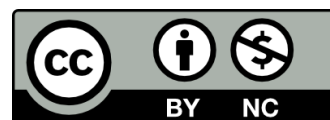


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Abstract:

The purpose of this study was to analyze through a sequential model the underlying mechanisms connecting transformational leadership with employee task performance. Specifically, it examined the causal chain transformational leadership-job characteristics (task variety and task significance)-job engagement-task performance. The hypotheses were tested on a sample of 320 employees and their supervisors from Spanish young technology and knowledge-intensive small and medium-sized enterprises (SMEs), using structural equations. The results show that the effect of transformational leadership on task performance (assessed by supervisors) occurs sequentially via task significance and job engagement. Additionally, job engagement mediates the relationship between task variety and task performance. Findings highlight the relevance for supervisors to employ a transformational leadership style that leads employees directly and indirectly, through task significance, to be more engaged and achieve higher task performance. They also emphasize the importance of proper job design that allows employees to be fully invested in the job performance. Despite the importance of leadership and employee performance for the survival and growth of these firms, the study of these relationships is largely unexplored. This study proposes and tests a serial model in which supervisor transformational leadership is linked to employee task performance through two sequential mediators: job characteristics (task variety and task significance) and job engagement.



How transformational leadership shapes employee task performance? A sequential mediation model

Purpose: The purpose of this study was to analyze through a sequential model the underlying mechanisms connecting transformational leadership with employee task performance. Specifically, it examined the causal chain transformational leadership-job characteristics (task variety and task significance)-job engagement-task performance.

Design/methodology/approach: The hypotheses were tested on a sample of 320 employees and their supervisors from Spanish young technology and knowledge-intensive small and medium-sized enterprises (SMEs), using structural equations.

Findings: The results show that the effect of transformational leadership on task performance (assessed by supervisors) occurs sequentially via task significance and job engagement. Additionally, job engagement mediates the relationship between task variety and task performance.

Practical implications: Findings highlight the relevance for supervisors to employ a transformational leadership style that leads employees directly and indirectly, through task significance, to be more engaged and achieve higher task performance. They also emphasize the importance of proper job design that allows employees to be fully invested in the job performance.

Originality: Despite the importance of leadership and employee performance for the survival and growth of these firms, the study of these relationships is largely unexplored. This study proposes and tests a serial model in which supervisor transformational leadership is linked to employee task performance through two sequential mediators: job characteristics (task variety and task significance) and job engagement.

Keywords: Transformational leadership, job characteristics, job engagement, task performance

Paper type Research paper

Introduction

The relationship between the supervisor's leadership style and employees' performance has been one of the issues that has attracted considerable interest in management literature in the last decades (Han *et al.*, 2020). Recent meta-analyses (see Ng, 2017; Wang *et al.*, 2011) confirm a positive influence of supervisor's transformational leadership on employee performance.

According to Lai *et al.* (2020), in the current context, characterized by complexity and fast changes, leaders need their followers to invest all their energies to fulfill the requirements of their jobs. In the same line, several authors have highlighted the important role of the leader in developing and maintaining subordinate job engagement (e.g., Crawford *et al.*, 2014; Ghadi *et al.*, 2013; Kahn, 1990; Authors, 2018). Managers can inspire and motivate employees through their leadership, and this process influences the job engagement experience. Recent research has corroborated the mediating role of job engagement in the relationship between transformational leadership and employee role and extra-role performance, creativity and innovation (Aryee *et al.*, 2012; Fernando and Jayawardana, 2024; Lai *et al.*, 2020; Park *et al.*, 2022; Pourbarkhordari *et al.*, 2016; Salanova *et al.*, 2011; Authors, 2018). However, the mechanisms through which the

relationship between transformational leadership, job engagement and employee performance occurs require further research (Bakker *et al.*, 2023; Crawford *et al.*, 2014; Han *et al.*, 2020).

According to the social information processing model (SIPM, Salancik and Pfeffer, 1978), “the social environment provides cues which individuals use to construct and interpret events” (p. 226). Supervisor leadership is considered a salient and relevant factor of the immediate social context (Hu *et al.*, 2020; Lu *et al.*, 2019; Piccolo and Colquitt, 2006; Rice and Young, 2023; Yang *et al.*, 2019) that influences and shapes the "reality" in which employees perform their work (Lai *et al.*, 2020; Cleavenger and Munyon, 2013; Piccolo and Colquitt, 2006; Yang *et al.*, 2019), with effects on their motivation and behavior.

Hackman and Oldham (1980), in the job characteristics model (JCM), argued that employees' reactions to their jobs (such as motivation or performance) are based on their perception of the job motivational characteristics: variety, significance, identity, autonomy, and feedback. Both models share that employees' reactions (motivation or performance) are based on their perceptions of job characteristics. While JCM assumes that employees' perceptions of the job itself affect individual outcomes, SIPM assumes that the social environment in which employees perform their work affect to formation of their jobs' perceptions, their motivation and performance. The former conceptualizes job characteristics as “objective” while the latter considers them as “subjective”, socially constructed (Grant, 2008, p. 109). Clearly, both models are complementary. Employees perceptions about their jobs are partially based on job design, and partially affected by cues from the social environment (Grant, 2008), in our case, the transformational leadership of the supervisor.

Therefore, integrating both models (SIPM, Salancik and Pfeffer, 1978, and JCM, Hackman and Oldham, 1980; Humphrey *et al.*, 2007), this study posits a serial mediation model in which supervisor transformational leadership is linked to employee task performance through two sequential mediators: job characteristics perceptions (namely, task variety and task significance) and job engagement. This is an important contribution to the literature with practical implications.

