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Effort and reward as a mechanism linking leader-member exchange with work engagement

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ABSTRACT

Leader-member exchange (LMX) theory concentrates on the unique dyadic relationships between leaders and followers. Consistent evidence associates LMX relationships to employee work engagement, but research on the mechanisms explaining the connection has remain scarce. This study applies social exchange, LMX and effort-reward imbalance theories to examine whether the effort made by employee and the reward gained mediate the relationship between LMX and three dimensions of work engagement: vigor, dedication, and absorption. A large Finnish cross-sectional sample (M=1701) collected from service-sector was analysed utilizing path modelling. The results indicate that high-quality LMX relationships were connected with employees' greater reward and reduced effort, which in turn partially mediated the positive association to work engagement dimensions. Reward was positively connected with vigor, dedication, and absorption, while effort had a negative relationship with vigor and a positive association with absorption. There was no significant interaction effect between effort and reward on any work engagement dimension. This study contributes to literature by connecting LMX with work engagement dimensions and, more importantly, provides empirical evidence on the mechanism explaining these relationships. Reward had a particularly important role in explaining the relationships. Distinct associations with vigor, dedication and absorption encourages to examine them separately in future studies.

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SUBJECTS

Human Resource Management; Organizational Studies; Leadership

Introduction

Employee well-being has become a major concern in modern complex, hectic and stressful working life, where the motivation to develop, use and sustain new skills is a constant requirement (Gagné et al., 2022; Inceoglu et al., 2018). The concept of work engagement addresses the current requirements regarding work-related employee well-being and motivation because organizations need employees who are energized by, dedicated to, and absorbed in their work (Bakker et al., 2014). Work engagement is a pervasive, active, and fulfilling work-related state of mind: a truly positive measure of work well-being (Bakker et al., 2014; Schaufeli et al., 2002). Work engagement has a wide range of positive consequences for employees and the organization as a whole (Bakker et al., 2011; Christian et al., 2011; Mazzetti et al., 2023). High-quality leadership is one organizational factor that has been suggested to improve employee well-being, motivation, and work engagement (e.g. Bakker et al., 2014; Breevaart et al., 2015; Garg & Dhar, 2017). This study concentrates on a relationship-based approach to leadership in the form of leader-member exchange (LMX) (Dansereau et al., 1975; Graen & Scandura, 1987; Liden et al., 1997) and examines the effect of LMX on the dimensions of work engagement vigor, dedication, and absorption. Furthermore, the study specifically examines whether social exchanges related to employee effort and reward act as a mechanism explaining the association between LMX and work engagement dimensions.

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LMX theory (Dansereau et al., 1975; Liden et al., 1997) focuses on the dyadic relationships between subordinates and their supervisors, where valued resources are exchanged. The LMX theory is partly based on social exchange theory (Cropanzano & Mitchell, 2005; Gouldner, 1960), which focuses on the rules and norms of exchange, resources exchanged and the relationship that emerges from the social exchange. The main argument is that exchanging resources generates obligations. Accordingly, a supervisor can offer different resources and reward, which subordinates can reciprocate, for example, by putting extra effort into work. The better the LMX relationship, the more and better-quality resources are exchanged. Several recent studies connect LMX positively with employee work engagement (e.g. Breevaart et al., 2015; Garg & Dhar, 2017; Hesmert & Vogel, 2024; Mao & Tian, 2022; Wagner & Koob, 2022). However, previous LMX literature has mainly concentrated only on the overall unidimensional measure of work engagement, although the examination of three separate work engagement subdimensions would be important as vigor, dedication, and absorption have partly different antecedents and outcomes (Bakker et al., 2007; Neuber et al., 2022; Mauno et al., 2007). In addition, a three-factor structure has proved statistically superior to a unidimensional conceptualization of work engagement (Mills et al., 2012). Accordingly, examining vigor, dedication, and absorption separately should offer a more accurate and detailed understanding of the aspects that engage employees than investigating work engagement as a unidimensional construct.

The main focus of the study lies in the examination of the possible mechanism explaining the positive relationship between LMX and work engagement as the current research has not adequately identified the explanatory pathways (Mao & Tian, 2022). Previous studies have theoretically explained the relationship between LMX and work engagement usually by leaning on the job demands-resources model (JD-R), stating that LMX enhances work engagement by increasing job resources. Few empirical studies have found that, for example, social resources (Breevaart et al., 2015; Radstaak & Hennes, 2017), challenging job demands (Radstaak & Hennes, 2017), reduced role overload and increased job security (Altinyay et al., 2019), psychological empowerment (Aggarwal et al., 2020), psychological safety (Mao & Tian, 2022) and team atmosphere (Wagner & Koob, 2022) partly mediate the relationship between LMX and work engagement. However, despite this recent empirical evidence, the mechanism linking LMX to work engagement has been described as essentially unresolved (Mao & Tian, 2022).

