Influence of the project manager's leadership styles on the work engagement mediated by sense of belonging

Influência dos estilos de liderança do gerente de projetos no engajamento no trabalho mediado pelo sentimento de pertencimento

Luciano Ferreira da Silva[1]
Universidade Nove de Julho – UNINOVE
lf_silvabr@yahoo.com.br

Osmar da Silva Junior[1]
Universidade Nove de Julho – UNINOVE
osmarjrlog@gmail.com

Paulo Sergio Gonçalves de Oliveira[2]
Universidade Anhembi Morumbi
psgoliveira@hotmail.com

Flavio Santino Bizarrias[3]
Escola Superior de Propaganda e Marketing – ESPM
flavioxsp@hotmail.com

Abstract: This paper aimed to evaluate the influence of project managers' leadership styles on work engagement mediated by individuals' sense of belonging. The techniques of Confirmatory Factor Analysis and Structural Equation Modelling were adopted to test the measurement and structural models. The instrument to collect data was composed of 36 assertions for the construction of the model's observable variables, which were adapted from validated previous studies. The face and content validation procedure sought to preserve the main characteristics of the scales regarding the measurement of the constructs involved. The sample size is 409 answers valid. Mediation models were analyzed using Maximum Likelihood estimation handling Bootstrap with 5,000 resamples. The software adopted was Jasp 0.17.12 version. The results show that sense of belonging mediates the relationship between leadership and

[1] Universidade Nove de Julho — Liberdade – CEP 01504-001 – São Paulo (SP) – Brasil
[2] Universidade Anhembi Morumbi — Mooca – CEP 03101-001 – São Paulo (SP) – Brasil
[3] Superior de Propaganda e Marketing — Vila Mariana – CEP 04018-010 – São Paulo (SP) – Brasil

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work engagement of the project team. Transformational leadership is the leadership style that promotes greater engagement, and the sense of belonging has a strong influence on this relationship. The results also highlight the negative impact of transactional leadership, which is more focused on tasks, and this type of leadership might reduce work engagement. Situational leadership did not obtain adequate results, and the ambiguity of situational leadership generates noises to understanding the direct and mediated effect. The sense of belonging acting as a mediator suggests that while transformational leadership has a positive and direct effect on work engagement, transactional has a negative effect on engagement behavior. Furthermore, the sense of belonging is a variable that can be seen as offering a substantial explanatory path for work engagement in a project context. Situational leaders must have the skills to accept and translate the ambiguous role to conduct members.

Keywords – Leadership; Project Manager; Work Engagement; Sense of Belonging; Transformational Leadership; Transactional Leadership; Situational Leadership.

Resumo: Este artigo teve como objetivo avaliar a influência dos estilos de liderança dos gerentes de projeto no engajamento no trabalho mediado pelo sentimento de pertencimento dos indivíduos. As técnicas de Análise Fatorial Confirmatória e Modelagem de Equações Estruturais foram adotadas para testar os modelos de mensuração e estrutural. O instrumento de coleta de dados foi composto por 36 assertivas para a construção das variáveis observáveis do modelo, que foram adaptadas de estudos anteriores validados. O procedimento de validação de face e conteúdo buscou preservar as principais características das escalas quanto à mensuração dos construtos envolvidos. O tamanho da amostra é de 409 respostas válidas. Os modelos de mediação foram analisados usando a estimativa de máxima verossimilhança manipulando o *Bootstrap* com 5.000 reamostras. O software adotado foi a versão Jasp 0.17.12. Os resultados mostraram que o sentimento de pertencimento medeia a relação entre liderança e engajamento no trabalho da equipe do projeto. A liderança transformacional é o estilo de liderança que promove um maior engajamento, e o sentimento de pertencimento tem forte influência nessa relação. Os resultados também destacam o impacto negativo da liderança transacional, que é mais focada em tarefas, e esse tipo de liderança pode reduzir o engajamento no trabalho. A liderança situacional não obteve resultados adequados, e a ambiguidade da liderança situacional gera ruídos para a compreensão do efeito direto e mediado. O sentimento de pertencimento atuando como mediador sugere que, embora a liderança transformacional tenha um efeito positivo e direto no engajamento no trabalho, a transacional tem um efeito negativo no comportamento de engajamento. Além disso, o sentimento de pertencimento é uma variável que pode ser vista como oferecendo um caminho explicativo substancial para o engajamento no trabalho em um contexto de projeto. Os líderes situacionais devem ter as habilidades para aceitar e traduzir o papel ambíguo na conduta dos membros das equipes.

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Palavras-chave – Liderança; Gerente de Projetos; Engajamento no Trabalho; Sentimento de Pertencimento; Liderança Transformacional; Liderança Transacional; Liderança situacional.

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Introduction

Research on leadership integrates a variety of approaches, ranging from personality traits to leadership skills as success factors in organizations (Tyssen, Wald, & Spieth, 2013; Tackett *et al*., 2023; Muller & Turner, 2007). Traditionally, there is a distinction between management and leadership roles in organizations. Managers are more focused on tasks, problem-solving, and achieving goals (Bass, 1990; Hsu, Li, & Sun, 2017), while Leaders are more focused on interpersonal relationships, influence, creating vision and meaning, and developing new approaches to long-term problems (Shenhar, 2004; Hsu, Li, & Sun, 2017). Thus, leadership comes from the ability to successfully influence a group's emotions and behaviors (Bennis & Nanus, 1985; Clarke, 2010), effectively engaging people in their work (Rich *et al*., 2010; Dulewicz & Higgs, 2005).

In this context, we suggest that the leader should not only emerge from a hierarchical position, but also be forged in their behaviors and skills to mobilize people towards a certain direction with greater intensity (Skulmoski & Hartman, 2010; Gruden & Stare, 2018). Within the project management environment, studies examine leadership's ability to directly influence people's engagement and project success (Aga, Noorderhaven, & Vallejo, 2016; Hassan, Bashir, & Abbas, 2017; Maqbool, Ye; Manzoor, & Rashid, 2017). It is also a fruitful topic to verify the influence exerted by leadership styles on managing project teams (Dulewicz & Higgs, 2005; Gray & Ulbrich, 2017).

Project management is understood as the use of the right tools and techniques to achieve project success (Shenhar, 2004). Therefore, the project manager needs leadership skills, which involve the ability to guide, motivate and direct a team to help the organization achieve its business goals (PMI, 2017; Ahmed, Philbin, & Cheema, 2021). Consequently, the project manager's leadership behavior, which is a combination of people-oriented and task-oriented behavior, not only directly influences people's development (Savelsbergh, Poell, & Heijden, 2015) but should also contribute to project tasks to accelerate your progress (Rahmani, Roels, & Karmarkar, 2018).

Muller and Turner (2007) indicated that different leadership styles are appropriate for different types of projects. Therefore, the best style should be delineated based on the conditions by which a leader influences the team, engaging members and driving toward project success (Dulewicz & Higgs, 2005;

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Tabassi, Roufechaei, Bakar, & Yusof, 2017; Ahmed, Philbin, & Cheema, 2021). We emphasize that the core of the discussion on leadership styles in this research is based on the three main styles studied in project management, which include transactional, transformational, and situational leadership (Yang, Huang, & Wu, 2011).

The choice for these three leadership styles is based on the ability of transformational leadership to emulate behaviors for professional development and evolution their competencies to achieve project objectives (Zhao et al., 2023; Srivastava & Pinto, 2022). On the other hand, transactional leadership focuses on reward and punishment systems to emulate behaviors toward project objectives (Castellani et al., 2021; Lin & Wang, 2019). Additionally, the situational leadership style would help to understand the contingency aspect of projects (Tvedt et al., 2023; Dhamija, Chiarini, & Shapla, 2023). Through these leadership styles, it is possible to distinguish the relationship between task-oriented and people-oriented leadership (Pant & Baroudi, 2008; Bolli & Renold, 2015).