Previous research has studied partial relationships, as such the link between transformational leadership, job characteristics (combining job characteristics in a single construct) and individual performance (e.g., Piccolo and Colquitt, 2006; Purvanova *et al.*, 2006; Wang, 2020) but without including job engagement. Other studies have analyzed the transformational leadership-job engagement-job performance relationship (Breevaart *et al.*, 2016; Jiatong *et al.*, 2022; Lai *et al.*, 2020; Park *et al.*, 2022; Pourbarkhordari *et al.*, 2016) but without taking into account particular job characteristics. To the best of our knowledge, research has not incorporated the proposed sequential mediators into a single model. This study provides, therefore, a better understanding of the relational chain between transformational leadership and task performance.

This paper also fills a research shortfall on leadership and employee motivation in young technology and knowledge-intensive SMEs. The choice of study variables was based on both the literature and the context in which the research was carried out. In young technology SMEs, individual performance is likely to be closely linked to firm performance (Messersmith and Wales, 2013). Given their resource constraints, these firms must do more with fewer resources. Having employees who are highly engaged, connected to their job performance and the multiple roles they play (Messersmith and Guthrie, 2010), will maximize their task performance, their contribution to the firm and its performance.

Despite the recognition that human resources and their adequate management are key aspects for the competitiveness and development of these firms (Harney and Alkhalaf, 2021), most studies in this context have focused on the role of the owner/entrepreneur. Therefore, it has been ignored the fact that the extent to which these firms are able to lead and engage employees is crucial to convert the vision of the entrepreneur or founding team into a reality (Jensen and Luthans, 2006) and for firm growth (Harney and Alkhalaf, 2021; Messersmith and Wales, 2013).

Task variety and task significance have been associated with meaningfulness in work (Allan, 2017), motivation (Humphrey *et al.*, 2007), and job engagement (Christian *et al.*, 2011; Shantz *et al.*, 2013). Regarding task variety, it is important to note that young technological intensive SMEs jobs are broadly defined, and the employees perform multiple tasks that change as the firm grows (Messersmith and Guthrie, 2010). Task significance is relevant for employees in all firms, as they increasingly seek to make an impact on others (Allan, 2017; Grant, 2008). But it is perhaps more pronounced for young technological SMEs, because to gain the necessary momentum it is essential that employees embrace the project and the vision of the founding team and perceive their work as having impact.

Young technology and knowledge-intensive SMEs are characterized by a few hierarchic levels, which favors close collaboration between supervisors and employees. Supervisors and employees often interact closely, and those are involved in the day-to-day organizational life of employees (Yang *et al.*, 2019). Thus, supervisors with a transformational leadership style, by providing informational cues to employees through their actions and messages, are expected to influence employees' perceptions and reactions (Piccolo and Colquitt, 2006; Purvanova *et al.*, 2006).

In summary, the main contributions of this study are the following: On the one hand, it extends the literature by analyzing the complex causal chain connecting transformational leadership with task performance, integrating SIPM and JCM and going beyond the previous studies that have examined in isolation the mediating role of job characteristics (Piccolo and Colquitt, 2006) or job engagement (Aryee *et al.*, 2012; Lai *et al.*, 2020; Ng, 2017; Park *et al.*, 2022). On the other, it responds to calls for empirical research analyzing the underlying mechanisms by which transformational leadership affects job engagement (Aryee *et al.*, 2012; Bakker *et al.*, 2023; Crawford *et al.*, 2014; Han *et al.*, 2020), focusing on two motivational job characteristics: task variety and task significance. As antecedents of job engagement, both characteristics have received notably less attention than other motivational job characteristics such as autonomy or feedback (Christian *et al.*, 2011; Crawford *et al.*, 2014). This is surprising, since according to the findings of Christian *et al.* (2011), job engagement seems more strongly related to job characteristics that are associated with the perceived meaningfulness. For Grant (2008), task significance has not received the attention it requires. Humphrey *et al.* (2007) noted the paucity of research on task variety and called for studies to analyze its effect on work outcomes. Finally, it focuses on the role played by leaders and employees in young technological and knowledge-intensive SMEs, which has received much less attention than in large, established firms despite their important contribution to the economy in terms of employment, productivity, and innovation (Desmarchelier *et al.*, 2013; Leung *et al.*, 2006).

Theoretical framework and hypotheses development

According to Bass (1990, p. 21), leaders behave in a transformational way when they “broaden and elevate the interests of their employees, when they generate awareness and

acceptance of the purposes and mission of the group, and when they stir their employees to look beyond their own self-interests for the good of the group". Elements of transformational leadership are inspirational motivation, idealized influence, individualized consideration, and intellectual stimulation (Bass, 1990). Inspirational motivation is the degree to which leaders articulate a clear, compelling, and shared vision for their followers. Idealized influence is the degree to which leaders engage in behaviors that engender admiration, respect, and trust from followers and promote their identification with the leader and his/her mission. The leader is consistent in his/her behavior with the underlying principles and values, serving as a role model. Individualized consideration is the degree to which leaders listen to the concerns of their followers, recognize, and address their developmental needs, act as mentors and coaches, and treat them as unique individuals. Lastly, through intellectual stimulation, leaders challenge established assumptions, take risks, solicit ideas from followers, and encourage them to consider problems from multiple perspectives.

Transformational leadership has been associated with employee attitudes and behaviors through multiple mediators, such as job engagement and job characteristics (Ng, 2017). Research has directed the attention towards the mechanisms by which transformational leadership affects job engagement, and subsequent individual outcomes. Salanova *et al.* (2011) concluded that transformational leadership, by reinforcing self-efficacy beliefs, promoted job engagement and this, in turn, extra-role performance in a sample of nurses. Aryee *et al.* (2012) found that transformational leadership increased job engagement, and subsequent innovation and task performance, by enhancing job meaningfulness and employees' felt responsibility in employees of Chinese telecommunications firm. Alamri's (2023) results revealed that transformational leaders triggered a promotion approach among followers that led them to be more engaged.