We consider it likely that there are several distinct pathways, and this study introduces the employee effort and reward as a novel mechanism with the potential to explain the relationship between LMX and work engagement. Employee effort and reward are introduced as potential mediators as they are central to the social exchange between supervisor and subordinates and have been extensively associated with employee well-being in the effort-reward imbalance (ERI) model (Siegrist, 1996). In addition, examining effort and reward enables the investigation of possible positive and negative pathways connecting LMX to work engagement. We examine effort and reward in the framework of the ERI model, where effort is defined by reference to the perceived strain caused by the workload and other job demands and reward in terms of salary, esteem, and career opportunities (Feldt et al., 2013; Siegrist, 1996; Siegrist et al., 2004). Similarly to LMX theory, the ERI model is based on social exchange theory, and according to the ERI model, effort should have an adverse effect and reward a positive effect on well-being (e.g. work engagement), but the focus of the ERI model lies on the combined effect of effort and reward (i.e. in their interaction or balance). The ERI model holds that if an employee's level of effort is not reciprocated with matching level of reward, negative emotions, disengagement and stress emerge (Ge et al., 2021; Li et al., 2023; Siegrist, 1996; Siegrist & Li, 2016), although this imbalance effect is only rarely properly tested (see also Allisey et al., 2012; Gorgievski et al., 2019; Kunz, 2019). Thus, unlike the previous research this study examines the mechanism linking LMX and work engagement in the framework of ERI model. Overall, the utilization of ERI model in LMX and work engagement research has remained relatively limited.

Based on the LMX and social exchange theories, we assume employees in high-quality LMX relationships receive more reward to counter the effort they invest. Such employees then reciprocate through vigorous, dedicated, and absorbed working. This study thus references LMX theory and the ERI model to examine whether the employee effort, reward, and the accordant interaction effect explain the connection between LMX and the three dimensions of work engagement: vigor, dedication, and absorption.

Association of leader-member exchange (LMX) with effort and reward

Leader-member exchange (LMX) is a leadership approach that focuses on the unique dyadic relationships between subordinates and their supervisors (Dansereau et al., 1975; Graen & Uhl-Bein, 1995; Liden et al., 1997). LMX theory is based on role theory (Graen & Scandura, 1987) and social exchange theory (Graen & Uhl-Bein, 1995; Liden et al., 1997), which suggest that dyadic LMX relationships develop in the process where a supervisor exchanges valued resources with subordinates (Liden et al., 1997). A supervisor can offer direct and indirect resources such as information, autonomy, attention, encouragement, social support, responsibility and interesting and challenging tasks. In addition, various tangible and intangible reward, such as approval, salary increases, and career progression, can be exchanged (Graen & Scandura, 1987; Graen & Uhl-Bein, 1995; Liden et al., 1997). Subordinates can reciprocate by taking greater responsibility, investing extra effort, or committing to the leader and organization; which are valued by the supervisors as they help them to meet their own goals (Liden et al., 1997; Wilson et al., 2010). The norm of reciprocity evokes an obligation for both sides to repay the acquired benefits (Gouldner, 1960). In low-quality LMX relationships, the exchange is restricted to material and formal levels and will focus only on the items of the job description. In contrast, in high-quality LMX relationships, the exchange will be material and social. The latter scenario fosters mutual trust, affect, loyalty, respect, and obligation between supervisor and subordinate (Graen & Uhl-Bein, 1995; Liden et al., 1997). Accordingly, the exchange of valued resources should improve in quantity and quality as the quality of the LMX relationship develops. The quality of the LMX relationship shapes the attitudes, perceptions, and behaviors of the subordinates (Dulebohn et al., 2012; Gerstner & Day, 1997; Liden et al., 1997). The quality of the LMX relationship is also connected to the amount of effort made by the subordinate and the reward earned (Liden et al., 1997).

LMX is associated with intensified effort

Resources are exchanged in all LMX relationships, but LMX theory suggests that employees involved in high-quality LMX relationships feel obliged to reciprocate the resources directed towards them by engaging in extra and undetermined work activities beyond contractual or transactional expectations (Liden et al., 1997). These added duties require them to accept extra challenges and responsibility, commit themselves and invest more time and energy in work and, thus, more physical and mental effort (Liden et al., 1997). Empirical findings support the positive relationships between LMX and effort, as Lu and Sun (2017) found a positive connection between LMX and effort measured as work intensity, and the study of Buch et al. (2014) connected social exchanges with supervisor with higher effort. Furthermore, high-quality LMX has been linked with extensive job demands measured for example by time pressure and physical workload (e.g. Jiang et al., 2014). Accordingly, the following hypothesis is presented:

Hypothesis 1: LMX is positively connected with effort.

LMX is associated with enhanced reward

LMX relationships can generate reward for subordinates in several ways. First, leaders provide attention, appreciation, career prospects and developmental opportunities in exchange for employee effort (Breevaart et al., 2015; Graen & Scandura, 1987; Liden et al., 1997). LMX relationships are positively connected with general reward and recognition (Karanika-Murray et al., 2015) and satisfaction with salary (Dulebohn et al., 2012), which can indicate at least adequate financial reward. Furthermore, employees in high-quality LMX relationships can obtain indirect reward as they are offered more challenging and responsible tasks, which should provide them with extra reward. It has also been shown that subordinates in high-quality LMX relationships receive better performance evaluations, which determine the organizational reward open to them (Graen & Uhl-Bein, 1995). Hence, we propose the following hypothesis:

Hypothesis 2: LMX is positively connected with reward.

Associations of effort and reward with work engagement

The effects of effort and reward have been examined comprehensively through the ERI model (Siegrist, 1996), concentrating on the perceived balance between effort and reward acquired at work. According to ERI model effort reflects the perceived strain caused by workload, time pressure, responsibilities imposed by the employer and other job demands (Feldt et al., 2013; Siegrist et al., 2004). Employee effort manifests in the time and energy they invest, and in exchange, they expect reward (Siegrist, 1996). From an ERI perspective, reward encompasses more than merely salary and bonuses, and can be intangible reward such as esteem (recognition and respect), career opportunities, and job security (Siegrist et al., 2004).