In this flow of interactions between leaders and teams, we point out the need to form interpersonal bonds in teams, where people's work engagement generates active dedication to their functions (Rich *et al*., 2010; He *et al*., 2014; Ding *et al*., 2017), and the sense of belonging increases organizational commitment (Lee-Kelley & Turner, 2017). Corroborating these ideas, Edwards (2011), Pickett, Gardner, and Knowles (2004), and Parry *et al*. (2019) indicate that personal relationships generate productivity gains in the workplace. Panteli, Yalabik and Rapti (2019) highlight that the leader may have the ability to increase work engagement throughout the whole project life cycle.

We assume that the project managers, through their leadership styles, can interfere with people's behavior and create an environment that generates a sense of belonging among members of the organization, which can influence their work engagement. Therefore, the sense of belonging is an antecedent of work engagement (Kahn, 1990; Rich *et al*., 2010; He *et al*., 2014), as it generates job satisfaction and intrinsic motivation (Ryan & Deci, 2000), which is linked to work performance.

Ruedas-Gracia et al. (2022) point out that the sense of belonging is understood by the experience of positive personal relationships with other people in a given context. The authors also highlight that in technology, science and engineering environments, naturally projected, the sense of belonging causes the well-being and retention of professionals. In the same way, a sense of belonging is a consequence of

leadership, as it treats each team member individually, stimulates development, inspires followers, motivates with its charisma, and generates emotional attachment and identification with the organization (see more in Dulewicz & Higgs, 2005; Maqbool *et al*., 2017; Hassan, Bashir, & Abbas, 2017; Ding *et al*., 2017).

Although transformational leadership style is highlighted in the research (Parry *et al*., 2019), this article is limited to researching a particular leadership style of project managers, as well as not exclusively focusing on aspects related to the hierarchical position that these professionals assume in the organization. Based on what was presented, this article aimed to evaluate the influence of project managers' leadership styles on work engagement mediated by people's sense of belonging.

We consider that the role of project leaders represents an activity to make individuals willing to give something beyond what is expected of themselves to contribute to the well-being of the entire organization (Mowday, Steers, & Porter, 1978; Zhao *et al*., 2012). This research is justified by the fact that teams are becoming increasingly common as a work organization unit (Rich *et al*., 2010; He *et al*., 2014; Ding *et al*., 2017).

Furthermore, work engagement represents an important means for organizations to develop their performance advantages (Schaufeli, Bakker, & Salanova, 2006; Rich *et al*., 2010; He *et al*., 2014; Lee-Kelley & Turner, 2017; Ding *et al*., 2017). Additionally, a sense of belonging must be tested as a mechanism of leadership and work engagement.

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Theoretical Background and Hypotheses

Kahn (1990) reports that work engagement makes people actively involved in their functions. Edwards (2011) indicates that engagement creates a sense of belonging linked to personal relationships. Parry *et al*. (2019) highlight that work engagement is an important factor in the development of emotional ties in charismatic leadership relationships. Schaufeli, Bakker, and Salanova (2006) define work engagement as a positive and satisfying state of mind, characterized by vigor, dedication, and absorption. We explained that the dedication indicated refers to being strongly involved in teamwork, which also corresponds to experiencing a sense of meaning, enthusiasm, inspiration, pride, and challenge.

Ding *et al*. (2017) treated work engagement and the intention of staff turnover in projects as dependent variables, ahead of transformational leadership as an independent variable, and identification with the project as a moderating variable. Based on the results obtained, the authors found a significant positive effect of transformational leadership on work engagement. Furthermore, it was found that transformational leadership negatively affects the project's turnover intention. Ding *et al*. (2017) explain that transformational leadership affects individual results, enabling the participation and identification of subordinates with their immediate organization. The authors conclude the article by saying that transformational leaders promote collective values and norms that lead to subordinates' sense of belonging to the project.

Parker and Skitmore (2005) point out that high people turnover in projects is typically a consequence of the belief that organizational performance is attributable to the leader. However, factors beyond just the leader and their leadership styles are observed. In this sense, Tulacz (2001) indicates among other factors, low wages, promotion, job security, job autonomy, broken promises, and unpaid bonuses impact people turnover. Due to the aforementioned factors that influence arising turnover, this construct was eliminated from the model by Ding *et al*. (2017) used in this research. Instead, we add the sense of belonging as a mediating variable to capture the leader's influence and understand people's commitment and satisfaction through work engagement.

The sense of belonging, which is also called emotional attachment (Zhao *et al*., 2012), is represented by a sense of identification with something (Hagborg, 1998). This feeling can also be defined

as the experience of personal involvement in a system or environment (Hagerty *et al*., 1992). Baskaya *et al*. (2020) and Zhao *et al*. (2012) point out that individuals with high levels of a sense of belonging are more willing to participate in the organizational processes, as well as make efforts for their profession. Baskaya *et al*. (2020) argue that to expand the sense of belonging, supervisors must create healthy working conditions, identifying factors that positively and negatively affect this feeling. It is also important that managers recognize this feeling in order to understand and participate in the exchanges and leadership challenges of their respective teams in organizations (Edwards, 2011).

The sense of belonging is an important factor in converting inactive members into active (Zhao *et al*., 2012), being a significant mediator of the relationships between affective commitment, interactions, and trust in other members (Baumeister & Leary, 1995; Zhao *et al*., 2012). In this context, we infer that people's sense of belonging is a key mechanism that explains the direct relationships established between leadership styles and work engagement (Schaufeli, Bakker, & Salanova, 2006; Lee-Kelley & Turner, 2017).

Regarding the sense of belonging construct, due to the evidence that there are few studies on this topic in project management, it was necessary to access researches from other areas of study, such as education and health. Thus, we used as a basis the dimensions in the healthcare model proposed by Baskaya, Sayıner, and Filiz (2020). This study was designed to develop a valid and reliable scale of qualified professional membership that can reveal the sense of belonging in midwives. This scale was named the Midwifery Belonging Scale (MBS).

Based on the content presented and establishing project management professionals as the research subject, this study assesses how the independent variable work engagement (ENT) behaves considering the likely influence of leadership styles, including being mediated by a sense of belonging (SPP).

In this way, we point out that work engagement and a sense of belonging are constructs inspired by the research of Ding *et al*. (2017). We also highlight that Ding *et al*. (2017) do not adopt the sense of belonging as an explanatory variable for the studied phenomenon. However, this construct is justified as individuals differed as their fundamental need to belong is met through social and productive relationships (Good, Rattan, & Dweck, 2012; Zhao *et al*., 2012).

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We emphasize that the mediating effect of the sense of belonging in these relationships was also inspired by the study by Zhao *et al*. (2012). The authors found that the sense of belonging is considered a significant mediating factor between members' intentions to participate in virtual communities. Therefore, the authors also define the feeling of belonging as the experience of personal involvement in the environment, with a positive effect on satisfaction in the work environment that is quite similar to affective commitment. In this way, we can infer that those members of a group who be more interested in each other are willing to participate more in activities. In this sense, project managers, by exercising a certain leadership style to promote a sense of belonging, can improve people's performance.

From what was previously presented, we assume that work engagement is driven by the sense of belonging (Ding *et al*., 2017), which increases and maintains the motivation and performance of people contributing to achieving the project's objectives and it's success (Zhao *et al*., 2012; Keskin & Pakdemirli, 2016; Dulewicz & Higgs, 2005). Due to these factors and using the hypotheses of the study by Ding *et al*. (2017), we propose here that people's sense of belonging, and work engagement have a positive relationship, thus generating the following hypothesis:

- H1: Sense of Belonging (SPP) positively influences Work Engagement (ENT).

