estimated across time points. In a fourth model, the effects of the LMX G- and S-factors were constrained to be equal over time. A similar sequence was utilized to assess the associations between the job engagement trajectories and the factor scores representing the time-varying outcomes, which were specified as being predicted by participants' time-specific levels of job engagement. For these models, a first model freely estimated the effects of the job engagement component on the outcomes across time points, whereas these effects were constrained to equality over time in a second model.

Model Assessment and Comparisons

Model fit assessment was based on sample-size independent goodness-of-fit indices (Hu & Bentler, 1999; Marsh et al., 2005), including the comparative fit index (CFI), the Tucker-Lewis Index (TLI), and the root mean square error of approximation (RMSEA). For the CFI and TLI, values above .90 are indicative of adequate fit, while values above .95 are indicative of excellent fit. For the RMSEA, values below .08 indicate adequate fit and values below .06 indicate excellent fit. The chi-square test of exact fit is also reported for the sake of transparency, but it will not be used for model evaluation as prior studies have shown that this indicator is overly sensitive to minor model misspecifications and to sample size variations (Marsh et al., 2005). For purposes of model comparisons, relative changes (Δ) in the fit indices were inspected. In these comparisons, a change of at least .010 for CFI and TLI and a change of at least .015 for the RMSEA were taken to suggest meaningful differences (Chen, 2007; Cheung & Rensvold, 2002). Additionally, model-based composite reliability coefficients (ω; McDonald, 1970) were calculated.

Results

Preliminary Measurement Models

The fit of the longitudinal measurement models is reported in Table S1 of the online supplements. These measurement models resulted in an adequate level of fit to the data (all CFI/TLI $\geq$ .95 and all RMSEA $\leq$ .06) and were fully invariant over time (ΔCFI and ΔTLI $\leq$ .01; ΔRMSEA $\leq$ .015). Parameter estimates from these models are reported in Tables S2, S3, and S4 of the online supplements, and correlations estimated among the job engagement, predictors, and outcomes factor scores are reported in Table S5 of the online supplements. These results revealed that job engagement was characterized by a well-defined and reliable G-engagement factor (λ = .534 to .907; ω = .979) across all time points. Beyond this G-factor, all three S-factors retained moderate levels of specificity and reliability (S-physical: λ = -.191 to .393; ω = .585; S-emotional: λ = .282 to .680; ω = .860; and S-cognitive: λ = -.060 to .504; ω = .606), as can be expected with bifactor models (Morin et al., 2020). Similarly, the results revealed that LMX was also characterized by a well-defined and reliable (λ = .365 to .927; ω =

.976) G-factor, as well as four S-factors that were themselves relatively well-defined and reliable (affect: λ = .255 to .313; ω = .685; loyalty: λ = .430 to .515; ω = .840; contribution: λ = .524 to .925; ω = .784; and professional respect: λ = .515 to .568; ω = .890). Finally, the job satisfaction (λ = .864 to .882; ω = .916), emotional exhaustion (λ = .835 to .939; ω = .900), life satisfaction (λ = .752 to .948; ω = .927), and turnover intentions (λ = .894 to .909; ω = .774) factors also appeared to be well-defined and reliable.

Latent Curve Models

Goodness-of-fit for all LCMs are reported in Table 1. These results first supported the adequacy of these solutions. A linear model with heteroscedastic residuals was retained for G-engagement (Model MG2), S-cognitive (Model MC3), and S-emotional engagement (Model ME2). However, for the cognitive engagement trajectories, the variance of the slope factor was not statistically significant (suggesting that the decreases observed in this sample were normative) and was fixed to be exactly 0 for parsimony. For S-physical engagement, because neither of the alternative models resulted in an acceptable fit to the data, we estimated a latent basis (non-linear model) in which no specific growth structure was imposed on the data (by fixing the first and last loadings on the slope factors to be respectively 0 and 1, while allowing the second loading to be freely estimated to capture non-linear growth)[2]. This model, with homoscedastic residuals, was supported and retained for further analyses.

Parameter estimates from the retained models are reported in Table 2. In response to Hypothesis 2, these results first revealed that the mean of all four intercept factors were significantly different from zero (i.e., 4.618 for G-engagement, -.939 for S-cognitive engagement, .962 for S-emotional engagement, and .079 for S-physical engagement)[3]. The variance parameters associated with these intercepts were also significant, suggesting the presence of substantial inter-individual variability at the beginning of the study, thus providing early support to Hypothesis 1 in relation to the initial level of the trajectories. Still in response to Hypothesis 2, the mean of the slope factor was non-significant for G-engagement, consistent with the presence of high and stable average longitudinal trajectories, but was associated with a statistically significant variance parameter, consistent with the presence of substantial inter-individual variability in the shape of these trajectories over time (i.e., increasing, stable, and decreasing). As a further element of response to Hypothesis 2, the slope factors were statistically significant and negative for all three S-components of job engagement, indicating that, on the average, S-cognitive, S-emotional, and S-physical levels of engagement demonstrated a small decrease over time. The variance parameters associated with these slopes were statistically significant for S-emotional and S-physical engagement, thus indicating that both positive and negative changes were observed in the sample (i.e., inter-individual variability). As a result, Hypothesis 1 appears to be supported in relation to the G-engagement, S-emotional engagement, and S-physical engagement trajectories, but not for S-cognitive engagement trajectories. As a final element of response to Hypothesis 2 in relation to the non-linear physical engagement trajectories, the factor loading on the slope factor associated with the second measurement point was 1.327 (SE = .136), indicating that 132.7% of the total decrease observed over the course of the study (corresponding to the average slope factor of -.025) had occurred by Time 2, which was followed by a slight increase (32.7%) between Time 2 and Time 3.

Trajectories calculated based on participants' G-engagement, S-emotional engagement, and S-physical engagement levels all revealed negative intercept-slope correlations, suggesting that participants with higher initial levels on these variables were less likely to display increasing trajectories over time. Finally, the time-specific residuals showed that the trajectories provided a satisfactory depiction of the repeated measures, with a proportion of explained variance varying between 58.5% and 99.6% for G-engagement, 32.6% and 88.7% for S-cognitive engagement, 42.6% and 98.3% for S-emotional engagement, and 28.4% and 73.2% for S-physical engagement.

Time-Varying Predictors

The results from the models including predictors are also reported in Table 1. Across components

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[2] No evidence of non-linearity was found for the other components of job engagement.

[3] The G-engagement factor reflects participants' global levels of engagement across all items expressed in a metric close to the original measurement scale. In contrast, the S-factors are interpreted *in relation to* the G-factor and reflect the extent to which scores on each specific dimension deviate from these global levels. Scores below 0 on the S-factors thus simply reflect scores lower than those on the G-factor (i.e., in the present example, participants seem to be, on the average, less cognitively engaged relative to their global levels of engagement).

of job engagement, the results revealed that it was necessary to account for the effects of the LMX G- and S-factors (consistent with the idea that both had a contribution), and that the effects of these factors were totally (for the models involving G-engagement and S-emotional engagement) or partially (for the models involving S-cognitive engagement and S-physical engagement) equivalent over time. The resulting models (TPG4 for G-engagement, TPC4p for S-cognitive engagement, TPE4 for S-emotional engagement, and TPP4p for S-physical engagement) all achieved an adequate level of fit to the data. For the models involving the prediction of S-cognitive and S-physical engagement levels, the final model allowed predictions involving the LMX affect S-factor to differ at Time 3 (S-cognitive engagement, which simply reflects an inversion of the sign of otherwise non-significant associations) or Time 1 (for S-physical engagement). Parameter estimates from these models are reported in Table 3. These results first show that G-engagement levels were positively predicted by the LMX contribution and LMX professional respect S-factors, whereas S-emotional engagement levels were positively predicted by the G-LMX factor. In contrast, S-cognitive engagement levels were not related to any of the predictors. Finally, S-physical engagement levels were negatively predicted by the G-LMX factor, and positively predicted by the LMX loyalty S-factor and, at Time 1 only, by the LMX affect S-factor. These results partially support Hypothesis 3.