The ERI model hypothesizes that effort and reward have separate effects on work-related well-being, but the main argument of the ERI model is that the combined effect (i.e. interaction or balance of effort and reward) explains outcomes over and above the separate effects (Siegrist & Li, 2016; van Vegchel et al., 2005). An imbalance between effort and reward, and more specifically, a high effort level combined with a low reward level, matters. A failure of reciprocity is likely to provoke negative emotions and sustained stress responses with adverse long-term effects on health (Siegrist & Li, 2016). The majority of empirical studies examining the ERI model support the imbalance effect, but most studies have not actually investigated whether the balance/interaction of effort and reward explains outcomes beyond their separate additive effects (Allisey et al., 2012; Gorgievski et al., 2019; Kunz, 2019; Tse et al., 2007). The ERI model was originally developed to examine strain reactions, which are also the focus of much of the empirical research (van Vegchel et al., 2005). However, the ERI model has recently been utilized in studies examining psychological well-being and motivational outcomes such as work engagement (e.g. Kinnunen et al., 2008; Li et al., 2023; Wolter et al., 2021).

Work engagement is considered a truly positive measure of work-related well-being in contrast to burnout and stress (Bakker et al., 2014). The measure is defined as a persistent and pervasive, active, positive, and fulfilling work-related state of mind, manifested in three dimensions: vigor, dedication, and absorption (Schaufeli et al., 2002). Vigor is an affective component, which implies high energy levels and mental resilience while working, the willingness to work intensively and persistence in difficult situations. Dedication manifests as a motivational dimension in a person's genuine and strong involvement in work and experiencing work-related pride, sense of significance, enthusiasm, challenge, and inspiration. Absorption refers to a cognitive state of being where a person is fully concentrated and completely occupied by their work, where time passes quickly, and the person finds it difficult to detach from work. The concept of flow relates closely to absorption, but with the difference that flow refers to a short-term peak experience while absorption refers to a more pervasive and persistent state of mind (Schaufeli et al., 2002; Mauno et al., 2007). Vigor and dedication are the closely related core components of work engagement (Bakker et al., 2011). Because of their similarity, they have rather similar antecedents in empirical studies compared to absorption (Bakker et al., 2007; Mauno et al., 2007; Mazzetti et al., 2023). In general, job resources, such as the various forms of reward, consistently facilitate work engagement, while job demands requiring effort have not usually been significant predictors of unidimensional measured work engagement (Bakker et al., 2011; Lesener et al., 2019; Schaufeli & Taris, 2014).

The association of effort on vigor, dedication and absorption

According to the ERI model, effort should cause strain and have a negative effect on well-being (Siegrist, 1996). Though, job demands and the requirement to make an effort can also be interpreted as a challenge, which can increase work engagement (Crawford et al., 2010). In practice, there are some evidence connecting efforts negatively (e.g. Li et al., 2023) and positively (e.g. Inoue et al., 2013) with work engagement. Though, the relationship between effort or job demands on work engagement has usually been nonsignificant (Hyvönen et al., 2010; Lesener et al., 2019; Wolter et al., 2021). However, effort could have different and even opposite effects on different work engagement dimensions, which could partly explain the nonsignificant association found in studies utilizing of unidimensional work engagement measure.

Overall, effort has been connected negatively, particularly to vigor and dedication. Spreitzer et al. (2010) state that excessive job demands reduce work engagement as demands take effort and are cognitively and physically taxing, and they exhaust resources. A situation like that drains employees of energy and vigor, which can lead them to opt to disengage from rather than dedicate themselves to work. For example, Pöysä et al. (2022) reported rather strong negative correlations between effort, vigor, and dedication, but the correlation between effort and absorption was weak. In addition, Van Bogaert et al. (2014) connect job demands negatively with vigor, as the associations to other work engagement dimensions were not significant. Accordingly, based on the ERI model and previous research on effort and job demands, we propose the following hypothesis:

Hypothesis 3a: Effort is negatively related to vigor and dedication.

Even though making effort drains employees' energy and has a negative effect on certain well-being indicators, it can simultaneously act as a challenge with positive effects on other well-being indicators (Crawford et al., 2010; Webster et al., 2011; Widmer et al., 2012). Regarding the work engagement dimension absorption it seems logical that effortless tasks do not absorb employees and therefore effort should have a positive effect on absorption. Furthermore, as absorption parallels with the concept of flow, it is likely that also absorption emerges in situations where employees have to invest time and energy and which are characterized by considerable challenges and matching skills (Bakker, 2005). Previous research supports a positive connection between effort and absorption. A follow-up study by Mauno et al. (2007) showed that time demands predicted follow-up absorption, although only when the baseline absorption was not controlled for. In addition, workload has been positively connected with absorption (Koyuncu et al., 2006), and the study of Kinnunen et al. (2008) reported a significant positive correlation between effort and absorption. Based on the literature on challenge demands (Crawford et al., 2010) and the empirical findings, the following hypothesis is proposed:

Hypothesis 3b: Effort is positively related to absorption.