The premise adopted in this article is that the influence of the leader affects the involvement in the work of subordinates, consequently, generating team engagement (He, Zhu, & Zheng, 2014; Ding *et al*., 2017). Rich *et al*. (2010) highlight that those led by the influence of a transformational leader are more likely to display vigor, dedication, and work absorption. From these findings, if the project manager does not know how to adapt his leadership style according to the maturity of his subordinates, it can affect individual performance and work engagement, which also influence the project result (Ding *et al*., 2017; Hsu, Li, & Sun, 2017). Concerning leadership styles, we have adopted the three main leadership styles in organizational studies, which are: transactional leadership, transformational leadership (Bass, 1985; 1990), and situational leadership (Hersey & Blanchard, 1974).

Transactional leadership is tied to control, obedience, authoritarianism, and hierarchy, which focuses much more on tasks than people (Burns, 1978; Bass, 1985; Tyssen, Wald, & Spieth, 2013).

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Transformational leaders promote collective values and norms that lead to subordinates' sense of belonging to inspire and motivate their subordinates (Ding *et al*., 2017). Parry *et al*. (2019) describe that personal identification with the leader has been considered a key factor in determining whether a follower perceives a leader as charismatic. Thus, the charismatic components of transformational leadership suggest that transformational leaders can facilitate the members' interaction with the leader and among members (Kark, Shamir, & Chen, 2003).

In project management, transformational leadership is generally characterized by four main factors in Bass' seminal work (1985; 1990), which are: idealized influence (charisma), inspirational motivation, intellectual stimulation, and individual consideration (Bass & Avolio, 1990; Keller, 1992; Thite, 2000; Strang, 2011; Berson & Linton, 2005; Muller & Turner, 2007; Tyssen *et al*., 2014; Tabassi *et al*., 2017). As a result, transformational leadership increases contextual performance at the team level and the individual level (Tabassi *et al*., 2017).

Furthermore, transformational leaders impact individual satisfaction by dealing individually, through guidance and training, where each employee can stimulate their self-development (Bass, 1990; Dulewicz & Higgs, 2005: Muller & Turner, 2007; Geoghegan & Dulewicz, 2008; Maqbool *et al*., 2017; Hassan, Bashir, & Abbas, 2017; Ding *et al*., 2017).

Transformational leaders through their influence gets followers to obtain results through superior team performance (Howell & Avolio, 1993; Aga *et al*., 2016). Judge and Bono (2000) and Geier (2016) investigated how some behaviors influence the effectiveness of transformational leadership, and this relationship can be extrapolated to all types of organizations and levels of hierarchy. Additionally, it was noted that transformational leaders can also lead in a transactional way, but a transactional leader cannot lead like a transformational leader (Judge & Bono, 2000).

In this way, using as a reference the hypotheses raised in the study by Ding *et al*. (2017), where transformational leadership and work engagement have a positive relationship, we included the sense of belonging as a mediator, inspired by the study by Zhao *et al*. (2012) to understand the leadership style phenomenon in project management. In this context, we infer that a sense of belonging is a key mechanism that explains the direct relationships between leadership styles and work engagement. Thus, we propose here the following hypotheses:

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- H2a: Transformational Leadership (LTF) positively influences Work Engagement (ENT).

- H2b: Transformational Leadership (LTF) positively influences Sense of Belonging (SPP)

- H3: Sense of Belonging (SPP) mediates the relationship between Transformational Leadership (LTF) and Work Engagement (ENT).

Transactional leadership is often contrasted with transformational leadership (Muller & Turner, 2007), consequently, we can affirm that transactional leaders are more focused on hard skills, emphasizing rewards, punishment, and bargaining (Bass 1985; 1990). Transactional leaders are also characterized by using power, obedience, transaction, or exchange through bargaining, exchanging favors and rewards (Burns, 1978; Bass, 1985; Strang, 2011; Yang, Huang, & Wu, 2011). Transactional leaders seek to engage team members through rewards, which can be personal or material (Bass, 1990). Therefore, we start from the premise that members always seek to be rewarded in a transactional leadership context, so we propose in this study the following hypotheses:

- H4a: Transactional Leadership (LTS) positively influences Work Engagement (ENT).

- H4b: Transactional Leadership (LTS) positively influences Sense of Belonging (SPP)

- H5: Sense of Belonging (SPP) mediates the relationship between Transactional Leadership (LTS) and Work Engagement (ENT).

Situational leadership comes from contingency theory and emphasizes that there is nothing absolute about organizations and everything is relative (Fiedler, 1964). The leader does not have a single style of leadership and acts according to the situation (Hersey & Blanchard, 1974), using the leader's ability to adapt to situational circumstances (Shenhar, 2001; Sauser, Reilly, & Shenhar, 2009). In

situational leadership, the leader must focus on a course of action or the need for results in the face of challenges or personal criticism (Muller, Geraldi, & Turner, 2011).

Therefore, in a Situational Leadership context, the leader can adapt his leadership style according to the maturity of the person being led in each situation (Hersey & Blanchard, 1974; Pilkiene *et al*., 2018). Thus, the leader can be more technical and authoritative with less mature subordinates, using a transactional leadership style. On the other hand, the leader can be more flexible and focused on relationships and trust, using transformational leadership with more mature subordinates, and can even use both styles at the same time. Additionally, Ding *et al*. (2017) highlighted that project managers must adopt different approaches to stimulate different work outcomes more effectively. In this context, and based on what has already been presented, we propose the following hypotheses:

- H6a: Situational Leadership (LS) positively influences Work Engagement (ENT).

- H6b: Situational Leadership (LS) positively influences Sense of Belonging (SPP).

- H7: Sense of Belonging (SPP) mediates the relationship between Situational Leadership (LS) and Work Engagement (ENT).

After the explanation presented, Figure 1 demonstrates the conceptual model proposed for this research. We propose that a better understanding of how leadership styles influence people's activities in project management will contribute to project results.

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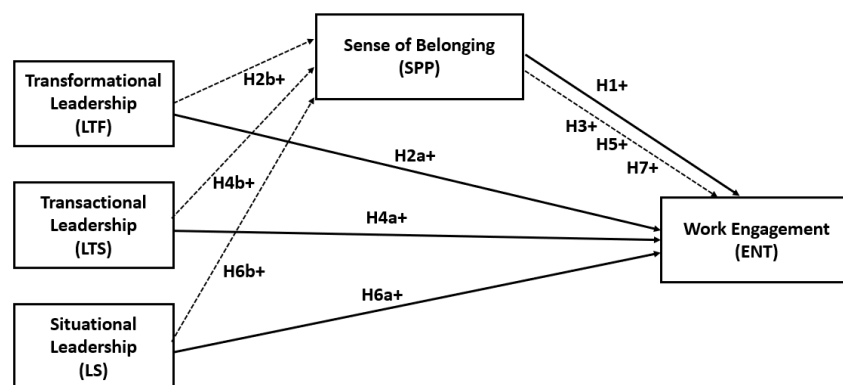
Figure 1. Conceptual research model

We explain that the independent variables of the model presented in Figure 1 are leadership styles, which include transactional, transformational, and situational leadership styles will be addressed. Additionally, we propose that the sense of belonging can mediate work engagement and leadership styles. Thus, after empirically testing these relationships, we can explain how leadership styles relate to work engagement and how the sense of belonging can mediate these relationships (Hair *et al*., 2014).