Other studies have explored the mediating role of job characteristics (in aggregate) between transformational leadership and individual outcomes. In the study by Piccolo and Colquitt (2006), which included employees from different firms and industries, job characteristics, by generating greater intrinsic motivation, explained the effect of transformational leadership on task performance and citizenship behaviors. Purvanova *et al.* (2006) and Wang (2020) supported the mediating effect of job characteristics between transformational leadership and citizenship behavior, and creativity, respectively.

Our study enriches this line of research that analyzes the complex causal chain linking transformational leadership with employee performance, incorporating two sequential mediators: job characteristics (task variety and task significance) and job engagement.

Two theoretical perspectives are utilized to explain these relationships: Social information processing model (SIPM, Salancik and Pfeffer, 1978) and job characteristics model (JCM, Hackman and Oldham, 1980; Humphrey *et al.*, 2007). SIPM (Salancik and Pfeffer, 1978) assumes that social informational cues affect the employee's evaluation of the work environment, how they interpret and perceive it, and their resulting motivation and behaviors. In line with this argument, research indicates that transformational leadership positively influences the sense of safety and meaning that employees experience in their work and the perception that they have resources necessary to put all their energies into the job (e.g., Aryee *et al.*, 2012; Ghadi *et al.*, 2013; Salanova *et al.*, 2011). Employees use information from their social environment in developing perceptions of "job significance, importance, and variety" (Salancik and Pfeffer, 1978, p. 228). So, immediate supervisors, as a source of social information, may have considerable influence on their subordinates' environment interpretation, job characteristics perceptions (namely, task variety and task significance), their motivation (job engagement) and their behaviors (task performance).

JCM posits that the motivating jobs allows employees to experience critical psychological states that favor their motivation and performance. Jobs that allow employees to perform a variety of tasks and use several skills, and endowed with task significance will lead to positive outcomes by generating greater meaningfulness. Based on this model, Kahn (1990) proposed that employees' perceptions of their job's characteristics can increase or decrease their job engagement.

Of course, it is up to the employees to decide whether or not to channel all their energies into job performance (Kahn, 1990), but the leader helps create the necessary conditions, and influences their construction of reality. According to SIPM, leaders provide key cues that shape employees' perceptions of work situations and job characteristics (Salancik and Pfeffer, 1978). For example, if a supervisor emphasizes the routine aspects of the job, employees will perceive less significance in the tasks they perform. If a supervisor, with transformational style, focuses on employees' understanding of the vision and mission of the firm and their contributions to the firm, employees will perceive their jobs as more valuable and significant. Job characteristics perceptions (influenced in part by social cues) will affect the degree to which employees to put all their energies into the performance of their work role (Grant, 2008).

Job engagement as mediator in the transformational leadership–task performance relationship

The concept of job engagement was introduced by Kahn (1990), who defined it as “the harnessing of organization members' selves to their work roles; in engagement, people employ and express themselves physically, cognitively, and emotionally during role performances” (Kahn, 1990, p. 694). This approach considers job engagement as a motivational state that involves the simultaneous investment of the employee's physical, cognitive, and emotional energies in work performance (Rich *et al.*, 2010).

According to SIPM (Salancik and Pfeffer, 1978), leaders are part of the social context in which employees perform their work, with important effects on their motivation and behaviors. Since “direct supervisors tend to be perceived as the main organizational representative in the eyes of employees” (Rice and Young, 2023, p. 11706) and leaders and employees interact closely in SMEs, it is argued that the actions and messages of supervisor will shape the employees' motivation and behaviors (Lai *et al.*, 2020). Indeed, it has been argued that “employees tend to collect value information from what their leaders do and say” (Lu *et al.*, 2019, p. 508), and based on this information, they will adapt their attitudes and behaviors (Salancik and Pfeffer, 1978). When leaders behave in a transformational way, developing and communicating a shared, inspiring, and challenging vision that emphasizes how collective goals are consonant with follower values, employees will perceive their work more congruently with their own values (Bono and Judge, 2003) and, consequently, will feel more intrinsically motivated and willing to engage in their job.

The perception of a supportive and trusting environment is fundamental to the development of job engagement (Kahn, 1990; Macey and Schneider, 2008). Transformational leaders consider the achievement and growth needs of their followers and provide personalized support and interactions with each follower. Consequently, according to SIPM, the support and care offered by transformational supervisors will boost the perception of support from their organization and facilitate employee's job engagement. In addition, transformational leaders motivate their employees by promoting their perception of resource availability (Kahn, 1990; Rich *et al.*, 2010). Transformational leaders communicate high performance expectations and express confidence in the ability

of their followers to meet them by reinforcing their beliefs of self-efficacy (Bono and Judge, 2003; Salanova *et al.*, 2011). As a result, employees will perceive and feel that they have the resources to invest themselves in role performance (Kahn, 1990) and will become more engaged. In a weekly study, Breevaart *et al.* (2016) confirmed that followers felt more engaged and achieved higher performance in weeks that the leader behaved in a transformational style.

Engaged employees are characterized by their predisposition to invest all their energies (physical, emotional, and cognitive) in the performance of their work roles (Kahn, 1990; Rich *et al.*, 2010). By working intensively on their tasks over long periods of time, paying close attention to their responsibilities, and being emotionally connected to the tasks that constitute their role, engaged employees will achieve better task performance (Rich *et al.*, 2010). Because engaged employees experience positive emotions and great enthusiasm for their job, they are likely to discover opportunities to improve performance and take actions that contribute to job completion (Ho *et al.*, 2011), extra-role behavior (Salanova *et al.*, 2011; Lai *et al.*, 2020; Authors, 2023), and creativity and innovation (Aryee *et al.*, 2012; Wang, 2020; Authors, 2020). Research by Fernando and Jayawardana (2024), Pourbarkhordari *et al.* (2016), and Lai *et al.* (2020) in samples of employees from various industries, a telecommunications firm, and a sample of nurses, respectively, supported the mediating role of job engagement between transformational leadership and job performance. Jiatong *et al.* (2022) and Park *et al.* (2022), the former in a sample of hotel employees in China and the latter in employees of private firms in Korea, found that job engagement mediated both the link from transformational leadership to job performance and affective commitment. Based on the above arguments, we propose the following hypothesis:

H1. Job engagement will mediate the relationship between the supervisor's transformational leadership and employee task performance.