Reward is associated positively with vigor, dedication, and absorption

The ERI model argues that reward has a positive effect on well-being (Siegrist, 1996). In addition, the connection between reward and work engagement can be explained by reference to social exchange theory and the norms of reciprocity, which predict that employees feel obligated to compensate for the received reward by engaging with work (Cropanzano & Mitchell, 2005; Saks, 2006). A meta-analysis offers strong empirical evidence that reward and recognition are connected with work engagement (Crawford et al., 2010). For example, appreciation (Hulkko-Nyman et al., 2012), job security (Mauno et al., 2007), performance feedback (Crawford et al., 2010) and opportunities for development (Breevaart et al., 2015; Crawford et al., 2010) have been connected with work engagement. In their meta-analysis, Mazzetti et al. (2023) concluded that developmental resources (feedback and learning opportunities) were among the strongest resources associated with engagement.

Based on the rules of social exchange, employees can reciprocate the reward earned with vigorous, dedicated, and absorbed working (Saks, 2006). Accordingly, all dimensions of work engagement can be utilized in social exchange, and there is some empirical evidence that reward have an equally strong relationship with vigor, dedication, and absorption (Koyuncu et al., 2006; Wolter et al., 2021). However, the majority of studies connect reward such as appreciation positively specifically with vigor and dedication, but also with absorption (Bakker et al., 2007; Hulkko-Nyman et al., 2012; Kinnunen et al., 2008; Wang et al., 2017). Accordingly, based on theory and empirical findings, we hypothesize as follows:

Hypothesis 4: Reward is positively related to all dimensions of work engagement and most strongly with vigor and dedication.

High effort combined with low reward is negatively associated with vigor, dedication, and absorption

The ERI model (Siegrist, 1996) states that it is not just effort and reward that matter but the balance between them. When employees perceive their effort is not reciprocated with adequate reward, the resulting imbalance will prompt strong negative emotions (Siegrist, 1996; Siegrist & Li, 2016). Negative emotions can reduce employees' willingness to work vigorously, dedicate themselves to work, or absorb themselves in it. In addition, the reward earned can help employees cope with job demands and put the effort invested in the job into perspective (Bakker et al., 2007). The few empirical studies examining ERI and work engagement have produced mixed results. The ratio of effort and reward (ERI ratio) has been connected negatively with work engagement (Ge et al., 2021; Hyvönen et al., 2010) and its dimensions (Wolter et al., 2021). Accordingly, in line with the ERI model, greater effort invested than reward acquired has been connected with reduced work engagement; however, there is also some evidence of a nonsignificant imbalance effect (Feldt et al., 2013; Inoue et al., 2013; Tse et al., 2007) and also that an 'over benefitting' imbalance would lead to slightly worse work engagement than a balanced situation (Li et al., 2023). Nevertheless, Hypothesis 4b proposes that effort can increase absorption. Based on the ERI model, we argue that effort does not have this kind of positive effect unless there is a compensating reward. Accordingly, in line with the ERI model, the following hypothesis is formed:

Hypothesis 5: A combination of high effort and low reward is associated with the lowest level of vigor, dedication, and absorption.

Indirect effect of LMX on work engagement via effort and reward

High-quality LMX relationships have been connected with several positive outcomes such as work engagement, which is a truly positive measure of employee well-being and motivation (e.g. Hesmert & Vogel, 2024; Mao & Tian, 2022; Wagner & Koob, 2022). However, only few studies have empirically examined the mechanism linking LMX with work engagement. It is generally thought that a positive leadership such as high-quality LMX relationship influences work engagement by impacting job demands and particularly by generating different job resources (Decuyper & Schaufeli, 2020; Tummers & Bakker, 2021). Resources such social support (Breevaart et al., 2015), social job resources (Radstaak & Hennes, 2017), psychological empowerment (Aggarwal et al., 2020), psychological safety (Mao & Tian, 2022) and team atmosphere (Wagner & Koob, 2022) have been found to mediate the positive effect of LMX on work engagement.

Based on social exchange theory and specifically on LMX and ERI theories, this study suggests a novel idea that employee effort, reward, and their interaction could constitute an additional pathway that explains the relationship. The norm of reciprocity holds that employees in a high-quality LMX relationship feel obliged to make more effort, but are simultaneously also rewarded in many ways (Graen & Uhl-Bein, 1995; Liden et al., 1997). Employees can reciprocate the earned reward by engaging with work (Crawford et al., 2010; Cropanzano & Mitchell, 2005; Saks, 2006). Based on the ERI model and discussion about challenge and hindrance job demands, effort can drain energy and reduce vigor and dedication (Spreitzer et al., 2010), while it can also increase absorption (Koyuncu et al., 2006; Mauno et al., 2007). Nevertheless, regarding the ERI model, if effort is not matched with reward, the impact of effort should be extra negative. Furthermore, few prior studies present indirect effects between LMX and work engagement through challenging job demands (Radstaak & Hennes, 2017) and development opportunities (Breevaart et al., 2015). Those findings offer indirect empirical evidence that effort and reward can mediate the relationship. Accordingly, we hypothesize:

Hypothesis 6a: LMX has a negative indirect effect on vigor and dedication through effort.

Hypothesis 6b: LMX has a positive indirect effect on absorption through effort.

Hypothesis 7: LMX has a positive indirect effect on vigor, dedication and absorption through reward.

Hypothesis 8: LMX has a negative indirect effect on vigor, dedication and absorption through effort, particularly when reward levels are low.