Time-Varying Outcomes

The results from the outcome models are also reported in Table 1. For all engagement components, inspection of the fit indices and parameter estimates allowed us to retain models in which the associations between job engagement and the outcomes were constrained to be equal over time. Model fit was adequate for the G-engagement and S-physical engagement solutions, while it was marginal for the S-cognitive and S-emotional engagement solutions where the TLI and RMSEA were lower than ideal, suggesting a lack of parsimony possibly reflecting the incorporation of non-statistically significant outcomes to the models. Parameter estimates for these solutions are reported in Table 4. These results showed that turnover intentions and emotional exhaustion were negatively predicted by G-engagement and by S-emotional engagement. In contrast, job satisfaction was positively predicted by G-engagement and S-emotional engagement, but also negatively predicted by S-physical engagement. Finally, life satisfaction was negatively predicted by S-cognitive engagement. These results partially support Hypothesis 4.

Discussion

Despite the well-documented benefits of job engagement for employees and organizations alike (e.g., Byrne et al., 2016; Rich et al., 2010), with few exceptions (e.g., van den Heuvel et al., 2020; Zuo et al., 2021), prior studies generally ignored the G/S operationalization (Gillet et al., 2020) of job engagement when investigating its dynamic nature (Sonnentag et al., 2021). The current research sought to address these limitations by focusing on the nature of the G- and S- trajectories of job engagement over a one-year period. To further increase our understanding of the dynamic predictors of these trajectories, we also considered the role of employees' global and specific levels of LMX in the prediction of time-specific fluctuations in employees' levels of job engagement. Finally, to better understand the dynamic implications of these trajectories, we considered the role played by time-specific fluctuations in job engagement levels to predict employees' levels of emotional exhaustion, turnover intentions, job satisfaction, and life satisfaction.

Job Engagement as a Multidimensional Construct

The need to account for the dual nature of job engagement as a global construct (the G-engagement factor) measured from distinct dimensions retaining some degree of specificity (the S-factors) has recently been documented in job engagement research (Gillet et al., 2020), as well as in research considering alternative representations of engagement (Gillet et al., 2018c, 2019; Tóth-Király et al., 2021). Our results thus provide replication evidence supporting a bifactor representation of job engagement. This representation encompasses a G-factor reflecting the variance shared among responses to all engagement items and demonstrated that each specific (S-factor) dimension (emotional, cognitive, and physical) retained some degree of meaningful specificity (reflecting the variance uniquely shared among responses to items forming a subscale) beyond the G-factor.

These results have important implications for future research on employee engagement. Indeed, the dual G/S nature of this construct indicates that any research in which these two layers are not properly disaggregated is likely to lead to biased results. Indeed, such results are likely to erroneously suggest that each job engagement dimension has similar implications for employees, reflecting in fact the unmodelled role played by the G-engagement factor, thus masking the possible unique role played by each job engagement component. For practitioners, this observation is particularly worrisome, given that biased results naturally translate into incomplete, or improper, intervention strategies.

Longitudinal Trajectories of Job Engagement

Theoretical interest in understanding employees' job engagement trajectories has typically been rooted in two alternative perspectives. One which assumes that job engagement should be relatively stable over time as a result of homeostatic processes, and one that positions engagement as a dynamic construct that evolves over time in connection to changes in employees' work conditions (with a specific focus on job demands and resources). Anchored in these divergent perspectives, previous studies have generally yielded inconsistent results, revealing stable (van den Heuvel et al., 2020), increasing (James et al., 2011; Kim & Kang, 2017), decreasing (Zuo et al. (2021), or heterogeneous (de Wind et al., 2017) trajectories of job engagement over time, possibly because of underlying differences in methods. Using a more generic sample of employees than in previous studies and relying on disaggregated G- and S-levels of job engagement, our results suggested that the shape of these trajectories differs across job engagement components, and that "traits" can also evolve. More precisely, our results showed that employees' G-levels of job engagement followed high and stable trajectories (thus providing support for the stability hypothesis), whereas their S-levels of cognitive and emotional job engagement followed slightly decreasing trajectories (which is consistent with the malleability hypothesis). However, these decreases were not large enough to induce drastic changes in job engagement trajectories over a one-year period. In contrast, their S-levels of physical engagement followed non-linear trajectories, characterized by an initial decrease, followed by a slight increase, which seems to highlight a more unstable evolution. Thus, to de Wind et al.'s (2017) results suggesting that job engagement trajectories might differ across subpopulations of employees, our results add that they are also likely to differ across components of job engagement. Importantly, when we consider the proportion of the variance in job engagement attributed to trait-like trajectories (relative to that explained by state-like fluctuations around these trajectories), our results revealed larger fluctuations in physical engagement (28.4% to 73.2% of variance explained at the trait level across time points) than in emotional (42.6% to 98.3%) and cognitive (32.6% to 88.7%) engagement, with the least fluctuations being associated with global levels of job engagement (58.5% to 99.6%). These results suggest that job engagement displays both stable patterns of evolution and dynamic fluctuations over time in some of its facets.

In relation to G-engagement, and S-emotional and S-cognitive job engagement, the average trajectories observed in our sample were generally consistent with the presence of no (G-engagement) or small (S-emotional and S-cognitive job engagement) variations over time. This observation is thus aligned with previous results revealing moderate to high level of stability in job engagement levels (Alessandri et al., 2018; Heinrichs et al., 2020) or profiles (Gillet et al., 2019) over time. These results indicate that workers may capitalize on their high levels of job engagement to facilitate their adaptation to a constantly changing work environment, as job engagement may provide them with the energy and motivation to cope with work-related difficulties, challenges, and transformations (Kahn, 1990). More generally, according to the gain spiral highlighted in the conservation of resources theory (Hobfoll, 2002), job engagement may facilitate access to other resources related to the achievement of work goals and well-being (Bakker et al., 2014).

In contrast, employees' trajectories of S-physical engagement were characterized by more pronounced changes during the first months of the study, thus reinforcing the idea that job engagement might display some reactivity to the professional context (Makikangas et al., 2016; Rich et al., 2010). Unfortunately, given our reliance on a convenience sample of employees from various occupations, organizations, and tenure levels, it is impossible to clearly identify the reasons for the change in the direction of these trajectories observed in this study. Beyond confirming that each engagement component is likely to follow distinct trajectories, these changes in the shape of the S-physical engagement trajectories between Time 1 and Time 2 (decreasing) and between Time 2 and Time 3 (increasing) are as likely to reflect a statistical artefact or random sampling variations as they may reflect some meaningful change in circumstances. A tentative explanation for these trajectories could be that most employees try, over time, to improve their work conditions, and that the degree to which these conditions match their expectations may be more intimately linked to their levels of S-physical engagement than to other components of job engagement. Clearly, replication evidence will be required to better understand the reasons for these nonlinear trajectories.