Materials and Methods

This research initially adopted a Confirmatory Factor Analysis (CFA) that is theory-based regarding the constructs and tested how well-measured variables represent a given construct (Hair *et al*., 2014). It is noteworthy that the research instrument was initially built based on already validated scales. As these scales were adapted, we sought the face and content validation suggested by Douglas and Craig (2007). The face validation procedure seeks to preserve the main characteristics of the scales regarding the measurement of the constructs involved (Kerlinger, 1980; Malhotra, 2007). In this sense, all original scales were submitted for translation into Portuguese by a native English-speaking professional fluent in

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Portuguese. The scale was evaluated by five Ph.D. researchers and an English language specialist who analyzed the translation to ensure accuracy, validating the protocol for this process.

The aforementioned procedures were used to ensure that the scales could measure what they were designed to do, that is, to ensure the reliability of the research instrument (DeVellis, 2016). The purpose of the adaptation is to ensure that respondents understand what is being asked in the content, reducing research biases and compromising the final result of the research. In this sense, it is worth noting that pre-tests were carried out with 12 project management practitioners who work in the area. After validation, it was found that some statements needed minor adjustments, such as the question: "I felt a sense of belonging in my work" was not adequate, being replaced by "I felt I belonged to my team". This process was carried out until the questionnaire was validated (Babbie, 2011), which occurred in the second validation carried out to improve the semantic aspects of the questions to the reality of project management practitioners, thus improving the instrument's accuracy. After these two steps of validation of the built instrument, we started to apply it through invitations on social networks (DeVellis, 2016), mainly LinkedIn. Data were collected seeking a convenience sample through the collection process by Google Forms.

Regarding the research instrument, in the first section, respondents were instructed to fill out the questionnaire considering the last project they participated in and considering the role of leadership during the management of this project. The second section had 36 assertions for the construction of the model's observable variables (see Appendix A). The final questionnaire consisted of 50 assertions, 36 of which the variables were on a seven-point Likert scale ranging from "Completely Disagree = 1" to "Completely Agree = 7" (Fowler, 2013; Malhotra, 2007). The third section comprised the collection of demographic data to qualify the sample. To resolve the issue of common method bias influencing the results, we used anonymized questionnaires, thus eliminating concerns about the disclosure of confidential information. In addition to procedural remedies, we adopt statistical techniques to ensure the validity and reliability of the research.

The items of transformational leadership construct deal with the actions of the leader who, through behavioral leadership factors, inspires followers, motivates, show his/her charisma, considering the needs of the individual and their development improvement (Lai, Hsu, & Li, 2018; Ding et al., 2017; Maqbool

et al., 2017; Pearce & Sims, 2002). The items of the transactional leadership construct deal with the actions of the leader who observes and looks for deviations from rules and standards, taking corrective actions through rewards and punishments (Lai, Hsu, & Li, 2018; Pearce & Sims, 2002). The situational leadership construct used items to capture the leader's ability to adapt to situational circumstances and, from there, use a transactional or transformational leadership style, or even both at the same time (de Andrade Melo, 2004; Scandura & Graen, 1984).

The work engagement construct presents items that allow assessing the individual's engagement through the physical, emotional, and cognitive effort allocated to tasks, making it possible to measure the level of engagement of subordinates based on the leadership style used by the leader (Schaufeli & Bakker, 2003; Ding et al., 2017). The sense of belonging construct used items to measure the level of pride, willingness to make an effort, level of relationship and participation among teams' members (Mowday, Steers, & Porter, 1979; Kember & Leung, 2010; Mowday, Steers, & Porter, 1979).

Furthermore, the statistical technique of Structural Equation Modeling (SEM) was used to test the relationship between all constructs (latent variables), which consists of a set of multivariate statistical techniques, covering several methodologies simultaneously, such as regression, analysis of covariance, path analysis, CFA, among others (Hair *et al*., 2014). In addition to the SEM, this study also tested the mediation effect between the variables as shown in the model proposed (Mathieu & Taylor, 2006; Hayes, 2009), which in this case occurred through the variable sense of belonging (SPP).

We emphasize that there are two methods to find a Confidence Interval (CI) and the significance of an indirect effect. Sobel (1986) provides a method that assumes the indirect effect is normally distributed. However, a growing body of statistical simulation literature questions this assumption, as the test relies on distribution assumptions that are generally not valid for the indirect effect, specifically, the multiplication of two normally distributed coefficients results in a non-normal distribution of your product (Hair *et al*., 2014).

Furthermore, the Sobel test requires unstandardized path coefficients as input, which lacks statistical power, especially when applied to small sample sizes (Preacher & Hayes, 2004; Hair *et al*., 2014). Hence, unlike the Sobel test, Bootstrap allows for inference based on an estimate of the indirect effect itself (Hayes, 2009). Bootstrapping is a statistical method that uses random resampling based on

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replacement to estimate and approximate a population parameter. Resampling a given data set makes it possible to estimate a parameter when it is not possible to do so. An advantage of bootstrapping is that it produces confidence intervals for its statistical estimate, providing valuable information about the probable value of a parameter. The disadvantage is that the values are estimated and are therefore a representation of reality from the original sample. Bootstrap is a versatile method for estimating the sampling distribution of parameter estimates and can be used to find approximate standard errors (Efron, 1988). Therefore, this study adopted the use of Bootstrap to build better normally asymmetrical CI (MacKinnon, Lockwood, & Williams, 2004; Shrout & Bolger, 2002; Hayes, 2009).

We point out that the software Jasp was adopted to conduct all analyses, i.e., CFA, SEM, and mediation analyses (see more in Rosseel, 2012). Jasp uses the Lavaan algorithm to perform the SEM analyses. The software allows you to perform numerous analyzes and compare models, so that methodological decisions can be tested easily, and reports can be imported into the article. Concerning mediation analysis (see, Baron & Kenny, 1986), provides reliable ranges for standardized or non-standardized indirect effects. Following the procedure of Preacher and Hayes (2004), in which CI values are within 95%, the indirect effect will be significant and the occurrence of mediation can be considered present.

Regarding the sample to be considered significant, it was decided to follow the recommendations of Hair *et al*. (2014), which indicate that the sample should have 5 to 10 respondents per parameter in the model. Additionally, the minimum number of elements that make up the sample must be between 100 and 150, when using the Maximum Likelihood (ML) estimation in the parameter calculation. Accordingly, the sample size with 422 responses received, 409 valid, is an acceptable number. Thus, thirteen answers were discarded because respondents answered the items of the research instrument with a single answer (e.g., 7, 7, 7, 7…).

Data were collected and tabulated in MS Excel® where the file was converted to .csv format to be imported into Jasp. The parameters adopted for the SEM analysis: ML, adjustment of independent and saturated models, standardized estimates, square of multiple correlations, moment residuals, factor weights, correlation estimates, as well reliability indices (Baron & Kenny, 1986). To conduct the

mediation analysis, we adopted Bootstrap using Bias-Corrected Percentile with 5,000 replications as recommended by Banjanovic and Osborne (2016).

We highlight that a mediation model is a statistical technique that allows studying how an intervenient variable explains the relationship between two variables. A condition for the mediation model to be viable is that the mediating variable must be explained by the independent variable and explain the dependent variable with statistical significance (Baron & Kenny, 1986; Preacher & Hayes, 2004). Therefore, to test a mediation model, the researcher needs to gather data for the three variables, which in this case were composed of the average of the variables already validated in the measurement model (Hair *et al*., 2014).

Model parameters include the direct and indirect effects of the independent variable on the dependent variable. Concerning Direct Effects (c'), it represents the relationship between two variables where the effect is controlled by a mediating variable ($x \rightarrow y$, controlled by m). Indirect effects are those relationships that involve a sequence of relationships with at least one mediating construct involved ($x \rightarrow m \rightarrow y$). Total effect ($c$) comprehends the relationship in which the independent variable links the dependent variable without mediating variable control ($x \rightarrow y$, without control by m). Thus, if the indirect effect is statistically significant, it means that the mediating variable explains the relationship between the independent variable and the dependent variable (Baron & Kenny, 1986; Preacher & Hayes, 2004).