Job characteristics as mediators in the transformational leadership–job engagement relationship

Task variety and task significance are two core job characteristics with motivational potential. Task variety refers to the degree to which a job requires employees to perform a wide range of tasks on the job (Morgeson and Humphrey, 2006). Task significance involves the degree to which a job has a significant impact on the lives or work of others (Morgeson and Humphrey, 2006).

Employees' perceptions of such attributes, based on both the nature of the job and the cues of their immediate social environment, will influence their attitudes and behaviors. According to SIPM (Salancik and Pfeffer, 1978), leaders, with their actions and informational cues, play a key role in developing employees' perceptions of job characteristics. Transformational leaders, by highlighting the ethical consequences of work (Piccolo and Colquitt, 2006) and articulating a vision that focuses employees' attention on the contribution of their work (Grant, 2012) encourage the perception of significance of the tasks they perform. Inspiring leaders will be able to make their subordinates aware of the value of their work. If they emphasize the importance of the job to the achievement of organizational goals, employees will understand the importance of individual contributions to the organization (Bass, 1990) and their perceptions of task significance might increase (Wang, 2020).

In addition, by encouraging employees to seek new ways of performing tasks, transformational leaders increase their perception of variety and autonomy (Piccolo and

Colquitt, 2006). If supervisors emphasize the scope of the job and the skills required for its performance, they encourage subordinates to question assumptions and to rethink the way of approaching different work situations, stimulating creativity, employees will perceive a greater task variety (Cleavenger and Munyon, 2013). Previous research has found that transformational leader behavior affected employees' perceptions of job characteristics (in aggregate) and, as a result, intrinsic motivation, and performance (Piccolo and Colquitt, 2006), citizenship behavior (Purvanova *et al.*, 2006) and creativity (Wang, 2020). Purvanova *et al.* (2006) followed up with employees in one of the study firms and found that transformational leadership behavior affected job perceptions even when job objective characteristics had not changed.

Based on JCM (Hackman and Oldham, 1980), Kahn (1990) proposed that task characteristics influence the degree to which people engage in work. Jobs characterized by variety, which offer task identity and significance, autonomy, and quick feedback offer employees the room and the incentive to bring more of their selves into their work (Kahn, 1992). Macey and Schneider (2008) reasoned that the nature of work (variety, challenge, autonomy) directly affects job engagement.

Ho *et al.* (2011) argued that employees will put more effort and energy into the roles they find enjoyable. When employees perceive that the job requires the performance of a wide variety of tasks, they will find it more interesting and enjoyable (Morgeson and Humphrey, 2006), more challenging and less monotonous (Humphrey *et al.*, 2007; Shantz *et al.*, 2013), and experience a greater connection with their work, whereas if the job requires limited skill variety it will probably be less stimulating and could lead to boredom. When employees consider that their jobs make substantial contribution to the lives of others and to the organization, they will be willing to devote more time and energy (Grant, 2008) and invest their entire selves in them (Kahn, 1990), therefore this provides employees' a reason to be engaged. Previous studies found that variety task (Shantz *et al.*, 2013) and task significance (Goštautaitė and Bučiūnienė, 2015; Shantz *et al.*, 2013) drove to job engagement. Other studies showed that experienced meaningfulness, partly a result of transformational leadership, encouraged employees to be more engaged, (e.g., Aryee *et al.*, 2012; Ghadi *et al.*, 2013). Based on the aforementioned arguments, it is proposed:

H2. Task variety will mediate the relationship between the supervisor's transformational leadership and employee job engagement.

H3. Task significance will mediate the relationship between the supervisor's transformational leadership and employee job engagement.

Job characteristics and job engagement as sequential mediators in the transformational leadership–task performance relationship

Drawing on SIPM (Salancik and Pfeffer, 1978), we argue that supervisors by behaving in a transformational manner sent signals to employees about the variety and significance of the tasks they perform. As Cleavenger and Munyon (2013) argue, the transformational leader “is able to frame the employee's work experience to create a new point of reference for understanding the meaning of his/her work” (p. 353). In turn, employees' perceptions about their jobs (formed on the basis of job characteristics and social information) will have an effect on job engagement and task performance. When employees perceive that their work is varied and that it impacts others (outside or inside the firm), they will feel

that what they do is useful, valuable, and worth doing (worthwhile) and, consequently, they will be willing to put all their energies (physical, cognitive, and emotional) into the job role (Kahn, 1990). According to JCM (Hackman and Oldham, 1980; Humphrey *et al.*, 2007), both task variety and task significance are expected to positively impact job engagement. As noted above, job engagement will, in turn, have positive implications for task performance (Shantz *et al.*, 2013).

Therefore, the proposed causal relationships are as follows: transformational leadership→task variety→job engagement→task performance; transformational leadership→task significance→job engagement→task performance.

Based on the above arguments, the following hypotheses are put forward:

H4. Task variety and job engagement will sequentially mediate the relationship between the supervisor's transformational leadership and employee task performance.

H5. Task significance and job engagement will sequentially mediate the relationship between the supervisor's transformational leadership and employee task performance.