Methods

Sample and procedure

The study sample (M=1701) was collected from multiple Finnish service-sector organizations: a communal day-care organization (N=364), an insurance company (N=334), a logistics organization (N=488), a retail company (N=175), a finance organization (N=211) and several small and medium-sized organizations (N=129). The combined sample offers a broad representation of the service sector and enhances statistical power in estimation. Participants were informed about the nature of study. Responding to the survey required employees to evaluate the behavior of their supervisors, and therefore the employee respondents were assured that their responses would remain confidential and the research team would hold the data. Participants presented their written informed consent by submitting the completed survey. Ethical approval for the study was exempted by the University of Vaasa Human Science Ethics Committee as participation in the research did not deviate from the principles of informed consent, the research did not intervene in the physical integrity of adult participants or expose them to strong stimuli. Furthermore, the research did not involve a risk for causing mental harm or threat to the safety of participants.

The majority of respondents (68%) were female, which is explained by the fact that almost all employees at the day-care organization were women (97%). However, the sample represents the gender distribution of the whole Finnish service sector (Statistics Finland, 2010). The age of the respondents varied between 18 and 66, with an average of 42.0 years (SD = 12.0). Almost one-third (29%) had a higher-level education, and a strong majority of the respondents (81%) held a permanent position. The average tenure with the current employer was 11.0 years (SD = 11.1), while the majority of the respondents had worked with their current supervisor for a relatively short time: 40% for less than one year and only 8% for over seven years, while 10% held a supervisory position.

Measures

Leader-member exchange (LMX) was assessed with a validated nine-item LMX-UVA scale (Tanskanen et al., 2019) that updates previously applied scales (e.g. LMX-7) and, for example, focuses more on the exchange between parties. Subordinates recorded responses on the Finnish LMX-UVA scale with a 7-point Likert scale anchored with *fully disagree* (1) and *fully agree* (7). Items included: 'We trust each other'. The internal consistency of the scale was excellent (Cronbach's $\alpha=.97$).

Vigor, dedication, and absorption were measured with the validated nine-item Finnish version of the Utrecht Work Engagement Scale (Seppälä et al., 2009). All dimensions were assessed with three items, and the responses were recorded on a scale ranging from *never* (0) to *every day* (6). Example items from the scales are 'At work, I feel bursting with energy' (vigor); 'I am enthusiastic about my job' (dedication) and 'I am immersed in my work' (absorption). The internal consistencies of the scales were good (Cronbach's $\alpha= .85$ to $.90$).

Effort and reward were measured with the ERI questionnaire developed by Siegrist et al. (2004), which has also been validated in a Finnish sample (Kinnunen et al., 2008). Five items measured effort (e.g. 'I have constant time pressure due to a heavy workload') and 11 items measured reward through esteem, career opportunities, and job security (e.g. 'I receive the respect I deserve from my superiors'). All items were measured with a 4-point Likert scale anchored with *fully disagree* (1) and *fully agree* (4). The effort (Cronbach's $\alpha=.70$) and reward ($\alpha=.81$) were internally consistent for both scales. The interaction term between effort and reward was calculated utilizing centred variables.

Analytical strategy

Confirmatory factor analysis of the measurements produced an adequate model fit ($\chi^2(512)= 3364.91$, $p<.001$; RMSEA= .06; SRMR= .07; CFI = .90; TLI= .90) according to a standard cut of values (L. Hu & Bentler, 1999). First, the connections between study variables were examined at a descriptive and correlational level. Then a moderated mediation path model was estimated. The imbalance between effort and reward has been operationalized in previous studies mostly as a ratio of effort and reward (effort/

reward) but also with the interaction term (effort*reward) or as latent profiles. This study utilizes the interaction term approach as it allows the examination of the main effects of effort and reward and whether the balance of effort and reward has explanatory power over and beyond the main effects (Allisey et al., 2012; Gorgievski et al., 2019). The path model utilized observed variables and was adjusted with possible confounders gender, age, tenure, LMX-tenure, supervisory position, and organization as they have been connected with the study variables (e.g. Garg & Dhar, 2017; Gerstner & Day, 1997; Hulkko-Nyman et al., 2012; Inoue et al., 2013). The path model was analysed with MPlus 8.3 software (Muthén & Muthén, 2017) utilizing a robust maximum likelihood estimation. A complex survey data (COMPLEX) procedure was applied as the data were clustered in work units (N=215). The main study variables had little missing data (1.1–1.6%), but the adjusting variables had more missing values and therefore, a full information maximum likelihood estimation was applied. The confidence intervals of the indirect effects and indexes of moderated mediation were calculated with a bias-corrected bootstrap procedure with 1000 iterations.

Results

The level of work engagement dimensions and specifically LMX, were generally satisfactory (see Table 1). Employees in the sample reported that at the average level, reward earned slightly outweighed effort made. LMX was positively correlated with work engagement dimensions and particularly with reward ($r=.56$).

The estimated path model was saturated and therefore had a perfect fit to the data. Figure 1 presents the results from the model explaining the variances of work engagement dimensions ($R^2=0.24-0.33$) and reward ($R^2=0.39$) relatively well but effort only modestly ($R^2=0.13$). Hypothesis 1 was rejected as LMX had

Table 1. Descriptive statistics of the main study variables.