Given our novel approach, it seems hard, based solely on the present results, to clearly determine the extent to which our results generalize across different social, cultural, or occupational contexts. However, consistent with Hypothesis 1 and with previous results (e.g., de Wind et al., 2017; van den Heuvel et al., 2020), all job engagement trajectories were found to display substantial levels of inter-individual variability at the beginning of the study. Likewise, the G-engagement, S-emotional, and S-physical job engagement trajectories also displayed significant levels of inter-individual variability over time. These observations thus indicate that the average shape of the job engagement trajectories might be less important to consider than this substantial degree of inter-individual variability, which is consistent with the dynamic nature of job engagement and with the idea that job engagement trajectories vary both within, as well as between, employees, and do so for a variety of reasons. From a practical perspective, our results suggest that interventions targeting job engagement as a whole could be implemented in employees' early careers, while interventions targeting the specific components of job engagement could be fruitfully implemented at any stage during their careers. The results also highlight the importance of developing interventions that nurture more desirable job engagement trajectories among specific subsets of employees. Furthermore, from a research perspective, these results highlight the value of a person-centered approach (de Wind et al., 2017; Gillet et al., 2019) to better capture the nature of this inter-individual heterogeneity and the likely causes (e.g., work conditions, employee proactivity, organizational culture etc.) and implications (well-being, commitment, turnover intentions, etc.) of different engagement trajectories.

LMX as a Predictor of Job Engagement Trajectories

From a theoretical perspective, LMX is generally proposed to contribute positively to employees' perceptions of their work environment (Gillet et al., 2018b; Graves & Luciano, 2013), thus increasing the satisfaction of their basic psychological needs for autonomy, relatedness, and competence (Graves & Luciano, 2013; Kuvaas & Buch, 2020). As a result, LMX is often positioned as a positive driver of employees' social adaptation (Carnevale et al., 2017; Liden & Maslyn, 1998; Montano et al., 2017), and thus as a theoretically plausible driver of their job engagement trajectories (e.g., Deci et al., 2017; Ryan & Deci, 2017; Sandrin et al., 2022). Consistent with these expectations and with Hypothesis 3, specific levels of LMX contribution and LMX professional respect were found to be associated with increases in G-engagement levels at all time points, whereas global levels of LMX were associated with increases in levels of S-emotional engagement at all time points. Specific levels of LMX loyalty were also associated with increases in S-physical levels of engagement at all time points, whereas specific levels of LMX affect were associated with increases in S-physical engagement levels at Time 1 only. These observations replicate previous results showing that employees' LMX perceptions tend to be positively related to job engagement (Agarwal et al., 2012; Tanskanen et al., 2019). However, to the best of our knowledge, this study is the first to demonstrate that these associations are dynamic (i.e., time-structured) in nature, suggesting that time-specific levels of LMX may help to temporary increase employees' levels of job engagement beyond their typical trajectories of job engagement.

In contrast, and contrary to our expectations, global levels of LMX were found to be associated with lower levels of S-physical engagement at all time points. Unfortunately, only a handful of previous studies have focused on the possible downsides of LMX (e.g., Bryant & Merritt, 2021; Harris & Kacmar, 2006), meaning that our attempts to explain this unexpected result would remain tentative. Thus, employees enjoying high-quality LMX relationships have been shown to be more willing to adopt pro-leader or pro-organization unethical behaviors (Bryant & Merritt, 2021; Vriend et al., 2020), possibly leading them to want to invest less physical energy in their work. This association between LMX and unethical behaviors could be related to the fact that employees with high-quality LMX may feel the need to reciprocate that benefit, in turn leading them to experience more pressure to support their supervisors (Harris & Kacmar, 2006). For instance, employees reporting higher levels of LMX were more likely to perceive legitimate abusive supervisory behaviors directed at their teammates, and less likely to help, or sympathize with, the victims (Hu et al., 2022). More generally, employees with high levels of LMX tend to reciprocate by increasing their levels of performance and organizational citizenship behaviors (e.g., Liden & Maslyn, 1998; Restubog et al., 2010). As a result of this desire to reciprocate, these employees thus come to display a higher level of involvement in multiple aspects of their work, making them more likely to experience a depletion of their physical resources (Hobfoll, 2002). This theoretical sequence may partly explain the negative association observed in the present study between global levels of LMX and the S-physical engagement factor.

Beyond this need to reciprocate, characteristics of the work context have also been found to moderate the impact of LMX (Erdogan & Bauer, 2010). For instance, because people generally prefer equality and consistency, work units characterized by high levels of LMX differentiation (i.e., when employees report highly divergent levels of LMX) might increase the likelihood that employees experience undesirable consequences resulting from their high LMX (Harris et al., 2014). Likewise, LMX ambivalence (i.e., when employees experience both positive and negative thoughts about the relationship with their supervisor) may also increase the likelihood of experiencing undesirable outcomes resulting from high LMX (Conner et al., 2021; Lee et al., 2019). Additional investigations are thus required to verify whether the unexpected association between global LMX and S-physical engagement will be replicated, and to clarify the mechanisms underlying this association. Yet, and matching our expectations, the effects of LMX on specific physical engagement were much smaller than those observed for specific emotional and global engagement.

Finally, and in support of our proposition that specific cognitive engagement should not be strongly influenced by LMX, no association was found between global and specific levels of LMX and employees' levels of S-cognitive engagement. Thus, LMX appears to have stronger effects on the emotional and global components of job engagement, supporting the idea that LMXs' effect differs as a function of the outcomes under study (Montano et al., 2017; Olsson et al., 2012), and appears intricately associated with more relational outcomes. This observation reinforces the importance for future research to incorporate a broader range of constructive (e.g., transformational leadership, empowering leadership) and destructive (e.g., passive leadership, abusive supervision) leadership behaviors to better understand the mechanisms underlying these different relations.

Moreover, we examined the isolated (i.e., additive) effects of different global and specific components of LMX without considering that individual employees' LMX relationships tend to be simultaneously characterized by distinctive multifactorial LMX configuration (or profiles). Yet, Dienesch and Liden (1986) proposed that there may be between-person variability in the role played by each LMX dimension, which have always been proposed to be complementary rather than mutually exclusive (Liden & Maslyn, 1998). There is also growing evidence that supervisors can rarely be described in an all good or all bad manner, but that most supervisors rather tend to display a combination of destructive and constructive leadership behaviors (Chénard-Poirier et al., 2022). In relation to LMX, Gillet et al. (2022) recently highlighted the value of considering LMX dimensions in combination, rather than in isolation, by identifying six profiles of employees based on their global and specific levels of LMX. These profiles also displayed well-differentiated associations with all outcomes (e.g., affective commitment, well-being), consistent with the idea that a complete understanding of the role played by LMX requires a consideration of the role played by all LMX facets among distinct types of employees. Importantly, Gillet et al.'s (2022) results also helped to expand our understanding of the within-domain exacerbation phenomenon (Duffy et al., 2002) by showing that profiles characterized by high and consistent levels of LMX across dimensions tend to be associated with more desirable outcomes than more imbalanced profiles. This suggests that employees sharing an exchange relationship with their supervisor that inconsistently acts as a source of stress and support could interfere with employees' job engagement. Indeed, when confronted with hard to anticipate inconsistent interactions with their supervisors, followers may come to feel uncertainty due to their incapacity to anticipate and control their environment, their relationship with their supervisor, and their perception of themselves (van den Bos & Lind, 2002). These forms of uncertainty could then make it harder for employees to be cognitively engaged in their job (Skiba & Wildman, 2019). More generally, these results encourage scholars to further examine the complementary role of global and specific levels of LMX.