Results

CFA and measurement model adjustments

The sample consisted of 409 valid completed forms. Respondents were classified as gender, age, organizational position, and sector of the project as shown in Table 1.

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Table 1.
Demographic characteristics

Variable	Group	Frequency	%
Gender	Female	136	33.25
	Male	271	66.25
	Not informed	2	0.48
Age	From 17 to 20 years old	1	0.24
	From 21 to 25 years old	17	4.15
	From 26 to 30 years old	61	14.91
	From 31 to 40 years old	171	41.80
	From 41 to 50 years old	111	27.13
	From 51 to 60 years old	44	10.75
	More than 60 years old	4	0.97
Organizacional position	Analyst	122	29.82
	Assistant	10	2.44
	Director	30	7.33
	Manager	158	38.63
	Supervisor	69	16.87
	Missing	20	4.89
Project Sector	Industry	101	24.69
	Public	23	5.62
	Services	253	61.85
	Third sector/NGO	12	2.93
	Missing	20	4.89

Source: Research Data, 2023.

As can be seen in Table 1, 66.25% of respondents are male. The age of respondents is mainly in the range of "From 31 to 40 years old" with 41.80%, and "From 41 to 50 years old" with 27.13%. The organizational position was predominantly manager with 38.63%, followed by analysts at 29.82%. The main sector was service with 61.85%. After demographic description, the next stage of data analysis consists of the CFA to validate the measurement model with the data introduced in the Jasp software.

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The items and factors were calculated several times, and adjusted indices were tested parsimoniously. Thus, the analysis started removing some observable variables with load values below 0.7 (Byrne, 2001). The idea was to eliminate from the model indicators with a large margin of error and low factorial loads (Hair *et al*., 2014). Following this recommendation, we chose to exclude the observable variables carefully, choosing for this the one with the lowest load, and so on. Therefore, the model was run again and again until the observable variables were adequate to measure the latent variables – constructs. After this procedure, the final values for the item loads of the debugged model constructs are shown in Table 2.

Table 2.
Final Loads of Variables, Model Reliability Indices

Factor	Indicator	Estimate	Std. Error	z-value	p	95% Confidence Interval		Std. Est.
						Lower	Upper	
	LS1	0.878	0.084	10.484	< .001	0.714	1.043	0.512
LS	LS3	1.480	0.076	19.395	< .001	1.330	1.629	0.883
	LS4	1.498	0.077	19.510	< .001	1.348	1.649	0.887
	LTF1	1.229	0.060	20.518	< .001	1.111	1.346	0.845
LTF	LTF2	1.382	0.064	21.717	< .001	1.257	1.506	0.876
	LTF5	1.217	0.068	17.951	< .001	1.084	1.350	0.774
	LTF6	1.269	0.072	17.742	< .001	1.129	1.410	0.767
LTS	LTS5	1.265	0.082	15.343	< .001	1.104	1.427	0.704
	LTS6	1.332	0.087	15.308	< .001	1.162	1.503	0.702
	LTS7	1.671	0.085	19.555	< .001	1.504	1.839	0.840
	LTS8	1.463	0.087	16.854	< .001	1.293	1.633	0.758
	ENT2	1.296	0.063	20.730	< .001	1.173	1.418	0.863
ENT	ENT3	1.080	0.055	19.644	< .001	0.972	1.187	0.832
	ENT4	0.844	0.060	13.971	< .001	0.725	0.962	0.648
	ENT7	1.160	0.072	16.056	< .001	1.019	1.302	0.723
	SPP3	1.213	0.058	20.967	< .001	1.099	1.326	0.855
SPP	SPP4	1.054	0.047	22.501	< .001	0.962	1.146	0.894
	SPP5	0.749	0.040	18.679	< .001	0.670	0.827	0.794
	SPP7	0.930	0.050	18.711	< .001	0.833	1.028	0.795

Source: Research Data, 2023.

Table 2 presents the factorial loads (estimate) of each item in its respective factor, as well as its standard error (std. Error), statistical significance (p), confidence interval of the factorial load at 95%, and

the standardized factorial load. Based on this information, it was possible to validate the items that built each construct, as well as to assess their contribution to explaining the respective construct and its significance based on CI. Thus, we point out that the items that were kept with the standardized values below 0.70 were LS1 = 0.512 and ENT4 = 0.648 because otherwise, these constructs would have only two items of observable variables. This decision was based on the analysis of the adjustment items to avoid overfitting the model.

Kline (2015) indicates that models where some latent variables have only two indicators are more susceptible to technical problems, such as failure of iterative estimation. Thus, several tests were performed by inserting and removing other items from the model to parsimoniously verify the robustness and capacity of the model to measure what it proposes. For this, we base ourselves on the idea that indicators with external loads lower than 0.70 should be considered for removal from the scale only when the exclusion of the indicator leads to an increase in the Average Extracted Variance (AVE) above the suggested threshold value (Hair, Ringle, & Sarstedt, 2011).

Table 3.
Value of convergent validity and internal consistency of the Model

Factor	AVE	McDonald's Omega (ω)	Cronbach Alpha
Factor LTF	0.663	0.887	0.887
Factor LTS	0,572	0.842	0,839
Factor LS	0.605	0.814	0,793
Factor ENT	0.597	0.851	0,844
Factor SPP	0.708	0.918	0,910

Source: research data, 2023.

Based on Table 3, we can observe the AVE values, which is a measure of the convergent validity of the model's constructs, which must be greater than 0.50 to be significant (Hair *et al*., 2014). In this line, the values of Cronbach's Alpha and McDonald's have also been included to measure internal consistency. This stage of the analysis showed that the model has convergent validity and internal consistency for all constructs (Byrne, 2016; Hair *et al*., 2016; Pituch & Stevens, 2015). The reliability of Cronbach's Alpha coefficient normally varies between 0 and 1, with the minimum acceptable value for Alpha being 0.70.

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McDonald's Omega (ω) is also an indicator of the internal consistency of items with calculations based on factor analysis. The omega coefficient works with the factor loadings, which makes the calculations more stable, with a higher level of reliability and regardless of the number of items in the instrument, its value must be $\omega > 0.70$, which indicates the reliability of the set of factors.

The Chi-square test (X^2) allows evaluation of the adequacy of the data to the proposed model. The Factor model corresponds to the model proposed by the analysis, which in this case presented as values $X^2 = 354.712$, df = 142, p > 0.001. Note that in addition to statistical significance, the value of X^2 divided by degrees of freedom (X^2 / df) can be used. Hair *et al*. (2009) indicate that the ratio of this ratio must be less than 5 to be considered adequate.

We used other indicators for estimating the model fit of the SEM. Kline (2015) suggests that CFI (Comparative Fit Index) and TLI (Tucker-Lewis Index) values above 0.90 are considered adequate, RMSEA (Root Mean Square Error of Approximation) below 0.06 or with upper confidence interval less than 0.10. RMSEA is an index that assesses whether a model fits the population well, as it is used to correct sample size when using chi-square statistics. Xia and Yang (2019) suggested that an RMSEA value of < .05 indicates a close fit, and that < .08 suggests a reasonable model–data fit. SRMR (Standardized Root Mean Square Residual) value > 0.10 may indicate poor fit. After the analysis, we had the following values for these indicators: CFI = 0.952; TLI = 0.942; RMSEA = 0.061, CI 90% [0.53; 0.68]; SRMR = 0.039. Additionally, we used NFI (Bentler-Bonett Normed Fit Index) = 0.923 which is inside the index recommended by Byrne (2016) > 0.90 to 0.95. The value of GFI (Goodness of Fit Index) > 0.9 means satisfactory fit, in this case, GFI = 0.992 is adequate.