Method

Sample

The data for the study were collected from employees working in 21 young –operating for 10 or fewer years (McKelvie *et al.*, 2017) in high-tech and knowledge intensive industries according to Eurostat classification– SMEs located in Spain. A purposive sample technique was used. Two reasons justify the focus on this context: First, SMEs, and the way they are managed, can vary according to the stage of life cycle and the industry (Harney and Alkhalaf, 2021). Second, the relevant role played by these firms in the economic growth of the countries (Messersmith and Guthrie, 2010; Authors, 2023). Several sources of information were used to draw up a list of firms that met the requirements: the record of Spanish firms associated with RedEmprendia (an Ibero-American University Network that encourages responsible entrepreneurship), the web records of the spin-offs of the main Spanish universities, and the directory of firms in the main technology parks in Spain. One hundred SMEs were contacted to collaborate in the study. Ultimately, 21 firms, sizing between 10 and 100 employees, agreed to participate. Management provided the research team with the employees' emails. Matching online questionnaires were mailed directly to employees and their supervisors in each firm, guaranteeing the confidentiality of their answers. In the mail sent, a code was provided that would then allow the employee's responses to be linked to those of the supervisor. The relationship between the employee's identity and the code was only in the hands of the research team, which guaranteed the anonymity of the responses.

The final sample comprised data from 320 employees and their supervisors (who assessed their employees' task performance). The average age of the participating employees was 32.09 years, and the average tenure was 3.17 years, 63.75% were men. In terms of educational level, 69.06% held a higher education degree, 27.81% held a master or a PhD degree, and only 3.12% had high school education or below.

Measures

All measurements, with the exception of control variables, used a seven-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree).

To measure transformational leadership, employees were asked to rate the behavior of their immediate supervisor, using the Global Transformational Leadership (GLT) scale developed by Carless *et al.* (2000). Its shorter length, the high reliability and validity, together with its conceptual equivalence with the MLQ have led to a wide use of this measure (e.g., Alamri, 2023; Bakker *et al.*, 2023; Ghadi *et al.*, 2013).

Task variety (3 items) and task significance (3 items) measures were taken from the corresponding subscales of the Work Design Questionnaire (WDQ) by Morgeson and Humprey (2006).

Job engagement was measured with 12 items from Rich *et al.*'s (2010) scale, based on Kahn's (1990) theoretical conceptualization of three dimensions: physical engagement, emotional engagement, and cognitive engagement.

Finally, immediate supervisors were asked to assess the task performance of their direct employees. For this purpose, 4 items of the Williams and Anderson's (1991) scale were used.

Since age and gender could affect employees' task performance, they were incorporated as control variables in the analyses.

Statistical analysis

The analysis of the data was carried out in two steps. First, a confirmatory factor analysis was performed to analyze the fit of the measurement model and to examine the internal consistency of each construct, the convergent validity of the scales, as well as the discriminant validity of the constructs. Secondly, model comparison was used to identify the best model to test the proposed hypotheses. Finally, to estimate the serial mediation effects, Gaskin's (2019) plugin with 2000 bootstrapping sample had been employed.

Results

Table I shows the descriptive statistics, correlations, and Cronbach's alpha in the diagonal.

(Insert Table I)

First, we analyzed the fit of the job engagement measure through the construction of a second-order factor from its three dimensions, obtaining appropriate adjustment indexes ($\chi^2(49) = 119.601$; $\chi^2/df = 2.441$; CFI = 0.979; TLI = 0.972; RMSEA = 0.067). Then, the adjustment of the measurement model was tested. The results of the CFA showed that the measurement model produced good fit to the data ($\chi^2(365) = 775.854$; $\chi^2/df = 2.126$; CFI = 0.955; IFI = 0.955; TLI = 0.950; RMSEA = 0.059).

As can be seen in Table II, the results supported the reliability of the scales, since composite reliability (CR) and average variance extracted (AVE) exceeded the recommended minimums of 0.7 and 0.5 respectively (Hair *et al.*, 2010). With regard to convergent validity, the standardized lambda parameters were significant and higher than the minimum value of 0.5. The discriminant validity of the constructs was also confirmed since the value of the squared correlations is lower than the AVE of the constructs and the confidence intervals of the correlations do not include the unit (Hair *et al.*, 2010).

(Insert Table II)

Following Hair *et al.* (2010) recommendations, a sequence of nested models was compared to determine which model best fit the data. The model comparison was based on the saturated model, a model with all possible relationships. From this, eight models were proposed, in which one of the proposed relationships was eliminated. In M1, we removed the direct path between transformational leadership and employee task performance. In M2, we removed the direct path between transformational leadership and job engagement. In M3, we removed the direct path between transformational leadership and task variety. In M4, we removed the direct path between transformational leadership and task significance. In M5, we removed the direct path between task variety and task performance. In M6, we removed the direct path between task variety and job engagement. In M7, we removed the direct path between task significance and task performance. And in M8, we removed the direct path between task significance and job engagement. Finally, we tested M9, a model where we removed all the relationships discarded in the models that did not show significant differences with respect to the saturated model. That is, in M9, we eliminated the direct paths from job characteristics and transformational leadership to task performance, and the direct path from transformational leadership to task variety. As shown in Table III, M9 is the best model. Consequently, this was the model on which the proposed relationships were tested.

(Insert Table III)

Figure 1 shows the standardized coefficients of the relationships posed in the best model. As can be seen, all direct relationships were positive and significant except the relationship between transformational leadership and task variety, which was discarded in the comparison of models. This provides initial support to three of the five hypotheses proposed. The *H2* and *H4* hypotheses were not confirmed because if transformational leadership did not influence task variety, it cannot act as a mediating variable.

(Insert Figure 1)

Since the hypotheses raised concerned indirect effects, the confidence intervals of the estimated indirect effect were calculated using bootstrapping. The indirect effect is significant at the $p < 0.05$ level if the confidence intervals do not include zero. The results confirmed the role of job engagement as mediator between transformational leader and task performance ($\beta = 0.065$; $CI = 0.023-0.124$), supporting *H1*. The results also supported *H3*, because there is an indirect effect of transformational leadership on job engagement via task significance ($\beta = 0.053$; $CI = 0.004-0.113$).

Finally, employing Gaskin's (2019) plugin to estimate serial mediations to M9, we calculated the serial mediation index for the transformational leadership-task significance-job engagement-task performance pathway. The results ($\beta = 0.011$; $CI = 0.001-0.027$) supported hypothesis *H5*.