Outcomes of Job Engagement Trajectories

Finally, our results clearly supported the importance of time-structured fluctuations in employees' levels of job engagement in the prediction of various outcomes relevant to the work and personal contexts (turnover intentions, emotional exhaustion, job satisfaction, and life satisfaction). More precisely, findings indicated that increases in G-engagement and S-emotional engagement were both associated with decreases in employees' levels of turnover intentions and emotional exhaustion at all time points, as well as with increases in their levels of job satisfaction at all time points. These results support Hypothesis 4 and are consistent with those reported in previous research (Gillet et al., 2019; Huyghebaert et al., 2018b) regarding the expected benefits of job engagement. Likewise, our results were also consistent with previous reports indicating that the effects of the various components of job engagement were likely to differ as a function of the outcomes considered (e.g., Gillet et al., 2019), thus reinforcing the need to expand the present results to a wider range of outcome variables.

Unexpectedly, our results showed that increases in employees' levels of S-physical engagement were associated with decreases in their levels of job satisfaction at all time points. Similarly, employees' levels of S-cognitive engagement were found to be associated with lower levels of life satisfaction. When considering these results, it is important to keep in mind that the interpretation of a S-factor taken from a bifactor model differs from that of a first-order factor. In a bifactor model, S-factors reflect levels of imbalance in employees' levels of physical and cognitive engagement relative to their global levels of job engagement across dimensions (G-engagement). These S-factors reflect feelings of physical and cognitive engagement that are not backed by a matched feeling of emotional engagement. The S-cognitive engagement factor might thus be taken to reflect a lack of psychological detachment or rumination toward work once disaggregated from employees' G-levels of job engagement. In line with the potential detrimental role of S-cognitive engagement observed in the present research, numerous studies have shown that rumination (i.e., a cognitive preoccupation about adverse work-related events while in another role; Junker et al., 2021), contrary to psychological detachment (i.e., the ability to stop thinking about work-related matters during off-job time; Sonnentag & Fritz, 2015), tended to be associated with a variety of negative outcomes (e.g., Gillet et al., 2021; Huyghebaert et al., 2018a). Likewise, the S-physical engagement factor may itself reflect a tendency to over-invest physical resources into one's work role in a way that is not backed up by other facets of job engagement, and which might also make it harder for employees to find enough time to replenish these resources.

From this angle, the present study is not the first to report detrimental effects associated with specific facets (i.e., S-factors) of engagement (e.g., Caesens et al., 2016; Gillet et al., 2019, 2020; Huyghebaert-Zouaghi et al., 2021). These detrimental effects are consistent with the idea that when employees are excessively engaged physically and cognitively in their jobs, they may eventually come to struggle to recover from their work (Sonnentag, 2011), which may in turn decrease their levels of job and life satisfaction (Hobfoll, 2002). Interestingly, previous person-centered studies have reported that negative effects were more frequently associated with the engagement S-factors among employees displaying low G-engagement levels (Gillet et al., 2019, 2020), thus highlighting the possible risks of displaying an imbalanced job engagement configuration. Likewise, these studies have also highlighted the benefits of job engagement configurations characterized by a higher level of alignment across dimensions, possibly because this alignment is likely to stem from a more adequate allocation of ones' psychological resources at work (Hobfoll, 2002). Future studies focusing on the potential synergetic effects between G- and S-job engagement factors would thus be useful to improve our understanding of the links between job engagement and outcomes.

Limitations and Future Directions

The current study offers the first examination of the nature, predictors, and outcomes of job engagement (G/S) trajectories over a one-year period among a generic sample of employees from a variety of occupations. However, it also has limitations. First, the present research relied on self-report measures, which come with an increased risk of social desirability and self-report biases. Future investigations should include more objective indicators of employees' behaviors (e.g., turnover), as well as multiple informants' ratings (e.g., spouses, supervisors). All items were rated on the same scale. Even though LCMs (and most multivariate analyses) are robust to common method variance effects, relying on the same measurement scale for all items could increase the chance of systematic response bias. To address this limitation, future studies should consider using different response scale for different measures. Second, this study involved a sample of Canadian employees who were followed over a one-year period. Other investigations will be needed to confirm the generalizability of the trajectories identified in this study, and their associations with additional predictors and outcomes across different cultures and countries. Additionally, while the study was longitudinal, employees were likely at different career stages which could have played a role in the results, just like relying on alternative time lags is also likely to have an impact on the conclusions of any longitudinal investigation. Although we considered work-related predictors (i.e., G- and S-levels of LMX) of employees' job engagement trajectories, it would be interesting for upcoming investigations to incorporate other individual (e.g., psychological capital, motivation), organizational (e.g., perceived organizational support, perceived justice), or contextual (e.g., job changes, sick leave, promotions, other organizational changes, significant changes in one's work situation) predictors of these trajectories. Finally, although research has provided evidence for significant change in LMX in both the short-term (e.g., weekly) and the long-term (e.g., months and years), the time period during which LMX's variability is mostly concentrated remains to be determined. Further research is thus needed to examine the longitudinal malleability of LMX.

Practical Implications

Our results highlight the importance for organizations and managers to focus on employees characterized by low G-levels of job engagement. Indeed, these employees seem to be exposed to higher risks of impaired functioning (e.g., turnover intentions, emotional exhaustion). In this regard, our findings suggested that interventions seeking to improve the quality of the bidirectional exchange relationship between employees and their supervisors may be useful to increase employees' G-levels of job engagement. For instance, perceptions of organizational support have been found to be associated with higher levels of LMX (Eisenberger et al., 2014), and to be themselves influenced by fairness and recognition (Gillet et al., 2018a), suggesting that such practices could be used to nurture LMX. Moreover, to nurture such perceptions of organizational support, organizations could promote a supportive culture within their organization (e.g., by reducing job insecurity, offering personal development plans, promoting perceptions of procedural justice; Eisenberger & Stinglhamber, 2011), as well as via supportive human resource practices (Rhoades & Eisenberger, 2002).

In addition, human resource departments should design leadership training programs to help their managers realize the important role of high LMX in building an engagged and thriving workforce, and to equip them with relevant skills to do so. Meanwhile, considering that leaders may have limited time and resources to maintain high-quality relationships with each follower, human resource departments could provide learning opportunities and socio-emotional support for their employees directly (Xu et al., 2019). Such training would promote the understanding that leaders can use social exchange to meet performance demands and accommodating workers' work-life balance needs (Morganson et al., 2017).