To understand the quality of data for testing the proposed SEM model, KMO (Kaiser-Meyer-Olkim) and Bartlett's sphericity tests were performed. Field, Miles, and Field (2012) emphasize that the KMO varies between 0 and 1, which represents the proportion of the variance of the variables that can be explained by the latent factors or traits. Thus, when the KMO value is closer to 1, the data are more suitable to fit a factor analysis model. Bartlett's Test of Sphericity must be statistically significant (p < 0.05). The results of the KMO test = 0.861, and Bartlett's Test of Sphericity was 4488.543, p< 0.001, which demonstrated the suitability of the data for factor analysis.

Measurement Models and Hypotheses Tests

Since adjustment indices were satisfactory to accept the proposed model, i.e., it demonstrates a good fit. We justify our decision based on concern to avoid overfitting the data with many coefficients and we sought parsimony in the adjustment of the data (Hair *et al*., 2005). Therefore, by assessing Pearson's coefficients of determination (R^2), we can explain the proposed model. R^2 is a measure of the amount of variation in one variable that is explained by the other. This value tells us how much of the variation can be explained in the model (Field, 2009).

For the area of social and behavioral sciences, Cohen (1988) suggests that R^2=2% (0.02) be classified as a small effect, R^2=13% (0.13) as a medium effect, and R^2=26% (0.26) as a large effect. Thus, the values of ENT = 42.8% and SPP = 19% represent a large effect. Finally, R^2 also represents the amount of variance in the endogenous constructs explained by all exogenous constructs linked to it, indicating the quality of the adjusted model (Hair *et al*., 2014). The validity of the model Path coefficients was then verified to test the hypotheses initially formulated, as shown in Table 4.

To assess the significance in Table 4, the statistical test used is the p-value and CI, which give valuable information about the likely magnitude and direction of the effect being investigated and the reliability of the estimate. So, based on the values that p > 0.05, and if the estimated interval comprehends zero, the hypothesis must be rejected (Banjanovic & Osborne, 2016).

Table 4.
Path Coefficients and Hypotheses tests

Hypotheses	Predictor	Outcome	Estimate	Std. Error	t-value	p	95% Confidence Interval		Std. Est.	Results
							Lower	Upper		
H1	SPP	ENT	0.488	0.058	8.456	< .001	0.375	0.601	0.457	Accepted
H2a	LTF	ENT	0.169	0.083	2.039	0.041	0.007	0.332	0.160	Accepted
H2b	LTF	SPP	0.479	0.083	5.788	< .001	0.317	0.641	0.486	Accepted
H4a	LTS	ENT	-0.153	0.074	-2.059	0.039	-0.299	-0.007	-0.150	Rejected
H4b	LTS	SPP	0.066	0.078	0.849	0.396	-0.086	0.218	0.069	Rejected
H6a	LS	ENT	0.215	0.075	2.848	0.004	0.067	0.363	0.146	Accepted
H6b	LS	SPP	-0.045	0.077	-0.587	0.557	-0.195	0.105	-0.033	Rejected

Source: Research Data, 2023.

However, based on these results, we also reject H4a because although there is adequate CI value, the effect of the relationship is negative. Table 4 shows the significance of the paths and, thus, accepted the hypotheses H1, H2a, H2b, and H6a. The hypotheses H4a, H4b, and H6b were rejected because they have CI values greater than 0.05 (Field, 2009; Hair *et al*., 2014). Therefore, hypothesis H4a was rejected, demonstrating that the relationship between transactional leadership and work engagement was not validated for this sample. Hypotheses H4b and H6b, which presented the relationship between transactional leadership and the situation with the sense of belonging, were also rejected. The results demonstrate that more pragmatic aspects oriented towards tasks are not effective in the opinion of the respondents.

Another aspect that should be explored is the value of the relationships between the constructs presented on the table. It is noted that the values of 0.479 for the relationship between transformational leadership and sense of belonging, as well as 0.215 for the relationship between situational leadership and work engagement, are positive and significant. On the other hand, the other relationships are not significant, drawing attention to the relationship between transactional leadership and work engagement, which is -0.153. Finally, after demonstrating the good fit of our model and checking the direct relationships between the variables, the last process carried out was to test the mediation in the relationship between the constructs and verify the accuracy of this mechanism.

Mediation Models Analysis

Mediation models between the independent variables (LTF, LTS, and LS) and dependent variable (ENT) mediated by SPP were conducted using standardized values, Bootstrap bias-corrected percentile CI, and ML estimator using 5,000 resamples. According to Hair *et al*. (2014), a mediating effect is created when a third variable or construct intervenes between two other related constructs. To carry out the analysis, we reinforce that the means of the observable variables of each latent construct were used.

Furthermore, to understand how mediating effects work, we consider Standardized Estimate (Std. Est.) values and CI in terms of direct, indirect, and total effects. A Standardized Estimate allows an understanding of the magnitude of effects, and CI indicates the significance of the relationship. Thus, if

the upper and lower limits are negative, then the indirect effect is considered negative. The opposite is true for positive lower and upper limits. If one of the limits is positive and the other negative, the effect is considered null, or not significant (Preacher & Hayes, 2004).

Table 5 shows LTF direct, indirect, total effects, and path coefficients.

Table 5.
LTF direct, indirect, total effects and Path coefficients

		Std. Est.	Std. Error	t-value	p	95% Confidence Interval	
						Lower	Upper
Direct effect	LTF → ENT	0.207	0.032	6.427	< .001	0.032	0.242
Indirect Effect	LTF → SPP → ENT	0.122	0.019	6.463	< .001	0.081	0.174
Total Effect	LTF → ENT	0.329	0.033	10.073	< .001	0.247	0.416
Path coefficient (a)	LTF → SPP	0.293	0.034	8.738	< .001	0.214	0.377
Path coefficient (b)	SPP → ENT	0.418	0.044	9.604	< .001	0.296	0.522

Source: Research Data, 2023.
Note. Delta method standard errors, bias-corrected percentile bootstrap confidence intervals, ML estimator.

The direct effect (*c*') of the model in which LTF influences ENT controlled by the SPP was significant with $\beta = 0.207$, 95% CI [0.032, 0.242], $t = 6.427$, p < 0.001. SPP impacted ENT in this model statistically significantly resulting in $\beta = 0.418$, 95% CI [0.296, 0.522], $t = 9.604$, p < 0.001. The analysis of the mediation effect of the relationship between LTF and ENT by the SPP was significant with $\beta = 0.086$, p < 0.001; $R^2 = 0.346$. This effect is a result of the product of *a* and *b* path coefficients (*a*b*). When analyzing the mediating proportion, by dividing the direct effect value by the total effect, it was found that SPP had a mediating effect on the LTF and ENT ratio of approximately 37.08%. These results confirm the hypothesis H3.

Table 6 demonstrates the test of the mediation model when the construct is LTS. The direct effect (*c*') of the model in which LTS influences ENT controlled by the SPP was significant with $\beta = -0.139$, 95% CI [-0.200, -0.082], $t = -5.229$, p < 0.001. SPP impacting on ENT in this model has a statistically significant effect with $\beta = 0.481$, 95% CI [0.382, 0.573], $t = 11.563$, p < 0.001. The analysis of the mediation effect of the relationship between LTS and ENT by the SPP was significant with $\beta = 0.673$, p < 0.001; $R^2 = 0.302$. When analyzing the mediating ratio, it was found that SPP had a mediating effect on

LTS and ENT by approximately 32.85%. Based on these results, we reject H5, because although there is mediation, the effect of the relationship is negative.