	Mean (SD)	1	2	3	4	5	6
1. LMX	5.56 (1.24)	$\alpha = .97$					
2. Vigor	4.75 (1.22)	.36***	$\alpha = .87$				
3. Dedication	4.67 (1.41)	.37***	.82***	$\alpha = .90$			
4. Absorption	4.61 (1.41)	.31***	.69***	.77***	$\alpha = .85$		
5. Reward	2.82 (0.48)	.56***	.44***	.46***	.34***	$\alpha = .81$	
6. Effort	2.73 (0.59)	-.16***	-.15***	-.02	.03	-.29***	$\alpha = .70$

Note. Means, standard deviations, Cronbach's alphas (on the diagonal) and correlations.

*** $p < .001$.

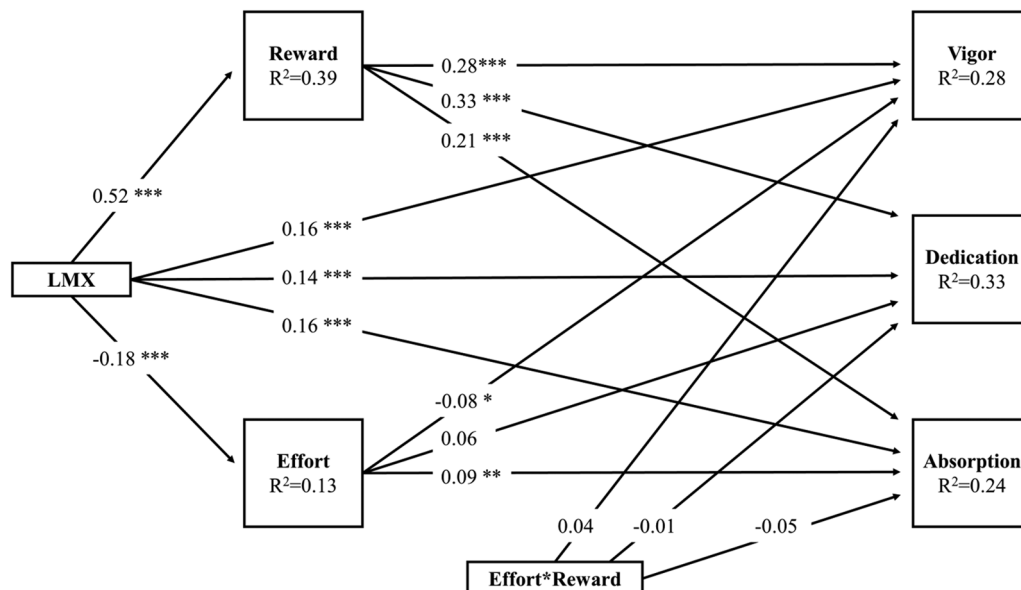


Figure 1. Standardized path coefficients between main study variables.

Table 2. Support for hypotheses.

Hypothesis	Support for hypothesis
H1: LMX is positively connected with effort.	Not supported
H2: LMX is positively connected with reward.	Supported
H3a: Effort is negatively related to vigor and dedication.	Partially supported
H3b: Effort is positively related to absorption.	Supported
H4: Reward is positively related to all dimensions of work engagement and most strongly with vigor and dedication.	Supported
H5: A combination of high effort and low reward is associated with the lowest level of vigor, dedication, and absorption.	Not supported
H6a: LMX has a negative indirect effect on vigor and dedication through effort.	Not supported
H6b: LMX has a positive indirect effect on absorption through effort	Not supported
H7: LMX has a positive indirect effect on vigor, dedication and absorption through reward.	Supported
H8: LMX has a negative indirect effect on vigor, dedication and absorption through effort, particularly when reward levels are low.	Not supported

a negative connection with effort ($\beta=-0.18$), but LMX had a significant positive connection with reward ($\beta=0.52$), which supported Hypothesis 2. Effort had a negative association with vigor ($\beta=-0.08$) and positive associations with absorption ($\beta=0.09$). Unexpectedly, effort was not significantly associated with dedication. Accordingly, Hypothesis 3a, stating that effort has a positive association with vigor and dedication, was partially supported, and Hypothesis 3b predicting a positive relationship between effort and absorption, was also supported. Reward was significantly and positively connected with vigor ($\beta=0.28$), dedication ($\beta=0.33$) and absorption ($\beta=0.21$), which supported Hypothesis 4.

The interaction terms between effort and reward were small ($\beta=-0.05-0.04$) and nonsignificant for vigor, dedication and absorption. Therefore, Hypothesis 5 was not supported. The results of the path model indicated that besides the direct connections with vigor ($\beta=0.16$), dedication ($\beta=0.15$) and absorption ($\beta=0.16$), LMX also had an indirect effect on work engagement dimensions through effort and reward. The analysis indicated that LMX had a significant, but very weak, positive indirect effect on vigor ($b=0.01$, 95% CI: 0.00 – 0.03) and a negative indirect effect on absorption ($b=-0.02$, 95% CI: -0.03 – -0.01) via effort. The indirect effect on dedication was not significant. Accordingly, neither Hypothesis 6a nor 6b was supported. However, Hypothesis 7 was supported as LMX had a significant indirect effect on vigor ($b=0.14$, 95% CI: 0.11 – 0.17), dedication ($b=0.19$, 95% CI: 0.15 – 0.24), and absorption ($b=0.12$, 95% CI: 0.08 – 0.16) through reward. The analysis of moderated mediation revealed that reward did not moderate the indirect effect between LMX and vigor, dedication or absorption through effort. Moreover, all 95% confidence intervals of indexes of moderated mediation included a zero (vigor: IMM=-0.01, 95% CI: -0.04 – 0.01; dedication: IMM = 0.00, 95% CI: -0.02 – 0.03; absorption: IMM = 0.02, 95% CI: -0.01 – 0.05). According to Hayes (2015), if the index of moderated mediation is not significant (the confidence interval includes a zero), then the simple slopes of indirect effects do not differ significantly either. Therefore, Hypothesis 8 was not supported. The support for each hypothesis is presented in Table 2.