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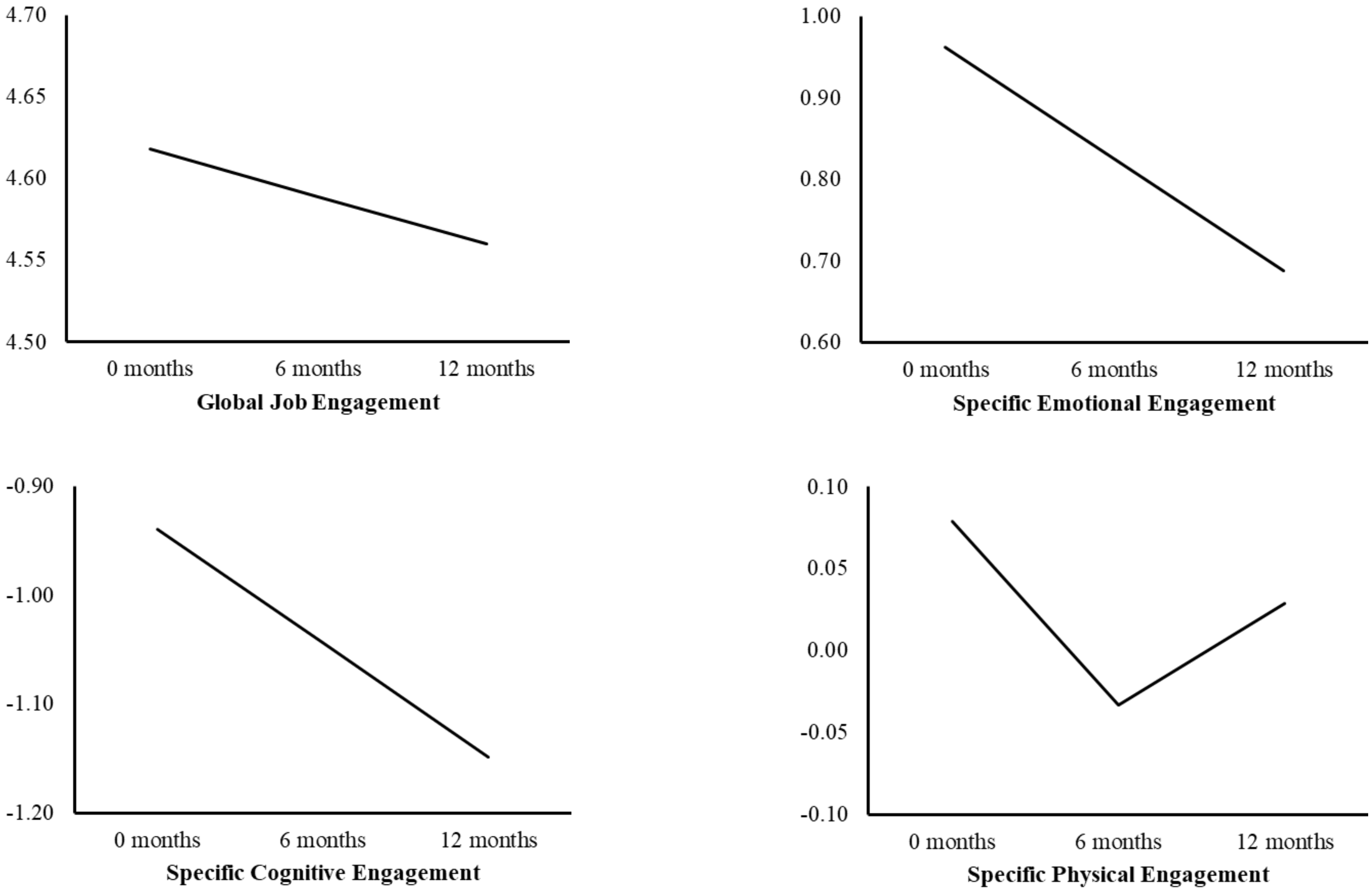

Figure 1

Trajectories for Global Job Engagement (upper-left), and Specific Cognitive (upper-right), Emotional (bottom-left) and Physical (bottom-right) Engagement

Table 1

Goodness-of-Fit Results for the Estimated Latent Curve Models

Model	χ^2	df	CFI	TLI	RMSEA [90% CI]
Unconditional Latent Curve Models of Job Engagement					
MG1. Global job engagement: Intercept-only model (stable)	25.113*	4	.899	.924	.138 [.089; .191]
MG2. Global job engagement: Intercept-slope model (linear)	1.512	1	.998	.993	.043 [.000; .172]
MG3. MG2 with homoscedastic residuals	16.302*	3	.936	.936	.126 [.071; .189]
MC1. Specific cognitive engagement: Intercept-only model (stable)	51.834*	4	.762	.821	.207 [.159; .259]
MC2. Specific cognitive engagement: Intercept-slope model (linear)	3.973*	1	.985	.956	.103 [.011; .218]
MC3. MC2 with slope variance and covariance fixed to be 0	7.038*	2	.975	.962	.095 [.026; .176]
MC4. MC3 with homoscedastic residuals	131.390*	4	.366	.524	.338 [.290; .389]
ME1. Specific emotional engagement: Intercept-only model (stable)	36.606*	4	.670	.752	.171 [.123; .224]
ME2. Specific emotional engagement: Intercept-slope model (linear)	0.558	1	1	1.013	.000 [.000; .143]
ME3. ME2 with homoscedastic residuals	29.791*	3	.729	.729	.179 [.124; .240]
MP1. Specific physical engagement: Intercept-only model (stable)	41.734*	4	.408	.556	.184 [.136; .236]
MP2. Specific physical engagement: Intercept-slope model (linear)	13.228*	1	.808	.424	.209 [.119; .316]
MP3. Specific physical engagement: Latent basis model (non-linear)	0	0	1	1	.000 [.000; .000]
MP4. MP3 with homoscedastic residuals	.607	2	1	1	.000 [.000; .083]
Latent Curve Models with the Time-Varying Predictors					
TPG1. TVP G-factor → Job engagement G-factor (free)	42.178*	13	.930	.740	.090 [.060; .121]
TPG2. TVP G-factor → Job engagement G-factor (invariant)	40.940*	15	.937	.800	.079 [.050; .108]
TPG3. TVP G- and S-factors → Job engagement G-factor (free)	8.520*	3	.987	.787	.081 [.018; .148]
TPG4. TVP G- and S-factors → Job engagement G-factor (invariant)	17.600	11	.984	.931	.046 [.000; .085]
TPC1. TVP G-factor → Cognitive engagement S-factor (free)	25.081	14	.967	.888	.053 [.015; .086]
TPC2. TVP G-factor → Cognitive engagement S-factor (invariant)	39.194*	16	.932	.795	.072 [.044; .101]
TPC3. TVP G- and S-factors → Cognitive engagement S-factor (free)	1.750	4	1	1.079	.000 [.000; .060]
TPC4. TVP G- and S-factors → Cognitive engagement S-factor (invariant)	36.201*	12	.929	.715	.085 [.054; .117]
TPC4p. TVP G- and S-factors → Cognitive engagement S-factor (partial invariant)	15.254	11	.987	.945	.037 [.000; .078]
TPE1. TVP G-factor → Emotional engagement S-factor (free)	16.554	13	.988	.954	.031 [.000; .071]
TPE2. TVP G-factor → Emotional engagement S-factor (invariant)	17.197	15	.992	.975	.023 [.000; .063]
TPE3. TVP G- and S-factors → Emotional engagement S-factor (free)	1.943	3	1	1.059	.000 [.000; .086]
TPE4. TVP G- and S-factors → Emotional engagement S-factor (invariant)	10.097	11	1	1.014	.000 [.000; .059]
TPP1. TVP G-factor → Physical engagement S-factor (free)	29.044*	14	.887	.611	.062 [.029; .094]
TPP2. TVP G-factor → Physical engagement S-factor (invariant)	33.547*	16	.868	.603	.063 [.032; .092]
TPP3. TVP G- and S-factors → Physical engagement S-factor (free)	3.119	4	1	1.080	.000 [.000; .081]
TPP4. TVP G- and S-factors → Physical engagement S-factor (invariant)	28.333*	12	.877	.508	.070 [.037; .104]
TPP4p. TVP G- and S-factors → Physical engagement S-factor (partial invariant)	13.203	11	.983	.928	.027 [.000; .071]