Table 6.
LTS direct, indirect, total effects and Path coefficients

		Std. Est.	Std. Error	t-value	p	95% Confidence Interval	
						Lower	Upper
Direct effect	LTS → ENT	-0.139	0.027	-5.229	< .001	-0.200	-0.082
Indirect Effect	LTS → SPP → ENT	-0.068	0.016	-4.243	< .001	-0.104	-0.039
Total Effect	LTS → ENT	-0.207	0.030	-6.917	< .001	-0.271	-0.145
Path coefficient (a)	LTS → SPP	-0.140	0.031	-4.561	< .001	-0.203	-0.082
Path coefficient (b)	SPP → ENT	0.481	0.042	11.563	< .001	0.382	0.573

Source: Research Data, 2023.
Note. Delta method standard errors, bias-corrected percentile bootstrap confidence intervals, ML estimator.

Table 7 demonstrates the test of the mediation model when the construct is LS. The direct effect (c') of the model in which LS influences ENT controlled by the SPP was significant with $\beta = 0.105$, 95% CI [0.042, 0.170], $t = 3.602$, $p < 0.001$. SPP impacting on ENT in this model has a statistically significant effect with $\beta = 0.516$, 95% CI [0.418, 0.611], $t = 11.457$, $p < 0.001$. The analysis of the mediation effect of the relationship between LS and ENT by the SPP was significant with $\beta = 0.0315$, p < 0.001; $R^2 = 0.302$. When analyzing the mediating ratio by dividing the direct effect value by the total effect, it was found that SPP had a mediating effect on the LS and ENT ratio of approximately 22.79%.

Despite these results, it is necessary to make a reservation because the model found is invalid, as it presents inadequate CI values, comprising the value of zero in its range. Also, the p-value is greater than acceptable.

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Table 7.
LS direct, indirect, total effects and Path coefficients

		Std. Est.	Std. Error	t-value	p	95% Confidence Interval	
						Lower	Upper
Direct effect	LS → ENT	0.105	0.029	3.602	< .001	0.042	0.170
Indirect Effect	LS → SPP → ENT	0.031	0.018	1.738	< .082	-0.006	0.074
Total Effect	LS → ENT	0.136	0.034	3.999	< .001	0.065	0.211
Path coefficient (a)	LS → SPP	0.061	0.035	1.755	< .079	-0.013	0.137
Path coefficient (b)	SPP → ENT	0.516	0.041	12.457	< .001	0.418	0.611

Source: Research Data, 2023.
Note. Delta method standard errors, bias-corrected percentile bootstrap confidence intervals, ML estimator.

According to Table 7, the value of the direct effect of LS on ENT ($p = 0.001$) is adequate (Mathieu & Taylor, 2007), but the result of the indirect effect on the relationship between LS and ENT is no longer significant once SPP was included (MacKinnon *et al*., 2002; Preacher & Hayes, 2004). As the mediation models are based on a significant relationship between $x \to m$ variables, in the case of LS → SPP there was no significance of the indirect effect, which does not cause a mediation effect between the LS → ENT constructs (MacKinnon *et al*., 2002; Preacher & Hayes, 2004). In conclusion, we can infer that there is no mediation confirmed by the CI of 95%.

Concluding Discussion

Overall Results

As proposed, the general aim of this article was to assess the influence of leadership styles on work engagement mediated by a sense of belonging in a project management context. After analyses, we mainly evidenced that transformational leadership is directly and positively related to work engagement. This result corroborates studies of Ding *et al*. (2017) and Schaufeli, Bakker, and Salanova (2006), where respondents who perceived higher levels of transformational leadership were more likely to exhibit vigor, dedication, and absorption at work. Consequentially, we reaffirm that this leadership style also increases participation and trust among subordinates (Dulewicz & Higgs, 2005).

We highlight that when testing the mediation model, it was noted that the sense of belonging is a mechanism to mediate the relationship between transformational and transactional leadership styles and work engagement. Thus, we accept the H3 and H5 which corroborate the results of Baskaya *et al*. (2020) when they mention that professional belonging is related to the theories of organizational commitment. A relevant finding in this research is the negative effect of transactional leadership on work engagement, which is reduced when mediated by the sense of belonging. Although the condition that transactional leadership should have a significant relationship with a sense of belonging, it was not met when analyzing the observable variables.

Therefore, if we reject the mediated sense of belonging relationship between transactional leadership and work engagement, these results corroborate the fact that transactional leaders use power over their subordinates to engage them only to obtain the expected results, using punishment and bargaining (Bass, 1985; Bass, 1990). In addition, transactional leaders are not concerned with the moral development of their team members (Burns, 1978).

As previously highlighted, hypotheses H4a, H4b and H6b represented more pragmatic ways of emulating behavior to achieve results by professionals. A way of dealing with the situation through a transaction process based on punishments and rewards, or even a situational way seeking the leader's behavior in a contingent way. However, the reality of the interviewees seems to be more aligned with the behaviors of leaders aimed at emulating the behaviors of their subordinates through motivation, recognition of their needs, or even charisma. The results point to a more affective relationship between leaders and subordinates.

Consequently, for those leaders who are driven by transactional behavior, it is more difficult to engage, as leaders focus only on mistakes (Strang, 2011; Yang et al., 2011). Members focus more on the responsibilities or obligations they should fulfill to avoid criticism from leaders (Lai, Hsu, & Li, 2018). We reinforce that employee motivation and performance are increased when the sense of belonging is effective (Mowday, Steers, & Porter 1978; Keskin & Pakdemirli, 2016). Consequentially, motivation generates real engagement of people in a project, who behave differently when they feel they belong to the project teams (He *et al*., 2014). Although the sense of belonging lacks studies in project management, we can infer those personal belonging needs, commitment to the organization, and motivation generate

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engagement among people in a project. In other words, the sense of belonging can explain work engagement through your mediator role in our structural model. Thus, the greater the subordinate's sense of belonging, the greater the work engagement.

To conclude, situational leadership is directly and positively related to work engagement, and when the mediation was tested by the sense of belonging (H7), this relationship was rejected. This result is not entirely satisfactory, because when the relationship between situational leadership and a sense of belonging was observed, the p-value was above the recommended (Mathieu & Taylor, 2007). The same condition was observed when the style is transactional leadership. Therefore, situational leadership results tests show no significance to the mediation model, but they are very close to an acceptable one. We recommend that further tests can be performed to better understand this relationship, besides we emphasize the importance of demonstrating this mediation statistically to reinforce the theoretical gap that we present.

Accordingly, situational leaders must have the skills to accept and translate the ambiguous role to conduct members (Gray & Ulbric, 2017), furthermore the leaders must have the ability to adapt to situational circumstances (Shenhar, 2001; Sauser, Reilly, & Shenhar, 2009). As the leader acts according to the maturity of the team member, it is more difficult to capture this influence when the leader permeates between hard skills and soft skills according to the complexity of the project (Muller, Geraldi, & Turner, 2011; Brière *et al*., 2015).

Theoretical contributions

This paper contributes to the literature on leadership styles and work engagement in projects. The critical discussion of these relationships is that the leadership that promotes the most work engagement is transformational when mediate by the sense of belonging. We also verify the negative influence of transactional leadership, which is more focused on tasks, so this type of leadership reduces work engagement.

Therefore, when we analyze the mediation by the sense of belonging, we confirm that the feeling of belonging increases organizational commitment, reducing the strain on the team (Lee-Kelley & Turner 2017). He *et al*. (2014) stress that when people feel that they belong to the teams, they are more engaged

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in the project, as professional belonging increases and maintains the motivation and performance of employees (Keskin & Pakdemirli, 2016). Results found about the sense of belonging are in line with the behavioral, emotional, and cognitive dimensions proposed by Fredricks, Blumenfeld, and Paris (2004). The emotional attachment was identified as a sense of identification by Zhao *et al*. (2012).