Table IV summarizes the support or rejection of the hypotheses.

(Insert Table IV)

Discussion

This study provides interesting results. On the one hand, consistent with previous research (Breevaart *et al.*, 2016; Fernando and Jayawardana 2024; Jiatong *et al.*, 2022; Park *et al.*,

2022; Pourbarkhordari *et al.*, 2016), job engagement mediated the effect of transformational leadership on task performance, which supported hypothesis 1. When employees feel that their immediate supervisor is behaving in a transformational style, job engagement and subsequent task performance increase.

On the other hand, the mediating role of the two job characteristics in the transformational leadership-job engagement relationship was partially confirmed. In line with Shantz *et al.* (2013) both task variety and task significance were related to job engagement, endorsing the importance of work context in nurturing employees' enthusiasm and energies in their jobs. However, while task significance partially mediated the relationship between transformational leadership and job engagement, task variety did not, as transformational leadership did not affect this job dimension. Consequently, we only found support for hypothesis 3.

Finally, the main objective of this study was to examine the causal chain transformational leadership-job characteristics (task variety and task importance)-job engagement-task performance (hypotheses 4 and 5). The results corroborated hypothesis 5: the supervisor's transformational leadership generated greater task significance perception and this, in turn, fed job engagement, increasing task performance (as rated by supervisors). However, hypothesis 4 could not be verified. It has only been found that task variety affected performance through job engagement.

Implications for theory

This study contributes to the existing literature on leadership and motivation in the context of young technology-intensive SMEs by integrating SIPM and JCM. Corroborating SIPM's postulates, the transformational leader's behaviors and messages encouraged employees to bring themselves into the job, generating higher job performance. Supervisors, that transmit a shared and exciting vision of the future, establish individualized interactions with employees, act as role models, show interest in them as individuals, encourage participation, creativity, and the development of their skills, favor greater enthusiasm and connection of employees with their work. This result is consistent with Kahn's (1990) and Macey and Schneider's (2008) proposals, who argued that leaders who communicate clear expectations, are fair, value employee contributions and recognize good performance will generate in employees a sense of connection to the job, which will promote greater job engagement. In turn, employees who are psychologically present, attentive, connected and focused on their jobs attain higher task performance. Results support the role of job engagement as a key mechanism for mediating the impact of social context on employee behaviors (Christian *et al.*, 2011) and reaffirm those of the research undertaken in other industries and contexts on the transformational leadership-job engagement-task performance relationship (Breevaart *et al.*, 2016; Fernando and Jayarwardana, 2024; Jiatong *et al.*, 2022; Lai *et al.*, 2020; Park *et al.*, 2022; Pourbarkhordari *et al.*, 2016). In a daily study, Breevaart *et al.* (2014) observed that transformational leadership explained more variance in job engagement than contingent reward. Lai *et al.* (2020) concluded that job engagement conveyed the effect of transformational leadership on task performance beyond transactional leadership.

According to SIPM (Salancik and Pfeffer, 1978), close interactions between leader and followers affect to how employees perceive their work environment, and their motivation and behavior (e.g., Hu *et al.*, 2020; Lu *et al.*, 2019; Piccolo and Colquitt, 2006; Rice and Young, 2023; Yang *et al.*, 2019). Specifically, our study brings new evidence of how the leader, through what he/she says and does, influences employees' perceptions of task

significance, their level of job engagement, and their subsequent task performance. And we respond to the call of Aryee *et al.* (2012) for future studies that analyze the mediating role that job characteristics play in the transformational leadership-job engagement relationship.

Obviously, the perceptions of employees about their jobs derive both from the objective characteristics of the job design and from the informational cues of social context. Previous research (Piccolo and Colquitt, 2006; Purvanova *et al.*, 2006; Wang, 2020) indicates that perceptions of job characteristics can be, at least partly, an effect of the supervisor's transformational leadership. However, because these studies used an aggregate job enrichment variable, they did not determine how transformational leadership contributed to the perception of particular job characteristics. Extending this line of research, our study confirmed that when supervisors behave in a transformational manner, employees perceive greater task significance. Results of experiments conducted by Grant (2008) showed that employees who received cues in the form of stories perceived more task significance and increased their dedication to the job.

However, the link between transformational leadership and task variety was not significant. This may be because employees working in young technological firms often perform a wide variety of tasks: "Organizational members must be able to adapt and remain flexible to the organization's demands and be willing to accept roles that peers in larger organizations are not expected to assume." (Messersmith and Guthrie, 2010, p. 243). Consequently, their perception of task variety may be attributable more to the objective characteristics of the job than to the supervisor's leadership. Another reason could be the leader's fear of generating overload when employees already perform jobs with a high level of variety and complexity. The meta-analysis of Humprey *et al.* (2007) reported a correlation of 0.39 between task variety and overload.

Results also showed that the perceptions of two job characteristics (task variety and task importance) had a positive and significant impact on job engagement, supporting the notion that more enriching jobs increase motivation (Hackman and Oldham, 1980). When employees perceive that their job is varied and significant, they will generate a feeling of enthusiasm and exert higher levels of energy at work. The significant relationships between the task variety and significance and job engagement are consistent with the findings of Christian *et al.* (2011), Shantz *et al.* (2013) and Goštautaitė and Bučiūnienė (2015). It supports that job engagement is associated with the motivational potential of task context (Kahn, 1990), which can be facilitated by job design and reinforced, for the case of task significance, by the transmitted cues by transformational leader. Perceptions of task variety (more attributable in our study to the characteristics of the job itself) and task significance (also influenced by the social environment) make employees consider their work more valuable and meaningful and, thus, they experience higher job engagement.