Table 2
Parameter Estimates (with Standard Errors in Parentheses) form the Retained Unconditional Latent Curve Models

	Global Job Engagement	Specific Cognitive Engagement	Specific Emotional Engagement	Specific Physical Engagement
Intercept Mean	4.618 (.102)**	-.939 (.048)**	.962 (.051)**	.079 (.005)**
Intercept Variance	2.860 (.238)**	.567 (.077)**	.704 (.101)**	.006 (.001)**
Slope Mean	-.029 (.037)	-.105 (.015)**	-.137 (.020)**	-.025 (.005)**
Slope Variance	.365 (.055)**	.000 (.000)	.102 (.030)**	.002 (.001)*
Intercept-Slope Correlation	-.630 (.051)**	NA	-.479 (.094)**	-.936 (.037)**
Time-Specific Residual (Time 1)	.004 (.000)**	.113 (.064)	.029 (.098)	.268 (.043)**
Time-Specific Residual (Time 2)	.415 (.038)**	.674 (.038)**	.574 (.044)**	.716 (.094)**
Time-Specific Residual (Time 3)	.045 (.087)	.387 (.095)**	.017 (.002)**	.604 (.066)**

Note. *p < .05; **p < .01; Numbers in parentheses are standard errors.; NA: not applicable due to the zero slope variance.

Table 3

Parameter Estimates from the Retained Predictive Models

	Global job engagement (from TPG4)					
	Unstandardized coefficients (S.E.)			Standardized coefficients (S.E.)		
	T1	T2	T3	T1	T2	T3
Global LMX	.285 (.222)	.285 (.222)	.285 (.222)	.144 (.113)	.149 (.116)	.184 (.144)
Affect	1.077 (.578)	1.077 (.578)	1.077 (.578)	.313 (.169)	.322 (.176)	.389 (.211)
Loyalty	.105 (.356)	.105 (.356)	.105 (.356)	.046 (.154)	.046 (.157)	.055 (.186)
Contribution	.657 (.184)**	.657 (.184)**	.657 (.184)**	.274 (.078)**	.256 (.073)**	.344 (.101)**
Professional respect	.706 (.318)*	.706 (.318)*	.706 (.318)*	.330 (.148)**	.305 (.137)**	.421 (.195)**
	Specific cognitive engagement (from TPC4p)					
	Unstandardized coefficients (S.E.)			Standardized coefficients (S.E.)		
	T1	T2	T3	T1	T2	T3
Global LMX	.104 (.230)	.104 (.230)	.104 (.230)	.111 (.245)	.094 (.210)	.135 (.298)
Affect	-.433 (.527)	-.433 (.527)	.661 (.552)	-.266 (.324)	-.225 (.278)	.484 (.399)
Loyalty	-.418 (.336)	-.418 (.336)	-.418 (.336)	-.382 (.306)	-.319 (.264)	-.435 (.351)
Contribution	-.302 (.154)	-.302 (.154)	-.302 (.154)	-.266 (.137)	-.207 (.106)	-.321 (.171)
Professional respect	-.302 (.264)	-.302 (.264)	-.302 (.264)	-.298 (.259)	-.228 (.203)	-.355 (.312)
	Specific emotional engagement (from TPE4)					
	Unstandardized coefficients (S.E.)			Standardized coefficients (S.E.)		
	T1	T2	T3	T1	T2	T3
Global LMX	.569 (.203)**	.569 (.203)**	.569 (.203)**	.574 (.207)**	.442 (.144)**	.626 (.231)**
Affect	-.137 (.430)	-.137 (.430)	-.137 (.430)	-.079 (.250)	-.061 (.190)	-.086 (.269)
Loyalty	-.369 (.257)	-.369 (.257)	-.369 (.257)	-.320 (.224)	-.241 (.166)	-.332 (.230)
Contribution	-.006 (.135)	-.006 (.135)	-.006 (.135)	-.005 (.112)	-.003 (.079)	-.005 (.125)
Professional respect	-.084 (.224)	-.084 (.224)	-.084 (.224)	-.078 (.209)	-.054 (.145)	-.086 (.229)
	Specific physical engagement (TPP4p)					
	Unstandardized coefficients (S.E.)			Standardized coefficients (S.E.)		
	T1	T2	T3	T1	T2	T3
Global LMX	-.026 (.011)*	-.026 (.011)*	-.026 (.011)*	-.253 (.108)*	-.439 (.186)*	-.396 (.166)*
Affect	.178 (.066)**	.037 (.026)	.037 (.026)	.994 (.374)**	.356 (.244)	.313 (.217)
Loyalty	.039 (.039)*	.039 (.015)*	.039 (.015)*	.325 (.126)*	.549 (.208)**	.472 (.181)**
Contribution	.010 (.010)	.010 (.009)	.010 (.009)	.080 (.075)	.125 (.114)	.123 (.113)
Professional respect	.024 (.014)	.024 (.014)	.024 (.014)	.217 (.127)	.335 (.195)	.332 (.190)

Note. *p < .05; **p < 01; LMX: leader-member exchange; S.E.: standard error. The final model included invariant predictive paths, which explain why the unstandardized coefficients (b) are invariant across time periods except for the partial models. Conversely, the standardized coefficients (β) are a function of the variances of latent constructs on which no constraints were imposed, and thus differ slightly across time periods.

Table 4

Parameter Estimates from the Retained Outcome Models

	Turnover intentions b (S.E.) [invariant]	Time 1 β (S.E.)	Time 2 β (S.E.)	Time 3 β (S.E.)
Global job engagement	-.054 (.016)**	-.106 (.032)**	-.123 (.036)**	-.098 (.029)**
Specific cognitive engagement	.003 (.020)	.003 (.018)	.005 (.028)	.003 (.018)
Specific emotional engagement	-.164 (.026)**	-.166 (.030)	-.232 (.036)	-.178 (.032)
Specific physical engagement	.504 (.272)	.050 (.029)	.034 (.019)	.039 (.021)
	Job satisfaction b (S.E.) [invariant]	Time 1 β (S.E.)	Time 2 β (S.E.)	Time 3 β (S.E.)
Global job engagement	.102 (.016)**	.201 (.035)**	.241 (.039)**	.186 (.032)**
Specific cognitive engagement	-.003 (.021)	-.002 (.019)	-.004 (.031)	-.002 (.019)
Specific emotional engagement	.251 (.029)**	.264 (.037)**	.382 (.040)**	.289 (.043)**
Specific physical engagement	-.578 (.288)*	-.056 (.030)	-.040 (.020)*	-.045 (.023)*
	Emotional exhaustion b (S.E.) [invariant]	Time 1 β (S.E.)	Time 2 β (S.E.)	Time 3 β (S.E.)
Global job engagement	-.049 (.016)**	-.100 (.034)**	-.124 (.042)**	-.086 (.030)**
Specific cognitive engagement	-.014 (.022)	-.014 (.022)	-.023 (.036)	-.013 (.020)
Specific emotional engagement	-.159 (.031)**	-.169 (.034)**	-.252 (.047)**	-.168 (.037)**
Specific physical engagement	.065 (.379)	.007 (.040)	.005 (.029)	.005 (.029)
	Life satisfaction b (S.E.) [invariant]	Time 1 β (S.E.)	Time 2 β (S.E.)	Time 3 β (S.E.)
Global job engagement	.008 (.019)	.015 (.037)	.018 (.043)	.013 (.032)
Specific cognitive engagement	-.049 (.023)*	-.044 (.021)*	-.070 (.033)*	-.040 (.019)*
Specific emotional engagement	.020 (.034)	.019 (.034)	.027 (.047)	.019 (.034)
Specific physical engagement	.336 (.371)	.034 (.038)	.023 (.026)	.025 (.027)

Note. *p < .05; **p < .01; b: unstandardized regression coefficient; β: standardized regression coefficient; S.E.: standard error.