Thus, a sense of belonging can be considered a factor that increases and maintains the motivation and performance of employees in a project context (Keskin & Pakdemirli, 2016), generating greater team engagement (Rich *et al*., 2010; He *et al*., 2014; Ding *et al*., 2017). However, personal identification with the transformational leader is a key factor in determining whether a follower perceives the leader as an example to be followed by their charisma (Parry *et al*., 2019). Because of this, individuals with high levels of professional belonging will be more willing, engaged and will make more efforts in pursuit of the project's success (Baskaya *et al*., 2020).

Notwithstanding the results presented, the high level of need for satisfaction occurs in a work environment where people are given a job that allows them an opportunity for achievement, growth, development, and challenge (Hersey & Blanchard, 1974; He *et al*., 2014; Ding *et al*., 2017). Because of this, to meet these personal needs, this relationship tends to switch from transactional to transformational, which generates noise, as it is difficult to capture this fine line in a questionnaire. Due to these factors, we were unable to prove the mediation of a sense of belonging in work engagement and situational leadership, as well as in transactional leadership with acceptable CI values in the final model.

Furthermore, leadership styles studies point to leaders who motivate and inspire team members toward a holistic conception of project success (Geoghegan & Dulewicz, 2008; Maqbool *et al*., 2017; Hassan *et al*., 2017; Ding *et al*., 2017). Although this result is relevant when we evidence the negative influence of transactional leadership, which is more focused on tasks, this type of leadership reduces work engagement. Therefore, a leader's role should be focused on people relationships, which differs from the manager's role. Leaders should be characterized by efficiency, effectiveness, stakeholder satisfaction, interpersonal relationships, problem-solving, and creating a highly capable and committed project team (Muller, Geraldi, & Turner, 2011; Aga, Noorderhaven, & Vallejo, 2016; Tabassi *et al*., 2017). To the extent which team members perceive that their work environment is supportive, determines their level of motivation, energy, and effort during project implementation (Kissi *et al*., 2013).

In conclusion, the sense of belonging construct is a theoretical gap that was presented in the study by Ding *et al*. (2017). The sense of belonging mediation results helped to explain the theoretical gap in the importance of stakeholder engagement in project performance, as there is a paucity of studies that prove this importance. Therefore, our finding of the sense of belonging acting as a mediator suggests that while transformational leadership has a direct relationship to engagement, emotional attachment may be a more important factor in this relationship, which transfers the intrinsic satisfaction and motivation that generates teams' engagement. Therefore, the sense of belonging is a variable that can be seen as offering a substantial explanatory path for work engagement.

Managerial Implications

As practical implications, we reinforce that it is necessary to invest so that leaders act with a transformational style of leadership. The observed relationships showed that when transformational leadership provides a greater sense of belonging, the subordinate automatically starts to feel more engaged. Thus, appropriate training programs can improve the behavioral tendencies of project leaders, and these tendencies can become useful for the effectiveness of projects, creating a state of motivation that can increase team engagement through a sense of belonging. According to the findings of this study, the transactional leadership style did not obtain positive results, and the ambiguity of situational leadership generates noise in the understanding of the followers.

Therefore, when teams' members feel well to participate in tasks, they tend to satisfy the needs of affiliation and esteem and feel recognized as important in decision-making, which can be related to the sense of belonging (Keskin & Pakdemirli, 2016; Baskaya et al., 2020). Consequently, if organizations use a sense of belonging as the mediator of leadership and work engagement, team members care about each other and they are willing to participate more in activities taking the opinions of other members seriously (Zhao et al., 2012). Additionally, if employees show higher levels of engagement, they will contribute to their organizations with higher levels of individual task performance (Rich et al., 2014).

However, the degree of sense of belonging varies from person to person. Individuals with high levels of this behavior are more willing to define themselves by their profession, as well to participate in occupation-related processes, and continue doing their work well. It is thought that there is a positive

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relationship between the feeling of belonging and professional success (Baskaya *et al*., 2020). In this context, organizations can create professional development programs based on activities that promote a sense of belonging, which can reduce the effects of poor leadership.

Limitations and Further Research

The limitations of this research come from the construction of the scales, due to the use of adaptations from other authors of these original scales in the three styles of leadership. However, the scales were also altered to better fit our study, which happened through the face and content validation process. Given this, negative results may contribute to future research.

Accordingly, some research opportunities can be taken advantage of by applying interviews with a qualitative approach, in order to understand which elements can constitute good indicators for the constructs studied. Other variables can also emerge from exploratory studies. It is worth remembering that the activities of project professionals are knowledge-intensive, which may imply greater resistance to leadership styles based on punishment systems or oriented solely towards results.

In this context, future research must study how these relationships occur in certain types of projects, whether they use predictive methodologies approach, whether they use agile or hybrid methodologies approach. Furthermore, research can verify whether the approaches used, or segment of activity can influence the style of leadership, and the relationships between a sense of belonging that generates teams' engagement.

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Influence of the project manager's leadership styles on the work engagement mediated by sense of belonging

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Appendix A

Transformational Leadership (LTF) based in Lai, Hsu, & Li (2018), Ding et al. (2017), Maqbool et al. (2017), and Pearce & Sims (2002).
LTF1- My leader acted in a way that built respect among the people on the team.
LTF2 - My leader helped each of us develop our strengths.
LTF3 - My leader went beyond self-interest for the good of the group.
LTF4 - My leader considered my individuality and not just another member of the team.
LTF5 - My leader helped team members learn to solve problems on their own.
LTF6 - My leader encouraged me to go beyond what is normally expected by the organization.
LTF7 - My leader questioned the traditional way of doing things.

Transactional Leadership (LTS) based in Lai, Hsu, & Li (2018) and Pearce & Sims (2002).
LTS1 - My leader often expected things to go wrong and then acted.
LTS3 - My leader focused all his attention on dealing with errors, complaints, and failures, rather than focusing on results.
LTS5 - My leader recommended punishments for poor team performance.
LTS6 - My leader monitored my performance for mistakes.
LTS7 - My leader pointed out what I was doing wrong, but he didn't point out what I was doing correctly.
LTS8 - My leader delayed action until problems became serious.

Situational Leadership (LS) based in De Andrade Melo (2004), and Scandura & Graen (1984).
LS1 - My leader gave greater or lesser freedom to work depending on the subordinates' security regarding the task to be performed.
LS2 - My leader gave subordinates greater or lesser freedom of work depending on their competence to carry out the task.
LS3 - My leader gave subordinates greater or lesser freedom of work depending on the motivation to perform the task.
LS4 - My leader gave subordinates greater or lesser freedom of work depending on their willingness to carry out the task.
LS5 - My leader alternated his level of confidence in me depending on my performance.

Work Engagement (ENT) based in Ding *et al*. (2017), and Schaufeli & Bakker (2003).
ENT1 - I devoted a lot of energy to my work.
ENT2 - I was excited about my work.
ENT3 - I was proud of my work.
ENT4 - For me, my job was challenging.
ENT5 - My work inspired me.
ENT6 - In my work, I always persevered, even when things didn't go well.
ENT7 - When I woke up in the morning, I felt like going to work.

Sense of Belonging (SPP) based in Mowday, Steers, & Porter (1979), Kember & Leung (2010), and Good & Dweck (2012).
SPP1 - I was proud to tell others that I am part of that organization.
SPP2 - I was willing to go the extra mile to help my team succeed.
SPP3 - I felt like I belonged to my team.

Influence of the project manager's leadership styles on the work engagement mediated by sense of belonging

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SPP4 - I felt that I was establishing a good relationship with my team.
SPP5 - I was able to relate to my team.
SPP6 - I didn't feel like a stranger within my team.
SPP7 - I tried to participate as much as possible because I felt comfortable with my team.

Comentado [A1]: Inserir as informações