By integrating SIPM and JCM, the results revealed the existence of a serial mediation relationship between transformational leadership-task significance-job engagement-task performance. That is, transformational leaders shape the employee perception of task significance, which prompts them to invest all their energies in their jobs and translates into better task performance (rated by supervisors). Although task variety positively influenced task performance through of job engagement, it was not possible to verify a serial mediation since task variety was not significantly influenced by the supervisor's transformational leadership. While employees in young technology-and knowledge-intensive SMEs are perhaps more aware of the variety of tasks they perform, they may find it more difficult to understand the value of their work and how it contributes to impact

on the lives or work of others, and to this end the supervisor transformational behavior is critical.

Implications for practice and society

The findings suggest that the management of technology and knowledge-intensive young SMEs can foster employees' job engagement and, consequently, their performance through various means. On the one hand, by properly designing jobs to include motivational characteristics such as task variety and task significance. For this purpose, jobs could be designed to employees perceive that they perform a variety of tasks that have a significant impact on others (Morgeson and Humprey, 2006). Encouraging employees to have more interaction with those they benefit will strengthen the significance they attach to their work (Grant, 2008). From the proactive perspective of job design, it is important to structure jobs with sufficient autonomy and freedom for employees themselves to modify them (Petrou *et al.*, 2012). Through job crafting, employees alter the number of job tasks or their content, improving the meaning of their work or modifying relationships, for example, by increasing the number or intensity of contacts with colleagues or customers (Wrzesniewski and Dutton, 2001).

On the other hand, by promoting a transformational leadership style among supervisors which, in addition to directly favor job engagement, makes it easier for employees to perceive their tasks as more significant. Hence, management needs to pay special attention to the implementation of training programs that promote a transformational leadership style among supervisors. According to Lai *et al.* (2020, p. 8) "through these programs, leaders may enhance their coaching skills including how to set unit goals, communicate with members about these goals, motivate members to achieve goals, invent new methods for problem-solving, and cheer up members when they experience setbacks". Moreover, supervisors can increase the significance that employees attribute to their work by clarifying the relevance of their individual contributions and making them see the impact their work has on the well-being of others, both inside and outside the firm (Grant, 2008) or even linking the department/unit contribution to bottom-line metrics (Cleavenger and Munyon, 2013).

Also, since certain personality traits, such as extraversion and emotional stability (Bono and Judge, 2004) have been related to the adoption of a transformational leadership style, such traits could be considered in the selection and promotion decisions of employees to managerial positions (Wang *et al.*, 2011). Lowe *et al.* (1996) emphasized the importance of including questions regarding the candidate's leadership style in selection interviews. For example, open-ended questions could be incorporated regarding the candidate's behavior in situations requiring intellectual stimulation and showing confidence and support for the followers' skills to cope with complicated situations. This could also be assessed through role-playing.

For Messersmith and Wales (2013), the success of young technology SMEs is based on the continuous improvement of employee performance. To thrive and grow, management needs to ensure that the firm human capital contributes to organizational goals and, with it, to business performance (Rauch and Hatak, 2016). Due to its size, each employee has great influence on firm performance (Messersmith and Wales, 2013). This, together with scarcity of studies in this context and the importance of these firms for the countries innovation and economic progress, as well as for the generation of employment (Desmarchelier *et al.*, 2013; Messersmith and Guthrie, 2010), makes the results relevant for society.

Limitations and future lines

This study has some limitations. A first limitation is its cross-sectional design. Although mediation analysis implies causal mechanisms, the cross-sectional design does not allow such causal inferences to be drawn. Longitudinal research is required to support the causal direction of the relationship. Second, the fact that task significance partially mediated the relationship between transformational leadership and job engagement suggests the need for further studies that analyze the mediating role of other job characteristics to understand their differential effects on the relationship between transformational leadership and job engagement. Furthermore, given that the interaction between personality and job characteristics could impact employees' job engagement, we encourage researchers to consider this effect in future studies. Finally, considering the results (specifically, the non-significant relationship between transformational leadership and task variety), future studies could examine the moderating role of job characteristics in the relationship between transformational leadership and job engagement, contributing new evidence to the approach of Han *et al.* (2020). The strength of the positive relationship of transformational leadership on job engagement can be expected to weaken as job characteristics perceptions increase. Particularly, a high task variety could potentially make transformational leadership irrelevant to promote job engagement. This could help to explain the findings of our study, conducted in a context where employees perform multiple tasks.

Conclusion

Drawing on SIPM and JCM, this study addressed the complex process by which transformational leadership affects employees' task performance (rated by supervisors) by examining the causal chain with two sequential mediators. The results revealed that both task variety and task significance impacted on job engagement. It also advances knowledge on how the supervisor's transformational leadership helps employees to be aware of the value and significance of the tasks performed and, thus, to channel all their energies into the performance of their work role, resulting in higher task performance.