Online Supplements for:

Job Engagement Trajectories: Their Associations with Leader-Member Exchange and their Implications for Employees

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Table S1

Goodness-of-Fit Indices Associated with the Estimated Preliminary Measurement Models

Model	χ^2	df	CFI	TLI	RMSEA	90% CI	$\Delta\chi^2$	Δdf	ΔCFI	ΔTLI	ΔRMSEA
Job Engagement											
Configural	1542.201*	1221	.982	.979	.031	[.026, .035]					
Weak	1596.275*	1285	.983	.981	.029	[.024, .034]	84.821	64	.001	.002	-.002
Strong	1679.797*	1369	.983	.982	.029	[.024, .033]	101.875	84	.000	.001	.000
Strict	1719.182*	1405	.982	.982	.028	[.023, .033]	46.636*	36	-.001	.000	-.001
Latent Variance-Covariance	1659.346*	1413	.986	.986	.025	[.019, .030]	9.556	8	+.004	+.004	-.003
Latent Means	1660.428*	1421	.987	.987	.025	[.019, .029]	7.861	8	+.001	+.001	.000
Antecedents											
Configural	465.696*	354	.994	.992	.034	[.025, .042]					
Weak	502.229*	388	.994	.992	.033	[.024, .040]	53.339	34	.000	.000	-.001
Strong	540.595*	444	.995	.994	.028	[.018, .036]	51.964	56	.001	.002	-.005
Strict	597.569*	466	.993	.992	.032	[.024, .039]	61.879*	22	-.002	-.002	.004
Latent Variance-Covariance	573.128*	476	.995	.995	.027	[.018, .035]	11.364	10	.002	.003	-.005
Latent Means	580.055*	486	.995	.995	.026	[.017, .034]	12.963	10	.000	.000	-.001
Outcomes											
Configural	656.874	597	.993	.991	.019	[.003, .027]					
Weak	672.758	615	.993	.992	.018	[.000, .027]	15.682	18	.000	.001	-.001
Strong	731.271	679	.994	.993	.016	[.000, .025]	53.910	64	.001	.001	-.002
Strict	771.637	705	.992	.992	.018	[.004, .026]	46.699*	26	-.002	-.001	.002
Latent Variance-Covariance	804.307	725	.990	.990	.020	[.008, .027]	29.786	20	-.002	-.002	.002
Latent Means	804.043	733	.991	.991	.018	[.006, .026]	5.368	8	.001	.001	-.002

Note. * $p < .01$; χ^2 = WLSMV chi-square test of fit; df = degrees of freedom; CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root mean square error of approximation; 90% CI = 90% confidence interval of the RMSEA; Δ: change in fit information relative to the previous model.

Table S2

Standardized Parameter Estimates for the Bifactor Confirmatory Factor Analytic Model of Job Engagement (Latent Means Invariance)

	Global job engagement (λ)	Specific physical engagement (λ)	Specific emotional engagement (λ)	Specific cognitive engagement (λ)	δ
Item 1	.868**	-.191**			.211**
Item 4	.858**	-.113*			.251**
Item 7	.907**	-.152**			.155**
Item 10	.860**	.300**			.170**
Item 13	.779**	.393**			.239**
Item 16	.902**	.148**			.165**
Item 2	.699**		.541**		.219**
Item 5	.813**		.282**		.259**
Item 8	.615**		.661**		.186**
Item 11	.642**		.363**		.456**
Item 14	.534**		.680**		.252**
Item 17	.593**		.631**		.250**
Item 3	.785**			.461**	.171**
Item 6	.836**			-.002	.301**
Item 9	.772**			.504**	.150**
Item 12	.855**			.188**	.234**
Item 15	.866**			.251**	.187**
Item 18	.801**			-.060	.354**
ω	.979	.585	.860	.606	

Note. *p < .05; **p < .01; λ: standardized factor loadings; ω: McDonald's (1970) omega coefficient; δ: item uniqueness.

Table S3

Standardized Parameter Estimates for the Bifactor Confirmatory Factor Analytic Model of Leader-Member Exchange (Latent Means Invariance)

	LMX G-factor (λ)	Affect S-factor (λ)	Loyalty S-factor (λ)	Contribution S-factor (λ)	Prof. Res S-factor (λ)	δ
Item 1	.927*	.313*				.042*
Item 2	.867*	.290*				.163*
Item 3	.896*	.255*				.133*
Item 4	.778*		.430*			.210*
Item 5	.833*		.500*			.056*
Item 6	.777*		.515*			.131*
Item 7	.365*			.925*		.011
Item 8	.397*			.524*		.567*
Item 10	.728*				.553*	.164*
Item 11	.792*				.515*	.108*
Item 12	.786*				.568*	.060*
ω	.976	.685	.840	.784	.890	

Note. **p* < .01; λ: standardized factor loadings; ω: McDonald’s (1970) omega coefficient; δ: item uniqueness.

Table S4

Standardized Parameter Estimates for the Confirmatory Factor Analytic Model of the Outcomes (Latent Means Invariance)

	Job Satisfaction (λ)	Emotional Exhaustion (λ)	Life Satisfaction (λ)	Turnover Intentions (λ)	δ
Item 1	.864*				.174*
Item 2	-.869*				.201*
Item 3	.882*				.253*
Item 4		.835*			.246*
Item 5		.939*			.221*
Item 6		.860*			.302*
Item 7			.796*		.118*
Item 8			.780*		.260*
Item 9			.948*		.366*
Item 10			.752*		.392*
Item 11			.697*		.102*
Item 12				.909*	.435*
Item 13				.894*	.515*
ω	.916	.900	.927	.774	

Note. *$p < .01$; λ: standardized factor loadings; ω: McDonald's (1970) omega coefficient; δ: item uniqueness.