Discussion

This study extended the available literature by connecting LMX with the work engagement dimensions of vigor, dedication, and absorption and investigating a mechanism explaining these connections. The path analysis revealed that a high-quality LMX relationship was connected to an employee experience of reduced effort and greater reward, which in turn partially mediated the positive relationship between LMX and vigor, dedication and absorption.

Contrary to expectations, the connection between LMX and effort was negative. There are however some concurring prior empirical evidence (e.g. Hesselgreaves & Scholarios, 2014; Muldoon et al., 2012). It is therefore possible that those in high-quality LMX relationships actually make less effort. They may feel safe at work owing to their good relationship with their supervisor, and rather than proving themselves and reciprocating by working hard, as LMX theory states, they may work at a lower intensity. For example, employees who already experience their LMX relationship to be high-quality might not anymore feel pressure to work very hard as a way to develop the relationship and gain trust. On the other hand, high-quality LMX relationships have been connected to employee job crafting that decrease hindering job demands (Ji et al., 2023). Furthermore, in high-quality LMX relationships, supervisors should be aware

of the subordinate's effort level, and they can influence on the job demands and ensure that the pressure does not rise too far (Decuyper & Schaufeli, 2020; Sonnentag & Pundt, 2016; Tummers & Bakker, 2021).

However, it might be possible that employees in high-quality LMX relationships work hard and have a high level of job demands (e.g. Jiang et al., 2014), but do not perceive they are making a great effort. Several pathways can explain this association. First of all, LMX can influence attitudes to work and therefore, employees involved in a high-quality LMX might have a positive approach to the volume of job demands (Karanika-Murray et al., 2015). Furthermore, a leader's appreciation and support can mean effort is viewed differently (Bakker et al., 2007). Additionally, the LMX and social exchange theories (Cropanzano & Mitchell, 2005; Graen & Uhl-Bein, 1995) indicate that those in a high-quality LMX relationship feel obliged to reciprocate their benefits by making more effort. Such employees might, therefore, not consider the effort they expend at work to be overwhelming but just an acceptable price to pay for the reward gained from high-quality LMX-relationship. The negative correlation ($r=-.29$) between perceived reward and effort, which is usually observed in other samples as well (e.g. Hyvönen et al., 2010; Inoue et al., 2013; Kinnunen et al., 2008) supports those last interpretations.

In accordance with LMX theory (Dansereau et al., 1975; Graen & Scandura, 1987; Graen & Uhl-Bein, 1995; Liden et al., 1997) and previous research (Karanika-Murray et al., 2015), the LMX relationship was positively connected with reward earned. Resources are exchanged in every dyadic supervisor-subordinate relationship regardless of the quality of the LMX relationship, but in high-quality LMX relationships, more resources are exchanged, and therefore subordinates earn a greater reward.

Theoretical implications

This study contributed to the literature by examining the work engagement dimensions, which have not previously been studied in the LMX literature. Unsurprisingly, reward was strongly connected with work engagement dimensions, and the strongest effect was on dedication, followed by that on vigor, which is in line with previous research (Bakker et al., 2007; Hulkko-Nyman et al., 2012; Mauno et al., 2007). Reward was a far stronger predictor of vigor, dedication, and absorption than effort, and the results indicated that reward mediates the connection between LMX and work engagement dimensions particularly strongly. Overall, LMX had a distinct relation to vigor, dedication and absorption, particularly because of the indirect effects through effort. In addition to the indirect effects through reward and effort, the study identifies significant direct effects between LMX and the work engagement dimensions, which indicates that there are several other mediators/pathways in addition to reward and effort, explaining the connection between LMX and work engagement. Therefore, future LMX research should comprehensively examine the possible pathways to work engagement and other outcomes.

Effort had an expected negative connection to vigor and a nonsignificant effect on dedication but did enhance employee absorption, as found in previous studies (Koyuncu et al., 2006; Mauno et al., 2007). Understandably, making an effort reduces energy (vigor) levels as job demands are cognitively and physically taxing and also deplete resources (Spreitzer et al., 2010). However, an employee cannot be absorbed in work with little to do. Research offers mixed findings concerning the relationship between demands and work engagement, which Crawford et al. (2010) explained with two types of demands: challenges and hindrances. However, utilizing an overall unidimensional work engagement scale instead of examining vigor, dedication, and absorption separately could also explain the nonsignificant connection between effort and work engagement in the study of Hyvönen et al. (2010) and the nonsignificant relationship between job demands and work engagement usually found. Utilizing a unidimensional scale implicitly assumes that antecedents have a similar connection with every work engagement dimension. This study, however, indicates that effort has a negative effect on one dimension, a positive one on another, and no effect on the third. Accordingly, these contrasting effects could cancel each other out if examining the association of effort on unidimensional work engagement; a notion also supported by the small and nonsignificant correlation ($r=-.046$) between them. It is apparent that in addition to the type of antecedent, the work engagement dimension also determines the connection. Therefore, more research focusing on the predictors and outcomes of work engagement is merited.