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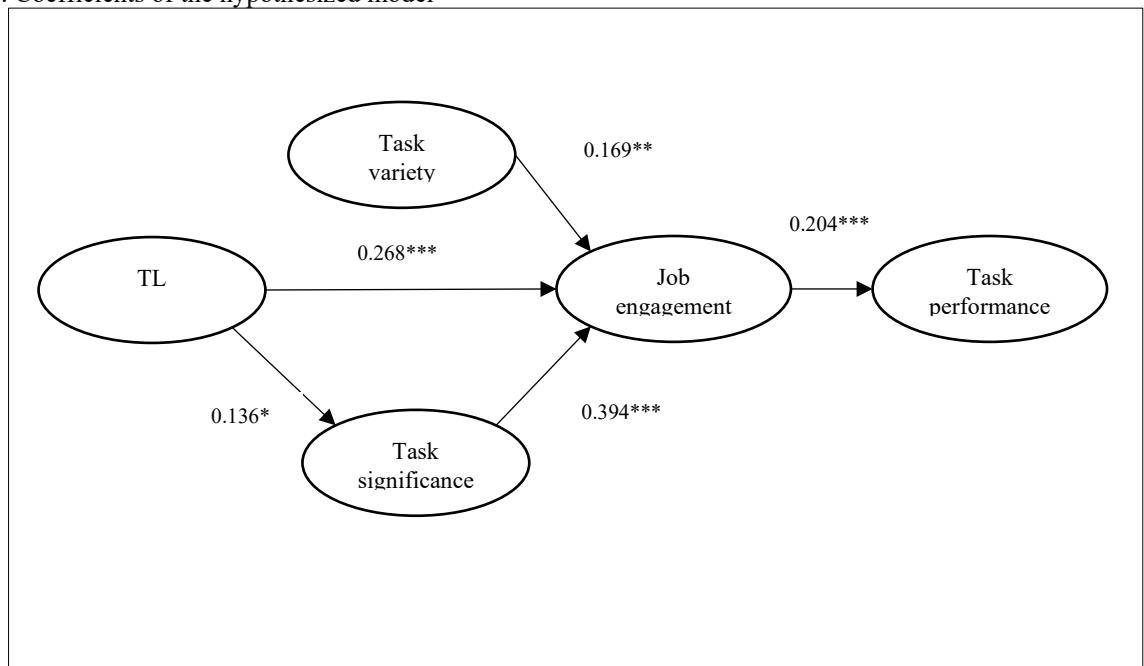
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Figures

Figure1. Coefficients of the hypothesized model



Notes: TL, transformational leadership; *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

Tables

Table I. Descriptive statistics and correlations.

| Variable | M | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|--------------------------------|-------|------|-----------|--------|----------|----------|----------|---------|---------|
| 1. Age | 32.09 | 6.18 | | | | | | | |
| 2. Gender | - | - | -0.093 | | | | | | |
| 3. Transformational leadership | 5.26 | 1.43 | -0.195*** | -0.063 | (0.964) | | | | |
| 4. Task significance | 4.71 | 1.30 | 0.094 | 0.001 | 0.143* | (0.814) | | | |
| 5. Task variety | 5.63 | 1.12 | 0.134* | -0.099 | 0.083 | 0.330*** | (0.953) | | |
| 6. Job engagement | 5.78 | 0.82 | 0.042 | 0.108 | 0.380*** | 0.433*** | 0.303*** | (0.930) | |
| 7. Task performance | 5.82 | 1.10 | -0.058 | 0.027 | 0.150** | 0.088 | 0.064 | 0.162** | (0.956) |

Notes: n = 320. *p < .05, **p < .01, ***p < .001.

Table II. Overall reliability and validity of the constructs.

| | Transformational leadership | Task significance | Task variety | Job engagement | Task performance |
|-----------------------------|-------------------------------|-------------------------------|-------------------------------|------------------------------|---------------------------|
| Transformational leadership | CR = 0.964 AVE = 0.792 | | | | |
| Task significance | SC = 0.019 (0.008; 0.266) | CR = 0.818 AVE = 0.600 | | | |
| Task variety | SC = 0.007 (-0.028; 0.200) | SC = 0.137 (0.252; 0.488) | CR = 0.954 AVE = 0.873 | | |
| Job engagement | SC = 0.105 (0.206; 0.442) | SC = 0.233 (0.361; 0.605) | SC = 0.092 (0.173; 0.435) | CR = 0.917 AVE = 0.738 | |
| Task performance | SC = 0.029 (0.051; 0.287) | SC = 0.010 (-0.026; 0.224) | SC = 0.004 (-0.063; 0.195) | SC = 0.040 (0.070; 0.332) | CR = 0.957 AVE = 0.846 |

Notes: AVE, average variance extracted; CR, composite reliability; SC, squared correlation

Table III. Model comparison.

| Models | χ^2 | df | CFI | IFI | RMSEA | CI 90 % RMSEA | $\Delta\chi^2$ | df | p |
|-----------------|----------|-----|-------|-------|-------|------------------|----------------|----|--------|
| Saturated model | 775.854 | 365 | 0.955 | 0.955 | 0.059 | 0.054-0.065 | | | |
| M1 | 779.497 | 366 | 0.954 | 0.955 | 0.060 | 0.054-0.065 | 3.643 | 1 | ns |
| M2 | 796.662 | 366 | 0.953 | 0.953 | 0.061 | 0.055-0.066 | 20.808 | 1 | <0.001 |
| M3 | 778.141 | 366 | 0.955 | 0.955 | 0.059 | 0.054-0.065 | 2.287 | 1 | ns |
| M4 | 780.485 | 366 | 0.954 | 0.955 | 0.060 | 0.054-0.065 | 4.631 | 1 | <0.05 |
| M5 | 775.862 | 366 | 0.955 | 0.955 | 0.059 | 0.053-0.065 | 0.008 | 1 | ns |
| M6 | 783.987 | 366 | 0.954 | 0.954 | 0.060 | 0.054-0.066 | 8.133 | 1 | <0.001 |
| M7 | 775.856 | 366 | 0.955 | 0.955 | 0.059 | 0.053-0.065 | 0.002 | 1 | ns |
| M8 | 811.675 | 366 | 0.951 | 0.951 | 0.062 | 0.056-0.068 | 35.821 | 1 | <0.001 |
| M9 | 781.787 | 369 | 0.955 | 0.955 | 0.059 | 0.053-0.65 | 5.933 | 4 | ns |

Notes: n = 320. ns, not significant

Table IV. Summary of support/rejection of hypotheses

| Hypotheses | Support/ rejection |
|--|-----------------------|
| <i>H1.</i> Transformational leadership → Job engagement → Task performance | Support |
| <i>H2.</i> Transformational leadership → Task variety → Job engagement | Rejection |
| <i>H3.</i> Transformational leadership → Task significance → Job engagement | Support |
| <i>H4.</i> Transformational leadership → Task variety → Job engagement → Task performance | Rejection |
| <i>H5.</i> Transformational leadership → Task significance → Job engagement → Task performance | Support |