Table S5

Correlations between the Examined Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. GJE T1	—																		
2. PHY T1	0	—																	
3. EMO T1	0	0	—																
4. COG T1	0	0	0	—															
5. LMX T1	.199**	.067	.151*	-.036	—														
6. AFF T1	-.101	-.065	-.060	.049	0	—													
7. LOY T1	.025	.140*	-.001	-.071	0	0	—												
8. CON T1	.337**	.064	-.052	-.013	0	0	0	—											
9. PRO T1	.097	-.014	.156**	-.039	0	0	0	0	—										
10. TO T1	-.313**	.044	-.468**	-.058	-.365**	-.006	-.095	-.017	-.155*	—									
11. JS T1	.435**	-.052	.654**	.015	.379**	.000	.085	.039	.123*	-.808**	—								
12. EE T1	-.179**	-.032	-.399**	-.072	-.026	.029	.005	.026	-.019	.308**	-.471**	—							
13. LS T1	.152*	.030	.283**	.053	.098	-.021	.108	.104	-.025	-.216**	.326**	-.159**	—						
14. GJE T2	.719**	.240**	-.082	-.114	.078	-.094	.007	.300**	.047	-.169*	.301**	-.195*	.082	—					
15. PHY T2	.045	.362**	.073	-.230**	.036	.082	.020	-.031	-.101	-.043	.069	.014	.038	0	—				
16. EMO T2	.039	-.189*	.628**	.071	.087	.037	-.046	-.158	.085	-.267**	.436**	-.309**	.271**	0	0	—			
17. COG T2	.049	-.262**	.005	.426**	-.130	.052	-.116	.031	-.077	.059	-.038	-.083	-.027	0	0	0	—		
18. LMX T2	.303**	-.014	.233**	-.074	.590**	.195*	.006	-.037	.196*	-.327**	.399**	-.169*	.123	.297**	-.071	.370**	-.176**	—	
19. AFF T2	-.020	-.185*	.179*	-.023	.172*	.400**	-.261**	-.122	-.068	-.112	.148	-.097	.112	.004	-.098	.254**	.039	0	—
20. LOY T2	.029	.158	-.149	.035	.010	-.179*	.446**	.098	-.218**	.060	-.078	.070	.056	-.028	.151	-.102	-.135	0	0
21. CON T2	.297**	.252**	-.120	-.120	.014	-.100	.071	.307**	.025	.025	.024	.016	-.016	.420**	.149	-.133	-.230**	0	0
22. PRO T2	.076	-.014	.117	-.042	.172*	-.159	-.168*	-.075	.499**	-.126	.112	-.011	-.109	.107	-.089	.062	-.003	0	0
23. TO T2	-.310**	.033	-.495**	-.027	-.337	-.011	-.097	.001	-.123*	.884**	-.790**	.353**	-.228**	-.228**	.053	-.443**	.092	-.429**	-.114
24. JS T2	.394**	-.0191	.603**	.006	.277**	-.017	.086	.000	.086	-.651**	.837**	-.473**	.359**	.390**	-.027	.632**	-.066	.471**	.212**
25. EE T2	-.125*	.085	-.343**	-.085	.029	.010	.025	.040	-.004	.160**	-.344**	.747**	-.242**	-.207*	-.047	-.419**	-.055	-.198**	-.086
26. LS T2	.119*	-.006	.290**	-.044	.104	-.039	.119*	.097	-.035	-.211**	.353**	-.079	.751**	.036	.089	.204*	-.184**	.109	.077
27. GJE T3	.685**	.442**	-.163**	-.104	.132*	-.071	.071	.292**	.040	-.122*	.190**	-.073	.133*	.685**	.140	-.091	-.072	.166*	-.083
28. PHY T3	-.119*	.471**	.034	-.704**	.035	-.137*	.143*	.021	.040	.068	-.035	.034	-.084	.131	.369**	-.141	-.384**	.097	-.014
29. EMO T3	.152*	-.180**	.674**	.070	.046	-.041	.004	-.054	.075	-.340**	.475**	-.246**	.216**	.031	-.109	.658**	.047	.306**	.103
30. COG T3	.391**	-.158**	.202**	.795**	.062	-.052	-.044	.111	.060	-.250**	.304**	-.209**	.135*	.170*	-.095	.119	.354**	.100	.052
31. LMX T3	.165	-.016	.045	-.079	.515**	.235*	.006	-.129	.140	-.309**	.295**	-.043	.169	.170	-.140	.175	-.168	.707**	.347**
32. AFF T3	.062	-.029	.060	.132	.311**	.327**	-.140	-.091	.016	-.258**	.157	-.005	-.077	-.026	-.079	.200*	-.125	.346**	.466**
33. LOY T3	-.069	-.121	-.130	-.012	-.009	-.100	.453**	.051	-.334**	.078	-.037	.058	.077	-.044	-.145	-.004	.054	.064	-.224*
34. CON T3	.276**	.250**	-.137	-.084	-.055	-.101	.210*	.328**	-.191*	.081	.040	-.104	.201*	.377**	-.073	-.062	-.147	.023	-.212*
35. PRO T3	.064	.046	.124	-.247**	.042	-.050	-.318**	-.037	.438**	.020	.049	-.063	.146	.095	.141	-.119	-.037	.102	-.029
36. TO T3	-.212**	-.034	-.307**	-.135	-.233**	-.071	-.033	.073	-.045	.684**	-.568**	.212**	-.205**	-.162*	.083	-.351**	.159	-.384**	-.081
37. JS T3	.320**	.059	.462**	.157*	.202*	.057	-.001	-.073	.030	-.527**	.661**	-.416**	.328**	.300	-.013	.537**	-.080	.420**	.163*
38. EE T3	-.130	-.051	-.158*	-.301**	.037	-.033	.112	.113	-.071	.018	-.173*	.414**	-.325**	-.117	.060	-.287**	.016	-.239**	-.080
39. LS T3	.137	-.112	.338**	.047	.079	.000	.071	.063	-.029	-.184*	.389**	-.283**	.678**	.046	-.029	.339**	-.044	.179*	.134

Table S5 (continued)

	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
20. LOY T2	—																		
21. CON T2	0	—																	
22. PRO T2	0	0	—																
23. TO T2	.015	-.035	-.138	—															
24. JS T2	-.069	.017	.102	-.818**	—														
25. EE T2	.052	-.020	-.055	.323**	-.555**	—													
26. LS T2	.093	.019	-.122	-.302**	.402**	-.175**	—												
27. GJE T3	.047	.344**	.077	-.176**	.239**	-.141*	.128*	—											
28. PHY T3	.057	.169*	-.003	.058	-.021	.005	.009	0	—										
29. EMO T3	-.031	-.104	.124	-.452**	.590**	-.380**	.288**	0	0	—									
30. COG T3	-.16	.003	.014	-.224**	.265**	-.193**	.071	0	0	0	—								
31. LMX T3	-.019	-.065	.149	-.371**	.321**	-.080	.085	.201*	-.009	.269**	-.030	—							
32. AFF T3	-.165	-.165	-.158	-.240**	.106	.001	-.112	-.042	-.127	.151	.066	0	—						
33. LOY T3	.466**	-.024	-.122	-.017	.074	.002	.078	-.037	-.014	.055	-.044	0	0	—					
34. CON T3	.184	.497**	-.042	-.064	.159	-.091	.221*	.353**	.036	.012	-.066	0	0	0	—				
35. PRO T3	-.251**	.061	.415**	.057	-.008	-.043	.103	.147	.208*	-.093	-.051	0	0	0	0	—			
36. TO T3	-.056	-.024	-.073	.836**	-.663**	.206**	-.353**	-.163*	.149	-.469**	-.154	-.449**	-.238**	-.076	-.095	.071	—		
37. JS T3	-.005	.021	.051	-.745**	.874**	-.596**	.415**	.293**	-.116	.654**	.273**	.409**	.172	.061	.182*	-.036	-.800**	—	
38. EE T3	-.029	.053	-.037	.161*	-.370**	.665**	-.286**	-.162*	.151	-.444**	-.293**	-.276**	-.178	.039	-.078	-.021	.308**	-.560**	—
39. LS T3	.001	-.018	-.079	-.272**	.432**	-.294**	.787**	.085	-.123	.359**	.108	.131	-.019	.022	.121	.081	-.310**	.395**	-.375**

Note. *$p < .05$; **$p < .01$; T1-T3: Time 1-3; GJE: global job engagement; PHY: physical engagement; EMO: emotional engagement; COG: cognitive engagement; LMX: global leader-member exchange; AFF: affect; LOY: loyalty; CON: contribution; PRO: professional respect; TO: turnover intentions; JS: job satisfaction; EE: emotional engagement; LS: life satisfaction. Job engagement factor scores were derived from the strict measurement invariance model, whereas the other variables were factor scores (with a mean of 0 and a SD of 1) derived from the latent means invariant measurement model.