The main premise of the ERI model is that the combination of high effort and low reward has a greater influence on outcomes than the separate main effects of effort and reward alone (Siegrist, 1996).

However, contrary to the predictions of the ERI model, the current analysis revealed no interaction effects between effort and reward on work engagement dimensions. Accordingly, instead of the balance of effort and reward, the separate effects of effort and particularly of reward were important in explaining work engagement, which was also the case in the studies of Inoue et al. (2013), Tse et al. (2007) and Wolter et al. (2021). Previous ERI studies have rarely investigated whether an imbalance of effort and reward is actually relevant (see Allisey et al., 2012; Gorgievski et al., 2019; Kunz, 2019; Tse et al., 2007), but many studies that have examined the significance of imbalance have concluded that imbalance does not explain the outcome beyond the separate main effects of effort and reward (Kunz, 2019; Gorgievski et al., 2019; Preckel et al., 2007; Kinman, 2019). These results suggest that the ERI model might be unnecessarily complicated, and more parsimonious models, such as the JD-R, could be preferable.

As a robustness check for this finding that is contrary to the ERI model, we performed additional analyses utilizing the ERI ratio (effort/reward) instead of the interaction term of effort and reward (effort*reward). The ERI ratio was analysed with the main effects of effort and reward and without them, which is typical in the ERI literature. The logarithm of the ERI ratio was utilized in the analysis as suggested by (Kinnunen et al., 2008; Siegrist et al., 2004). In the additional analyses, the ERI ratio was not significantly related to vigor, dedication, or absorption when the main effects of effort and reward were controlled for. Furthermore, when analysing just the ERI ratio, the coefficients of determination (R^2) regarding work engagement dimensions were lower than in the main model of the study, indicating that the main effects of reward and effort explained the work engagement dimensions better than the ERI ratio. Accordingly, the robustness analyses supported the main analysis.

Limitations and future directions

The current study is not without its limitations. The study was based on self-reports, which are sometimes the most appropriate option to obtain data, for example, when studying affective, attitudinal, perceptual, or other internal states of the subjects (Spector, 2006). Self-report measurements can prompt concerns over common method variance, but the questionnaire used clearly separated the measurements proximally on different themes. The measures also have different scale anchors and numbers of scale points (Podsakoff et al., 2003). However, future studies should utilize an objective measurement technique to complement personal evaluations of effort and reward.

The current study also followed previous research and assumed all the examined relationships were linear, which might not be the most realistic assumption. It is also likely that at least some of the connections studied are bidirectional. Effort and especially reward should enhance an LMX relationship (Dulebohn et al., 2012), and high levels of work engagement probably lead to enhanced effort and reward. Even though, several possible confounders have been adjusted in the analysis, the cross-sectional data do not permit an examination of bidirectional or causal effects. Therefore, future research should apply longitudinal designs and causal modelling.

The study sample was a broad representation of the Finnish service sector. Because the measurements were not specifically related to service work and were rather general, the results can, to some extent, be generalized to other sectors as well, but research would benefit if the analysis were expanded to a wider range of sectors and to different kinds of jobs.

Practical implications

The most obvious practical implication for organizations and supervisors is the importance of social relationships and the well-being of employees in the workplace. Engaged employees experience positive emotions such as happiness and joy and have better health (Bakker et al., 2014). Furthermore, work engagement has been connected with several positive organizational outcomes, such as organizational citizenship behavior, good performance, and lower turnover intention rates (Christian et al., 2011). Supervisors should try to create as many high-quality LMX relationships as possible. Moreover, organizations could enhance such effort by training leaders in the LMX concept, active listening skills, reflecting on the negative and positive components of relationships with each follower, and discussing the leader's

expectations and the resource and reward needs of the followers (e.g. Scandura & Graen, 1984). However, a concern is evident in the LMX literature that time and other resource constraints prevent a supervisor from establishing high-quality LMX relationships with each subordinate. In that case, the levels of mediating variables (effort and reward) could be more easily manipulated in organizations, which would result in positive outcomes even for those with a low-quality LMX relationship. The results of the study indicate that employee effort is not purely negative or positive predictor of employee work engagement. High effort can increase absorption, but simultaneously decrease vigor. Furthermore, according to the analysis the negative effect of effort cannot be mitigated with reward. However, reward were strongly associated with all dimensions of work engagement and therefore rewarding in terms of salary, career opportunities, recognition, appraisal, support and fair treatment should be given attention in organizations. Accordingly, organizations could benefit from assigning sufficient positional power and resources to supervisors to reward employees. Reward are also important in the development process of LMX relationships (Graen & Scandura, 1987; Graen & Uhl-Bein, 1995; Liden et al., 1997). Future research would benefit from examining subtly the dynamic and intertwined development of LMX relationship and rewarding.

Conclusions

This study reinforces the empirical evidence connecting LMX with work engagement and contributes to the literature by showing that the relationship can be partly explained by the employee effort and reward concept. In addition to investigating relevant mechanisms, the study examines work engagement dimensions and the combined effect of effort and reward. A good leader-member exchange relationship can decrease subordinates' perceived level of effort and increase their perceived level of reward, which are, in turn, connected to all dimensions of work engagement.

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Data availability statement

The data that support the findings of this study are available upon reasonable request from the author. The data are not publicly available due to their containing information that could compromise the privacy of research participants.

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